ANNUAL REPORT
2016-'17

ANGRAU

Acharya N.G. Ranga Agricultural University

Guntur, Andhra Pradesh, India

Unveiling of pylon by the Hon'ble Chief Minister, Govt. of Andhra Pradesh Sri Nara Chandrababu Naidu garu at Agricultural College, Bapatla on 26-09-2016

Release of Vyvasaya Panchangam-2017-18 by Hon'ble Chief Minister, Govt. of Andhra Pradesh Sri Nara Chandrababu Naidu garu on Ugadi Day celebration held at Vijayawada

Fifty-Third Annual Report

2016-'17

ANGRAU

Acharya N.G. Ranga Agricultural University

Guntur-522 509, Andhra Pradesh, India

Compiled by

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ANGRAU

Acharya N.G. Ranga Agricultural University
Lam, Guntur-522 034, Andhra Pradesh, India

Dr. V. Damodara Naidu
Vice-Chancellor

FOREWORD

It is a great pleasure for me to present the 53rd Annual Report of Acharya N.G. Ranga Agricultural University for the period from June 2016 to May 2017. The University which served 50 long years for United Andhra Pradesh is now serving for a residual state of Andhra Pradesh with much greater commitment and dedication by emerging as an 'Institute of National Importance'. Presently, we are keen in up scaling our brand image further duly focusing on mandatory areas viz., Teaching, Research and Extension activities to accelerate Agricultural growth and development in Navyandhra Pradesh.

During this period, altogether, 4918 students (2076 boys & 2842 girls) were on rolls of the University in Undergraduate, Postgraduate, Doctoral besides Diploma programmes. A total number of 1438 students (1192 in Agriculture; 221 in Agricultural Engineering & Technology and 25 in Home science faculties) had passed out during the academic year 2016-'17.

The ANGRAU library system comprised 10 libraries besides the Central Library at Lam, Guntur. During this period, these libraries were in receipt of over 534 Indian and 75 Foreign Periodicals in Agriculture and allied sciences. In addition, 5,324 books and about 176 theses and 284 reports have been added during the year. Noteworthy events during this period are unveiling of Pylon at Agricultural College, Bapatla by Shree Nara Chandrababu Naidu Garu, our Hon'ble Chief Minister, Government of Andhra Pradesh on 26th September, 2016 under Infrastructural Development in the Colleges of ANGRAU with Rs. 156.33 crores through NABARD-RIDF-XX. Further, University Faculty Block at RARS, Lam, Guntur was inaugurated by Sri Prathipati Pulla Rao Garu, the Hon'ble Minister for Agriculture in the presence of Sri Ravela Kishore Babu Garu, the Hon'ble Minister for Social Welfare & Empowerment, Sri B. Rajsekhar, IAS, Special Chief Secretary (Agri) and Vice-Chancellor, Hon'ble Members of Board of Management, University Officers and Staff of Acharya N.G. Ranga Agricultural University on 24.03.2017.

On the research front, during this period, eight new crop varieties viz., "Bheema (MTU 1140)", "Tarangini (MTU 1156)," "Samruddi (MTU 1155)' and "Nandyala Sona (NDLR-7)" in rice;" Tirupathi Minumu (TBG 104)" in blackgram; "Nandyala Sanaga 49 (NBeG 49)" in bengalgram; "Kadiri Amaravathi (K 1535)" in groundnut and "Prabhat (NSDH 1012)" in sunflower were released from our

University. Besides, we have developed ecologically safe approaches for combating various biotic & abiotic stresses, Integrated Farming System models, and progressed well in research including biotechnology and nanotechnology. I appreciate the efforts of our scientific personnel in presenting research at various national and international fora.

The University has an effective network transfer of technology (ToT) in realizing the desired benefit. During 2016-'17, a total of 122 technologies in agriculture, horticulture, fisheries and home science were assessed in 613 locations by KVKs; and about 107 technologies in field crops and in Horticultural crops in 347 locations were assessed by DAATT Centres. Further, 2508 diagnostic surveys, 941 capacity building programmes to Extension Personnel, Farmers and farm women and NGO's were taken up certain new initiatives like National Initiative on Climate Resilient Agriculture (NICRA); Farm Science Clubs, Tribal Youth Network, Kisan Mobile Advisories, Reach Every Panchayat, DESI programme and Integrated Agromet Advisory Services were also taken up during this year.

On the academic front, the Students' Counselling and Placement Cells are functioning in all the Colleges and Polytechnics of the University. During this year, the campus interviews were held and about 155 students were placed in different public and private organizations. I appreciate the students' efforts that were successful on getting qualified to JRFs, SRFs, NET examinations at National Level and for their active involvement in NSS activities.

I congratulate the team on their strenuous efforts in coming up with the compilation of 53rd Annual Report of ANGRAU.

వల్లభనేని దామోదర నాయుడు

(V.DAMODARA NAIDU)

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SUMMARY

Acharya N G Ranga Agricultural University (ANGRAU) was established in the year 1964 as the sole Agricultural University for the State of Andhra Pradesh. Consequent to bifurcation of Andhra Pradesh into Telangana State and residuary State of Andhra Pradesh on 02.06.2014, the ANGRAU, an Institute of national importance is now in operation in the 13 districts of residuary state of Andhra Pradesh. The University is entrusted with the responsibility of imparting quality education, research and extension in the fields of Agriculture, Agricultural Engineering & Technology and Home Science.

The University is executing its functions through its FIVE Agricultural Colleges, ONE Advanced Post Graduate Centre, ONE Institute of Agri-Business Management, TWO Agricultural Engineering Colleges, TWO Food Science and Technology Colleges, ONE Home Science College, SEVENTEEN Polytechnics, of which fourteen Agriculture, one Seed Technology and two Agricultural Engineering, THIRTY SIX research stations including SIX Regional Agricultural Research Stations (RARS), THIRTEEN District Agricultural Advisory and Transfer of Technology Centres (DAATTCs), THIRTEEN Krishi Vigyan Kendras (KVKs) and ONE Farmers' Call Centre (FCC), located throughout Andhra Pradesh.

The activities of the University taken up from June 2016 to May 2017 have been summarized and placed below.

Administration

His Excellency, the Governor of Andhra Pradesh is the Chancellor of the University. The Board of Management (BoM) with 21 Members is the governing body of the University with Vice-Chancellor as the Chairman. The BoM assembled six times during the year and took decisions on various issues and aspects. The Vice-Chancellor acts as the Chief Executive Officer of the University with the assistance of FIVE Deans (Agriculture, Agricultural Engineering & Technology, Home Science, Post Graduate Studies, and Student Affairs), TWO Directors viz. Director of Research and Director of Extension and one each of Registrar, Comptroller, Estate Officer, University Librarian and Controller of Examinations.

Teaching

- During the academic year 2016-'17, a total of 1861 students had enrolled in to the University. Of them, 1049 were from undergraduate courses, 178 in Masters, 62 in Doctoral programmes and 572 in diploma courses.
- A total number of 4918 students were on rolls of the University in different Undergraduate, Postgraduate, Doctoral and Diploma programmes. Out of them 2076 were boys and 2842 were girls.
- A total number of 1438 students comprising of 1192 in Agriculture, 221 in Agricultural Engineering & Technology and 25 in Home science faculties have passed out of the different portals of the University during the academic year 2016-17.
- Ms. G. Lakshmi Bhavani, M.Sc. (Agronomy) and Ms. K.Mrunalini have participated in Students exposure programme 13th to 17th Jun. 2016 at Wageningen, Netherlands.
- Ms.Ch. Naga Satyasri from Agricultural College, Bapatla attended Internship program on "Start Up Rural India- From Farm to Fork in Soy/ Miller Value Addition from 1st Feb, 2017 to 30th April, 2017 at Kansas State University, USA
- The NSS volunteers of various colleges actively participated in NSS Camps during the year. The NSS activities included planting

of ornamental and tree plants, sanitation programmes, awareness programmes on Health & Hygiene and AIDS, blood donation programmes, vaccination to animals, rodent control, Parthenium eradication in public places and Clean & Green programmes, etc.

- The NSS special camps of about ten days duration were organized for the students of all the final year Undergraduate and Diploma programmes.
- The students' counseling and placement cells functioned in all the Colleges and Polytechnics of the University and acted as liaison between the colleges and the public & private sector organizations / institutes that are in need of graduates/diploma holders. During this year, the campus interviews were held by several organizations and a total of 155 students got placed in different public and private organizations.
- The ANGRAU library system comprises10 libraries apart from the University Central Library located at the Head-Quarters in Lam, Guntur. All the libraries together continued to receive over 534 Indian and 75 Foreign Periodicals in Agriculture and allied sciences. In addition, 5,324 books and about 176 theses and 284 reports have been added during the year. All the libraries have a separate reference book collection viz., dictionaries, encyclopedias, almanacs, etc.

Research

- During 2016-'17, eight new crop varieties viz.,"Bheema (MTU 1140)", "Tarangini (MTU 1156)," "Samruddi (MTU 1155)' and "Nandyala Sona (NDLR-7)" in rice;" Tirupathi Minumu (TBG 104)" in blackgram; "Nandyala Sanaga 49 (NBeG 49)"in bengalgram; "Kadiri Amaravathi (K 1535)" in groundnut and "Prabhat (NSDH 1012)" in sunflower were released from ANGRAU.
- The cultures "NLR 40065", "NLR 40058", "NLR 33671", NLR 34242", "NLR 3042", "NLR 3083", "NLR 20084", "NLR 20104", "RGL 11226", "BPT 2295" and "BPT 2411"of rice, "Kadiri Chitravati (K 1719)", "TCGS 1157", TCGS 1073 in groundnut, "PPR 1012" of finger millet, "NJ2647" of white sorghum and "NJ 2446" of yellow sorghum have completed minikit testing and are ready for release.
- The rice entry viz., NLR3238 (IET24336) (4775 kg/ha) in bio-fortification studies stood first in ranking at Kerala (11890 kg/ha), Punjab (6141 kg/ha), Second in Maharashtra & Gujarat (5426 kg/ha) and it recorded 53% HRR, 3 ASV, 24.37 % Amylose content & 43 mm Gel consistency,19.06 ppm of Zinc, 4.4 ppm of Iron and 8.43 % of Protein in polished rice.
- Groundnut genotype "TCGS 1157" a short-statured Spanish bunch culture with profuse branching with high yield potential and fresh seed dormancy and higher frequency of three seeded pods with 110 days duration was identified for release and notification by the Varietal Identification Committee meeting held on 19-5-2017 at HRS, Yercaud (Tamil Nadu) for Zone III for *kharif* season.
- In rice, 19 cultures were under minikit testing during 2016-17.
- In North Coastal zone, in rice – maize system, Dhaincha as preceding crop to rice produced the highest crop residue on fresh weight basis (16.67t/ha) followed by pillipesara (11.81 t/ha) and both of them improved the grain yield of the succeeding crop of rice (6743 and 5800 kg/ha respectively) than all other pre *kharif* crops.).

- In a long term organic farming experiment in *kharif* and *rabi* seasons significantly higher tiller count, panicle count and grain yields were realized. In organic farming experiment, highest mean system grain yield was recorded with 100% RDF + micronutrients (10.22 t/ha/yr) followed by 50%RDF + 50% N as FYM (9.96 t/ha/yr).
- In semi dry rice, post emergence application of bis-pyribac sodium @ 25 g ai/ha at 20 DAS fb Ethoxysulfuron @ 20 g ai/ha+ fenoxapropPEthyl with safenor (Rice star) @ 625ml/ha^{-1} at 40 DAS recorded higher grain yield (6567kg/ha) and BC ratio (2.85).
- In Rice-Rice cropping system, the farmers practice of higher dose of NPK(102-65-62 kg/ha) recorded the system equivalent yields of 10299 kg/ha^{-1} compared to the NPK+Zn application(7349kg/ha) and reaped higher returns(Rs.67,500/-/ha).
- Efficacy studies of zinc and chelated zinc along with pesticides during *rabi* revealed that, per cent reduction in damage due to stem borer is highest (82.48 %) with zinc and profenophos, and in case of leaf folder, it is with spinosad and chelated zinc at 74.47 per cent followed by chlorantraniliprole with zinc (70.9). Highest yield is recorded in cartap hydrochloride with chelated zinc (6373 kg/ha).
- Among the biocontrol treatments during *rabi*, neck blast in rice was significantly reduced (8.57%) with four sprays *Pseudomonas fluroscens* @10g/l with 1% milk powder and was at par with four sprays with *Pseudomonas fluroscens* @10g/l at 15, 30, 45 and 60 DAT. Leaf blast was significantly reduced with three sprays of *Pseudomonas fluroscens* @10 g/l at 15, 30 and 45 DAT and with four sprays with *P. fluorescens* @10 g/lat 15, 30, 45 and 60 DAT.
- In rice fallows maize, the highest C: B ratio of 2.13 was recorded with atrazine @ 1.0 kg/ha + paraquat @ 0.60 kg/ha as Pre Emergence followed by topramezone @ 0.025 kg/ha at 25-30 DAS (seed yield-10400 kg/ha), atrazine @ 1.0 kg/ha + paraquat @ 0.60 kg/ha as Pre Emergence and tembotrione @ 0.100 kg/ha at 25-30 DAS with 2.11 (seed yield-10135kg/ha).
- Maize stem borer damage was significantly low in all the NBAIR entomopathogenic Beauveria strains i.e., *Beauveria basiana* -19 (1.5 % DH), *Beauveria basiana* 23 (2.32%DH), *Beauveria basiana* -7 (2.58 %DH), *Beauveria basiana* -5a (2.64 % DH), *Beauveria basiana* 14 (3.14% DH) and Ma 35 (1.8%DH) as compared to carbofuran whorl application (6.34 % DH) and untreated control (12.48%DH).
- In released hybrid and varietal trial, the hybrid Pratap recorded highest grain yield (3374 kg / ha) followed by PAC 909 (3175 kg/ha), 86 M 86 (3064 kg/ha) and NBH 5061 (3059 kg/ha).
- In pearlmillet, atrazine @ 0.75 kg/ha, pendimethalin @ 1.0 kg/ha and alachlor @ 1.0 kg/ha as pre-emergence recorded a grain yield of 13.75 q/ha, 12.50 q/ha and 12.50 q/ha, respectively compared to 7.50 q/ha recorded in untreated check. Among the post emergence herbicides metsulfuron 0.0015 kg/ha + chlorimuron @ 0.0015 kg/ha at 20 DAS recorded a grain yield of 18.75 q/ha followed by 2, 4-D Sodium salt @ 0.80 kg/ha at 20 DAS with 17.50 q/ha.
- Fingermillet culture PR 10-35, nominated for national level multi location testing (MLT) has gained second rank among 13 entries tested during kharif, 2016. In addition the entry has exhibited resistance against banded sheath blight.

- Fingermillet culture "PR 10-45" which has completed testing as pre released culture under coordinated trials has been given for fourth year minikit testing in Andhra Pradesh. The entry was reported to have shown 14.9% yield advantage over the check PR 202 with lodging tolerance.
- Among different inter crops, fingermillet equivalent yield (6721 kg/ha) was significantly high in Fingermillet + Bhendi (8:2) system with per he returns (Rs.118926.00) and B:C ratio(4.11), followed by Fingermillet + Pigeon pea system (8:2).
- The foxtailmillet variety SiA 3222 with 58 days duration completed the minikit testing and ready for release.
- Among different contingent crops sown in the month of August, foxtailmillet has recorded highest yield of 529 kg/ha compared to other crops with higher net returns of Rs. 2558/- and B:C ratio of 1.32.
- The redgram variety, TRG-59 (ICP7035x ICPL-87119) tolerant to wilt and sterility moraic disease completed second year minikit testing during 2016 with an yield of 2092 kg/ha against check LRG-41(1828kg/ha) in State level MLT.
- Redgram based cropping system for climate resilience (kharif & rabi), groundnut + Red gram 7:1 recorded the highest redgram equivalent yield (2215kg/ha) with higher net returns (Rs 40,135/ha) fb cluster bean + redgram in 5:1 ratio(2113 kg/ha; Rs33,899/-) under rain water management.
- The blackgram entry GBG-1 is proposed for second year of minikit testing and the blackgram entry GBG-12 is proposed for first year of the minikit testing during 2016.
- The weed management practices in black gram during rabi season indicated that, significantly superior grain yield (825 kg/ha) was recorded with two hand weedings at 20 and 35-40 DAS followed by application of Clodinofoppropergyl 8%+aceflorfen sodium 16.5 % @187.5 g a.i /ha at 25-30 DAS (725 kg/ha) compared to the check.
- The blackgram entries IPU 12-20, OBG 39, VBG 12-0-34 and TJU 258 were found promising against YMV during rabi 2016.
- In blackgram,IPM module (seedtreatment with imidacloprid 600 FS @ 5 g/kg seed, sorghum as border crop, yellow and blue sticky traps 20 each/acre and spraying azadirachtin 10000 ppm@ 200 ml/acre) realized a CB ratio of 1: 2.8 against 1:1.15 in famers practice (non-IPM).
- Greengram culture GGG-1 is an extra early variety with 55-60 days duration, a bold and shiny seed with yield potential of 17-18 q/ha and suitable for preceding paddy and rabi seasons.
- During kharif, the mungbean recorded significantly higher grain yields (637 kg/ha) with hand weeding at 20 and 35-40 DAS and was superior to all other treatments. Among the herbicidal treatments, the maximum grain yield (555 kg/ha)was registered with post-emergence application of imazethapyr 55g a.i./ha at 15-20 DAS followed by pre-emergence application of pendimethalin + imazethapyr @1.0kg/ha (491 kg/ha).
- In IPM module seedtreatment with imidacloprid 600 FS @ 5 g/kg seed, sorghum as border crop, yellow and blue sticky traps @ 20/acre and spraying azadirachtin 10000 ppm@ 200 ml/acre) realized a CB ratio of 1: 2.8 against 1:1.15 in famers practice (non-IPM).
- In molecular mapping of Yellow Mosaic Virus tolerance in mungbean *(Vignaradiata L.)*, identified an SSR marker SVGG7 loci,

distinguished the YMV tolerant genotype from the susceptible genotypes. This marker can be employed in molecular mapping confirmation and further in marker assisted breeding for YMV tolerance.

- Ten promising entries of chickpea viz., NBeG 776, NBeG 738 (IVT Desi), NBeG 620, NBeG 779 (IVT Rainfed), NBeG 778, NBeG 785 (IVT late sown), NBeG 510, NBeG 790 (IVT ELSK), NBeG 529, NBeG 440 (IVT Kabuli) were included in co-ordinated trials during 2016-17.
- Post emergence application of acifluorfen sodium + clodinafop propargyl 160 + 80 g a.i. recorded grain yield of 1830kg/ha followed by hand weeding at 20 and 40 DAS (1872 kg/ha^{-1}) and resulted in higher net returns (Rs 74,075/-) and benefit cost ratio (2.07) in chickpea.
- Cowpea variety, TPTC-29 was released as Tirupati cowpea -1 in 2016 and notified in 76th variety release committee meeting held on 31-1-2017.It is dual purpose variety with bold seeded long pod suitable to all seasons with 15 q/ha^{-1} seed yield in 80-85 days.
- Studies on the performance of fodder cowpea varieties under varied phosphorus levels in rainfed conditions during kharif - 2016 revealed that the entry EC-4216 recorded significantly highest green fodder yield of 9.5 t ha^{-1} which was comparable with Co-8 (9.5 t ha^{-1}.).
- Rajmash varieties viz., Arun (15.3 q/ha), Amber (13.2 q/ha) and Utkarsh (12.3 q/ha) have recorded higher yields and local variety CTPL Red (5.26 q/ha.) in tribal areas.
- The groundnut variety TCGS 1157, a short-statured Spanish bunch culture with profuse branching, high yield potential, fresh seed dormancy and higher frequency of three seeded pods with 110 days duration was identified for release and notification by the Varietal Identification Committee meeting held on 19-5-2017 at HRS, Yercaud (Tamil Nadu) for Zone III for *kharif* season.
- TCGS 1073 a high yielding water use efficient groundnut culture with bold seeds suitable for *kharif* and *rabi* (irrigated situation) maturing in 105-110 days with mean pod yield of 2371 kg/ha in *kharif* season 3440 kg/ha in *rabi* season is ready for release.
- In drought advanced varietal trial of groundnut during *kharif*-2016, only one entry viz., TCGS-1546 (pod-1852 kg/ha, kernel-1296 kg/ha) gave significantly higher pod (23%) and kernel yield (24%) over the check variety Dharani (pod-1467 kg/ha, kernel-1041 kg/ha).
- Among different isolates of the beneficial bacterium *Pseudomonas fluorescens* (antibiotic diacetylphloroglucinol (2-4 DAPG), P-86 has recorded significantly higher pod yield (948 kg/ha) than all other treatments but on par with DAPG-2. Dry root rot was significantly lowest with DAPG-2, which was on par with DAPG-4, FP-86 and Trichoderma spp compared to other treatments. Stem rot incidence was also significantly lower with DAPG-2, but on par with DAPG-, FP-86 and FP-98.
- Profitability of intercropping system of groundnut with redgram under paired row planting system indicated that higher groundnut equivalent yield was recorded with groundnut + redgram (8:1) which was on par with groundnut + redgram (14:2) intercropping system and both of them are significantly superior to other intercropping systems. Higher net returns were recorded with groundnut + Redgram (8:1).
- Pendimethalin @ 1.5 kg ai/ha (pre-

emergence) + imazethpyr (60%) + quizalofop ethyl (40%) resulted in lowest weed density, weed dry matter, highest weed control efficiency in groundnut, which was on par with two other tank mix applications along with pendimenthalin as pre-emergence and pendimethalin @1.5 kg ai/ha (pre-emergence) + Imazethpyr @ 75 g ai/ha.

- Among different nutrient management practices, application of FYM @5t/ha+100% P + DGRC2 resulted in significantly higher pod yield (664 kg/ha) and was on par with two other 100 % P applied treatments and FYM @ 5t/ha + 50% P + DGRC2. Higher gross and net returns were also recorded with FYM @ 5t/ha+100% P+DGRC2, whereas beneft cost ratio was higher with FYM @ 5t/ha + 50% P+DGRC2.
- In pooled analysis among 35 entries screened for resistance against thrips and leaf hoppers during *kharif*, 2014, 2015 and 2016 revealed that lowest thrips foliar damage of 6.30 % recorded in TCGS 1327 fb SB 5 (6.62 %) and SB-10 (7.48 %). Lowest leaf hopper foliar damage of 3.17 % recorded in TCGS 1097 followed by SB-5 (4.16 %) and TCGS 1157 (5.28 %).
- Among different concentrations of nano zinc oxide particles against peanut stem necrosis disease, maximum incubation period (localized infection: 7 days post inoculation; systemic infection: 15 days post inoculation) coupled with less % of PSND (53 .0 %) at 21 DPI (days post inoculation) and less virus titer (0.83) were recorded by spraying nano zinc oxide @ 1000 ppm.
- Compatibility of insecticides and fungicides in groundnut ecosystem" revealed that, five insecticides novaluron @1ml/l, thiodicarb @1g/l, chlorfenapyr@2ml/l, chlorpyriphos @2.5ml/l, Indoxacarb @ 1.0ml/l, were physically and chemically compatible with three fungicides viz., tebuconazole@1g/l, chlorothalonil@2g/l and hexaconazole @2ml/l.
- In management of peanut bud necrosis disease, high reduction of both PBND (4.7 %) and thrips damage (33.2 %) and high pod (937 kg/ha) and haulm yield (1816 kg/ha) were recorded by adopting practices of border crop with bajra (4 rows) + seed treatment with imidacloprid 600 FS@ 1 ml/kg seed + foliar sprays using thiocloprid 480 SC @ 150 ml//ha at 20 - 25 DAS followed by Fipronil 5 SC @ 2 ml/l @ 40 DAS and Acetamiprid 20 SP @ 100 g/ha at 35-40 DAS].
- In All India Sunflower Hybrid Varietal Trial, entries IHT 1030 (1124 kg/ha), IHT 1036 (1085 kg/ha) & AHT 9 (1047 kg/ha) have recorded high grain yield during kharif 2016. Similarly, I.H.T 255 (1821 kg/ha), IHT 253 (1809 kg/ha), IHT 259 (1807 kg/ha) and IHT 2 (1644 kg/ha) recorded top yields during rabi 2016-17.
- Pooled data for three consecutive years on *Alternaria* leaf spot disease control in sunflower indicated that, seed treatment with *Pseudomonas flourescens* @ 10g/ kg seed, spraying propiconazole 0.1% at 45 days and *Pseudomonas flourescens* (1 %) at 60 days were effective in reducing the disease with higher grain yield (1193 kg/ha).
- Seed treatment with new insecticides i.e., imidacloprid 5 ml/kg of seed, spray with spiromesifen 1 ml/l at 30 & 45 days after sowing during *rabi* effectively reduced the incidence of necrosis (5.88%) and leaf curl (7.14%) whereas control recorded 6.96% and 17.2%, respectively.
- In sesame, two hand weedings at 15 and 30 DAS significantly reduced weed

population,weed dry weight and increased weed control efficiency with more seed yield (427 kg/ha) followed by pendimethalin @ 0.5 kg a.i/ha and quizalofop-ethyl @ 40 g a.i / ha at 20 DAS .

- Post emergence application of pendimethalin followed by chlorimuron ethyl @ 10 g reduced the weed growth significantly and gave higher kernal yield (1054 kg/ha), net returns (Rs12,015/-) and benefit cost ratio (1.295) than the hand weeding twice in castor.
- The inter specific cotton hybrid *(G. hirsutum & G. barbadense)* LAHB 1 tested in National Trial was promoted to Zonal Trial in Central Zone and South Zone.
- In the HDP cotton cultures, LHDP1 stood first in Zonal Trial during 2016-17 and is proposed for agronomic evaluation and on farm trial during 2017-18.
- Two prerelease cotton cultures viz., NDLH 2010 *(G.hirsutum)* and NDLA 2985 *(G. arboreum)* exhibited good performance in minikit testing were promoted for on-farm testing.
- Higher weed control efficiency (62.0 %) was observed at 90 DAS with Pendimethalin @ 1.0 kg a.i/ha as pre-emergence followed by glyphosate @ 5 ml/lit as spray at 2-4 weed leaf stage + one hoeing compared to lower weed control efficiency (27.6%) in Chlorimuron Ethyl @ 4.0g a.i/ha at 2-4 leaf stage weed + one hoeing at 90 DAS.
- Application of Spinetoram 10% w/w + Sulfoxaflor 30% w/w WG was highly effective against all the sucking pests in cotton at 300 and 350 g/ha followed by Sulfoxaflor 30% w/w WG @ 350 ml/ha. While, Fenpropathrin 15% EC @ 750 ml/ha, either alone or in combination with Pyriproxyfen 5% EC @ 750 ml/ha was found effective against pink bollworm in cotton.
- Inundative release of *T. bactrae* twice at flowering and thrice at boll formation stage helps in reducing the pink bollworm when compared to untreated control.
- In Mesta based intercropping system, Mesta intercropped with Mungbean, Urdbean and Groundnut in 3:4 row ratio recorded highest equivalent fibre yield of 22.97, 22.09 and 21.52 q/ha^{-1} respectively against 20.9 q/ha in sole mesta.
- Metalaxyl MZ as seed dresser and foliar spray against *Phytophthora parasitica* var. *sabdariffae* in Mesta recorded less incidence of disease (2.73%) at the time of harvest followed by trifloxystrobin (2.94%), cymoxanil (3.0%), copper oxychloride (3.43%) and azoxystrobin (3.56%).
- The sugarcane clone 2011 A 294 has recorded medium sucrose content of 16.75, fibre percent of 16.12 and high biomass of 1295 g per stool among the energy canes in Main Yield Trial ratoon crop.
- Post-harvest deterioration losses in sugarcane clones indicated that the clone 2007 V 127 maintained less loss in quality (0.516) and cane weight (1.91%) even after 72 hours after harvesting. TAI was less in 2007 V 127 and dextran formation was less in 2007 V 127 when compared to other clones.
- Application of organics and in-organics in improving soil health and sugarcane productivity of ratoon crop indicated that application of FYM @ 10 t/ha + biofertilizer + 100% inorganic nutrient (89.9 t/ha) or application of FYM @ 10 t/ha+ Biofertilizer + inorganic nutrient application based on soil test (89.6 t/ha) registered significantly higher cane yield as compared to application of trash and 50% RDF registered lowest cane

yield of 76.4 t/ha.

- Efficacy of liquid bio fertilizers in comparison with carrier based bio fertilizers in sugarcane (ratoon) revealed that, shoot population at harvest (85815/ha), cane yield (82.65 t/ha) and sugar yield (11.11 t/ha) were the highest with 100 % Recommended Dose of Fertilizers + liquid Azospirillum + liquid PSB indicating the efficacy of liquid biofertilizers than the solid biofertilizers.
- Post emergence application of halosulfuran 75% WG at 40 days after planting controlled the Cyprus weeds effectively (72% WCE) and gave cane yield (123.9 t/ha) and is on par with three hand weedings and proved significantly superior over weedy check (77.8 t/ha).
- Fertigation of 125% RDN + 125 % RDK in 12 equal splits through drip from 30-150 DAP recorded highest cane yield (107.8 t/ha) followed by application 100% RDN + 100 % RDK in 12 equal splits through drip from 30-150 DAP (104.2 t/ha) and 75% RDN + 75 % RDK in12 equal splits through drip from 30-150 DAP (102.4 t/ha).
- Under water logging conditions 2011 V 102 (mid late) recorded higher cane yield (127.43 t/ha) and higher per cent juice sucrose of 17.50 against the standard Co 7219 (77.93 t/ha and 17.51%).
- Trash mulching + *Trichogramma chilonis* release @ 75,000/ha from 30 DAP for 6 times and two releases after node formation (9.48 %) and Trash mulching+ *Trichogramma chilonis release* @ 50,000/ha from 30 DAP - 6 releases at 7-10 day interval and two releases after node formation (9.85%) were found effective in managing shoot borers in sugarcane with high cane yield (125.51 t/ha and 114.72 t/ha).
- Soil application of chlorantraniliprole 0.4G @ 22.5kg/ha (5.8% DH), fipronil 0.3G @ 25 kg/ha (5.87 % DH) at planting and 60 days after planting, spraying of chlorantraniprole18.5 SC @ 375 ml/ha^{-1} (5.95% DH) at 30 & 60 days after planting was effective against the early shoot borer compared to untreated control (20.58% DH).
- Eco friendly management of red rot disease in sugarcane indicated that the *Rhizobacteria* 7 and 19 are highly antagonistic to *C. falcatum* under in vitro conditions and sett treatment with *Rhizobacteria* increased sett germination and seedling vigour when compared to control.
- The tobacco entry NyBTH 121 has exhibited good performance and included in IHT of All India Coordinated trials.
- In bidi tobacco foliar application of KNO_3 twice at 45 and 60 days after transplanting the cured leaf yield was significantly higher (1783 kg/ha) than foliar spray with Ammonium Sulphate twice at 45 and 60 DAT (1743 kg/ha). While supplementation of N & K fertilizer twice at 45 and 60 DAT through Ammonium sulphate + Sulphate of potash has recorded maximum net returns of Rs. 80169 /- ha and Rs. 69645/- ha than KNO_3 spray twice at 45 and 60 DAT.
- The crops and cropping systems performance under delayed monsoon conditions, castor crop recorded higher net returns (Rs 70,664) followed by cowpea as vegetable (Rs 65,175) and redgram (Rs 59,585) during August II fortnight, while at September I FN sowings, cowpea as vegetable (Rs 60,950) followed by castor + korra recorded higher net returns (Rs 47,552) and castor (Rs 42,764) followed by horsegram (Rs 33,025) recorded higher returns during second fortnight sowings.

- On farm diversified farming system of Crop + Dairy + Vermicompst across 24 marginal tribal households indicated annual higher returns (Rs.55,600) over the bench mark value of farm returns (Rs.48,400) with the effective recycling of the residues in the systems by minimizing, the external inputs.
- Adaption of reclamation technology like insitu incorporation of green manure @12 kg ac^{-1} at 50 % flowering stage, application of gypsum @ 2.5 t ac^{-1} and zinc sulphate @ 20 kg ac^{-1} to reduce the adverse effects of alkali soil in Rice crop (NLR-23334) , 6.25 to 31.25 % increase in yield compared to non-reclaimed soil.
- Potassium silicate application recorded significantly higher grain yield (5686 kg ha^{-1}) and straw yield (6237 kg ha^{-1}) compared to control (grain yield:4631 kg ha^{-1} and straw yield:5118 kg ha^{-1}) and was on par with calcium silicate application in both grain and straw of paddy.
- In mole drainage systems, the temporarily waterlogged soils can be reclaimed with low cost mole drainage systems and addition of soil oxygenation agents (placement of Calcium peroxide granular powder @2 g/ plant at 15 cm deep and 15 cm away from the plant) during monsoon season will ensure good aeration. The combined effect of mole drainage and soil oxygenation resulted in 25-38% increase in the sugarcane yields of Co 86032 variety.
- Higher pigeonpea equivalent yield was obtained with subsoiling at 1 m distance (331 kg/ha^{-1}) and was on par with subsoiling at 2 m distance (293 kg/ha^{-1}) and significantly superior to no subsoiling. Among crops tested, castor produced higher pigeonpea equivalent yield (396 kg/ha^{-1}), which is on par with Bajra (347 kg/ha^{-1}) and were significantly superior to other crops. Whereas, subsoiling at 1 m distance produced higher net returns and among crops, Bajra produced higher net returns.
- Complete mechanization of groundnut cultivation, the proper tillage with primary tillage implement has given better results and gave 15.9% more yield. The crop sown with control track system of sowing reduced about Rs. 1,400/acre expenditure on groundnut intercultural operations.
- Estimation of actual evapotranspiration and crop coefficients for groundnut revealed that highest pod yield was recorded with 0.8 IW/ CPE ratio under all sowing environments and the crop coefficients by irrigating the crop at 0.8 IW/CPE can be used for realizing higher yields along with saving of irrigation water.
- For control pulse bruchid in blackgram, clove (3.5 adults), sweet flag rhizome (1.5 adults), and tobacco leaf powders (1.5 adults) were effective as grain mixing at 0.4 compared to untreated control (587 adults).
- During storage, mixing of black pepper powder @ 0.4%(no adults emergence) was very effective in controlling pulse bruchid in greengram compared to the untreated control (1530 adults emerged).
- Jaggery tablets prepared with and without binders met the IP standards. The tablets prepared without using any binder for compression of jaggery into tablets will reduce cost and also minimizes the use of external binders. The jaggery tablets prepared without binder can be kept for storage for a period of 3 months under ambient temperature (28±2°C) at 60% RH..
- Standardized the process technology for the preparation of various value added products from jaggery under value chain i.e., jaggery chocolates, oats-jaggery cookies, jaggery cakes, jaggery based mouth fresheners and

jellies, and sold to the public at the sale counter, RARS, Anakapalle.

- Germination percent of 80% was recorded in blackgram and greengram seed when stored upto for 10 months using 6 % wood powder or 2 % neem kernel powder or 6 % neem leaf powder at farmer level.
- In molecular tagging study for the 'Mungbean Yellow Mosaic Virus, in greengram molecular mapping of Yellow Mosaic Virus tolerance, an SSR marker SVGG7 loci, distinguished the YMV tolerant genotype from the susceptible genotypes unambiguously was identified. This marker can be employed in molecular mapping confirmation and further in marker assisted breeding for YMV tolerance. (MYMV) tolerance' in mungbean, an SSR marker CEDG305 was identified to be distinguished the tolerant genotypes.
- For North Coastal Zone, the cost of cultivation per hectare was worked out for crops such as sugarcane (Irrigated- plant crop Rs 1,81,610, ratoon crop Rs 1,32,280), rice (Rs78,,852), maize (Rs 1,00,452), groundnut (Rs 59,110), ragi (Rs 63,050), redgram (Rs 29,750), Rice fallow black gram (Rs 13,738), Rice fallow green gram (Rs 14875), sesame (Rs 22,000) and mesta (Rs 71,320).
- The per quintal cost of production of cotton, sugarcane, bengalgram, chillies. redgram, turmeric and tobacco was Rs.4700.82/-, Rs.3383.34/-, Rs.4140/-, Rs.6923.37/- , Rs.7489/-, Rs.5279/- and Rs.18980/- respectively.
- A quantity of 14,443 quintals of breeder seed was produced during 2016-17 against the target of 12401 quintals. Large quantity of breeder seed (3076 q) was produced in rice particularly in five varieties viz., BPT 5204, MTU 1001, MTU 1010, MTU 7029 and NLR 34449. Groundnut breeder seed 10297 quintals was also produced during 2016-17 against the target of 9140 quintals. In addition, 10,646 quintals of foundation seed was produced in different crops during the year 2016-17.
- A total of 208.6 Metric tons of powder biofertilizer formulations and 39.0 Metric tons of liquid biofertilizer formulations to a worth of Rs. 200.8 lakhs were produced and supplied to the farming community of Andhra Pradesh during the year 2016-17.
- Over all by application of biofertilizers, could able to save 50% of chemical fertilizers with an extra benefit of 14.7% yield increase over 100% RDF in pigeonpea crop during 2016-17.

Extension

- During the year 2016-17, the DAATT Centres and KVKs(5 no.) together have tested 47 minikit cultures of 12 crops i.e., Jowar, Bajra, Ragi, Korra, Redgram, Blackgram, Greengram, Bengalgram, Groundnut, Cotton and Chillies at 1773 locations covering all the districts of the state.
- During 2016-17, a total of 122 technologies in field crops (62), Horticultural crops (38), Fisheries (13) and Homescience (9) assessed in 613 locations by KVKs and DAATT Centres assessed about 107 technologies in field crops (106) and in Horticultural crops (1) in 347 locations.
- During the year 2016-17, a total of 1215 frontline demonstrations covering 670.40 ha under pulses, cereals, oilseeds, commercial crops, horticulture crops, fodder crops and livestock areas.
- During 2016-'17, a total of 2508 diagnostic surveys were undertaken in different districts of the state. Out of 2508, 738 surveys were undertaken by the DAATTC scientists and

Es alone and 956 by KVKs alone while 814 surveys were conducted jointly by the DAATTC, KVK, ARS Scientists and Officers of DOA.

- About 157 capacity building programmes to Extension Personnel, 668 programmes to Farmers and farm women,116 programmes to NGO's, 478 Method demonstrations,52 Vocational training programmes, 23 AMC level farmers training, 102 Rythu sadassus, 1063 Group sadassus and 189 Field days organized for the benefit of the farmers etc.
- KVK, Undi, West Godavari with the financial assistance of ASCI, New Delhi conducted skill training programmes of 200 hours duration on two job roles viz., quality seed grower and organic grower each with 20 participants. A total of 120 fish farmers and farm women gained knowledge and skills during the human resources development training programmes on culture, capture, value addition, disease management, breeding of fish, water quality management in fish ponds and integrated farming etc.
- The DAATTCs and KVKs had altogether conducted a total of 902 group discussions for 15462 farmers, which included topics like green manure crops before rice, weed management in direct sown rice, zero tillage in maize, management of YMV in pulses, production technology for summer pulses, IPM in groundnut, management of *botrytis* grey mold in castor, good agricultural practices in cotton, budchip method of planting in sugarcane, seed production at farmers level, kharif contingency plan, management practices in vegetable crops, plant protection in mango, Nutritional gardening, Techniques in Vannamei culture, feed management in carp culture, management of acidic and alkaline soils, agriculture farm machinery, importance of drudgery reducing implements etc.
- A total of 151 field days were conducted by DAATTCs and KVKs and benefited 4396 farmers. These included field days on varieties of rice (MTU 1061, NDLR 47,), sugarcane, groundnut (Dharani, TCGS 1073), redgram, blackgram (LBG 752), MSRI in rice, sunflower, drum seeder technology in rice, zero tillage cultivation in maize, soil test based fertilizer application in paddy, management of foliar diseases in cotton, liquid bio fertilizer in rice, captive rearing of fish etc.
- Kisan Melas were organized at RARS, Maruteru, Nandyal and Chintapalli during the period under report. On the occasion of World Soil Day on 5th December, 2016, eight, Kisan Sammelans (pre-rabi) were organized at viz., KVKs Rastakuntubai, Undi, Garikapadu, Ghantasala, Darsi, Nellore, Kalikiri, Banavasi.
- Under distance education through a private TV channel, ETV under "Annadata-Velugubata" programme from 2nd October, 1998 twice a week, Tuesday and Friday. After bifurcation of the University the distance education again became functional from July, 2016. Under this programme, on Wednesday and Friday in Pasidipantalu Phone–in-Live programme, about 28 programmes telecasted by Doordarshan on agriculture and allied subjects during the year 2016-17.
- The Annapurna programme of TV5 will run for three days in a month on first three Thursdays on agriculture and allied subjects in which a scientist from the university will answer the questions asked by the farmers on a pre-informed topic of the day, from 5.30 to 6.00 PM. Five prorgammes were telecasted during the year 2016-17.
- The Vyavasaya Patasala programme was

broadcasted on every Monday in All India Radio (AIR) and a total of 9 programmes were broadcasted using the services of ANGRAU scientists.

- Agricultural Information and Communication Centre (AI & CC), Guntur has brought out the publications viz., Vyavasaya Panchangam, Journal of Research, ANGRAU (Quarterly) and Vyavasayam – Monthly Telugu Farm Magazine during the year 2016-17.
- Three KVKs namely Reddipalli, Banavasi and Nellore have organized one year long duration training under DAESI programme for 120 inputs dealers during 2016-17 to transform them as para-extension professionals.
- With an objective of creation of awareness among farmers and other stakeholders about the provisions of Protection of Plant Varieties and Farmers Right Act 2001, three (3) Krishi Vigyan Kendras viz., Nellore, Reddipalli and Utukur have organized training programme during the year 2016-17. A total of six awareness cum training programmes on provisions of PPV and FR act 2001 were organized and 324 farmers and 35 extension personnel have participated.
- Three zonal-level pre-action plan workshops were organized at RARS, Tirupati (for Southern and Scarce rainfall zones), RARS, Anakapalle (for North Coastal and High Altitude & Tribal Area Zones) and at RARS, Lam, Guntur (for Krishna and Godavari zones) with a purpose to identify suitable location specific emerging technologies developed by researchers for on farm assessment under OFTs (on-farm trials).
- The scientists of the DAATTCs and the KVKs along with other scientists of the research stations actively participated in T&V Meetings, Polam Pilusthondi, AMC Level Interaction Meetings, Janmabhumi – maa uuru programme, swachhta pakhwada, jai kisan and jai vignan programme and interacted with the farmers and suggested solutions for their problems.
- During the year 2016-17, the Directorate of Extension organized two workshops on 'Strengthening of Extension Services in ANGRAU' at DAATTC, Vijayanagaram and KVK, Utukur with the involvement of the Scientists of KVKs, DAATTCs, innovative farmers and progressive farmers.
- Several android based mobile applications were developed and kept for downloading by the farmers free of cost from Google play store. The applications developed / supported from ANGARU are Eruvaka, Greeshma, Krishi Vigyan, Mana verusanaaga, Plantix, and also Pocket Cards for the benefit of the farming community.
- In addition to existing popular extension methods such as Flag Method and Developing Farmer Master Trainers, etc., new initiatives such as National Initiative on Climate Resilient Agriculture (NICRA), Farm Science Clubs, Tribal Youth Network, Reach Every Panchayat, Kisan Mobile Advisories and Integrated Agromet Advisory Services etc., have been taken during the current period.

Research Publications

- The research and extension activities carried out by the students and the faculty were published in various national and international journals, accounting to a total of 442 number by the teaching faculty, 20 in agricultural engineering, 465 number by the research scientists and 13 number by the extension specialists, besides 18 number under chapters and books, during the report period.

Awards

- Dr. G. Ramachandra Rao, Professor, Department of Environmental Science, Advanced P.G. Centre, Lam received Dr. I.V. Subba Rao, Rythu Nestham award for his excellence in extension activities as DAATTC Co-ordinator.
- Dr. K. Radhika, Associate Professor Department of Seed Science & Technology received Sri Mandava Venkataramaiah Best Teacher award.
- Dr. Lal Ahamed M, Assistant Professor Department of Molecular Biology & Biotechnology was conferred with University Best Teacher award.
- Dr. P. V. Krishnayya, Professor and University Head, Entomology received Ugadi Puraskar for the year 2017.
- Dr. V. R. K. Murthy, Professor and Head, Department of Agronomy, Agricultural college, Bapatla, received Andhra Pradesh State Best Teacher award on 05.09.2016
- Dr. B. Venkateswarlu, Professor, Department of Agronomy, Agricultural college, Bapatla, received Best Teacher award as Ugadi Puraskaram in April 2017 from State Government of Andhra Pradesh.
- Dr. M. Shanthi Priya, Associate Professor, Department of Genetics and Plant Breeding, S.V. Agricultural College, Tirupathi was adjudged with University Best Teacher award for the year 2014 during 48th convocation held at Agricultural College, Bapatla.
- Dr. S.R.Koteswara Rao, Professor and Head, Department of Entomology, S.V. Agricultural College, Tirupathi received State level Best Teacher award for the year 2016.
- Dr. P. Sudhakar, Professor and Head, Department of Crop Physiology, S.V. Agricultural College, Tirupathi received Ugadi Puraskarm Award -2017 from the Government of Andhra Pradesh.
- Dr. K.N. Ravi Kumar Professor and Head, Department of Agricultural Economics, Agricultural College, Mahanandi, received State Best Teacher Award-2016 from the Government of Andhra Pradesh.
- Dr. L. Edukondalu, Assistant Professor, College of Agriculture Engineering, Bapatla, received "Meritorious Teacher Award".
- Dr. Ch. V. V. Satyanarayana, Assistant Professor, College of Food Science and Technology, Bapatla received A.P State Best Teacher award from the honorable Chief Minister of A.P on 7.9.2016 at Vijayawada.
- Dr. S.V.S. Gopala Swamy, Scientist, Entomology, Post Harvest Technology Centre, Bapatla received "MERITORIOUS SCIENTIST AWARD" in the Agriculture from the Honorable Chief Minister of Andhra Pradesh, Sri. N. Chandrababu Naidu on the occasion of 48th Annual Convocation of Acharya N. G. Ranga agricultural University on 26th September, 2016 at Bapatla.
- Er. S. Vishnuvarddhan, Scientist, Agricultural Engineering and Food Processing, Post-Harvest Technology Centre, Bapatla received "MERITORIOUS SCIENTIST AWARD" in Agricultural Engineering from the Honorable Chief Minister of Andhra Pradesh, Sri. N. Chandrababu Naidu on the occasion of 48th Annual Convocation of Acharya N. G. Ranga agricultural University on 26th September, 2016 at Bapatla.
- Dr. T. S. S. K. Patro, Senior Scientist and Head, ARS, Vijayanagara received Special Recognition Award-2016 during 5th International Conference on Integration of Science and Technology for Sustainable Development 2016 held during 26th and

27th, November, 2016 at Inle Cherry Queen Hotel, Southern Shan State, Myanmar.

- Smt. N.Anuradha, Scientist, Plant Breeding, ARS, Vijayanagaram received BRICPL Young Scientist Award-2016 at International Conference on Emerging Trends in Chemical, Physical and Biological Sciences (ICET-2016) held during 9th to 11th December, 2016 at Kathmandu, Nepal.
- Smt. Ch. Sreelakshmi, Scientist, Plant Breeding, ARS, Nellore, received Young Scientist award during 48th Annual convocation at Agricultural College, Bapatla on 26.09.16.
- Dr.P.Jamuna, Principal Scientist and Extension Specialist, RARS, Anakapalli received Ugadi Puraskaralu for the year 2017 from Hon'ble Chief Minister, Shri Nara Chandra Babu Naidu garu at Thummalapalli Kala Kshetram, Vijayawada on 29.3.2017.
- Dr. Ch.Mukunda Rao, Principal Scientist, Crop Physiology, RARS, Anakapalli received an award of Meritorious Scientist 2017 from International journal of tropical agriculture (IJTA), Rishikesh, Uttarakhand on 24.06.2017.
- Dr. B. Bhavani, Senior Scientist, Entomology received KCP Award of Prize (Gold medal) to an Agril. Scientist working in ANGRAU for notable and original research contribution on any aspects on Sugarcane production under endowment fund made by Sugarcane Growers Association of M/s. KCP Limited, Vuyyur for the year 2014 during 48th Annual Convocation of ANGRAU held on 26-9-16 at Agricultural College, Bapatla.
- Dr. Ch. S. Rama Lakshmi, Scientist, Soil Science received VR Durgamba Charitable trust endowment award for organic farming research in Sugarcane during 48th annual convocation of ANGRAU on 26.09.2016 held at Agricultural College, Bapatla.
- Dr. M. V. Ramana, Principal Scientist, Agricultural Engineering, RARS, Tirupathi recevied Dr. A. V. Krishnaih Memorial gold medal award for the year 2014-15 during 48th annual convocation held at Agricultural college Bapatla on 26.9.2016.
- Dr P. Pratima, Senior Scientist, Agro-meteorology, RARS, Tirupathi received National Level Best Agromet Field Unit award among 130 AMFUS on 142nd Foundation Day celebrations on 15th January, 2017 at Mausam Bhavan, Lodhi Road, New Delhi.
- Dr. Satish, Scientist, Plant Breeding, RARS, Lam, Guntur received University level Meritorious Research Scientist Award during 48th Annual Convocation of ANGRAU on 26.9.2016 at Agricultural College Bapatla.
- Dr. V. Bhuvaneswari, Scientist, Plant Pathology, Marutetu received Sri Veerapaneni Narasimham Memorial Gold Medal" for the year 2014-15 for best Research in Plant Pathology during 48th Annual Convocation of ANGRAU on 26.9.2016 at Agricultural College Bapatla.
- Dr. P. Munirathnam, Principal Scientist, Agronomy, Nandayal received Ugadi Puraskaram-2017 by Government of Andhra Pradesh.
- Dr. S. Rajasekhar Naidu, Co-ordinator, DAATTC, Chittoor is awarded with Ugadhi Puraskaram -2017 on 23.03.2017 from Hon'ble Chief Minister Sri. N. Chandrababu Naidu.
- Dr. V. Sailaja, Associate Professor, KVK, Gantashala received ANGRAU Meritorious Teacher Award in the faculty of Agriculture for 2014 during 48thANGRAU annual convocation at Agricultural college, Bapatla.
- Dr.M.Rajasri, Programme Coordinator, KVK, Garikapadu received "Distinguished Scientist Award" in ICET-2016,

Kathmandu, Nepal organized by Biologix Research and Innovation Centre, India in collaboration with Biotechnology Society of Nepal.

Other events

Foundation Stone

- Unveiling of Pylon by the Hon'ble Chief Minister, Government of Andhra Pradesh Shree Nara Chandrababu Naidu Garu at Agricultural College, Bapatla on 26th September, 2016 under Infrastructural Development in the Colleges of ANGRAU with Rs. 156.33 crores through NABARD-RIDF-XX.
- Laying of foundation stones for NABARD-RIDF-XX works at Agricultural College, Mahanandi by Hon'ble Chairman, A.P. Legislative Council, Dr. A. Chakarapani Yadav garu in the presence of Sri Budda Rajasekhara Reddy M.L.A, Srisailam, Sri B.C. Janardhan Reddy, M.L.A., along with Hon'ble Board Members and University Officers during Silver Jubilee Function on 04-12-2016.
- Bhoomipuja was performed for construction of Electronic Media Centre Building at RARS, Nandyal on 19.01.2017.

Inauguration

- **Farmers Call Centre** was inaugurated on 18.10.2016 by Sri Mekala Lakshminarayana, Hon'ble Member of Board of Management, ANGRAU in the presence of Director of Research and Scientists of RARS, Lam.
- **"Food Processing Unit"**, was inaugurated by Sri. Prathipati Pullarao, Minister for Agriculture, Agri Processing, Marketing and Warehousing, Animal Husbandry, Dairy Development and Fisheries, Govt. of A.P. on 09.12.2016 at Faculty of Home Science at RARS, Lam, Guntur.
- **University Faculty Block at RARS, Lam, Guntur** was inaugurated by Sri Prathipati Pulla Rao Garu, the Hon'ble Minister for Agriculture in the presence of Sri Ravela Kishore Babu Garu, the Hon'ble Minister for Social Welfare & Empowerment, Sri B. Rajsekhar, IAS, Special Chief Secretary (Agri) and Vice-Chancellor, Hon'bleMembers of Board of Management, University Officers and Staff of Acharya N.G. Ranga Agricultural University on 24.03.2017.

48th Annual Convocation

- The 48th Annual Convocation was held on the 26th of September, 2016 at Dr. B.V. Nath Auditorium, Agricultural College, Bapatla. The Hon'ble Chief Minister of Andhra Pradesh Shree Nara Chandrababu Naidu Garu was the Chief Guest. Sri P. Pulla Rao, Hon'ble Minister for Agriculture and Farmers Welfare was also participated as the Guest of Honour.

Agricultural College, Mahanandi Silver Jubilee Celebration

- Agricultural College, Mahanandi celebrated its Silver Jubilee Function on 4th December 2016 in a befitting manner. Sri A. Chakrapani Yadav, Chairman, Legislative Council of Andhra Pradesh participated as a Chief Guest and Sri B.C. Janardhan Reddy, Member of Legislative Assembly as presided over the function along with Hon'ble Board Members and University Officers.
- ANGRAU celebrated Acharya N.G. Ranga Jayanthi in collaboration with Ranga Trust, ATMA-Guntur and International Society of Farm Scientists by conducting "Agriculture Technology Day" on this occasion at RARS, Lam, Guntur. Dr. Kodela Siva Prasada Rao, Hon'ble Speaker of Govt. of Andhra Pradesh was the Chief Guest and Sri Galla Jayadev, Hon'ble Member of Parliament,

Guntur gave the key note address on the occasion. Sri Ravela Kishore Babu, Hon'ble Minister, Social Welfare & Empowerment, Smt. Nannapaneni Rajakumari, AP Women's Commission Chief, Sri Yalamanchili Sivaji, Ex-MP, Sri Alapati Rajendra Prasad, MLA, Sri D. Manikya Vara Prasad, Ex. Minister and Freedom Fighter Sri Pavuluri Siva Ramakrishna have participated in the celebrations.

- Faculty representatives from four Universities in South India, namely, University of Agricultural Sciences, Dharwad, Karnataka; VasantraoNaikMarathwada Krishi Vidyapeeth, Parbani, Maharashtra; Professor Jayashankar Telangana State Agricultural University, Telangana; Acharya N G Ranga Agricultural University, Andhra Pradesh participated in the deliberations. The issues that were resolved included semester wise credit load, courses distribution, departments and their nomenclature as well as the plan of action for the Student READY programme on the Fifth Deans' Committee Recommendations for the Faculty of Home Science on implementation of B.Sc. (Hons) Community Science Programme at ANGRAU, Lam, Guntur.
- **Best Exhibition Stall Award** was conferred to ANGRAU at Krishi Unnati Mela 2017 held at IARI, New Delhi from 15-17 March 2017.
- Agricultural Research Station, Vizianagaram received an award of best AICRP centre in Millets at the Annual Millets workshop held at Bangalore on 15th April 2017.

MOUs

- Entered MoU with University of Agricultural Science (UAS), Dharward.
- Entered MoU with Indian Institute of Horticultural Research (IIHR), Bengaluru.
- The University has entered MoU with ICRISAT for providing technical support in developing PLANTIX mobile App helpful in Pest management.
- Hon'ble Vice-Chancellor, Sri B. Rajsekhar, ANGRAU and the Director General, IRRI, Philippines have signed a MoU on SRMS (Satellite based rice monitoring system) on 09.02.2017.

Visitors

- Dr. M. Morell & Dr. S. Mohanty, IRRI, Philippines visited ANGRAU for signing MOU between IRRI and Govt.of A.P at secretariat,velagapudi on 09-02-2017.
- Ethiopian Delegates, Jigjiga University, Ethiopia visited the University on 10-02-2017 to discuss about MoU between ANGRAU and the Jigjiga University, meeting at Administrative office, ANGRAU with University Officers of ANGRAU.
- Ethiopian Delegates interacted with Director (Intl. Prog) and Director (P&M), ANGRAU on 24-03-2017.
- Ethiopian Delegates (4 members), Jigjiga University, Ethiopia visited ANGRAU on 25-04-2017 to discuss about the modalities of MoU, in the continuation meeting of the U.Os meeting.

Foreign Tours for Participation in Seminars / Conferences / Workshops

- Thirteen faculty members from the three Faculties of Agriculture participated in the overseas Conferences / Workshops / Seminars held in various foreign countries like Philippines, Czech, UMK, Malaysia, Istanbul Turkey, Singapore, Egypt, Kualalampur, Malaysia and USA.

I. INTRODUCTION

Acharya N G Ranga Agricultural University (ANGRAU) was established on the 12th of June 1964 in the name of Andhra Pradesh Agricultural University (APAU) under the APAU Act 1963. Later on the 7th of November 1996, it was renamed as Acharya N G Ranga Agricultural University in honour and memory of the noted Parliamentarian and Kisan Leader, Sri Gogineni Ranga Nayukulu (popularly known as N G Ranga). Consequent to bifurcation of Andhra Pradesh State into two states of residual Andhra Pradesh and Telangana on the 2nd of June 2014, the ANGRAU has been bifurcated 'on order to serve basis' into the Acharya N G Ranga Agricultural University for the State of the Residual Andhra Pradesh and Professor Jayasankar Telangana State Agricultural University for the State of Telangana. The University is entrusted with the responsibility of generating and grooming the personnel for the agricultural services (Education), formulating and pursuing research activities in agriculture science (Research) and transferring the fruits of research and development to farmers and other stake holders (Extension).

The University is governed by the Board of Management comprising 21 members with Vice-Chancellor as its Chairperson. The Vice-Chancellor is assisted by University Officers viz., Faculty Deans, Dean of PG Studies, Dean of Student Affairs, Director of Experimental Stations, Director of Extension, Registrar, Controller of Examinations, Comptroller, University Librarian and Estate Officer in the day to day University administration. The academic matters are looked after by the Academic Council and Faculty Boards under the guidance of Vice-Chancellor. The Research and Extension Programmes are formulated by the Research and Extension Advisory Council (REAC) under the Chairmanship of the Vice-Chancellor.

The ANGRAU has three faculties namely Agriculture, Agricultural Engineering and Technology and Home Science with UG, PG and Doctoral Programmes. The University carries out its teaching mandate through 12 constituent colleges. The University also offers two year Diploma in Agriculture and Seed Technology programmes in the local vernacular Telugu language and three year diploma in Agricultural Engineering in English to train grass root level technical workers. So far a total of 38695 students, comprising 28,688 graduates and 10007 postgraduates have taken their degrees from the University.

The University carries out its research programmes through 36 Research Stations including six Regional Agricultural Research Stations spread over the entire State of Andhra Pradesh. With the basic motto of 'making agriculture profitable and sustainable', the University has released 412 improved varieties / hybrids of different crops; a few of them are first of their kind not only in India but also in the world, over the years and tailored matching agro-techniques resulted in three-fold increase in agricultural production of the State.

Evolved over the last five decades, the University had introduced few programmes like introduction of Rural Agricultural Work Experience Programme (RAWEP) during undergraduate course and introduction of 2-year Agriculture/ Seed Technology and 3-year Agricultural Engineering diploma courses for development of skilled manpower; and establishment of District Agricultural Advisory and Transfer of Technology Centre (DAATTC – *Eruvaka Kendra*) in every district of Andhra Pradesh for the first time in the country, which altogether led to bag the Best Institution Award twice from the ICAR.

Today, in the residual Andhra Pradesh, the University has 13 DAATTCs located one each in the 13 districts of the State and 12 *Krishi Vigyan Kendras* (KVKs) in the service of farmers of the State. The Farmers Call Centre located in Guntur facilitates farmers, a direct access to crop experts to get their farm problems solved over phone.

At this glorious backdrop of the University, this 53rd Annual Report of the ANGRAU showcases activities and significant achievements of the University in the fields of education, research and extension during the period from June 2016 to May 2017.

II. UNIVERSITY ADMINISTRATION

The Hon'ble Governor of Andhra Pradesh, Sri E Srinivasan Lakshmi Narasimhan is the Chancellor of the University. Next to the Chancellor, Vice-Chancellor acts as the Academic Head and Chief Executive of the University.

The organogram of the University is presented in Fig.1.

The University is governed by the following bodies:

(i) Board of Management

(ii) Research and Extension Advisory Council

A. AUTHORITIES OF THE UNIVERSITY

1. Board of Management

The Board of Management (BoM) is the apex body of the University and makes policy decisions. The Vice-Chancellor is the Chairman of the Board of Management. The BoM comprises of representatives from State Legislature / Parliament (4), the Agro-industry (2) and the State Chamber of *Panchayat Raj* (1) as well as the Agricultural Scientific Community (1). Besides these, one representative from the Indian Council of Agricultural Research, three Members of the Academic Council of the University, Secretaries to Government from the *Panchayat Raj* and Finance Departments, Directors of State Departments of Agriculture and Animal Husbandry and Progressive Agriculturists (4), are also the members of the BoM of the ANGRAU.

Members of Board of Management

during 273rd meeting of Board of Management

Chairman	**Sri T Vijay Kumar, I A S** Special Chief Secretary to Govt. & Vice-Chancellor
Members	
Four Ex-Officio Members	**Sri K S Jawahar Reddy, I A S** Principal Secretary to Government, Panchayat Raj Department
	Sri K Dhananjaya Reddy, I A S Director of Agriculture
	Dr G Somasekharam, M.V.Sc, Director of Animal Husbandry
	K Venkateswara Rao Addl. Secretary to Government, Financial Department
Other Members *ICAR Nominee*	**Dr D Rama Rao** Director, NAARM
Distinguished Agricultural Scientist	**Dr V Damodara Naidu** Professor (Retd.), ANGRAU

Three Persons from Academic Council	**Prof. G V Nageswara Rao** Professor (Plant Pathology), Agricultural College, Rajamahendravaram
	Dr S R Koteswara Rao Professor & Head, Dept. of Entomology S.V. Agricultural College, Tirupati
	Prof. I Bhavani Devi Professor & Special Officer, Institute of Agri. Business Management S.V. Agricultural College, Tirupati
Four Persons from Members of Legislative Assembly / Parliament	**Sri Kinjarapu Rammohan Naidu** Hon'ble Member of Parliament (Loksabha)
	Sri K S Jawahar Hon'ble Member of Legislative Assembly, Govt. of Andhra Pradesh
	Sri B C Janardhan Reddy Hon'ble Member of Legislative Assembly, Govt. of Andhra Pradesh
	Smt. Meesala Geetha Hon'ble Member of Legislative Assembly, Govt. of Andhra Pradesh
Four Persons from Progressive Agriculturists, of whom one shall be a woman	**Sri Mekala Lakshmi Narayana**
	Smt. Alluri Vijaya
	Sri Chapara Ganapathi Rao
	Sri T V Muralinatha Reddy
One Person from among the Members of the State Chamber of Panchayat Raj	**Sri P Rajasekhar** ZPTC, Mummidivaram, G. Vemavaram (V), Polavaram (M), East Godavari District
Two Persons from among Agro-industrialists and other Entrepreneurs, includingSelf-Employed Graduates	**Vacant**
Secretary	**Prof. T V Satyanarayana** Registrar

Members of Board of Management
during 275th – 277th meetings of Board of Management

Chairman	**Sri B Rajsekhar, I A S** Special Chief Secretary to Govt. & Vice-Chancellor
Members	
Four Ex-Officio Members	**Sri K S Jawahar Reddy, I A S** Principal Secretary to Government, Panchayat Raj Department
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Members of Board of Management
during 278th meeting of Board of Management

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during 275th – 277th meetings of Board of Management

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Other Members	
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Members of Board of Management
during 278th meeting of Board of Management

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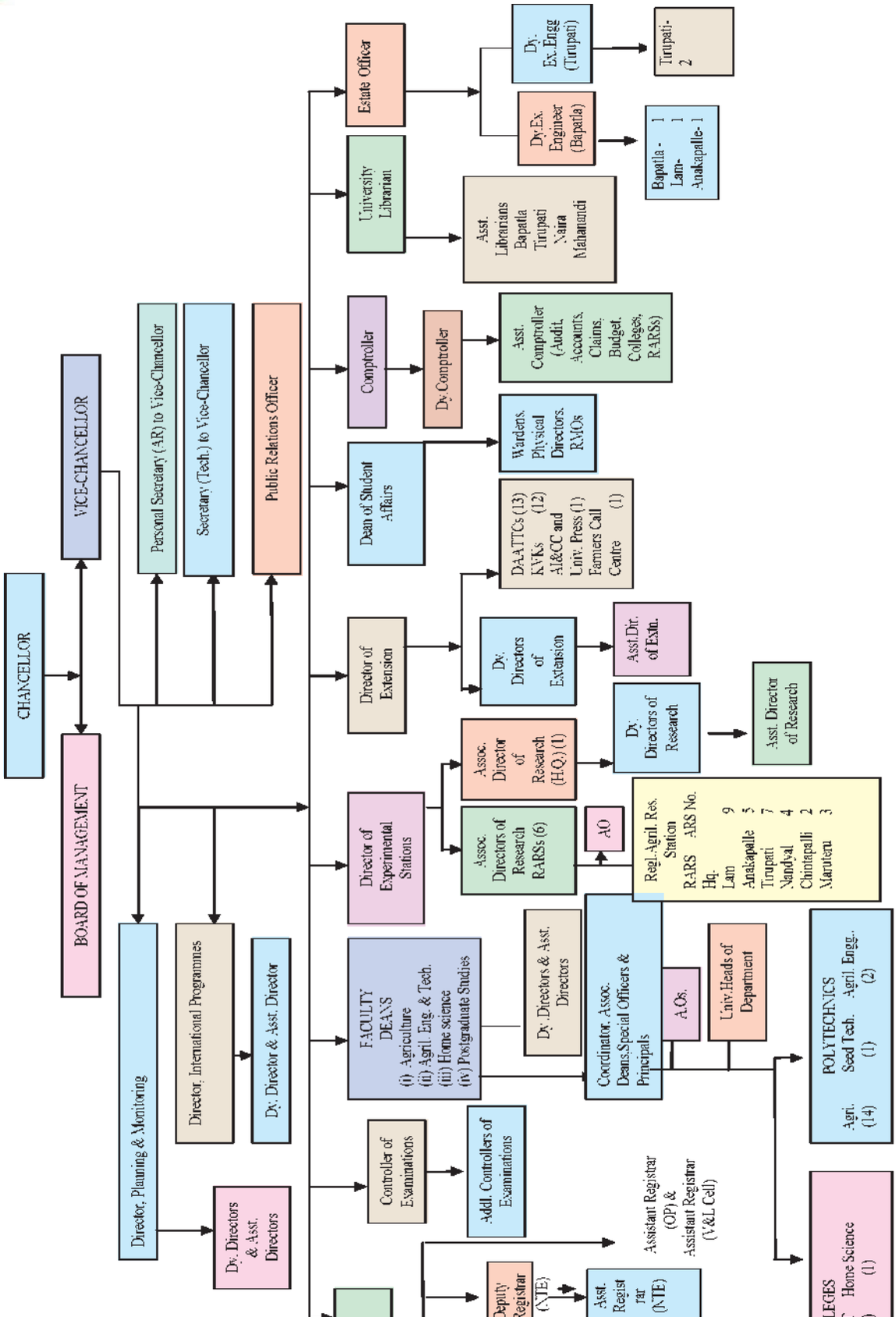


Fig. 1: ORGANOGRAM OF THE UNIVERSITY

2. Officers of the University

The list of University Officers for the period under report is given below.

University Officers	
Vice-Chancellor	**Sri T Vijay Kumar** (Up to 30.09.2016)
	Sri B Rajsekhar (01.10.2016 onwards)
Registrar	**Dr T V Satyanarayana**
Comptroller	**Sri K L Raju**
Dean of Postgraduate Studies	**Dr R Veeraraghavaiah**
Dean of Agriculture	**Dr T Ramesh Babu**
Director of Experimental Stations	**Dr N V Naidu**
Director of Extension	**Dr K Raja Reddy**
University Librarian	**Dr R Sarada Jayalakshmi Devi**
Controller of Examiations	**Dr A. Shiva Sankar**
Dean of Agril. Engg. & Technology	**Dr D Bhaskara Rao**
Dean of Home Science	**Dr T Neeraja**
Dean of Student Affairs	**Dr D Bhaskara Rao** (upto 22.07.2016)
	Dr P Sambasiva Rao (23.07.2016 onwards)
Estate Officer	**Smt N Madhavi Sukanya** (upto 24.06.2016)
	Sri K L Raju (upto 29.06.2016)
	Sri K Purushotham 30.06.2016 onwards

3. Research and Extension Advisory Council

The *Research and Extension Advisory Council (REAC)*, headed by Vice-Chancellor with Director of Extension, Director of Experimental Stations, Associate Directors of Research of the six Agro-climatic Zones, three each from Innovative Farmers' Network, Agri-business Consortium, representatives from KVKs (Operated by NGOs) and Special Invitees representing the different regions of the State and two Eminent Scientists of Agriculture as members (Annexure II), reviews the functioning of centres in the state.

B. MEETINGS OF THE AUTHORITIES OF THE UNIVERSITY

1. Board of Management

The Board of Management of the ANGRAU met 6 times during the year under report. The dates and venues of the meetings are given below.

S. No.	No. of the Board Meeting	Date	Venue
1	273rd	19.07.2016	Lam, Guntur
2	274th	17.09.2016	APRRI & RARS, Maruteru
3	275th	11.11.2016	Agricultural College, Naira
4	276th	09.01.2017	RARS, Lam, Guntur
5	277th	01.03.2017	Agricultural Research Station, Ananthapuramu
6	278th	26.04.2017	S.V. Agricultural College, Tirupati

C. FACULTY STRENGTH

The cadre-wise strength of teaching staff of the ANGRAU is shown in Table 1, while details of faculty working in various Colleges, Agricultural Research Stations and other Extension Centres including Administration are given in Annexure III.

Table 1: Faculty Strength in the ANGRAU during 2016-17

S. No.	Item	Professor		Associate Professor		Assistant Professor		Total	
		S	IP	S	IP	S	IP	S	IP
1.	Teaching	31	11	90	34	259	153	380	198
2.	Research	18	23	79	61	212	138	309	222
3.	Extension	4	12	10	4	113	53	127	69
4.	Administration	7	6	-	3	20	20	27	29
	Total	**60**	**52**	**179**	**102**	**604**	**364**	**843**	**518**

S – Sanctioned IP – In Position

Note: In-position includes faculty under Career Advancement Scheme also.

III. TEACHING

A. EDUCATION

1. Teaching Institutes

The Acharya N G Ranga Agricultural University offers both undergraduate and postgraduate programmes including doctoral programmes in the faculties of Agriculture, Agricultural Engineering & Technology and Home Science. The University has five Agricultural Colleges, one Advance Post Graduate Centre, one Institute of Agri-Business Management, fourteen Agricultural Polytechnics and one Seed Technology Polytechnic under the Faculty of Agriculture, two Colleges of Agricultural Engineering, two Colleges of Food Science & Technology and two Agricultural Engineering Polytechnics under the Faculty of Agricultural Engineering & Technology and one College of Home Science under the Faculty of Home Science.

The organogram of teaching institutes in the University is depicted in Fig.2. The list of Colleges and Polytechnics with their location, year of establishment and courses offered is given in Table 2.

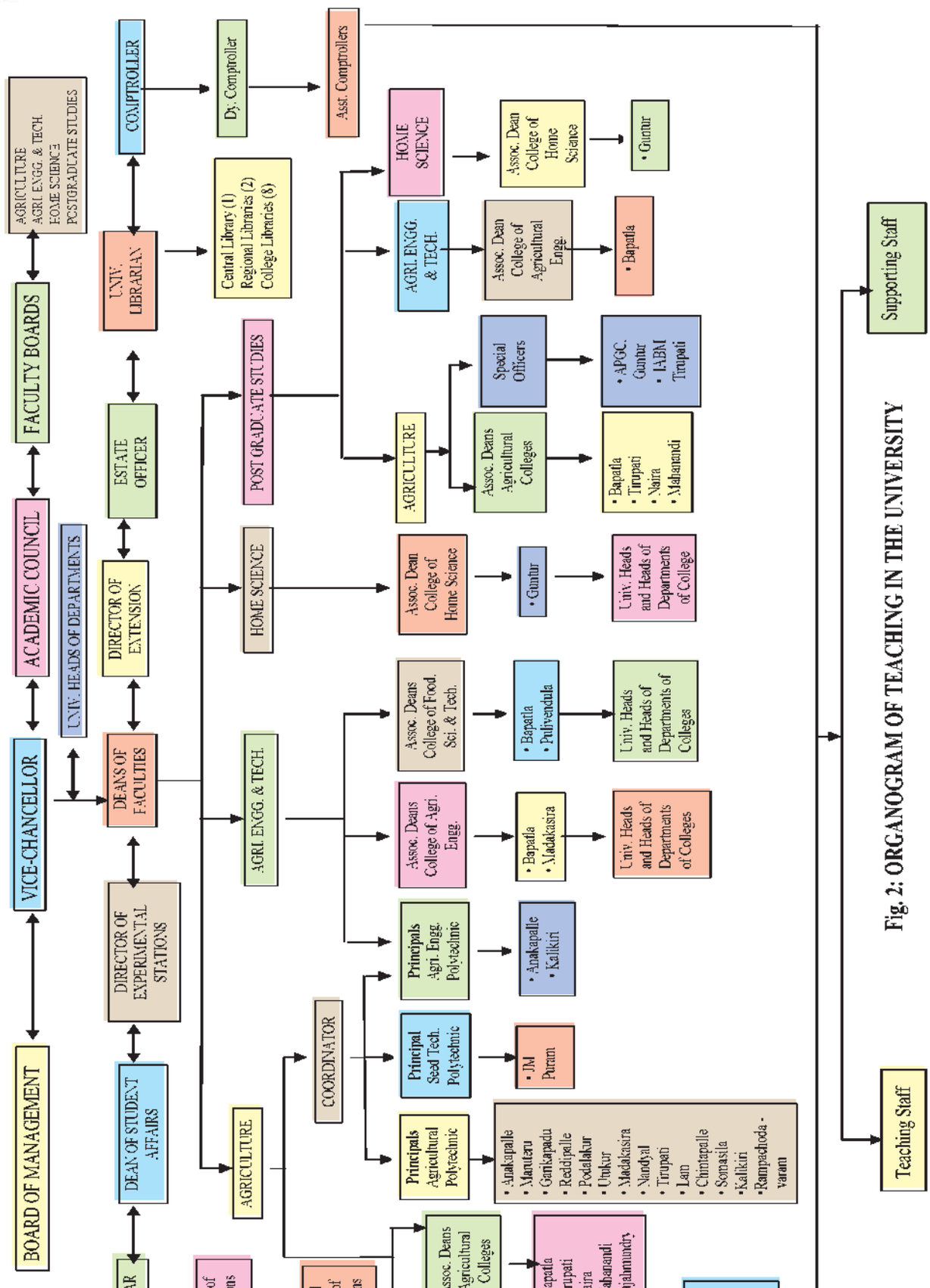


Fig. 2: ORGANOGRAM OF TEACHING IN THE UNIVERSITY

Table 2. Teaching Institutes of the University

S. No.	Teaching Institute with Location	Year of Establishment	Name of the Associate Dean / Principal	Courses Offered
(1)	(2)	(3)	(4)	(5)
Faculty of Agriculture				
1.	Agricultural College Bapatla – 522 101, Guntur Dist.	1945	Dr P R K Prasad	B.Sc. (Ag.) M.Sc.(Ag.) Ph.D. (Ag.).
2	S V Agricultural College Tirupati – 517 502, Chittoor Dist.	1961	Dr V Rajarajeswari	B.Sc. (Ag.) M.Sc.(Ag.) Ph.D. (Ag.)
3	Agricultural Collège Naira – 532 185, Srikakulam Dist.	1989	Dr R Ankaiah	B.Sc. (Ag.) M.Sc. (Ag.)
4	Agricultural College Mahanandi- 518 502, Kurnool Dist.	1991	Dr D Balaguravaiah	B.Sc. (Ag.) M.Sc. (Ag.)
5.	Agricultural College Rajamahendravaram – 533 103, East Godavari Dist.	2008	Dr P Jayarami Reddy	B.Sc. (Ag.)
6.	Advanced Post-Graduate Centre, Lam, Guntur - 522034, Guntur Dist.	2015	Dr K L Narasimha Rao	M.Sc. (Ag.) M.Sc. (H Sc.)Ph.D. (Ag.) Ph.D. (H Sc.)
7.	Institute of Agri. Business Management, S.V. Agricultural College, Tirupati – 517 502, Chittoor Dist.	2015	Dr I Bhavani Devi	M.Sc. (MBA)
Agricultural Polytechnics				
1.	Agricultural Polytechnic Regional Agricultural Research Station Maruteru – 534 122 West Godavari Dist.	1999	Dr P V Satyanarayana	Diploma in Agriculture
2.	Agricultural PolytechnicRegional Agricultural Research StationAnakapalle – 531 001 Visakhapatnam Dist.	1999	Dr. N. Venugopala Rao	Diploma in Agriculture

S. No.	Teaching Institute with Location	Year of Establishment	Name of the Associate Dean / Principal	Courses Offered
(1)	(2)	(3)	(4)	(5)
3.	Agricultural Polytechnic Podalakur– 524345, SPS Nellore Dist.	2005	Dr D Kodanda Rami Reddy	Diploma in Agriculture
4	Agricultural Polytechnic Reddipalli– 515001, Anantapuramu	2005	Dr S Vasundhara	Diploma in Agriculture
5.	Agricultural Polytechnic Utukur – 516 003, YSR Dist.	2005	Dr G Karuna Sagar	Diploma in Agriculture
6.	Agricultural Polytechnic Garikapadu – 521175, Krishna Dist.	2007	Dr B Venkateswarlu (Upto 17.07.2016) Smt. D.Sudha Rani (18.07.2016 onwards)	Diploma in Agriculture
7.	Agricultural Polytechnic Madakasira– 515 301, Anantapuramu Dist.	2007	Dr B Narendra	Diploma in Agriculture
8	Agricultural Polytechnic Regional Agricultural Research Station, Chintapalle-531 111, Visakhapatnam Dist.	2011	Dr G Jogi Naidu	Diploma in Agriculture
9	Agricultural Polytechnic Regional Agricultural Research Station, Tirupati – 517 502, Chittoor Dist.	2011	Dr TCM Naidu	Diploma in Agriculture
10.	Agricultural Polytechnic Regional Agricultural Research Station, Nandyal – 518 502, Kurnool Dist.	2011	Dr B Gopal Reddy	Diploma in Agriculture
11.	Agricultural Polytechnic Somasila SPS Nellore Dist.	2012	Dr D Kodanda Rami Reddy	Diploma in Agriculture
12.	Agricultural Polytechnic Kalikiri- 517234, Chittoor Dist.	2012	Sri A Subramanyam	Diploma in Agriculture

S. No.	Teaching Institute with Location	Year of Establishment	Name of the Associate Dean / Principal	Courses Offered
(1)	(2)	(3)	(4)	(5)
13.	Agricultural Polytechnic Rampachodavaram Rajahmundry – 533 103, East Godavari Dist.	2013	Dr P Jayarami Reddy	Diploma in Agriculture
14	Agricultural Polytechnic Jangameswarapuram, Gurajala-522415, Guntur Dist.	2015	Dr N Sambasiva Rao	Diploma in Agriculture
15	Agricultural Polytechnic Ghantasala (MD), Krishna (Dist.) - 521133	2016	Dr. Y.Vara.Prasad	Diploma in Agriculture
16	Agricultural Polytechnic Ramagiri, Ramagiri (Mandal), Anthapuram Dt	2016	Dr.B.RavindraReddy	Diploma in Agriculture
17	Agricultural Polytechnic (Seed Technology) Jangameswarapuram, Gurajala-522415, Guntur Dist.	2011	Dr N Sambasiva Rao	Diploma in Seed Technology
18	Agricultural Polytechnic (Organic Farming) Regional Agricultural Research Station, Chintapalle-531 111, Visakhapatnam Dist.	2016	Dr G Jogi Naidu	Diploma in Organic Farming
Faculty of Agricultural Engineering & Technology				
1.	College of Agricultural Engineering, Bapatla – 522 101,Guntur Dist.	1990	Dr M Raghu Babu (Up to 17.08.2016) Dr A. Mani (18.08.2016 onwards)	B.Tech.(Ag. Engg.), M.Tech.(Ag. Engg.) Ph.D.(Ag. Engg.)
2.	College of Agricultural Engineering, Madakasira - 515 301, Anantapuram Dist.	2008	Dr C Ramana	B.Tech. (Ag.Engg.)
3.	College of Food Science & Technology, Bapatla – 522 101, Guntur Dist.	2003	Dr BVS Prasad (Upto 16-08-2016) Dr Sival Kumar (17-08-2016 onwards)	B.Tech. (Food Technology)
4.	College of Food Science & Technology, Pulivendula – 516 390, YSR Dist.	2008	Dr. S. Kaleemullah	B.Tech. (Food Technology)

S. No.	Teaching Institute with Location	Year of Establishment	Name of the Associate Dean / Principal	Courses Offered
(1)	(2)	(3)	(4)	(5)
Agricultural Engineering Polytechnics				
1.	Polytechnic of Agricultural Engineering, Kalikiri, Chittoor Dist.	2013	Sri A Subramanyam	Diploma in Agricultural Engineering
2.	Polytechnic of Agricultural Engineering, Anakapalle, Vishakapatnam Dist.	2013	Dr N Venugopala Rao	Diploma in Agricultural Engineering
Faculty of Home Science				
1.	College of Home Science Guntur	2013	Dr L Uma Devi	B.Sc.(Home Science)

2. Admission Strength and Out-turn of Students

During the academic year 2016-17, a total of 1861 students were admitted in the University. Out of them, 1049 were admitted in undergraduate courses, 178 in masters, 62 in doctoral programmes and 572 in diploma courses. Student enrolment by courses and year-wise is presented in Annexure IV and students strength in various colleges of the ANGRAU is shown in Annexure V.

A total number of 1477 students were admitted in to the Faculty of Agriculture, comprising of 767 in undergraduate courses, 147 in postgraduate programmes, 49 in doctoral programmes and 514 in diploma programmes. The Faculty of Agricultural Engineering & Technology comprised of 185 undergraduate students, 17 masters students, 10 doctoral students and 58 diploma students, with the total student strength of 270. Home Science Faculty comprised of 97 undergraduate students, 14 postgraduate students and three doctoral students, with a total strength of 114.

A total number of 4918 students are on rolls of the University in different Undergraduate, Postgraduate, Doctoral and Diploma programmes. Out of them 2076 were boys and 2842 were girls. The information pertaining to the number of students admitted, students enrolled and students out-turn during the year is given in Table 3.

Table 3. Admission Strength, Students on Rolls and Out-turn of Students under Various Programmes during the Year 2016-17

Degree	Faculty & Course	Intake Capacity	Students Admitted			Students on Rolls			Students Out-turn		
			Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Faculty of Agriculture											
Diploma	Diploma in Agriculture		192	278	470	354	501	855	151	237	388
	Diploma in Seed Tech.		9	12	21	19	22	41	10	10	20
	Diploma in Organic Farming		7	16	23	7	16	23	0	0	0
	Total (Diploma)		208	306	514	380	539	919	161	247	408
UG	B.Sc. (Ag.)		330	437	767	1058	1383	2441	232	310	542
PG	M.Sc. (Ag.)		53	82	135	106	157	263	89	68	157
	M.Sc. (ABM)		8	4	12	9	6	15	5	5	10
	Total (PG)		61	86	147	115	163	278	94	73	167
Doctorate	Ph.D. (Ag.)		22	27	49	55	70	125	37	40	77
Sub Total (Agriculture)			621	856	1477	1608	2155	3763	524	670	1194
Faculty of Agricultural Engineering & Technology											
Diploma	Diploma in Ag. Engg.		28	30	58	71	92	163	20	24	44
UG	B. Tech. (Ag. Engg.)		61	46	107	233	194	427	58	55	113
	B. Tech. (Food Sci. & Tech.)		35	43	78	129	174	303	20	38	58
	Total (UG)		96	89	185	362	368	730	78	93	171

Degree	Faculty & Course	Intake Capacity	Students Admitted			Students on Rolls			Students Out-turn		
			Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
PG	M. Tech. (Ag. Engg.)		5	12	17	17	18	35	4	1	5
Doctorate	Ph.D. (Ag. Engg.)		10	0	10	18	7	25	1	0	1
Sub Total (Agril. Engg.)			139	131	270	468	485	953	103	118	221
Faculty of Home Science											
UG	B.Sc. (Home Science)		0	97	97	0	185	185	0	25	25
PG	M.Sc. (Home Science)		0	14	14	0	14	14	0	0	0
Doctorate	Ph.D. (Home Science)		0	3	3	0	3	3	0	0	0
Sub Total (Home Science)			0	114	114	0	202	202	0	25	25
Total (Diploma)			236	336	572	451	631	1082	181	271	452
Total (U.G)			426	623	1049	1420	1936	3356	310	428	738
Total (P.G)			66	112	178	132	195	327	98	74	172
Total (Ph.D)			32	30	62	73	80	153	38	40	78
GRAND TOTAL			760	1101	1861	2076	2842	4918	627	813	1440

Note: 1. ICAR and other States – 25% of seats in M. Sc. Through All India Entrance Examination conducted by ICAR

2. Foreigners / ICAR Employees – 10% in M. Sc. / Ph. D. Courses

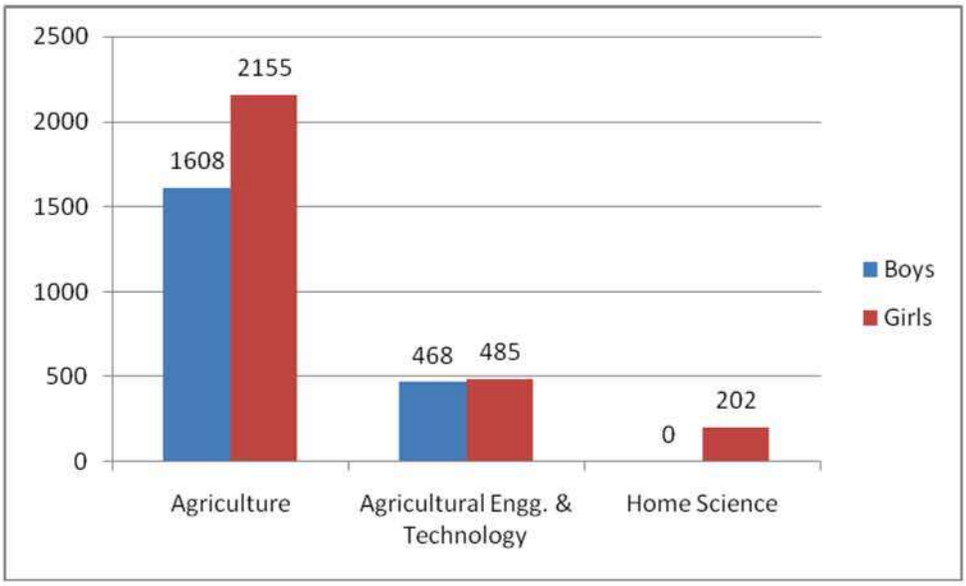


Fig. 3: Faculty-wise Students on Rolls

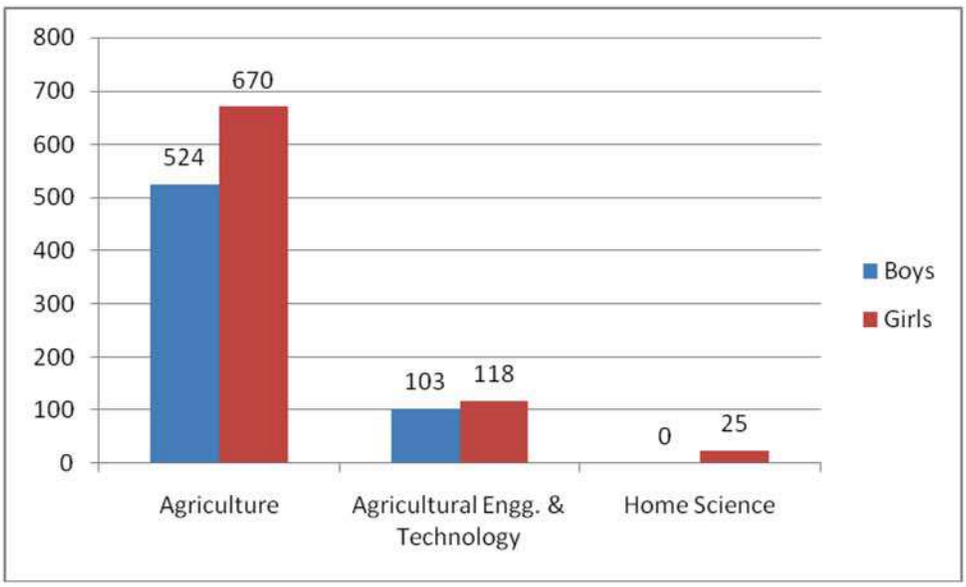


Fig. 4: Faculty-wise Students Passed

A total number of 1438 students comprising of 1192 in Agriculture, 221 in Agricultural Engineering & Technology and 25 in Home science faculties have passed out of the different portals of the University during the academic year 2016-17.

In the Faculty of Agriculture, 542 undergraduates, 242 postgraduates including 165 at master level and 77 at doctoral level have passed. In addition, 388 students obtained their diploma in Agriculture and 20 students got diploma in Seed Technology.

One hundred and seventy one undergraduate, six postgraduate and 44 diploma students passed out in the Faculty of Agricultural Engineering and Technology. Twenty five undergraduates obtained their degree in faculty of Home Science.

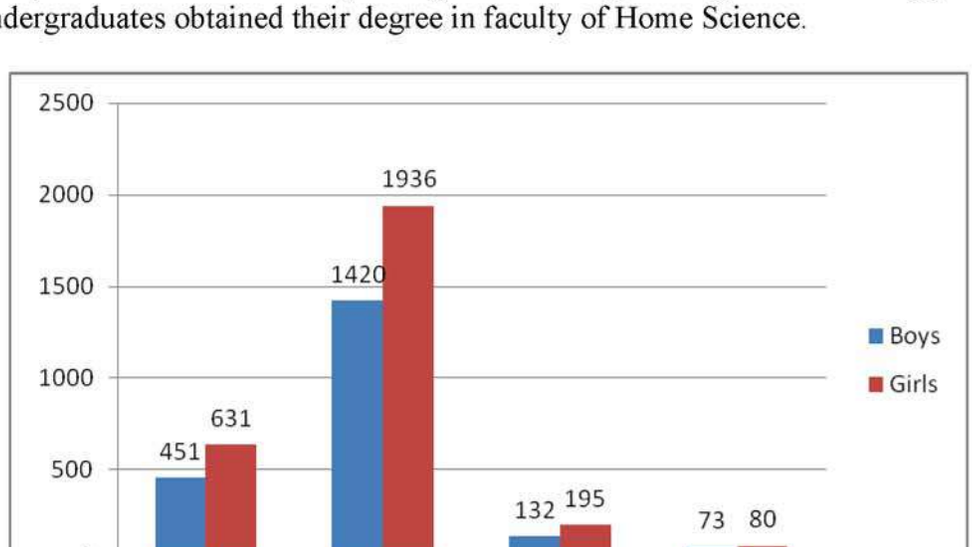


Fig. 5: Programme-wise Students on Rolls

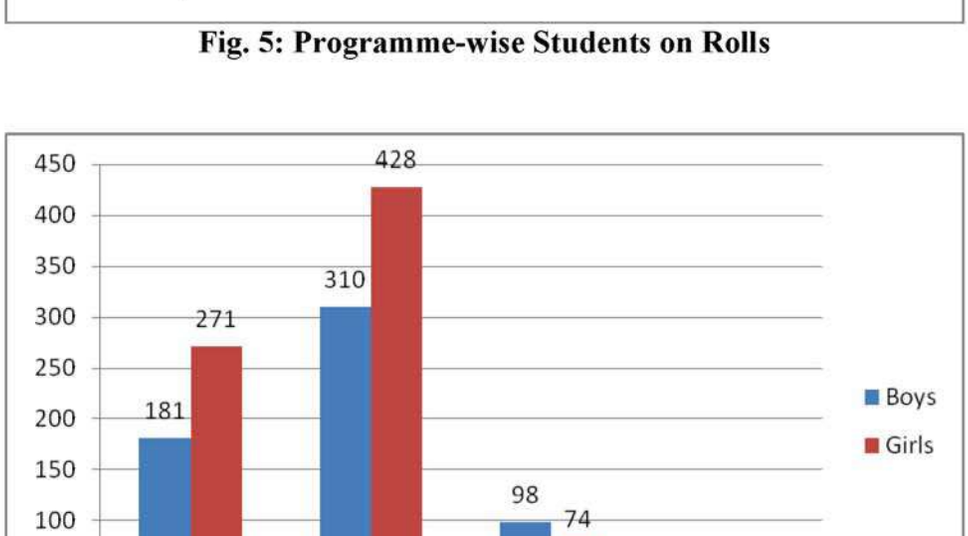


Fig. 6: Programme-wise Students Passed

3. Academic Excellence

Fifty students of different colleges of ANGRAU qualified in ICAR- JRF/ SRF and GATE examinations. While 147 students obtained different fellowships, awards and medals during 2016-17 as detailed below

S. No.	Name of the College		No. of ranks secured			
		ICAR-JRF	ICAR-SRF	GATE	Others	TOTAL
1	Agricultural College, Bapatla	3	2	-	a) ICAR-NTS: 41 b) Bayer Fellowship: 7 c) Inspire Fellowship: 2	55
2	S. V. Agricultural College, Tirupati	3	2	-	a) ICAR-NTS: 53 b) Bayer Fellowship: 17 c) Inspire Fellowship: 3 d) Cash awards: 9 f) Gold Medals: 5	92
3	Agricultural College, Mahanandi	1	-	-	-	1
4	College of Agril. Engineering, Bapatla	6	-	16	-	22
5	College of Agril. Engineering, Madakasira	13	-	4	a) ICAR-NTS: 8	25
7	College of Home Science, Guntur	-	-	-	a) AIEE-ICAR: 1	1
8	Advanced P.G.Centre, Guntur	-	-	-	a) Bayer Fellowship: 1	1
	Total	26	4	20	147	297

4. Academic Initiatives

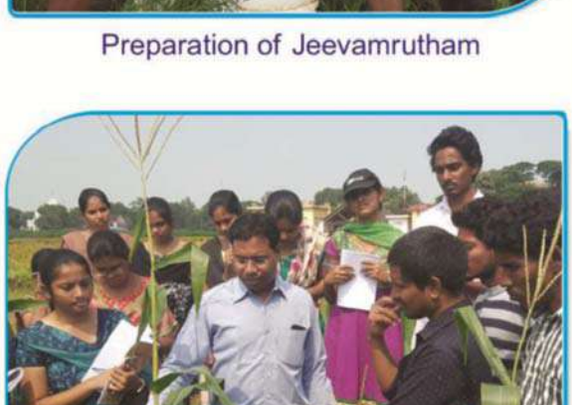
(i). B.Sc. (Ag.) - Rural Agricultural Work Experience Programme (RAWEP)

As a part of the regular curriculum, the final year B.Sc. (Ag.) students were placed in rural areas for one semester during kharif season, where each student was attached to one host farmer for practical learning with regard to crop production, crop protection, rural economics and also the dynamics of rural society.

Land preparation with Power Tiller

Preparation of Jeevamrutham

Propping in Sugar cane



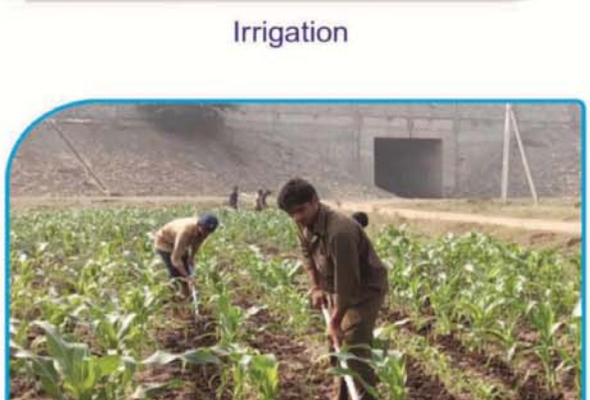
Maize crop production

(ii). B.Sc. (Ag.) - Agricultural Experiential Learning Programme (AELP)

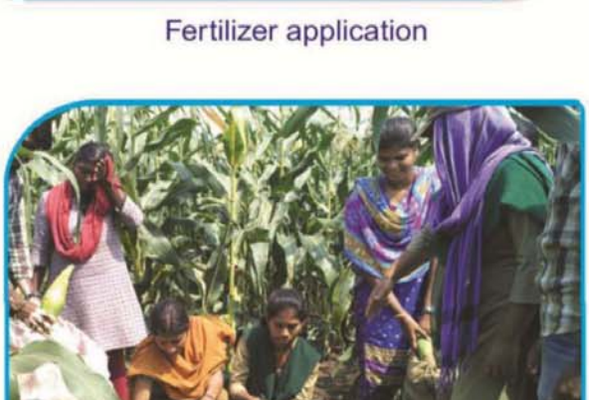
As a part of the regular curriculum, the final year B.Sc. (Ag.) students, after the completion of RAWEP were placed in different areas of entrepreneurship, for one semester, wherein each student was attached to any one of the experiential learning units.

Irrigation

Fertilizer application



Weeding



Harvesting of maize cobs

Maize cobs transportation

Selling of maize cobs in Kisan Mela on 4-4-2017 at RARS, Maruteru

AELP Activities

(iii). B.Tech. (Ag. Engg.) - In-plant Training

The final year students of B.Tech. (Ag. Engg.), Bapatla and Madakasira campuses were sent to different firms for practical learning.

(iv). B. Tech. (Food Sci. & Tech.) - In-Plant Training

The students of B. Tech. (Food Science & Technology) underwent In-plant Training at different Food Processing Companies all over India.

(v). B. H. Sc. - Rural Home Science Work Experience Programme (RHWEP)

Each student of the final year B. H. Sc. of College of Home Science, Guntur was attached to 6-8 households to teach rural women, youth and children in the identified areas of Home Science.

(vi). B.H. Sc. - *Experiential Learning Programme (ELP)*

In Home Science, the Departments of Foods and Nutrition, Apparel and Textiles and Resource Management and Consumer Sciences have provided in-depth managerial and entrepreneurial skills to the students in the production, marketing and management through Experiential Learning Program in the areas viz., Extrusion Technology, Production of Health Foods, Preserved Fruit and Vegetable Products, Apparel Production Management, etc.

The details of number of students, who attended the RAWEP / In-Plant Trainings/ RHWE programmes during the year are given in Table 4.

Table 4. Details of Scholarships and Stipends

Name of the College and Degree Programme	No. of Students Attended	No. of Villages / Plants	No. of Host Farmers
Faculty of Agriculture			
Agricultural College, Bapatla	193	32	187
S.V. Agricultural College, Tirupati	136	16	136
Agricultural College, Mahanandi	72	10	72
Agricultural College, Naira	101	-	-
Agricultural College, Rajahmundry	41	8	41
Faculty of Agricultural Engineering & Technology			
College of Agricultural Engineering, Bapatla	75	12	-
College of Agricultural Engineering, Madakasira	41	-	-
College of Food Science & Technology, Bapatla	45	12	-
College of Food Science & Technology, Pulivendula	17	-	-
Faculty of Home Science			
College of Home Science	100	25	125

5. *Scholarships and Stipends*

The students of Acharya N G Ranga Agri. University were provided with large number of scholarships, fellowships and stipends sponsored by various agencies. The details are given in Table 5.

Table 5. Details of Scholarships and Stipends

S. No.	Name of the Scholarship	No. of Students Awarded	Amount in Rs. per Year
1	2	3	4
1	National Merit/ Talent Scholarship	124	3304000
2	Govt. of India Post-Matric Scholarship to Scheduled Castes	--	--
3	Govt. of India Post-Matric Scholarship to Scheduled Tribes	--	--
4	Govt. of India Post-Inter Merit Scholarship (Dist. Level) to SCs and STs	--	--
5	Post Matric Scholarship to BC	1047	8116538
6	Post Matric Scholarship to EBC	410	3759144
7	Minority Post Matric Scholarship	90	1205572
8	State Scholarship to Denoted Tribes	--	--
9	State Scholarship to Listed Backward Class	--	--
10	State Scholarship to Economically Poor Persons.	--	--
11	Stipend to P.G. Students	252	11320000
12	Stipend to Ph.D. Students	70	5005000
13	Stipend to U.G. Students from Other States	--	--
14	Stipend to Agril. Officers studying M.Sc. (Ag.) Course	--	--
15	Stipend to VEOs studying B.Sc. (Ag.) Course	--	--
16	Stipend to VDOs studying B.Sc. (Ag.) Course	--	--
17	Dress and Book Allowance	755	151200
18	Others, if any a) Bayer Fellowship	26	2844000
19	State Post-Matric Scholarship to BC-E	--	--
20	Inspire Fellowship for Ph.D. Students	5	1929984

S. No.	Name of the Scholarship	No. of Students Awarded	Amount in Rs. per Year
21	Rajiv Gandhi Fellowship for Ph.D. Students	--	--
22	State scholarship to scheduled castes	389	4514464
23	State scholarship to scheduled tribes	110	1454336
24	ICAR- JRF Scholarship	6	584400
25	ICAR- SRF Scholarship	4	973328

6. Students' Hostels

The hostel facilities available in the Colleges and the number of students accommodated in different hostels in all the campuses of the University are given in Table 6.

Table 6. Campus-wise Hostel Accommodation

S. No.	Campus	No. of Hostels			No. of Students Accommodated		
		Boys	Girls	Total	Boys	Girls	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Faculty of Agriculture							
1	S.V. Agricultural College, Tirupati	3	1	4	214	429	643
2	Agricultural College, Bapatla	5	3	8	385	574	959
3	Agricultural College, Mahanandi	3	3	6	156	145	301
4	Agricultural College, Naira	2	1	3	187	189	376
5	Agricultural College, Rajamahendravaram	0	0	0	0	0	0
6	Advanced P.G. Centre, Lam, Guntur	0	0	0	0	0	0
7	Institute of Agricultural Business Management, Tirupati	0	0	0	0	0	0
8	Agricultural Polytechnic, Maruteru	1	1	2	87	44	131
9	Agricultural Polytechnic, Anakapalle.	1	1	2	37	64	101
10	Agricultural Polytechnic, Podalakur	0	1	1	0	24	24
11	Agricultural Polytechnic, Reddipalli	1	1	2	15	34	49
12	Agricultural Polytechnic, Utukuru	1	1	2	20	22	42
13	Agricultural Polytechnic, Kalikiri	0	1	1	0	35	35

S. No.	Campus	No. of Hostels			No. of Students Accommodated		
		Boys	Girls	Total	Boys	Girls	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Faculty of Agriculture							
14	Agricultural Polytechnic, Rampachodavaram	0	0	0	0	0	0
15	Agricultural Polytechnic, JM Puram	1	1	2	21	27	48
16	Agricultural Polytechnic, Madakasira	1	1	2	18	29	47
17	Agricultural Polytechnic, Chintapalle	RARS Staff quarters			06	16	22
18	Agricultural Polytechnic, Nandyal	RARS Staff quarters			19	22	41
19	Agricultural Polytechnic, Somasila	ARS Staff quarters			21	24	45
20	Agricultural Polytechnic, Garikapadu	ARS Staff quarters			28	41	69
21	Agricultural Polytechnic, Tirupati	Hostels of Ag College			20	27	47
22	Agricultural Polytechnic, Gantasala	Tribal welfare department hostels			25	46	71
23	Agricultural Polytechnic, Ramagiri	Boys at Sarvasiksha Abhiyan and girls at Dist. Sports Authority pavilion			23	19	42
24	Agricultural Polytechnic, (SST), JM Puram	Hostels of APT			19	22	41
25	Agricultural Polytechnic, (Org.F'ing), Chintapalle	RARS Staff quarters			07	16	23
Faculty of Agricultural Engineering & Technology							
26	College of Agricultural Engineering, Bapatla	1	1	2	136	122	258
27	College of Agricultural Engineering, Madakasira	1	1	2	83	53	136
28	College of Food Science & Tech, Bapatla	1	1	2	53	104	157
29	College of Food Science & Tech, Pulivendula	1	1	2	31	44	75
30	Polytechnic of Agricultural Engg, Kalikiri	0	1	1	0	39	39
31	Polytechnic of Agricultural Engg, Anakapalle	Farmers guest house RARS staff quarters			28	42	70
Faculty of Home Science							
32	College of Home Science, Guntur	0	0	0	0	0	0

B. RESEARCH PROJECTS OPERATED IN THE COLLEGES

The details of Research Projects operated at the Colleges during the year are given below.

1. S.V. Agricultural College, Tirupati:

a. ICAR extramural research project on "Assessment of present status and future prospects of basic sciences research in agricultural education".

b. ICAR extramural research project on "ICT Utilization in Agricultural Education - Gap analysis".

2. Agricultural College, Bapatla

a. DST project of "Web enabled and weather based decision support system for forewarning & Management of YSB & BPH of rice in A.P".

b. Management of infestation and quality of millets against storage insects under RKVY, 2016-17.

3. College of Agricultural Engineering, Bapatla :

a. ICAR Extramural project on "Gaps in Agricultural Engineering education to the Industry and Farmers needs".

b. ICAR Extramural project on "Spatio-Temporal explicit water foot print modeling for hydrological sustainability and enhanced water productivity in coastal Andhra Pradesh".

c. ICAR Extramural project on "Extraction and Mechanical Separation of Chiaseed Mucilage".

4. College of Food Science and Technology, Bapatla :

ICAR Extrmural Funded Project entitled "Extraction and Mechanical Separation of Chia Seed Mucilage".

5. APGC, Lam :

a. ICAR Extra Mural Project on "Mole drainage systems for control of water logging in black soils of Krishna Zone".

6. Office of the Dean of Agriculture, ANGRAU, Administrative Office :

a. ICAR extramural project on "impact of"PG Research in Agricultural Sciences in Southern India".

b. ICAR extramural Project on "impact of ICTs" on Agricultural Education in India.

C. STUDENT'S RESEARCH

1. Agricultural College, Bapatla

Department of Agronomy

Study on Effect of phosphorus management on yield and quality of finger millet (*Eleusinecoracana L.*) in sandy soils concluded that application of 50 % recommended dose of phosphorus + FYM @ 7.5 t ha^{-1} +PSB@ 5 kg $ha^{-1}$was more economical in obtaining higher returns per rupee investment and gave higher growth, yield parameters, grain and straw yields of finger millet.

Nitrogen management studies through combined use of organics and inorganics in transplanted rice (*Oryza sativa L.)* concluded that combined application of inorganic and organic sources (at 50% each) were more effective in realizing higher grain yield of rice in clay soils.

Investigation on Agro-climatic indices for prediction of growth and yield of finger millet (*Eleusine coracana* L.) on sandy loam soils found significant linear relationship for dry matter and grain yield of three varieties with various agro-climatic indices. The highest gross and net returns and B C ratio were obtained with Chaitanya

variety sown on second fourth night of July.

Application of 125% recommended dose of fertilizer with planting density of 3,33,333 plants ha^{-1} recorded significantly highest green fodder yield and with 1,11,111 plants ha^{-1} recorded significantly higher ear yield with highest net returns and cost benefit ratio in Baby Corn.

The sequential application of atrrazine @1.25 kg a.i ha^{-1} as pre-emergence followed by topramazone @25 g a.i ha^{-1} at 20 DAS as post emergence was found to be most effective and economical in managing weeds in maize. Among the nutrient management practices 75% recommended dose of fertilizer + bioconsortium (MI) found to be more economical and effective in getting highest benefit cost ratio in maize.

Department of Soil Science & Agricultural Chemistry

Application of 50% K_2O in the form of Muriate of potash along with KSB is as good as 100% K_2O in the form of inorganic source alone for achieving maximum & comparable bhendi fruit yield. The available form of K viz., water soluble K and exchangeable K have increased with organic sources, inorganic fertilizer and KSB. Maximum net returns (Rs. 1,12,107) and B:C ratio (2.54) was recorded in the treatment T_4 (RDF+PM@ 5 t ha^{-1}) and the least was in the treatment T_8 (RDF+FYM@ 5 t ha^{-1}+ KSB) with net returns of Rs. 83,254 and B:C 1.84.

Influence of microbial consortia were found to be effective in improving nutrient content and performance of blackgram crop, whereas higher yield of blackgram was observed in combined application of powdered biochar and bacterial consortium followed by use of coarse biochar along with bacterial consortium. While there was no significant influence of the type of biochars, microbial consortium and their interaction on nutrient content (N, P, K, Fe, Zn, Cu and Mn) of blackgram at all stages of crop growth.

Department of Entomology

The cumulative mean per cent of leaf folder damage in twenty one rice varieties indicated that, the lowest leaf damange was recorded in BPT-2231 (7.10%) and the highest damage was observed in BPT – 5204 (18.20%) followed by BPT-2570 916.90%). Among morphological characters, leaf length did not influence the leaf folder incidence, whereas positive significant correlation was observed with leaf width. Among biochemical constituents, nitrogen, protein and chlorophyll content exhibited positive significant correlation, whereas silica was negatively correlated with leaf folder damage.

Out of 28 rice cultures screened for resistance against BPH, four cultures *viz.*, BPT 2789, BPT 2703, BPT 2787 and BPT 2688 with 9.11, 9.59, 9.74 and 9.76 mean population per hill respectively were found resistant and remaining 24 genotypes were moderately resistant. Pymetrozine 50 WG @ 0.5 g l^{-1}, dinotefuran 20 SG @ 0.4 g l^{-1}, sulfoxaflor 25 SC @ 0.75 ml l^{-1} were the most effective insecticides with 62.98, 59.60 and 51.99 per cent population reduction over untreated control respectively and they were safer to the natural enemies *viz.*, spiders and green mirid bugs.

The Ghantasala, Maruteru, Nalgonda, Jangamaheswarapuram and Bapatla strains of *R. dominica* have showed 3.07, 2.61, 1.80, 2.10 and 3.80 folds resistance to malathion (50 % EC) at LC50 when compared to the laboratory susceptible strain. At LC50, Ghantasala, Maruteru, Nalgonda, Jangamaheswarapuram and Bapatla strains of *R. dominica*, revealed one fold resistance to deltamethrin (2.8 % EC) and ranged from one to two folds, respectively(when compared with laboratory susceptible strain).

The groundnut genotypes, Narayani, K 9 and ICGV 87846 were less susceptible for groundnut

bruchid and the genotypes, Dharani, K 1535 and ICGV 00350 were highly susceptible. The development of immature stages of groundnut bruchid was prolonged (50.01 to 55.46 days) on less susceptible genotypes compared to that on highly susceptible genotypes (39.25 to 41.86 days) The oviposition, adult emergence and growth index of *C. Serratus* were positively correlated with physical parameters such as length×width and pod weight, whereas pod shell thickness was negatively correlated.

Taxonomic studies of predacious coccinellid species on pulses in Guntur District revealed that *Cheilomenes sexmaculata* (47%) and *C. transversalis* (44%) were found as the most abundant species in different pulses-production systems, while very few population of *H. octomaculata* (5%), *M. discolor* (2%), *S.* (*pullus*) *coccivora* (1%) and *B. suturalis* (1%) were observed feeding on aphids in and around Guntur region, A.P.

Department of Plant Pathology

Survey on blackgram during *rabi,* 2016-17 in Guntur district of Andhra Pradesh for fungal foliar diseases revealed occurrence of Corynespora leaf spot (*Corynespora cassiicola*) (31.89% PDI at 40-45 DAS and 67.27% at 50-55 DAS), Cercospora leaf spot (*Cercospora canescens*) (28.88% at 40-45 DAS and 53.70% at 50-55 DAS) and powdery mildew (*Erysiphe polygoni*) (22.85% at 40-45 DAS and 63.22% at 50-55 DAS). During *rabi*, 2016-17, occurrence of Corynespora leaf spot, Cercospora leaf spot and powdery mildew was influenced maximum by maximum temperature and minimum temperature. Two genotypes T9 and LBG 645 were moderately resistant to Corynespora leaf spot. LBG 645 was moderately resistant to Cercospora leaf spot.

Studies on the phylogenetic variation of *Cercospora abelmoschi* using molecular markers revealed that polymorphism existed among the *Cercospora* isolates collected from Guntur district. 550 bp amplicon of the isolates when digested with EcoRI found two restriction sites in all isolates except the Yazali isolate while Bam HI found single restriction site in all the isolates with length polymorphism in Yazali isolate. Taq1 restriction indicated a high degree of genetic diversity among the isolates and was represented by three different banding patterns while in three isolates there were no restriction sites. Significant negative correlation existed between disease severity and total phenols (-0.903), total proteins (-0.903), chlorophyll a (-0.901), chlorophyll b (-0.788), total chlorophyll (-0.856), while significant positive correlation existed between total sugars and disease severity (0.932).

Department of Crop Physiology

Among the post emergence herbicides, the combined use of acifluorfen sodium 16% EC + clodinafop propargyl 8% EC (24% EC) @ 300 and 240 g a.i ha^{-1} at 15 DAS recorded higher weed control efficiencies by reducing weed density and dry matter to a maximum extent during critical period of crop-weed competition in blackgram, which might have helped in recording higher growth attributes i.e. more number of branches, leaf area and dry matter accumulation.

Pre soaking of groundnut seeds with HBL @ 3.0 ìM followed by foliar spray of HBL @ 3.0 ìM at 30 DAS and kinetin pre soaking @ 10 ppm also spread at 30 DAS increased the plant height, number of branches and number of flowers $plant^{-1}$, NAR and total dry matter. Nitrate reductase activity , leghaemoglobin content, number and fresh weight of nodules, nitrogen content of plants and soil, total chlorophyll content

and oil content were high with the trcatment pre soaking of seeds with kinetin @ 10 ppm followed by foliar spray of kinetin @ 10 ppm. Even though it could not resulted in higher yield compared to brassinosteroids.

Department of Agricultural Economics

The data collected from various sources with respect to selected mandals of Srikakulam district revealed that the area damaged was 19,550 hectares valued at Rs. 1877 lakh due to Phailin cyclone, heavy rains and floods. The total value of damage to agricultural assets was Rs. 2144100. Paddy was the worst affected crop with an extent of damage reported as 84.91 ha. The value of damage to ready to harvest crops was Rs. 3250529. The value of loss of standing crops was Rs. 684224. The total disaster effects incurred to all the respondents from crops and agricultural assets was valued at Rs. 6078853.

The comparison of chilli price forecasts by different agencies revealed that the accuracy was more in case of ANGRAU, PJTSAU, Reliance Foundation and Guntur Market yard Traders Association, when compared to that of by Guntur District Cold Storage Owners Welfare Association and Vijaya Krishna Spice Farms Pvt. Ltd. Majority of the adopters of price forecasts belong to medium category and educated. Majority of the adopters reported price forecasts were beneficial to them in taking farm decisions.

In Andhra Pradesh, the LGR and CGR values for milk production were 7.17 per cent and 7.10 per cent and for per capita availability were 6.16 per cent and 6.10 per cent respectively. The gross margin was found to be the highest in case of dairy farmers selling milk to private dairies (Rs. 1703.89), followed by farmers to cooperative society (Rs. 1244.61), faremrs to milk collection centres a(Rs. 862.83) and farmers to consumers (Rs. 442.94). Highest marketing efficiency and lowest price spread for butter milk was observed in one of the non-cooperative channel i.e., marketing butter milk through private dairies directly to consumers without the presence of intermediaries.

In the socio-economic profile, the middle aged farmers with less farming experience, low education status and more composition of family labour were going for vegetable cultivation. The average land holding size of small farmers was 0.96 ha. High gross returns were observed in bhendi-cluster bean cropping system, followed by red chilli. The net returns per rupee expenditure of two vegetable cropping systems was higher than red chilli. Bhendi was the low invested and most profitable crop and gross margin investment was low in ridge gourd – bottle gourd cropping system. The sum of elasticity of production was 1.308.

The average per hectare total cost with DMI in coconut was Rs. 133378 and Rs. 120058 for CMI. The per hectare total establishment cost for DMI was Rs. 261297 and Rs. 250570 for CMI. The per hectare maintenance cost for DMI was Rs. 6407591 and Rs. 6131196 for CMI. The cost of drip irrigation system in one hectare coconut with no subsidy was Rs. 29435 and with 90 per cent subsidy was Rs. 2943.50 in Andhra Pradesh under APMIP. The higher water use efficiency of 1024 nuts /ha-cm in DMI and 304 nuts/ha-cm in CMI was observed. The amount of water saved through DMI was 62.22 per cent accounting to 4522.39 ha-cm. The average per hectare of coconut was 56244 nuts under CMI and 44325 nuts under CMI.

S.V. Agricultural College, Tirupati

Agronomy

Based on production efficiencies and monetary returns, groundnut – sweet corn – greengram/cowpea cropping system was found

to be more remunerative, economically viable, profitable and sustainable food forage based system under irrigation for Southern Agro-Climatic Zone of Andhra Pradesh closely followed by groundnut – baby corn – greengram/ cowpea over other cropping systems.

Based on the outcome of the pre experimental laboratory and pot culture studies, it could be inferred that 100 ppm of concentration is optimum for foliar spraying of nanoscale nutrients of ZnO or CaO or MgO. The field investigations concluded that, for obtaining maximum grain yield, juice yield, improved quality of juice and fodder with higher monetary returns, the sweet sorghum crop should receive 100:60:40 kg N:P2O5:K2O ha-1 as RDF followed by foliar spray of 100 ppm each of nanoscale ZnO, CaO and MgO in combination on 40 and 60 DAS on standing crop. The post experimental laboratory analysis concluded that maximum ethanol productivity is possible when fermentation juice received 10 ppm nanoscale CaO and 20 ppm of nanoscale MgO.

The investigation revealed that intercropping of baby corn with amaranthus with a spacing of 60 cm × 15 cm produced the highest baby corn yield, green fodder yield along with higher leaf yield of amaranthus which inturn increased the overall productivity of the system.

Based on the observations it can be concluded that intercropping of pearlmillet with groundnut in paired row system in 2:2 row proportion was more remunerative system for realising higher monetary returns per unit area under rainfed conditions during kharif season.

The investigation revealed that, higher pod yield of groundnut as well as economic returns could be realized with 100% recommended dose of nutrients through fertilizers. Among the various organic sources tried, 100% N through FYM as well as 50% N through FYM + 50% N through sheep manure were proved to be promising organic manurial practices for higher yield and economics of groundnut along with maintenance of soil fertility under rainfed conditions in the present domain of study.

It was concluded that application of recommended dose of fertilizers (180-60-50 kg N, P2O5 and K2O ha-1) along with soil application of sulphur @ 30 kg ha-1 and foliar application of ZnSO4 and FeSO4 @ 0.5% each at booting and silking stage was the economically viable nutrient management strategy for obtaining higher seed yield of hybrid maize with improved quality in the sandy loam soils during rabi in Southern Agro Climatic Zone of Andhra Pradesh.

Genetics and plant breeding

The chemical mutagen sodium azide (SA) @ 1.5 mg l-1 followed by ethyl methane sulphonate (EMS) @ 1.0 µM l-1 were found effective in creating yellow leaf disease (YLD) resistance in both varieties viz., 2003V46 and Co86032 of Sugarcane, sustudied. Out of four growth hormones used; the growth hormone 2, 4 dichloro phenoxy acetic acid (2, 4 – D) at higher concentration created variation but not YLD . More number of somaclones was created with EMS @ 1.0 µM l-1 in 2003V46 and with SA @ 1.5 mg l-1 in Co86032. As these somaclones could not be used directly as commercial varieties, they have to be utilized in hybridization programmes, by crossing with commercial varieties to impart YLD resistance.

Groundnut genotypes K-6, Dharani, TCGS-1157 and K-1696 showed high mean performance for pod Yield and its component traits. The genotypes Kadiri Harithandhra displayed highest seed calcium uptake while TCGS-1157 exhibited highest seed sulphur and seed iron uptake at maturity, respectively. These genotypes could be

utilized as donor sources for developing nutrient uptake efficiency traits in groundnut. Based on Diversity analysis, the genotypes Bheema, K-1696, K-9, TPT-4, K-1648, K-6, Harithandhra, Abhaya, TCGS-1157 and Dharani were suggested for inclusion in hybridization programme for obtaining superior and desirable recombinants for yield and nutrient uptake efficiency traits in groundnut.

Based on genetic diversity analysis in Mungbean, the crosses between GVIT-203 x WGG-42 and KM-122 x EC-396117 etc., could be suggested for the exploitation of transgressive segregants for yield and yield related traits. Genotype–by–Trait biplot analysis revealed positive correlation of seed yield with number of clusters per plant, number of pods per plant, days to maturity, number of pods per cluster, leaf area duration and chlorophyll content.

Soil Science and Agricultural Chemistry

Studies on long – term effect of manures and fertilizers application on potassium dynamics in rainfed ground nut growing Alfisols showed that at sowing time, different forms of K like water soluble K, available K and fixed K were highest in K treated plots in both surface and sub-surface soils compared to other treatments in the experiment. Similar results were obtained with respect to available K and fixed K while the non-exchangeable K both in the surface and sub-surface were highest in N,P,K + gypsum + ZnSO4 treatment compared to the N alone treated plot. At pod formation stage similar trend with respect to different forms of K were observed.

In 34 years old long term manure and fertilizer experiments, the physical properties like Bulk Density, Porosity and maximum water holding capacity and structural indices viz., mean weight diameter, geometric mean weight diameter and per cent water stable aggregates (>0.25 mm) were improved due to application of FYM (5 t ha^{-1}) and similar affect was also observed with treatments like NPK + gypsum +ZnSO4, NPK +lime and NPS +Gypsum. Single nutrient application i.e., N or P or K were inferior to combined application of all nutrients with respect of pod and haulm yield.

Crop Physiology

A pot culture experiment on response of groundnut genotypes to iron revealed that, the tested groundnut genotypes differed in their response to both iron sufficient and deficient soil conditions. Among the genotypes, TCGS-1624 reported higher yield and yield components followed by TCGS-1616 while the lowest was reported in TCGS-1613 and TCGS-1609 compared to other genotypes. Hence TCGS-1624 and TCGS-1616 were considered to be tolerant to IDC and TCGS-1613 and TCGS-1609 were considered to be susceptible to IDC.

A set of diverse 45 blackgram genotypes were screened for heat tolerance using the standardized Thermo Induced Response (TIR) protocol. Among the 45 blackgram genotypes, 10 genotypes (KU-12-55, LBG-623, LBG-680, NDU-12-300, LBG-685, KU-12-14, LBG-645, KU-12-37, TBG-104, KU-12-13) showed higher heat tolerance in terms of higher seedling survival and less reduction in root and shoot growth. Among the selected genotypes TBG-104, KU-12-13 and KU-12-55 are superior in terms of physiological efficiency, rooting abilities, drought tolerance, yield under imposed moisture stress conditions.

Entomology

Seventeen species under nine genera of three sub families viz., Melolonthinae, Rutelinae and Dynastinae of Scarabeidae were collected through light traps from major groundnut growing areas during *kharif* 2014 and 2015. The alpha diver-

sity and species richness of scarabeids were high in Chittor district. *Holotrichia reynaudi* and *H. serrata* were the most predominant species in YSR Kadapa and Kurnool districts. Whereas in Chittoor, *Brahmina mysorensis* and *H. reynaudi* were abundant. Seed treatment with imidacloprid 600 FS @ 2 ml+2 ml of water per Kg seed was found to be the best treatment against root grubs in groundnut.

Among the twenty genotypes of chickpea tested, IG 70012, PI 599046, IG 70022, PI 599066, IG 70006, IG 70018 (*Cicer bijugum*), ICC 506EB, ICCL 86111 (resistant checks), IG 72933, IG 72953 (*C. reticulatum*) IG 69979 (*C. cuneatum*) and IG 599076 (*C. chrossanicum*) showed high levels of antixenosis for oviposition of *H. armigera*. Morphological characters of chickpea like glandular and non-glandular trichomes showed negative association with oviposition under multi-choice and no-choice conditions. Zymogram analysis revealed presence of 3 to 7 trypsin inhibitor (TI) isoforms in all 20 genotypes of chickpea GC-MS profile peaks of leaf surface chemicals identified with hexane extracts showed 56 peaks in all chickpea genotypes.

The mortality response of various life stages of cigarette beetle, *L. serricorne* to graded CO2 concentrations revealed that among the all life stages tested, pupal stage was found to be the most tolerant followed by late instar, egg, adult, middle instar and early instar grubs. The results obtained from mortality response of various life stages of cigarette beetle, *Lasioderma serricorne* exposed to various temperature levels indicated that all the life stages viz., egg, early instar, middle instar, late instar, pupa and adult were susceptible to low temperature at -5°C.

Incidence of leaf miner was high when the crop was sown in August compared to June and July months. Incidence of leaf miner and webbed leaves were negatively correlated with maximum temperature, minimum temperature, sunshine hours and rainfall, while positively correlated with morning relative humidity, evening relative humidity. Nano scale (Zn) coated NSKE formulations @ 30 g/l and @ 50 g/l were found to be most effective treatments against groundnut leaf miner.

Among the tested varieties and hybrids of brinjal for insect pests, the shoot damage by *Leucinodes orbonalis* ranged from 4.06 to 15. 37 per cent. The lower shoot damage was recorded in Arka Neelakanth (4.06%), CVK (4.66%), Shyamala (5.30%), PHB-909 (6.06%) and Arka Keshav (6.46%). Density of trichomes was found to have negative impact on *L. orbonalis*. Among the ten eco-friendly approaches tested against *L. orbonalis* on CVK variety, application of FYM or vermicompost or neemcake + removal of infested shoots and fruits at regular intervals + one spray of spinosad recorded lower shoot and fruit infestation.

Plant Pathology

Studies on "Biological and molecular characterization of pigeonpea sterility mosaic virus," identified resistant sources to Pigeonpea sterility mosaic virus. Screened 34 genotypes and found that PPSMV Tirupati isolate is more close to PPSMV-Bangalore isolate.

A study was undertaken to develop suitable management strategies against TSV in groundnut. Among different modules, module with improved practice i.e.,4 rows of Jowar as border crop + seed rate @ 200 kg ha^{-1} + seed treatment with imidacloprid 600 FS @ 2 ml kg^{-1} seed and mancozeb @ 3 g kg^{-1} seed + spraying of thiocloprid 480 SC @ 150 ml ha^{-1} at 20 DAS followed by acetamiprid 20 SP @ 100 g ha^{-1} at 35 DAS.) was found to be effective with lowest PSND disease incidence and thrips damage .

Studies on variability of *Fusarium udum* revealed that *F. udum* isolates from the same site or diverse geographical origins exhibit high variability in cultural and pathogenic characteristics. The pathogenic isolates were isolated and designated as FU-1 to FU-25. Screening of pigeonpea germplasm was done under sick plot conditions at Tandur and found TRG-59 as best genotype with lower wilt incidence of 17.42% and highest yield of 214.1 g per plant.

Agricultural Extension

Out of the fourteen selected independent variables five of the variables namely education, annual income, number of years benefitted, socio-politico participation and achievement motivation showed significant relation with the indirect changes of the MGNREGS beneficiaries. Remaining variables like age, gender, size of the family, occupation, caste, sources of information, risk orientation, economic motivation and level of aspiration did not show any significant relationship with the indirect changes.

Correlation analysis revealed that education, farming experience, extension contact, mass media exposure, innovativeness, training undergone, economic orientation, achievement motivation, social participation, scientific orientation, risk orientation, knowledge and adoption were positively and significantly related with Impact of APMIP at one per cent level of significance. Whereas, age was negatively significant with Impact of APMIP at 0.05 level of significance.

Correlation analysis revealed that land holding, annual income, extension contact, mass media exposure, social participation, economic orientation and risk orientation were positively and significantly related and fatalism was negatively significantly related at 0.01 level of significance whereas education was positively significant at 0.05 level of significance.

Agricultural Economics

The Economic Analysis of Production and Marketing of Ginger in Wayanad District of Kerala State revealed that the per hectare cost of cultivation of ginger in the study area was estimated at ‘ 4,54,991.62, ‘ 4,94,501.03 and ‘ 4, 81,957.23 on small, large and pooled farms respectively and thus exhibiting direct relationship with the size of the farm. The break- even analysis indicated that the break-even output per hectare in the cultivation of ginger was 41.28, 39.04 and 40.44 quintals on small, large and pooled farms respectively. The actual output obtained by the farmers exceeded the break-even output. The results of allocative efficiency highlighted that the MVP/MFC ratios were more than unity for seeds, fertilizers and manures on small farms, and seeds and plant protection chemicals on pooled farms. However, the negative ratio of MVP/MFC for fertilizers on large farms and less than one ratio of the same for manures on large and pooled farms indicated that the factor was used at higher levels than necessary in ginger production.

A study on “Economics of production and marketing of tomato in Chittoor district of Andhra Pradesh” indicated that, the total cost of cultivation of tomato per hectare worked out to Rs. 117374.33, Rs. 121333.03, and Rs. 118890.35 on small, large and pooled farms respectively. The per hectare cost of cultivation is directly related with the farm size and per hectare cost of production (Rs/q) is inversely proportional to the farm size. The gross returns worked out Rs. 147740, Rs. 1,43,590 and Rs. 145665 on small, large and pooled farms respectively indicating inverse relationship with the size of the farm. The functional analysis revealed that human labour and manures in tomato production significantly contributed to increase the yields. The MVP to MFC ratio was greater than unity for human labour and fertilizers in tomato cultivation

indicating greater potentiality for further use.

"An economic analysis of acid lime cultivation in Nellore district of Andhra Pradesh with special reference to variety balaji" indicated that, the total labour requirement during 15 years of acid lime orchard stood at 6171.19 man days per hectare on balaji variety farms and 5380.38 man days per hectare on local variety farms. The important labour absorbing operations were harvesting (1738 and 1172.5 man days), irrigation (975 and 729 man days), application of manures and fertilizers (728.6 and 838 man days) and weeding (718 and 669 man days) on balaji and local varieties of acid lime orchards.

Agricultural College, Naira

Significantly higher growth stature, yield structure and yield (762 kg ha^{-1}) were obtained in rice fallow blackgram with acifluorfen+clodinafop-propargyl @ 0.4 kg a.i ha^{-1} at 25 DAS followed by its lower doses 0.35 kg ha^{-1}, 0.3 kg ha^{-1}, 0.25 kg ha^{-1} and 0.2 kg ha^{-1}. The lowest nutrient uptake by *Vicia sativa* and other weeds and maximum nutrient uptake by blackgram was recorded with acifluorfen+clodinafop-propargyl @ 0.4 kg a.i ha^{-1}, which was on par with its lower doses.

Significantly higher growth stature, yield structure and yield (5599 kg ha^{-1}) were obtained in semi-dry rice with the highest level of NPK (160-90-75 kg ha^{-1}) with dhaincha as brown manuring (L_4). Nitrogen applied in four equal splits (S_1) was found to significantly enhance growth, yield attributes and yield. The study revealed that semi-dry rice can be grown profitably with application of 160-90-75 kg NPK ha^{-1} with dhaincha as brown manuring and N scheduled in four equal splits.

There was a progressive and significant increase in plant height and dry matter production, seed yield, stalk yield, uptake of N, P and K by seed and stalk, gross returns, net returns and B: C ratio in rice fallows on sandy loam soils with increase in seed rate from 15 to 20 and 25 kg ha^{-1}. Foliar application of DAP, 19-19-19 and KNO3 recorded higher values growth parameters, yield attributes, seed yield, stalk yield, seed quality parameters, uptake of NPK by seed and stalk, gross returns, net returns and B: C ratio compared to water spray.

Agricultural College, Mahanandi

Agronomy

Among irrigation levels, white sorghum irrigated with twice gave higher grain and stover yields thereby higher gross returns but these were comparable with one irrigation. However, net returns and benefit: cost ratio were higher with one irrigation than two irrigations. Application of 180 kg N ha-1 produced higher grain and stover yield and also higher net returns than other levels (90 and 120 kg N ha-1) but net returns were comparable with 150 kg N ha-1. White sorghum can be grown successfully by giving one irrigation with the application of 150 kg N ha-1 (as it was comparable with 180 kg N ha-1) for realizing higher yields and net returns in vertisols during post rainy season.

Among the secondary nutrients foliar spray, response of groundnut to sulphur and magnesium was more compared to calcium. With regard to micronutrients zinc has exerted main significant effect on growth and yield parameters compared to other micronutrients. Combined foliar application of secondary and micronutrients along with RDF was evolved as best combination for increased productivity and monetary returns of groundnut.

Application of higher levels of N, P, K and foliar application of Zn significantly resulted in linear increase in production and productivity of maize. However, application of 250-60-60 kg N-

P2O5-K2O ha-1 along with foliar application of 0.2% ZnSO4 at 15 and 25 DAS (T8) resulted in higher monetary benefits.

Soil Science & Agril. Chemistry Department

Dry matter, K content and K uptake of maize crop were increased gradually with increasing doses of K fertilizer application(0 to 90kg K_2O ha^{-1}) in all selected soils of Kurnool district , A.P. It indicated that soils having high initial K status also showed response to K fertilizer application. K availability indices i.e different forms of K, potassium releasing parameters i.e step-K, cumulative-K , and liable potassium were the highest in maize-maize cropping system than fallow Bengal gram cropping system even though fallow Bengal cropping system was grown in black soils which might be due to lack of K fertilization which results in K depletion over period of time. These K availability indices were the lowest in groundnut-groundnut cropping system.

Genetics and Plant Breeding Department

Genetic Diversity Studies on Peanut Stem Necrosis tolerant groundnut genotypes revealed that the groundnut genotypes, K 1717, K 1725, K 1647, 04 X 477-012 were identified as potential genotypes for cultivation, Further, kernel yield per plant, pod yield per plant, haulm yield per plant and 100 kernel weight were identified as potential selection criteria for effective improvement of yield.

Genetic stability analysis in drought tolerant groundnut genotypes found that the genotypes, K1717 and K1802 for pod yield per plant; K1899 and K1884 for kernel yield per plant; K1809 and Anantha for oil content; and K1886 and K1813 for kernel yield per plant coupled with oil content were identified for cultivation across the groundnut growing *kharif* seasons studied.

Studies on genetic variability for selective tolerance to post emergence weedicide in chickpea revealed that the genotypes NBeG 3 and NBeG 47, NBeG 49 were found be not only tolerant to post emergence weedicide (Pursuit) but also high yielding along with some yield attributes such as shoot biomass and number of pods per plant which can be further utilized in breeding programmes.

College of Agricultural Engineeing, Bapatla

Dept. of Soil and Water Engineering

The irrigation project boundaries of the study areas were digitised from the guidance available in public domain ISRO-Bhuvan and India WRIS web sites. The software used for analysis of satellite images were ERDAS IMAGINE and Arc GIS. Crop area information for each season has been extracted using Normalised Difference Vegetation Index (NDVI), unsupervised classification of satellite image.

A study carried out at field irrigation laboratory of department of Soil and Water Engineering, College of Agricultural Engineering, Bapatla during rabi 2015-16 and summer 2016 with drip fertigated through fertilizer injection pump, venturi injector, fertilizer tank and control respectively. The results indicated that,the yield response was best in fertigation with fertilizer injection pump in chillies crop as 10.51 t ha-1, with water use efficiency of 16.26 kg ha-1 mm-1 was observed to be higher than the all other treatments followed by venturi injector, fertilizer tank and flood method as 15.52, 12.66 and 9.18 kg ha-1 mm-1 respectively. In maize crop also, the yield was best in fertigation with fertilizer injection pump treatment as 6.10 t ha-1 with water use efficiency of 10.90 kg ha-1 mm-1 was observed to be higher than the all other treatments followed by venturi injector, fertilizer tank and flood method as 9.97, 8.47 and 5.75 kg ha-1 mm-1 respectively.

Dept. of Processing and Food Engineering

Developed a process technology for bottling tender coconut water using membrane filtration, pasteurization and chemical additive. A continuous cross flow flat sheet membrane module was used in the study to process by MF and UF.using 0.2 ìm pore size and 40 kDa and 500 Da molecular weight cut off (MWCO) membranes at various transmembrane pressures (TMPs). Based on different quality attributes, pasteurized treatment, MF and UF had been found to give a better quality bottled TCW in that order, the first treatment being the best. Membrane processing of TCW could be one of the alternate methods along with thermal processing for producing quality product.

Process parameters for prepress solvent extraction of corn oil were optimized. During the process of prepress solvent extraction of oil, the oil yield was 42.04% in pressing of maize germs and 12.37% in solvent extraction of pressed cake resulted total oil yield of 54.01% out of total oil content of 56.50%.

Developed a cleaner-cum-pearler for finger millet machine consisted of cleaning unit, hopper, and outer cylinder, inner cylinder with 12 cotton felts (10cm x 10cm x 1 cm) with one end of them bolted on its surface, main frame, aspirator (0.5 hp) and electric motor (2.5 hp). The optimum value of pearling efficiency was 80.1% , 4.3% of broken grain at 10% w.b moisture content, 900 rpm at 150 kg/h feed rate (II pass) Cleaning efficiency of the machine was 88.2%. Highest percentage of broken grain was found to be 9.5% at 10% w.b moisture content, 1400 rpm at 90 kg/h (II pass). Oerating cost of the machine per kg was Rs. 0.326/-.

A grader based on gravity and centrifugal force was designed and fabricated for grading round fruits and vegetables and evaluated for onion, sweet orange and lemon at different feed rates. Overall efficiency of grader for lemon, sweet orange and onion were 86%, 75% and 83% respectively. Maximum grading efficiency was obtained for lemon because of its more sphericity.

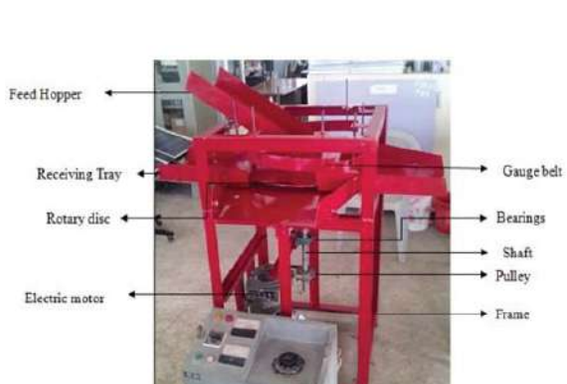


Fig. Grader suitable for round fruits and vegetables

Dept. of Farm Machinery and Power Engineering

Machines available viz., set cutter planter and bud-chip seedling transplanter for sugarcane planting were evaluated and its efficiencies were analyzed and compared with the farmer practice. Field efficiency of planting was 58.7% in set cutter planting, whereas, in bud chip planting machine it was 50.0%; time taken to complete operation was 2.544 h/acre in sett and 4.0473 h/acre respectively. The time saving with machine (set cutter & bud chip) planting was 98.4% and 97.47% respectively, when compared to manual planting method. Similarly the labour saving was found to be 92% and 92% in set cutter and bud chip planting compared to manual planting method. Highest yield was recorded in the bud-chip planting field and was 26.17% more than set cutter planting and 43.2% more than manual

method of planting. The cost economics of the planting was also analyzed and found to be Rs.4,575/acre (budchip planting) and Rs. 27,595/ acre (sett cutter planter) was saved over manual method of planting.

D. STUDENTS' ACTIVITIES

1. National Cadet Corps (NCC)

Fifty NCC cadets of S V Agricultural College, Tirupati attended AISCCON National Conference at Tirupati held from 23rd of November to 24th of November, 2016.

As many as fifty one students of the ANGRAU got 'B' certificate and eleven students obtained 'C' certificates in NCC during the year 2016-17. The NCC Camps attended by the students during the year are detailed in the Table 7.

Independence day celebrations at Agricultural College, Bapatla.

Table 7. NCC Camps Attended by the Students

Name of the College	Camp	Venue	Date	No. of Cadets Attended
S. V. Agricultural College, Tirupati	Combined Annual Training Camp (CATC)- XII	Gurukul Complex, NCC Nagar, Tirupati	01-10-16 to 11-10-16	13
	All India Trekking Expedition APTREK-II	Kalyani Dam, Tirupati	09-01-17 to 16-01-17	05
	Combined Annual Training Camp (CATC)- XIII	Gurukul Complex, NCC Nagar, Tirupati	17-02-17 to 26-02-17	02
Agricultural College, Bapatla	Annual Training Camp	Chilumuru	03-10-16 to 12-10-16	19

Republic day celebrations at S.V. Agricultural College, Tirupati

2. NSS Activities

The NSS volunteers of various colleges actively participated in NSS Camps during the year. The NSS activities included planting of ornamental and tree plants, sanitation programmes, awareness programmes on Health & Hygiene and AIDS, blood donation programmes, vaccination to animals, rodent control, parthenium eradication in public places and Clean & green programmes, etc. The NSS special camps of about ten days duration were organized for the students of all the final year Undergraduate and Diploma programmes. The details of the NSS special camps attended by the students during the year 2016-17 are shown in Table 8.

Table 8. NSS Camps Attended by the Students

Name of the College	Camp	Venue	Duration of Special Camp		No of Students Attended
			From	To	
Faculty of Agriculture					
S.V. Agricultural College, Tirupati	Special Camp	Paidipalli(V) Tirupati Rural (M)	17.01.17	23.01.17	140
Agricultural College, Bapatla	Special Camp	Gundlapalli (V) Maddipadu (M) Pedavadlapudi (V) Mangalagiri (M)	02.01.17 03.01.17	08.01.17 09.01.17	79 boys 128 girls
Agricultural College, Naira	Special Camp	Kasimvalasa (V). Srikakulam (M)	22.10.16	28.10.16	100
Agricultural College, Mahanandi	Special Camp	Thimmapuram (M)	01.10.16	07.10.16	73
Agricultural College, Rajahmundry	Special Camp	Dommeru (V) Kovvur (M)	13.11.16	19.11.16	50
Faculty of Agricultural Engineering & Technology					
College of Agril. Engg., Bapatla	Special Camp	Pothuraju (V) Kothapalem (M)	16.02.17	22.02.17	71
College of Agril. Engg., Madakasira	Special Camp	Gundumala (V)	22.03.17	28.03.17	144
College of Food Science & Tech., Bapatla	Special Camp	Bidarudibba (V)	15.02.17	21.02.17	48
College of Food Science & Tech., Pulivendula	Special camp	Brahmanapalle (V)	13.07.16	17.07.16	74

NSS ACTIVITIES

Tree Plantation Programme (2-7-16)

Navaniramana Deeksha Pledge (1-6-16)

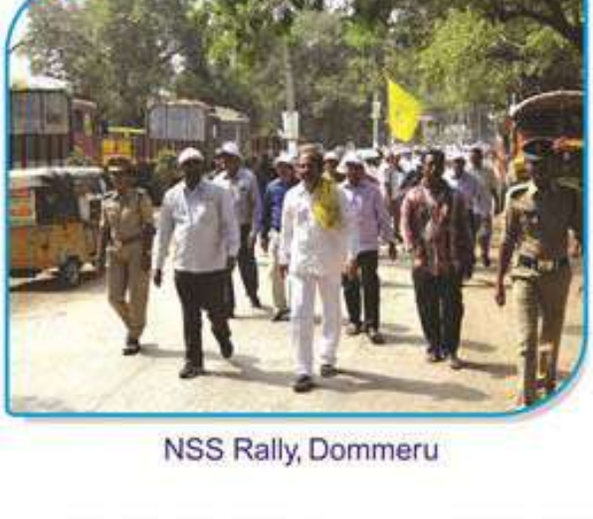
NSS Foundation Day (24-9-16)

International Yoga Day (2-6-16)

Coconut Seedlings Planting at Katheru Farm

Workshop on Digital Transaction

NSS SPECIAL CAMP

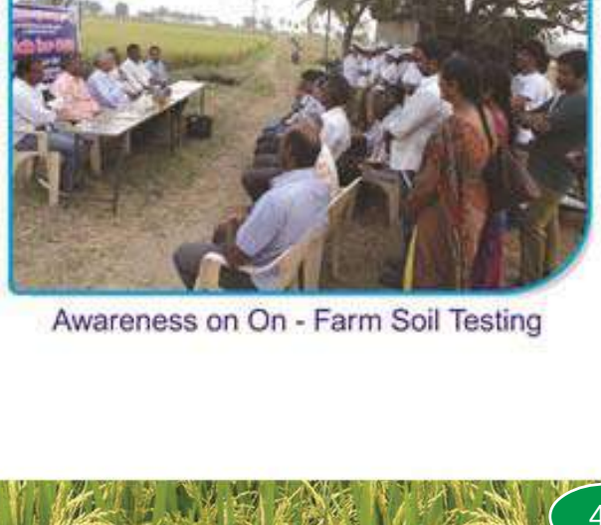


NSS Rally, Dommeru

Swatch Bharath

Children's day Celebration (14-11-16)

Clean and Green



Awareness on On - Farm Soil Testing

Organization of Exhibition (18-11-16)

3. Sports, Games, Cultural and other Activities

Thirty one students from various colleges of ANGRAU participated in 17th All India Inter Agricultural Universities Sports & Games Meet, 2016-17 held at CCS Haryana, Agricultural University, Hisar – Haryana from 25th – 29th March, 2017.

One student from Agricultural College, Bapatla participated in the Soft Ball Senior State meet held at Jangareddygudem. He got 1st place (winners) in the meet and he was also selected for senior national's team. Five students of College of Agricultural Engineering, Bapatla participated in "National Women Parliament – 2017" conducted at Pavitrasangamam, Vijayawada, Krishna district on 10th and 11th of February, 2017. One student of College of Agricultural Engineering, Madakasira Participated in NSS Youth Festival at Adikavi Nannaya University, Rajahmundry during January, 2017.

Students of College of Home science, Guntur Participated in various events *viz.*, i) State level elocution competition conducted by the Department of Women Development and Child Welfare, Government of A.P on topic "Role of students in creating Nutrition awareness" on 18.8.16, ii) Three day (10.02.17 to 12.02.17) National conclave – "National Women's Parliament" at Amaravathi, Andhra Pradesh, iii) AGRIUNIFEST–2017 held at RAJUVAS (Rajasthan University of Veterinary and Animal Sciences) Bikaner, Rajasthan from 22.02.17 to 25.02.17 and iv) "Yuvajanotsavam-2016" organized by Sri. Gogineni Kalaniketan at RVRR Vidya Kalasala, Guntur on 15.10.16

Students from all the colleges of different faculties participated in Inter Collegiate of Sports, Games, Literary and Cultural Events of ANGRAU which was organized in three different Phases. The Phase I was organized at Agricultural College, Naira from 27th to 30th Nov, 2016, Phase II at Agricultural College, Bapatla from 10th to 13th Dec, 2016 and Phase III at S.V. Agricultural college, Tirupati from 17th to 20th Dec, 2016 .

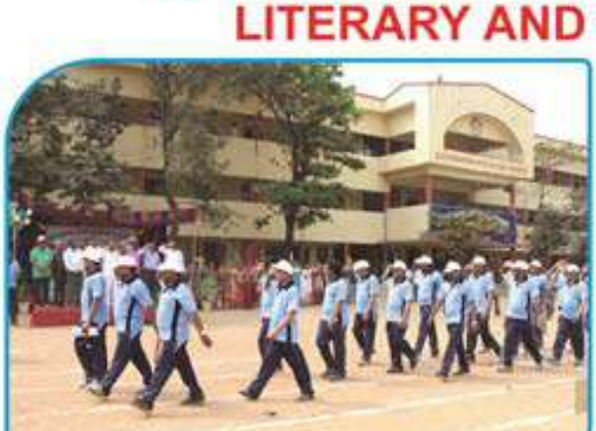
Teaching staff representing all the zones participated in the "ANGRAU Teaching staff games, sports, cultural & literary meet, 2016-17" conducted at Agricultural College, Rajamahendravaram from 10th to 12th February, 2017. North Costal and High Altitude & Tribal Area Zone banged the overall championship in this event. University also organized "ANGRAU Non-Teaching staff games, sports, cultural & literary meet, 2016-17" at S.V. Agricultural College, Tirupati from 23rd to 25th January 2017 in which Non-Teaching staff from all the zones participated. In this meet Krishna zone was adjuated as overall champion.

Sports Activities in ANGRAU for Teaching Staff

Sports Activities in ANGRAU for Teaching Staff

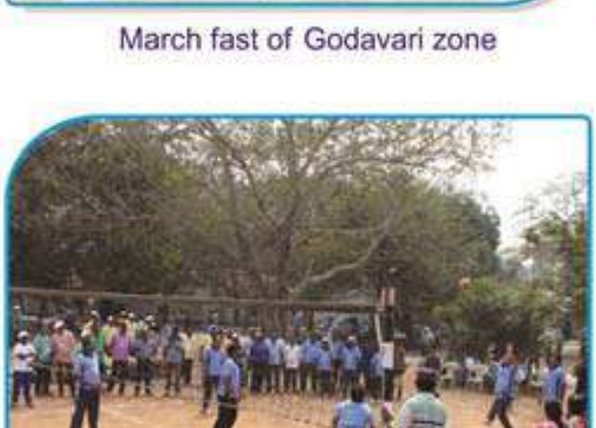
Sports, Games and Cultural Competitions for teaching staff of ANGRAU at Agricultural College, Rajamahendravaram

ANGRAU TEACHER'S GAMES, SPORTS, LITERARY AND CULTURAL MEET



March fast of Godavari zone

Swagatham by V.P.Sribala, B.Sc. (Ag.) IInd year



Volley ball match between
North coastal zone and Godavari zone

100 meters sprint by Sri S.Sreenivasa Raju,
Asst.Professor (Horticulture)

Carroms competition

Essay writing competition

4. Students' Counseling and Placement Cells

The Students' Counseling and Placement Cells are functioning in all the Colleges and Polytechnics of the University. They are acting as liaison between the University Colleges and the public & private sector organizations / institutes that are in need of graduates/diploma holders.

During this year, the campus interviews were held by several organizations and a total of 155 students got placed in different public and private organizations. The list of firms in which the students got placement is shown in Table 9.

Table 9. Student Placements during 2016-17

Name of the Organization	Name of the Post	Number of students placed
S.V. Agricultural College Tirupati		
ITC Limited	Agricultural Trainee	1
Sundaram Finance Ltd.,	Marketing Officers	7
Dhanuka Agritech Ltd.,	Business Development Officers	11
Agricultural College, Bapatla		
SAU's	Assistant Professor	24
FCI	Junior Technical Assistance	1
APSSCA	Seed Officer	12
Private Companies	Marketing Officer	11
Agricultural College, Naira		
Bayer Crop Science	Sales Executives	01
UPL	Sales Executive	01
Syngenta Limited	Sales Executive	01
Agricultural College, Mahanandi		
Center for sustainable livelihoods, Hyd.	Vocational Trainers	5
Nationalized banks	Junior Agril.Officers	5
Nationalized banks	Asst.Managers	2
Agricultural College, Rajahmundry		
Agriculture Polytechnic	Teaching Assistant	3
Agro based Industries	Sales Executive	12

Name of the Organization	Name of the Post	Number of students placed
College of Agricultural Engineering, Bapatla		
Mahindra &Mahindra	Work Engineer	2
Jain Irrigation Systems Ltd, Jalgaon	MI Engineers	6
Escorts Hyderabad	Sales & Field Officers	8
Yanmar Coromandel Pvt., Ltd. Chennai	Sales & Field Officers	2
Khedut, Hyedrabad	Sales	3
APMIP, Nellore	Engg. Trainee	1
Harvel Agua India Pvt., Ltc	Filed offers &Sales	2
College of Agricultural Engineering, Madakasira		
Escorts Tractors Ltd	--	1
ITC	--	1
Rivulis Irrigation Pvt.Ltd	--	3
NetFind Irrigation Pvt.Ltd	--	2
Pydah Polytechnic of Ag.Engg, Kakinada	--	4
College of Food Science & Technology, Bapatla		
Vimta Labs Ltd., Sharmeerpet-500078, Hyd.	Jr. Trainee	4
Hindustan Coca-cola Beverages Private	Quality Executive, Supply	
Limited, Atmakur Unit, Guntur.	chain Operation Trainee	5
Hindustan Coca-Cola Beverages Pvt Ltd.,	Supply chain Operation Trainee	1
Ameenpur, Patancheru, Medak.		
Heritage Foods Ltd. Uppal, Hyderabad	Production Executive	1
Hector Beverages Pvt. Ltd., Hyderabad	Trainee	7
College of Food Science & Technology, Pulivendula		
Sresta Organic Foods	Quality control officer	1
Parag Dairy, Palamneru	Quality control officer	1
Tirumala Dairy	Quality In-Charge	1
Hindustan Coca-Cola Beverage Pvt. Ltd.	Quality executive	1
Agro-herb care, Food Park	Quality In-Charge	1

5. Equipment Purchased by Different Colleges during the Year 2016-17

The details of equipment purchased by different colleges which costs more than Rupees One lakh per item are furnished in Table 10.

Table 10. Major Equipment Purchased during the Year in different Colleges Costing more than Rs. 1.00 lakh per item.

S. No.	Institution	Equipment	Cost (Rs.)
1	Agricultural College, Bapatla	E class with white board short throw projector	1,05,000/-
2		Labomed monocular Microscope with MICAPS with Laptop	1,10,000/-
3		Beng MX806 PST Short Throw Projector	1,05,000/-
4		Seed Germinator (Double Door)	4,94,000/-
5		One Horizontal and one vertical electrophoreses units along with accessories	1,96,557/-
6		Information KIOSK for digital display of	
		Insect specimens and symptoms	1,50,000/-
7		UV-Visible Spectrophotometer type 119 and 3 KVA stabilizer Model -119	1,80,000/-
8		UV Spectrophotometer	1,80,000/-
9		B.O.D. Incubator	1,19,595/-
10		Interactive Board	1,42,000/-
11		U.V. visible spectrophotometer (Systronic make)	1,80,000/-
12	S.V. Agricultural College, Tirupati	CX-41 Trinocular microscope	2,99,800/-
13		PCR	3,89,000/-
14		Gel Doc	4,76,000/-
15		Installation of Net house (20X50X2 feet), 2000Sft	4,20,000/-
16		SPAD Chlorophyll meter(Imported	
		Konica Minolta model no:SPAD-502)	1,93,988/-
17		Spectrophotometer and its accessories	5,97,450/-
18		Cooling centrifuge	1,49,500/-
19		Laptop & Horizontal Laminar Airflow Cabinet	1,75,000/-
20		Labtop cooling incubators	1,55,000/-
21		Multi Crop Thresher	1,88,700/-
22		Portable Leaf Area meter & Microtone	1,40,500/-
23		Chlorophyll Meter	1,97,500/-
24		Labtop Micro Controller	1,98,500/-
25		Seed Germinator along with 5KV Voltage Stabilizer	4,40,500/-

S. No.	Institution	Equipment	Cost (Rs.)
26	Agricultural College, Naira	UV Visible Spectro meter	4,95,850/-
27		Compact 6 bench top high capacity cooling centrifuge and voltage stabilizer	1,60,500/-
28		Autoclave-vertical, Bouble walled REMI	1,11,300/-
29		Lab Equipment	3,44,400/-
30		Labomed Trinocular Research Microscope	1,78,500/-
31		Labomed Trinocular Research Microscope	1,78,500/-
32		Lab Equipments	1,66,991/-
33	Agricultural Colllege, Mahanandi	PCR Sure cycler	4,47,909/-
34		Water bath with shaker	1,39,650/-
35		Electronic balance	1,19,994/-
36		BOD incubator with stabilizer	1,75,600/-
37		PCR Sure cycler	4,47,909/-
38		Water bath with shaker	1,39,650/-
39		Electronic balance	1,19,994/-
40		BOD incubator with stabilizer	1,75,600/-
41		Double beam UV spectrophotometer	3,69,514/-
42		Automatic N analyzer	7,49,137/-
43		Cooling Orbitol shaking incubat	1,97,980/-
44		Tractor	6,99,500/-
45		10 Computers (Dell)	2,40,000/-
46	College of Agricultural Engineering, Bapatla	Electronic theodolites - 3 Nos.	2,67,750/-
47		Drip irrigation system - 2 Nos.	1,51,130/-
48		Pentax Total station	3,36,000/-
49		Soil moisture probe set	4,98,750/-
50		Weather monitoring station	1,94,250/-
51		WMS premier software	1,99,962/-
52		Proto type watershed model	3,48,490/-
53		EPSON multimedia interactive made projector	1,04,172/-
54	College of Agricultural Engineering, Madakasira	Geomax Electronic Total Station, 1set	4,11,500/-
55		7 kw Models with 10 kv, Three phase Inverter	4,98,750/-
56		Street lights poles of 17'hight,2"Ø,MSmetal-25no's	1,00,000/-
57		Developed multistationed Gym for boys and Girls.	4,10,025/-
58	CFST, Bapatla	Dell laptop - 4No.	1,22,400/-
59		HP Desktops - 4 No.	1,29,800/-
60	CFST,Pulivendula	Lyodel freeze drying system	2,96,400/-
61	APGC, Lam	Generator	4,70,000/-

E. UNIVERSITY LIBRARY

1. ANGRAU LIBRARY SYSTEM AND MANAGEMENT

The ANGRAU Library System is having 11 Libraries in its fold including the University Library located at the Head-Quarter in Lam, Guntur. The main motto of the Libraries is to accomplish its task of reaching to wider user community, comprising of teachers, scientists, extension specialists and students. All the ANGRAU libraries hold rich collection in Agriculture and allied sciences which comprises of Books, Periodicals, Back-Volumes and Reports etc. Apart from print resources the e-Resources are being made available through online. The Library also focuses on electronic delivery of information and library resources accessible through web & local area network.

The ANGRAU Libraries function under the overall supervision of the University Librarian. The Regional Libraries and the College Libraries are run by the Assistant Professors (LIS) under the administrative control of the Associate Deans in their respective Colleges. In a nutshell the ANGRAU University Library has very rich collections print and non-print documents viz. of books, e-books (CABI, Elsevier, CRC Netbase, Arts and Science Academy Publications), e-journals, databases such as J-Gate Agriculture and Biological Sciences (CeRA), KrishiPrabha, KrishiKosh, DELNET, CMIE-Commodities, Indiastat.com and many more. All the library resources are being made available through offline/ online.

After provisional bifurcation of the ANGRAU, Library system consists of the following centers.

University Library :

Lam, Guntur

Regional Libraries :

1. Agricultural College, Bapatla
2. S.V. Agricultural College, Tirupati

College Libraries :

1. Agricultural College, Naira
2. Agricultural College, Mahanandi
3. Agricultural College, Rajahmundry
4. College of Agricultural Engineering, Bapatla
5. College of Agricultural Engineering, Madakasira
6. College of Food Science & Technology, Bapatla
7. College of Food Science & Technology, Pulivendula
8. College of Home Science, Guntur

In addition, every Polytechnic College is provided with Library facilities for the benefit of the students and teachers. These libraries are maintained by Officer-in-charge, Library.

OBJECTIVES

- To collect, maintain and make accessible all books and journals of Agriculture and allied subjects to the Scientific and Students community.
- To procure, consolidate and make accessible all types of documents in the principal areas of Agriculture and associated subjects of importance to the University.
- To maintain resource house of information on the continuing research and development in Agriculture and allied areas in the University.
- To interact with the associated institutes in the country for effective e-resource sharing and document delivery service.
- To participate in Agricultural Library and

Information Networking at the Regional, National and International levels.

2. COMPONENTS OF LIBRARY

Books and Periodicals: All the libraries together continued to receive over 534 Indian and 75 Foreign Periodicals in Agriculture and allied sciences. In addition, 5,324 books and about 176 theses and 284 reports have been added during the year. All the libraries have a separate reference book collection viz., dictionaries, encyclopedias, almanacs, etc.

Book Bank Scheme: The ANGRAU libraries are providing important books under special Book Bank Scheme for the benefit of SC, ST and BC students. Special text-book collection has been built up at each campus. All the libraries have procured good number of titles and increased the collection for the benefit of the students.

Reference Section: The reference section of the library houses the reference books which are meant to provide quick and accessible information on any particular topic. Reference books include topics that are intended to guide researchers in their studies. Each copy of book recommended by Teachers & Students will be kept for reference purpose. Reference material is not meant for circulation.

Competitive Examination Cell: A separate competitive examination cell has been established at all the ANGRAU campuses for the benefit of those students who are appearing for various competitive examinations for the better placement position and higher studies. This section provides the useful material required for the aspirants of ICAR Examinations, ASRB, ARS, ICAR-JRF/NET, UPSC, APPSC, GMAT, TOEFL, GRE, IELTS, BSRB Bank Exams and all other competitive exams.

Newspaper Section: The University library subscribes to 8 daily newspapers in different languages viz. Telugu and English which covers National and Regional News. All the college libraries subscribe to daily newspapers in different languages.

Air-Conditioned Reading Halls: University Library and other campus college libraries has well established Air-Conditioned Reading Halls for Students, Faculty, Scientists, Extension Specialists and other staff of the University.

Visitors: During this period, a total of 1,13,947 numbers of visitors utilized the library services in all the campuses of the ANGRAU Libraries. The regular membership of the libraries including teachers and students was 4879.

3. LIBRARY SERVICES

Document Delivery Service (DDR): Fulfilling requisitions for full-text articles from library subscribed journals, back-volumes and e-Resources requests received under CeRA Document Delivery Service. We receive and process about 2-5 requests every day under CeRA - Document Delivery Service.

Reprographic Services: The photocopying facilities available in all the campuses have been put to maximum use and nearly 3,68,482 copies were provided to the library users during the year. It is also generated an income of Rs. 4,74,445/- from all the ANGRAU libraries.

Exchange of University Publications: The University Library distributes 50 copies of ANGRAU Journal of Research to various National and International institutes. On exchange, the University Library receives foreign and Indian publications.

Library In-House Publications: The ANGRAU University Library is bringing out the following publications regularly for the benefit of Teachers, Scientists, Extension Specialists and Students.

Sl.No.	Name of the Publication	Periodicity	Form
1.	ANGRAU Theses Abstracts	Yearly	Print
2.	ANGRAU Current Agricultural Titles	Quarterly	Print and CD-ROM
3.	ANGRAU Library Bulletin	Half Yearly	Print
4.	News Paper Clippings	Monthly	Print

Digital Library Service

The digital library infrastructure facilities viz., interactive digital board, computers with the latest configuration, internet facility, etc., are fully strengthened in existing libraries as well as established digital libraries in new Colleges to utilize the electronic information i.e. CeRA, CAB abstracts with full text journals, Krishiprabha, Krishi Kosh, Indiastat, CRC, Netbase e-Books, CAB e-Books, Elsevier e-Books, etc. for the improvement of academic and research programmes. All the ANGRAU libraries are equipped with sufficient number of computers with latest configuration and U.P.S. facility, printers, etc. to access the e-Resources and also to browse the Internet. The Internet facility is available in all the campuses of the ANGRAU libraries.

4. RESOURCES / ONLINE RESOURCES

The ANGRAU University Library has subscribed e-Resources / Online Resources to provide the latest information to the teachers, scientists, extension specialists and students, etc., to meet their research and educational information needs.

- **Consortium for e-Resources in Agriculture (CeRA):** The ICAR has provided consortium online e-Resources service called CeRA (Consortium for e-Resources in Agriculture) under NAIP project from 2008 onwards. It is providing access to nearly 3951 journals in Agriculture and allied disciplines. The user ID and Passwords have been circulated to all the colleges of the University, Research Stations and also to all the patrons of the University to utilize the e-Resources effectively.
- **IndiaStat - Statistical Database:** Indiastat.com is an authentic storehouse for socio-economic statistics about India. It provides statistical data, current happenings with a statistical approach and articles from scholars on subjects of social and economic importance, etc.
- **CMIE Commodities Database:** Commodities database is the most comprehensive and reliable source of Indian Commodity Prices, Market intelligence, crop forecasts and time-series data for Agricultural commodities. India Harvest Database has been replaced with commodities database with additional resources.
- **e-Books Taylor and Francis:** The ANGRAU University Library has purchased more than 210 CRC Net Base e-Books on Agriculture and allied sciences, which can be accessed through I.P. and on User ID and Password basis. The e-Books are very much useful to the teachers, scientists, extension specialists and students to browse the important content on Agricultural and allied sciences.
- **e-Books CABI:** The ANRAU University Library has purchased 810 CAB e-Books on perpetual basis and on DVD, which has unlimited access from the year 2000 and

provided access to all the ANGRAU Colleges via I.P. range and on User ID and Password basis. The user ID and Password are circulated to all the Colleges and Research Stations in the University. e-Books are useful for the teachers, scientists and students to browse important Agricultural content by sitting anywhere, anytime and these will improve the quality of research and save lot of precious time of the students, teachers and researchers.

- **Elsevier e-Books / e-Books on Science Direct:** Elsevier e-Books / e-Books on Science Direct provide the comprehensive and reliable content that researcher's need, the accessibility and searchability that researchers want, which alone cannot be available in print sources. All the ANGRAU Colleges can access via I.P. range and on User ID and Password basis.
- **Informatics e-Books on Agricultural Science:** Informatics Publishing Ltd provide 176 e-Books on Agricultural and allied Sciences, comprehensive and reliable content that researcher's need, the accessibility and searchability that researchers want, which alone cannot be available in print sources. All the ANGRAU Colleges can access via I.P. range and on User ID and Password basis.
- **Arts and Science Publication e-Books:** 256 e-Books on Agricultural Science provide the comprehensive and reliable content that researcher's need, the accessibility and searchability that researchers want, which alone cannot be available in print sources. All the ANGRAU Colleges can access via I.P. range and on User ID and Password basis.
- **J-Gate Agriculture and Biological Sciences**: It provides access to 1985 online e-Journals Portal called J-Gate Agriculture and Biological Sciences for the year 2015-16 (which covers data from 2001 to 2017).
- **AgriCat:** AgriCat is the Union Catalogue of the holdings of 12 major libraries of the ICAR Institutes, Deemed Universities and SAUs. It has been created with the partnership of OCLC WorldCat. The ANGRAU University Library is also a member library in AgriCat / WorldCat and contributed nearly 35,000 bibliographical records.
- **KrishiKosh:** KrishiKosh is an Institutional Repository under National Agricultural Research System (NARS). The repository of knowledge in agriculture and allied sciences, having collection of old and valuable books, records and various documents spread all over the country in different libraries of Research Institutions and State Agricultural Universities (SAUs).
- **DELNET:** Developing Library Network (DELNET) DELNET provides access to more than 1.75 crore bibliographic records of books, journals, articles, CD's etc. The internet Library Loan/document Delivery Services are one of the most popular services of DELNET. The main objectives of DELNET are to promote resource sharing among the Member-Libraries by collecting, storing and disseminating information by offering networking services to users.
- **EzProxy Remote Login Server:** The ANGRAU University Library has implemented EzProxy middleware software to provide remote access to web-based licensed resources offered by the library. The EzProxy server authenticates library users against local authentication authorization. It enables to access all the Library subscribed online resources in a single platform and to download full text articles through EzProxy server without any IP Address.

5. ACADEMIC ACTIVITIES

PGS-501 Library Services Course: Offering PGS-501, Non-Credit Library and Information Services Course to the PG and Ph.D. Students. The main objective of the course is to educate the users on how to access resources of library, search strategies, online educational resources etc.

Orientation Programme: University libraries are being conducting Orientation Programmes for newly admitted U.G., P.G and Ph.D students about the library system, rules and regulations, access to library facilities and services.

Awareness Programmes on e-Resources: The University Library is regularly conducting training cum and awareness Programmes on e-Resources on accessing online information resources viz., CeRA, CABI, CMIE, e-Books, e-Journals, Databases etc. for the benefit of Scientists, Teachers, Students and Extension Specialists.

ICAR - OPEN ACCESS POLICY

ICAR Open Access Policy has implemented in ANGRAU and M.Sc. and Ph.D. Theses are uploading in the KrishiKosh Repository after embargo period of one year.

Table 11. Library facilities and services for the year 2016-2017

S. No.	Name of the Library	Books		E-books	Theses		Periodicals Subscribed		Membership		Books Issued	No. of Readers Visited	No. of Internet Users	No. Of Xerox Copies Exposed	Income Gene-ration (Rs)
		Number added during the year	Total	Total	Number added during the year	Total	Indian	Foreign	Number added during the year	Total					
1.	University Library, Lam	1031	1031	1240	–	–	62	11	--	–	--	662	662	18477	8945.00
2.	Regional Library, Bapatla	330	53437	Access to 1240 e-Books	73	1882	73	19	317	1068	4000	19135	804	50,440	74,790.00
3.	Regional Library, Tirupati	652	22131	–	70	4019	105	32	220	834	3361	29235	5025	1,18,130	2,07,684.00
4.	Agricultural College Library, Naira	614	12881	–	7	26	170	–	166	528	1487	18374	4937	50,323	61,312.00
5.	Agricultural College Library, Mahanandi	1136	12464	–	13	42	54	–	124	824	5775	8330	650	21,670	16,253.00
6.	Agricultural College, Rajahmundry	222	3782	–	–	--	–	–	198	198	750	2505	200	–	–
7.	Agricultural Engineering College Library, Bapatla	618	10893	–	5	58	9	10	106	706	13845	8179	577	4,895	12,862.00
8.	Agricultural Engineering College, Madakasira	403	5407	–	–	--	21	2	43	157	2000	16619	142	17,450	9471.00
9.	College of Food Science & Technology Library, Bapatla	56	7966	–	8	72	23	1	64	249	7251	272	252	6,254	32,218.25
10.	College of Food Science & Technology, Pulivendula	76	2524	–	–	--	17	–	25	96	1736	9879	84	50,843	40,737.25
11.	College of Home Science, Guntur	186	704	–	--	–	--	–	74	219	106	757	72	30,000	10,172.00
	TOTAL	5324	133220	1240	176	6099	534	75	1337	4879	40311	113947	13405	3,68,482	4,74,445.00

F. INTERNATIONAL PROGRAMMES

The ANGRAU established a centre to facilitate International Programmes under the control of the Director International Programmes in 2005. The Centre serves as an internal and external liaison for the University, providing a source of assistance to faculty, administrators and students and enhancing their ability to pursue and develop international activities and initiatives. The ANGRAU promotes the process of actively partnering with the International Universities and Organizations to effectively utilize and apply the University's knowledge, resources and expertise to mutually address the needs and problems facing global society today.

During the period under report, the Centre took up the following activities.

- Identified collaborative research projects with the institutes abroad
- Stimulated the Faculty and Students to apply for various International Fellowships
- Coordinated the participation of Faculty in overseas programmes
- Coordinated the visits of foreign delegations

The details of participation of ANGRAU Faculty in various overseas programmes and the visits of foreign delegations to the University during the period under report are given in detail in Table 12a and 12b.

Table 12 a. PARTICIPATION OF FACULTY IN OVERSEAS PROGRAMMES

S. No.	Name of the Faculty	Programmes attended	Period	Place
1	Dr. Prabhu Prasadini Director of Intl. Prog., ANGRAU.	Participated and presented a research paper in International Conference on Agriculture & Forestry, 2016. Was awarded two awards: best paper presentation in Soil Science and soil fertility division and Best presentation of the Conference	1st to 3rd June, 2016	Philippines
2	Dr. A. S. Rao	Nodal Officer, ANGRAU. Participated and presented a research paper in 7th International Weed Science Congress organized by International Weed Science Society.	19th to 25th June, 2016.	Czech
3	Dr. Prabhu Prasadini Director of Intl. Prog., ANGRAU			
4	Dr. N.V. Naidu Director of Research., ANGRAU	Visited Univeristy Malaysia Kelantan in view of strengthening of relations under MoU	6th to 10th August, 2016	UMK, Malaysia
5	Dr. R. Veeraraghavaiah Dean of PG Studies, ANGRAU			
6	Dr. T.N.V.K.V. Prasad Senior Scientist, RARS, Tirupati			
7	Dr. P. Punna Rao Deputy Director of Extension, Admin. Office, ANGRAU, Guntur.			
8	Dr. T. Srinivas Professor (Academics & Education), Admin. Office, ANGRAU, Guntur	Participated and presented a research paper in 5th European Academic Research Conference	15th to17th December, 2016	Istanbul, Turkey
9	Dr. A. Lalitha Scientist (Extension) Communication center, Admin office, Guntur	Participated and presented a research paper on "Promotion of Indian Good Agricultural Practices (INDGAP) Among Farming Community" in 5th European Academic Research Conference.	12th to 13th January, 2017	Singapore

S. No.	Name of the Faculty	Programmes attended	Period	Place
10	Dr. Lal Ahamed Mohammad Assistant Professor, Department of Molecular Biology and Biotechnology, APGC, Lam, Guntur	Participated and presented a research paper in Internati-	27th to 29th	Egypt
11	Dr. G. Ramachandra Rao Professor, Department of Environmental Science, APGC, Lam, Guntur	onal Conference on Advanced Technologies and their Applications in Agriculture.	March, 2017	
12	Dr. M. Suresh Kumar Coordinator, DAATTC, Amadalavalasa			
13	Dr. P.V. Sathya gopal Associate Professor, Department of Agricultural Extension, S.V. Agricultural College, Tirupati	Participated and presented a paper on "Strengthening ICT Utilization In Agricultural Education - A Strategic Perspective" in the 3rd International Conference on Education (ICEDU 2017)	20th to 22nd April, 2017	Kualalampur, Malaysia
14	Dr T. Ramesh Babu Dean of Agriculture, Admin. Office, ANGRAU, Guntur	Participated in the 21st TANA Conference as a Guest speaker and participated in deliberations of Agril forum, on duty only.	26th to 28th May, 2017	USA

Table 12 b. VISIT OF FOREIGN DELEGATIONS TO ANGRAU

S. No.	Name	Purpose	Date
1.	Dr. M. Morell & Dr. S. Mohanty, IRRI, Philippines	Signing of MoU between IRRI and Govt. of A.P at Secretariat, Velagapudi (Dr Prabhu Prasadini brought the concept to A.P from her IRRI visit. So, she is the local coordinator for the project and ANGRAU is the R&D Institute for the SRMS project)	9th February, 2017
2.	Ethiopian Delegates, Jigjiga University, Ethiopia	To discuss about MoU between ANGRAU and Jigjiga University meeting at Administrative office, ANGRAU with University Officers of ANGRAU	17th February, 2017
3.	Ethiopian Delegates	Interactive meeting with Dr. Prabhu Prasadini, Director (Intl. Prog) and Dr E. Narayna, Director (P&M), ANGRAU	24th March, 2017
4.	Ethiopian Delegates (4 members), Jigjiga University, Ethiopia	To discuss about the modalities of MoU, in the continuation meeting of the U.Os meeting.	25th April, 2017

Programmes for the Students

S.No.	Name of the Student	Name of the prog	Period	Place
1.	Ms. G. Lakshmi Bhavani M.Sc. (Agronomy)	Students exposure programme	13th to 17th June, 2016	Wageningen, Netherlands
2.	Ms. K. Mrunalini M.Sc. (Agronomy)			
3.	Ms.Ch. Naga Satyasri ID No: BAM-14-28, Department of Entomology, Agricultural College, Bapatla	Internship program on "Start Up Rural India- From Farm to Fork in Soy/ Miller Value Addition".	1st Feb, 2017 to 30th April, 2017	Kansas State University, USA
4.	Mr.A. Siva Shankar ID No: BEM-15-11, Department of Agricultural Process & Food Engineering, College of Agril. Engineering, Bapatla			

MoUs

- Entered MoU with Indian Institute of Horticultural Research (IIHR), Bengaluru on 21.12.2016
- MoU was between Govt. of A.P and International Rice Research Institute, Philippines on 09.02.2017 (Dr Prabhu Prasadini brought the concept to A.P from her IRRI visit. So She is the local coordinator for the project and ANGRAU is the R&D Institute for the Satellite based Rice Monitoring System mainly for crop insurance - SRMS project).
- Entered MoU with University of Agricultural Science (UAS), Dharward on 14.02.2017
- Established Geospatial Technology Centre at Lam ,Guntur

IV. RESEARCH

Of the three major functional components of the University, research is by far the largest component of the University's functions in terms of manpower engaged and funds utilized through several projects including ICAR, RKVY, NABARD, Department of Biotechnology (DBT), Department of Science & Technology (DST), Paid up trials and seed production etc.

The University continued its research efforts in Agriculture, Agricultural Engineering & Technology, Home Science and allied fields with the renewed vigour and commitment for improving the production and economic status of the farmers of the Andhra Pradesh State in particular and contributing for food security of India in general.

The research activities of the University in the faculties of Agriculture and Agricultural Engineering & Technology are being carried out at 36 Research Stations including six Regional Agricultural Research Stations spread over in 13 districts of the entire state of Andhra Pradesh.

The organogram of research in the University is depicted in Fig. 7. The Agro-climatic zone-wise list of research stations of the University and their functions, the List of ICAR Coordinated research projects and the List of projects under Rashtriya Krishi Vikas Yojana are given in Annexures VI, VII and VIII, respectively.

The research activities of the University mainly focus on crop improvement, crop production, crop protection, climate resilient agriculture, post-harvest management and farm mechanization aspects for adoption by the farming community for overall increase in agricultural production and reducing cost of cultivation besides solving location specific problems. Research is also carried out in basic sciences, which is supportive to applied research. On-farm research is conducted for evaluation and refinement of newly developed technologies under farmers' field conditions.

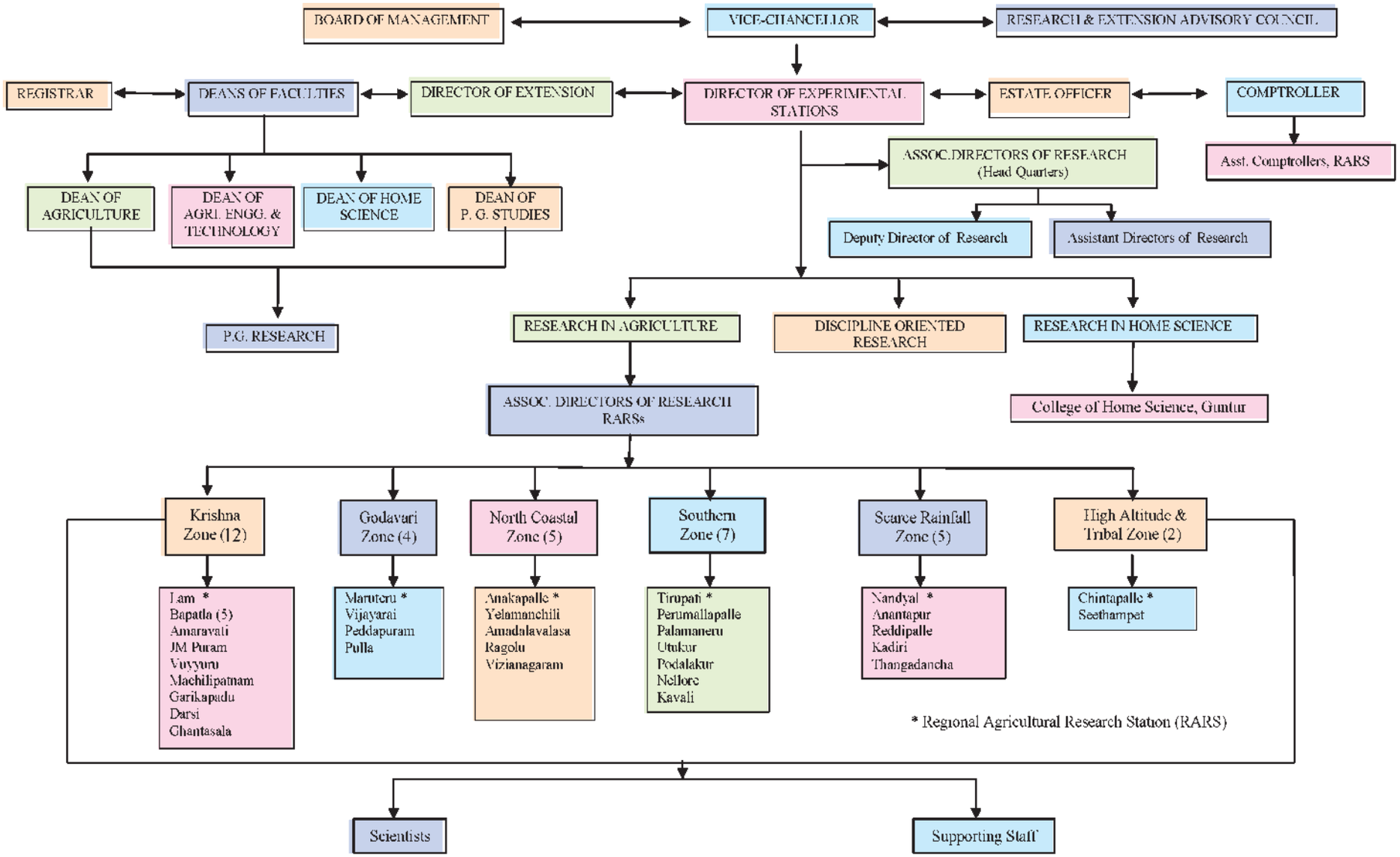


Figure No. 7. Organogram of research in the University

SEASONAL CONDITIONS AND CROP PERFORMANCE

A rainfall of 533.8 mm was received in the State during the South West Monsoon period of 2016-17 as against the normal rainfall of 556 mm with a deficit of 4 %. The deficit is higher (71%) in the North East monsoon period as only 85.3 mm rainfall was received as against the normal rainfall of 296 mm is during the period. Winter period recorded 1.6 mm rainfall as against the normal rainfall of 15.7 mm. Rainfall recorded during summer period was 56.5 mm as against normal rainfall of 98.3 mm.

During the year 2016-17, the average rainfall received was 677.2 mm as against normal rainfall of 966.0 mm, deficit being 30 percent. The rainfall was deficit in Srikakulam, East Godavari, West Godavari, Krishna, Prakasam, Chittoor, Kadapa, Ananthapuramu and Kurnool districts; normal in Vizianagaram, Visakhapatnam and Guntur districts and scanty in Nellore district of the State.

Rice crop was grown in an area of 21.05 lakh ha (15.20 lakh ha in *Kharif* and 5.85 lakh ha in *rabi*) during the year 2016-17. During *rabi*, rice crop recorded 41.53 lakh tons production with a productivity of 7095 kg ha^{1}. Increase in *rabi* productivity has resulted in higher rice production in the state (120.04 lakh tons). Significant increase in the production of Rice during *Kharif* season together with productivity improvement in some of the crops was through adoption of best practices largely contributed to this improved production.

Groundnut crop was sown in an area of 10.13 lakh ha. Drought prevailed during August and September months in major groundnut growing areas has resulted in low yields in *Kharif* (419 kg ha^{1}) and 2664 kg ha^{1} in *rabi* with a total production of 6.03 lakh tons.

Cotton, an important commercial crop of the state was sown in an area of 4.72 lakh ha, 15.64 lakh bales of lint was produced in the state. The total area, production and productivity of cotton crop was decreased during the year 2016-17 compared to 2015-16.

Maize crop grown in 2.5 lakh ha (1.65 lakh ha in *rabi*) recorded average productivity of 6014 kg/ha and total production during *Kharif* and *rabi* season was 16.53 lakh tons.

Redgram, an important *Kharif* pulse crop was grown in an area of 3.49 lakh ha, total production in the state was 1.33 lakh tons. During *rabi*, bengalgram, blackgram and greengram were grown in 3.97, 4.40, 1.02 lakh ha, respectively. The total pulse production during the year 2016-17 was 9.31 lakh tons.

Season and district wise normal and actual rainfall received and area, production and productivity of major crops in Andhra Pradesh for the year 2016-17 are given in table 13 and table 14.

Table 13
District wise and Monsoon wise rainfall received in Andhra Pradesh: 2016-2017

S. No.	District	South - West Monsoon (mm) (June - September 2016)			North - East Monsoon (mm) (October - December 2016)		
		Normal	Actual	%Dev	Normal	Actual	%Dev
1.	Srikakulam	705.7	627.3	-11.1	276.0	93.7	-66.1
2.	Vizianagaram	692.7	790.0	14.0	245.8	105.4	-57.1
3.	Vishakapatnam	712.6	850.7	9.4	297.2	905.9	-68.7
4.	East Godavari	768.0	801.6	4.4	305.4	59.4	-80.6
5.	West Godavari	791.9	796.5	0.6	239.4	44.3	-81.5
6.	Krishna	685.1	668.8	-2.4	249.4	93.4	-62.6
7.	Guntur	525.8	653.9	24.4	228.9	66.0	-71.2
8.	Prakasam	388.3	341.6	-12.0	393.7	102.9	-73.9
9.	SPSR Nellore	331.3	160.4	-51.6	661.4	197.6	-70.1
10.	YSR Kadapa	343.6	384.1	-2.4	251.0	77.5	-69.1
11.	Kurnool	455.1	466.8	2.6	149.6	14.6	-90.2
12.	Anantapuramu	332.4	257.4	-23.9	155.3	26.5	-82.9
13.	Chittoor	439.4	342.2	-22.1	395.4	158.1	-60.0
	Andhra Pradesh	556.0	533.8	-4.0	296.0	85.3	**-71.2**

S. No.	District	Winter period (mm) (Jan. and Feb. 2017)			Summer period (mm) (March to May 2017)			Total rainfall (mm) 2016-17 (June 2016 to May 2017)		
		Normal	Actual	%Dev	Normal	Actual	%Dev	Normal	Actual	%Dev
1.	Srikakulam	25.9	0.3	-98.8	154.0	71.7	-53.4	1161.6	793.0	-31.7
2.	Vizianagaram	25.5	0.2	-99.2	166.7	99.5	-40.3	1130.7	995.1	-12.0
3.	Vishakapatnam	22.3	0.6	-97.3	120.2	119.0	-30.0	1202.3	1063.2	-11.6
4.	East Godavari	19.7	0.2	-99.0	124.5	44.7	-64.2	1217.6	90.9	-25.6
5.	West Godavari	17.7	0.0	-100.0	104.0	30.6	-20.6	1153.0	871.4	-24.4
6.	Krishna	15.8	0.0	-100.0	83.2	32.5	-60.9	1033.5	794.7	-23.1
7.	Guntur	18.4	0.2	-98.9	79.9	36.4	-54.4	853.0	756.5	-11.3
8.	Prakasam	16.3	0.4	-97.5	73.2	50.1	-31.6	871.5	495.0	-43.2
9.	SPSR Nellore	19.9	3.9	-80.4	67.8	26.6	-60.8	1080.4	388.5	-64.0
10.	YSR Kadapa	3.4	1.3	-61.8	51.6	54.8	6.4	699.6	517.7	-26.0
11.	Kurnool	4.6	0.3	-93.5	61.2	49.1	-19.6	620.5	530.8	-20.8
12.	Anantapuramu	2.9	0.3	-89.7	55.7	49.6	-11.0	552.3	333.8	-39.6
13.	Chittoor	12.1	9.9	-18.2	87.0	91.6	5.2	933.9	601.8	-35.6
Andhra Pradesh		15.7	1.6	-89.8	98.3	56.5	-42.5	966.0	677.2	-29.9

Table 14
Area, Production and productivity of Major Crops in Andhra Pradesh (2016-17)

S. No	AREA (in Lakh ha.)			YIELD (Kg/ha.)			PRODUCTION (in Lakh tonnes)		
	Kharif	*Rabi*	*Total*	*Kharif*	*Rabi*	*Total*	*Kharif*	*Rabi*	*Total*
1 Rice	15.20	5.85	21.05	5166	7095	12261	78.51	41.53	120.04
2 Jowar	0.14	0.83	0.97	1436	2139	3575	0.20	1.78	1.98
3 Bajra	0.39	0.03	0.42	1744	1394	3138	0.68	0.04	0.72
4 Maize	0.86	1.65	2.50	4150	7879	12029	3.55	12.98	16.53
5 Ragi	0.27	0.05	0.32	953	1724	2677	0.26	0.09	0.35
6 Minor Millets	0.24	0.07	0.31	699	1044	1743	0.17	0.07	0.24
7 Bengalgram	0.00	3.97	3.97	0	960	960	0.00	3.81	3.81
8 Redgram	3.43	0.07	3.49	377	583	960	1.29	0.04	1.33
9 Greengram	0.32	1.02	1.34	518	485	1003	0.17	0.50	0.66
10 Blackgram	0.60	4.40	5.00	819	636	1455	0.49	2.80	3.29
11 Horsegram	0.01	0.11	0.13	129	496	625	0.00	0.06	0.06
12 Other pulses (cowgram etc)	0.08	0.12	0.19	584	985	1569	0.04	0.12	0.16
13 Groundnut	9.33	0.80	10.13	419	2664	3083	3.91	2.12	6.03
14 Sesamum	0.33	0.30	0.64	228	290	518	0.08	0.09	0.16
15 Sunflower	0.09	0.13	0.21	698	1215	1913	0.06	0.15	0.21
17 Safflower	0.00	0.00	0.00	731	623	1354	0.00	0.00	0.00
18 Niger seed	0.00	0.06	0.06	0	390	390	0.00	0.02	0.02
19 Soybean	0.02	0.00	0.02	922	0	922	0.01	0.00	0.01
20 Castor	0.32	0.01	0.33	471	520	991	0.15	0.00	0.15
21 Rape & Mustard	0.00	0.05	0.05	423	412	835	0.00	0.02	0.02
22 Cotton (Lint)	4.63	0.08	4.72	566	411	977	15.44	0.20	15.64
23 Mesta (#)	0.07	0.00	0.07	1703	0	1703	0.63	0.00	0.63
24 Chillies	1.69	0.40	2.09	4896	4096	8992	8.29	1.64	9.93
25 Sugarcane	1.03	0.00	1.03	76220	0	76220	78.30	0.00	78.30
26 Turmeric	0.19	0.00	0.19	4156	4231	8387	0.80	0.00	0.80
27 Tobacco	0.04	0.73	0.78	2707	2250	4957	0.12	1.65	1.77
28 Onion	0.32	0.04	0.36	17370	17851	35221	5.56	0.63	6.19
29 Coriander	0.00	0.04	0.04	80	552	632	0.00	0.02	0.02
Total cropped area	**39.60**	**20.80**	**60.40**						

(#) Mesta production in lakh bales of 180 kgs.
Source: Directorate of Economics & Statistics, AP

A. AGRICULTURE

Crop improvement is one of the major mandates through which development of superior varieties/hybrids with high yielding ability, resistant to biotic and abiotic stresses in tune with the changing needs and climate is a continuous process. During 2016-17, eight new crop varieties, four in rice and one variety each in blackgram, bengalgram, groundnut and sunflower were released from ANGRAU.

Crop Varieties/ Hybrids released during 2016-17 at state level

RICE

Variety : **MTU 1140 (Bheema)**
Parentage : MTU 5249 x PLA 8572
Duration : 140-145 days
Season : *Kharif*
Reaction to pests, diseases and abiotic stresses : Moderately resistant to brown spot and resistant to BPH
Average yield : 6.0 t/ha

Salient features : Suitable for *Kharif* flood prone areas of Krishna, Godavari and North Coastal Zones of Andhra Pradesh. Tolerates 10 days flash floods (75% plant survival). Suitable for stagnant flooding (30-35 cm) and for direct seeded conditions. It possesses two weeks anaerobic germination (80% plant survival). Medium slender grain with good cooking quality. It is a non-lodging variety with strong culm suitable for machine harvesting.

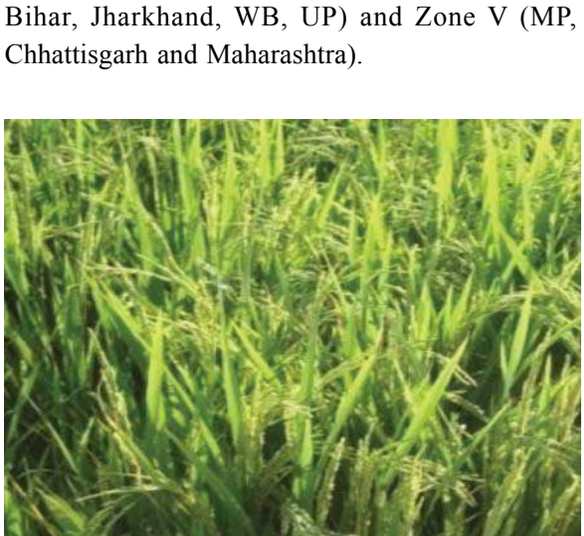
RICE

Variety : **Tarangini** (MTU 1156)
Parentage : MTU 1010 x MTU 1081
Duration : 115-120 days
Season : *Rabi*
Reaction to and abiotic stresses : Resistant to leaf blast and pests, diseases BPH
Average yield : 7.5 t/ha

Salient features : Non-lodging, fertilizer responsive up to 180 Kg N/ha. Strong culm with more culm diameter and culm length. Two weeks seed dormancy. Low shattering of grains (< 2 %). Suitable for direct seeded conditions. Long slender translucent grain with good cooking quality.

RICE

Variety : **Samruddhi (**MTU 1155)
Parentage : MTU 1001/ Annadha
Duration : 135-140 days
Season : Kharif
Reaction to pests, diseases and abiotic stresses : Resistant to leaf blast and neck blast, moderate resistant to BLB, brown spot, sheath rot and RTD
Average yield : 6.0 - 7.0 t/ha
Salient features : High yielding, non lodging, low shattering and highly responsive to nitrogen. High milling recovery (72%), high head rice recovery (70%), intermediate amylase content (22.9%) with translucent kernels. Released for zone III (Orissa, Bihar, Jharkhand, WB, UP) and Zone V (MP, Chhattisgarh and Maharashtra).



RICE

Variety : Nandyala Sona (NDLR-7)
Parentage : BPT 3291 x CR 157-212
Duration : *Kharif* (140 days) and *rabi* (135 days)
Season : Suitable for both *Kharif* and *Rabi*
Reaction to pests, diseases and abiotic stresses : Tolerant to moisture stress. Highly tolerant to leaf folder, BPH and tolerant to blast
Average yield : 7.5 t/ha
Salient features :

BLACKGRAM

Variety : Tirupati Minumu – 1 (TBG 104)
Parentage : PU 19 x LBG 623
Duration : 75-80 days
Season : *Kharif, Rabi* and Summer
Reaction to pests, diseases and abiotic stresses : Resistant to Yellow Mosaic Virus (YMV)
Average yield : 17-18 q/ha
Salient features : Seeds are shining black and medium size. Photo insensitive and suitable for all seasons

BENGALGRAM

Variety : Nandyala Sanaga 49 (NBeG 49)
Parentage : Annegiri x ICC 4958
Duration : 90-105 days
Season : *Rabi*
Reaction to pests, diseases and abiotic stresses : Tolerant to *Fusarium wilt*
Average yield : 20-25 q/ha
Salient features : A high yielding desi bengalgram variety with attractive seeds. Semi spreading plant type and medium in height. Seeds are medium bold, angular, brown in colour with rough testa and uniform in size. A better alternative to JG 11. Suitable for all bengalgram growing districts of Andhra Pradesh.

GROUNDNUT

Variety : Kadiri Amaravathi (K 1535)
Parentage : Kadiri 6 x NCAC 2242
Duration : 115 – 120 days
Season : *Kharif*
Reaction to pests, diseases and abiotic stresses : Tolerant to PSND, thrips, jassids and leaf spots
Average yield : 16 -17 q/ha
Salient features : Possesses 50% oil content with good kernel characters (smooth rose testa). Tolerant to Peanut Stem Necrosis disease with the preferred kernel characters of Kadiri 6.

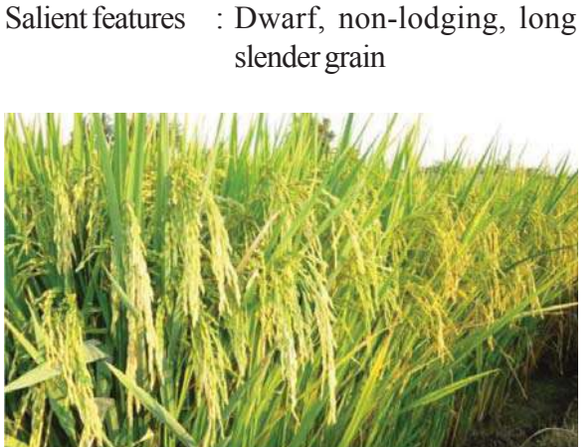
SUNFLOWER

Variety : Prabhat (NSDH 1012)
Parentage : NDCMS 30A X R 843
Duration : 90-95 days
Season : *Kharif*, *rabi* and summer
Reaction to pests, diseases and abiotic stresses : Moderately resistant to downy mildew
Average yield : 20 -25 q/ha
Salient features : It is an early maturing, high yielding hybrid with high oil content (40-41%). It has flat and medium size head with ovoid elongate seeds with a test weight of 4 to 5 grams. Suitable for all seasons. A better alternative to KBSH 44, DRSH 1, SB 275 and other popular private hybrids.

Cultures completed three years of minikit testing and ready for release

RICE

Variety : **NLR 40065**
Parentage : NLR 34150 X NLR 33057
Duration : 120-125 days
Season : Early *Kharif*, *Kharif* and *rabi*
Reaction to pests, diseases and abiotic stresses : Thermo tolerant and tolerant to blast
Average yield : 6.5-7 t/ha
Salient features : Dwarf, non-lodging, long slender grain



RICE

Variety : **NLR 40058**
Parentage : NLR 34150 X NLR 33057
Duration : 120-125 days
Season : Early *khraif*, *Kharif* and *rabi*
Reaction to pests, diseases and abiotic stresses : Tolerant to blast
Average grain yield : 6.5-7 t/ha
Salient features : Dwarf, non-lodging, medium slender grain

RICE

Variety : **NLR 33671**
Parentage : NLR 33055XNLR145
Duration : 120-125 days
Season : Early *kharif*, *Kharif* and *rabi*
Reaction to pests, diseases and abiotic stresses : Tolerant to blast and BPH
Average grain yield: 6.5-7 t/ha
Salient features : Purple and thick culm, purple colour on the edge of the leaf as a marker character, dwarf, non lodging, medium slender grain with good cooking quality

RICE

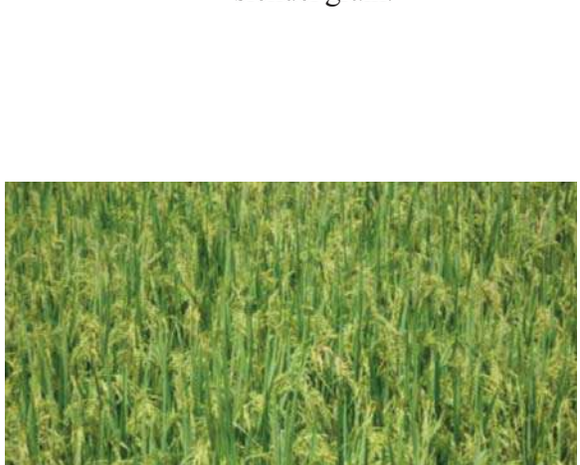
Variety : **NLR 34242**
Parentage : IR 36 x IET 2508
Duration : 120-125 days
Season : Early *khraif*
Reaction to pests, diseases and abiotic stresses : Thermo tolerant
Average yield : 6.5-7 t/ha
Salient features : Dwarf, non-lodging, early vigour, medium bold grain.

RICE

Variety : **NLR 3083**
Parentage : MTU 1001 X RNR 19994
Duration : 130-135 days
Season : *Rabi*
Reaction to pests, diseases and abiotic stresses : Tolerant to blast and BPH
Average grain yield : 7-7.5 t/ha
Salient features : Dwarf, non-lodging, medium slender grain with good cooking quality.

RICE

Variety : **NLR 3042**
Parentage : BPT 5204 X NLR 145
Duration : 120-125 days
Season : Early *khraif*, *Kharif* and *rabi*
Reaction to pests, diseases and abiotic stresses : Tolerant to blast
Average grain yield : 6.5-7 t/ha
Salient features : Dwarf, non-lodging, medium slender grain.



RICE

Variety : **NLR 20084**
Parentage : NLR 33057 X NLR 28600
Duration : 150-155 days
Season : *Kharif* (can be sown up to the end of October)
Reaction to pests, diseases and abiotic stresses : Tolerant to blast
Average yield : 7-7.5 t/ha
Salient features : Medium tall, non-lodging, medium slender grain, slightly photo sensitive, molagolukulu rice culture with good cooking quality. Suitable for direct seeding and organic farming.

RICE

Variety : **RGL 11226**
Parentage : Srikakulam Sannalu x Swarana
Duration : 155 days
Season : *Kharif*
Reaction to pests, diseases and abiotic stresses : Resistant to gallmidge biotype 4
Average yield : 6.0 – 7.0 t/ha
Salient features : Tolerant to over-ageing in nursery, fine grain type. The culture was tested for three years (2010-2012) under minikit in the three districts of North Coastal Zone *viz.*, Srikakulam, Vizianagaram and Visakhapatnam

RICE

Variety : **NLR 20104**
Parentage : BPT 5204 X NLR 33359
Duration : 150-155 days
Season : *Kharif* (can be sown up to the end of October)
Reaction to pests, diseases and abiotic stresses : Tolerant to blast
Average grain yield : 7-7.5 t/ha
Salient features : Dwarf, non-lodging, slightly photo sensitive, fine grain with good cooking quality. Suitable for direct seeding and organic farming.

RICE

Variety : **BPT 2295**
Parentage : BPT 1768 x NLR 33641
Duration : 150-155 days
Season : *Kharif*
Reaction to pests, diseases and abiotic stresses : Tolerant to BPH, BLB and salinity
Average yield : 7-7.5 t/ha
Salient features : It is a high yielding, non-lodging, semi-dwarf, and has good plant type with pale green foliage, profuse tillering ability, straw glume and medium slender grains. Kernels are white and translucent with high milling and head rice recovery. It has got 3 weeks dormancy and is photo insensitive.

GROUNDNUT

Variety : **Kadiri Chitravati**(K1719)
Parentage : Kadiri 7 Bold x TAG 24
Duration : 110-120 days
Season : *Rabi*
Reaction to diseases and abiotic stresses : Tolerant to thrips, PSND, P BND and leaf spotpests,
Average yield : 30-52 q/ha
Salient features : Possesses 49% oil content with 100 kernel weight of 50-60 g and has 70 % shelling . Submitted proposal for release for Zone IIIb (Andhra Pradesh, Tamilnadu and Telangana) in National level.

RICE

Variety : **BPT 2411**
Parentage : BPT 5204 x BPT 4358
Duration : 140-145 days
Season : *Kharif* (can be sown up to the end of October)
Reaction to diseases and abiotic stresses : Moderately resistance to stem borer and BPHpests,
Average yield : 7-7.5 t/ha
Salient features : Semi dwarf, medium slender grain. Suitable to both single and double cropped areas.

GROUNDNUT

Variety : TCGS 1157
Parentage : TAG 24 × Jyothi
Duration : 110 days
Season : *Kharif*
Average yield : 25 q/ha

Salient features: A short-statured Spanish bunch culture with profuse branching with high yield potential and fresh seed dormancy and higher frequency of three seeded pods. It was identified for release and notification by Central subcommittee on crop standards, notification and release of varieties in the Varietal Identification Committee meeting held on 19-5-2017 at HRS, Yercaud (Tamil Nadu) for Zone III for kharif season.

GROUNDNUT

Variety : TCGS 1073
Parentage : Narayani × JAL 30
Duration : 105-110 days
Season : *Kharif* and *Rabi* (irrigated situation)
Average yield : 24 to 35 q/ha
Salient features : A high yielding water use efficient groundnut culture with bold seeds.

FINGER MILLET

Variety : PPR 1012
Parentage : GPU 28 x Ratnagiri
Duration : 115-120 days
Season : *Kharif, Rabi* and Summer
Reaction to pests, diseases and abiotic stresses : Tolerant to leaf blast, neck blast and finger blast
Average yield : 35-40 q/ha
Salient features : Lengthy, large, semi compact ear head and broad fingers are the distinguishing features. Grain size is large and reddish brown colour having high calcium and free amino acids. Fodder yields are also higher (8-10 t/ha)

WHITE SORGHUM

Variety : NJ 2647
Parentage : CS 3541 x NJ 2401
Duration : 100 days
Season : *Kharif* and early *rabi*
Average yield : 45-60 q/ha
Average fodder yield : 3-4 t/ha
Salient features : Semi compact and conical ear head with good exertion, round and bold seed. Medium photosensitivity.

YELLOW SORGHUM

Variety : NJ 2446
Parentage : N65-4 x N 14
Duration : 120 days
Season : *Kharif* and early *rabi*
Average yield : 20-30 q/ha
Average fodder yield 4-5 t/ha
Salient features : Semi compact, oblong and conical ear head with clear exertion, round and bold seed. Medium photosensitivity.

CEREALS AND MILLETS

RICE

Research on Rice was carried out at Nellore, Bapatla, Nandyal, Ragolu, Chinthapalli, Machilipatnam and Utukur Research Stations with RARS, Maruteru as the lead centre.

Crop Improvement

Regional Agricultural Research Station, Maruteru

Promising rice cultures under minikit testing during 2016-17

MTU 1229

- Duration: 155-160 days
- Medium slender grain type similar to Swarna.
- Recorded 6837 Kg/ha grain yield compared to check, Swarna (5968 kg/ha).
- Registered 14.6% higher grain than check variety.

It is under first year of minikit testing during *Kharif*, 2016

MTU 1224

- Duration: 135-140 days
- Alternative to BPT 5204
- Fine grain culture with good cooking quality.
- Registered 12.94% higher yield (6593 kg/ha) than local check BPT 5204 (5845 kg/ha).
- It is under first year of minikit testing during *Kharif*, 2016.

MTU 1226

- Duration: 155 days
- Bold grain with high test weight. Similar to Prabhat.
- Gave 11.6% higher grain yield (6753 kg/ha) over the check Swarna (6048 kg/ha).
- It is under first year of minikit testing during *Kharif*, 2016.

MTU 1184

- Duration: 150 days
- Tolerant to flash floods for 10 days at tillering stage.
- Suitable for stagnant flooding (20-50 cm).
- Possesses two weeks dormancy.
- Performed better than check entry PLA 1100 and recorded 6.1% higher yield.
- It is under first year of minikit testing during *Kharif*, 2016.

MTU 1194

- Duration: 150 days.
- High yielding, non lodging, Medium slender grain type.
- Recorded grain yield of 6325 kg/ha which is 6.13% higher than the local check Swarna (5959 kg/ha).
- It is under first year of minikit testing during *Kharif*, 2016.

MTU 1210

- Duration: 125 days.
- Medium slender grain type and high head rice recovery.
- Recorded a grain yield of 9817 kg/ha where as the check MTU 1010 recorded 9053 kg/ha (8.46% higher than MTU 1010).
- It is under first year of minikit testing during *rabi*, 2016-17.

MTU 1187

- Duration: 125 days.
- Long slender grain type.
- Recorded 7.29% higher yield than local check MTU 1010.
- It is under second year of minikit testing during *rabi*, 2016-17.

NLR 4001

- Duration: 140-145 days.
- Fine grain rice culture, Tolerant to BPH and blast.
- Registered 23.9% higher yield (7966 kg/ha) than local check RpBio226 (6426 kg/ha).
- It is under second year of minikit testing during *kharif*, 2016.

NLR 3513

- Duration: 135-140 days.
- Medium bold grain, dwarf, non-lodging, tolerant to BPH and Blast.
- Recorded 3.1 % higher yield (6677 kg/ha) than local check BPT 5204 (6478 kg/ha).
- It is under first year of minikit testing during *kharif*, 2016.

NLR 3354

- Duration: 120-125 days.
- Fine grain, dwarf, non-lodging, thermo tolerant, tolerant to blast having initial vigour at high temperatures.
- Recorded 14.9% higher yield (8589 kg/ha) than local check NLR 34449 (7471 kg/ha).
- It is under first year of minikit testing during *rabi*, 2016-17.

NLR 40054

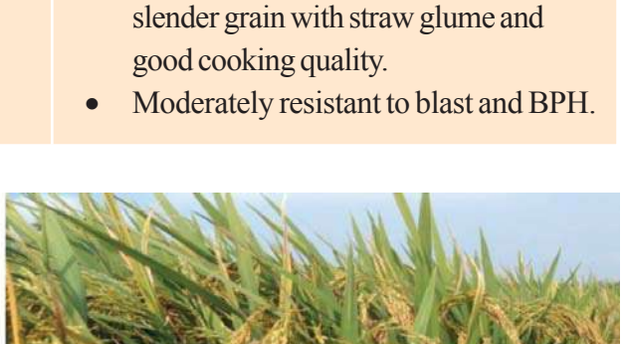
- Duration: 125-130 days.
- Fine grain, aromatic rice culture, dwarf, good cooking quality, requires low N, tolerant to blast and gall midge.
- Registered 5.6% higher yield (6912 kg/ha) than check MTU 1010 (6547 kg/ha) in early *kharif* and 21.3% higher yield (7385 kg/ha) than check NLR 34449 (6087 kg/ha) in *rabi*.
- It is under second year of minikit testing during early *kharif*, 2016 & *rabi* 2016-17.

NLR 3217

- Duration: 120-125days.
- Fine grain, tolerant to blast, sheath rot, sheath blight, RTD, dwarf, non lodging.
- Gave 13.3% higher yield (8083 kg/ha) than local check MTU 1010 (7133 kg/ha).
- It is under second year of minikit testing during *rabi*, 2016-17.

S.No.	Culture	Duration (days)	Characters
1	RGL7009 (3rd Year)	140-150	• Long duration. • Field tolerant to gallmidge biotype 4 and moderately resistant to neck blast. • Partial lodging at the time of maturity.
2	BPT 2615 (IR 20 x Tulasi) *Kharif* 2016 (2nd Year)	120-125	• Possess medium slender grain. • High yield potential. • Moderately resistance to blast and BPH. • Suitable for late *Kharif* and rabi season.
3	BPT 2595 (Mutant of BPT 2270) *Kharif* 2016 (1st Year)	145-150	• Non lodging culture and possess medium slender grain with good cooking quality. • High yield potential. • Moderately resistant to blast and BPH.
4	BPT 2660 (BPT 1768xNLR145) *Kharif* 2016 (1st Year)	150-155	• Non-lodging and has medium slender grain with straw glume and good cooking quality. • Moderately resistant to blast and BPH.
5	BPT 2782 (NLR145xMTU 2077) *Kharif* 2016 (1st Year)	140-145	• Non-lodging and has medium slender grain with straw glume and good cooking quality, • Moderately resistant to blast and BPH. • Recorded >80.0% germination under 14 days of submergence (Anaerobic germination) also.
6	BPT 2776 (BPT 2231/NLR145) *Kharif* 2016 (1st Year)	150-155	• Non-lodging culture and has medium slender grain with straw glume and good cooking quality. • Moderately resistant to blast and BPH.

BPT 2782



BPT 2595

MCM 103

- Parentage : (BPT 5204 x MTU 4870).
- Duration : 140-150 days.
- Semi dwarf, Non-Lodging, Straw glume and medium slender grain with salinity tolerance.
- Dormancy for 3 weeks.
- Tolerance to BPH.
- Recorded 6.0 % higher yield (5776 kg/ha) than local check MTU 1061 (5449 kg/ha).
- It is under second year of minikit testing during *Kharif*, 2016

APRRI & RARS, Maruteru

kharif

In Advanced Varietal Trial-1 (Late), MTU 1193 (6326 kg/ha) had recorded significantly superior yield than the best check, Pushyami (5640 kg/ha).

In Advanced Varietal Trial 1 (Irrigated Medium), the entries Siri-2277 (Gold) (5849 kg/ha) and CR 3962-4 (5784 kg/ha) recorded highest grain yield in comparison with the local check, MTU 1075 (574 kg/ha).

Among 26 entries tested, the entry NK-17508 (Hybrid) recorded 6384 kg/ha followed by MEPH-123 (Hybrid) (6304 kg/ha), while the local check, MTU 1153 recorded grain yield of 6038 kg/ha) in AVT1-ETP(early) VII set.

In AVT2-ETP(early), out of 13 entries (along with checks) tested the hybrid check entry SAVA-134 (Hybrid) recorded highest grain yield of 5808 kg/ha^{-1} followed by SVZ-1109 (Hybrid), RP 5125-8-10-2-B, Gontra Bidhan-3 (NC) and HRI-184 (Hybrid) with 5785, 5746, 5744 and 5723 kg/ha^{-1}, respectively compared to the local check MTU 1153 recorded 4699 kg/ha^{-1} grain yield.

Out of 34 entries evaluated in AVT-1 IME(early), the entry PR-15103 (Hybrid) recorded highest grain yield of 6513 kg/ha^{-1} followed by NVSR 6121 and YNP-9183 with 6299 and 6272 kg/ha^{-1}, respectively whereas the local check MTU 1001 recorded 5404 kg/ha^{-1}grain yield.

In MLT-Early sown in late direct sown conditions, out of 23 entries evaluated DRR Dhan 46 (IET 23420) recorded highest grain yield of 4924 kg/ha^{-1} followed by Tripura Khara Dhan-1 (4561 kg/ha^{-1}) and CR Dhan 100 (Satyabama) (4545 kg/ha^{-1}), while MTU 1010 recorded 3712 Kg/h.

In AVT-2 Biofort, the entries, CR 2829-PLN-32 (6185 kg/ha^{-1}), RP4920-Bio-51(B) (5938 kg/ha^{-1}) and RP 5898-54-21-9-4-2—2 (5905 kg/ha^{-1}) had recorded significantly superior yield than the best check, BPT 5204 (5372 kg/ha^{-1}).

In AVT,among 11 entries tested under rainfed shallow low land conditions entries OR 2439-4 (5002 Kg/ha), OR 2330-1-1 (4638kg/ha^{-1} gave higher yield than local check MTU 1064 (3923 kg/ha^{-1}) .

In AVT1 saline deep water trial, entries MTU 1184 (5994 kg/ha^{-1}), CR 2592-1-1-1-1 (5498 kg/ha^{-1}), CR3838-1-2-1-4-2 (5410 kg/ha^{-1}) were found to be top yielders among 12 entries tested than local check PLA 1100 (4185 kg/ha^{-1}).

AVT sub & Drought among 21 entries tested,entries IR 81896-13-13-194 (DONOR) (4191 kg/ha^{-1}), MTU 1231 (3933 kg/ha^{-1}), Swarnasub1 (3253 kg/ha^{-1}) exhibited better

performance under submerged conditions and entries Swarnasub1 (5333Kg/ha), Bahdur sub1 (5121 kg/ha^{-1}), MTU 1231 (4972 kg/ha^{-1}) performed well under normal condition among 21 entrie.

In MLT (Hybrids), the hybrid VNR 2335(6927 kg/ha^{-1}) recorded superior yield than the best local check variety MTU 1075 (5399).

In Multi Location Trial (late), out of 38 entries evaluated, the entries MTU II 327-39-1-3-1-1 (7870 kg/ha^{-1}), MTU 2087-9-1-1 (7745 kg/ha^{-1}), MTU 2126-44-1-1-1 (7745 kg/ha^{-1}), MTU 2071-13-1-1 (7695 kg/ha^{-1}), NLR 3432 (7645 kg/ha^{-1}), MTU 2197-12-1 (7595 kg/ha^{-1}), MTU 2022-8-3-3 (7270 kg/ha^{-1}), MTU 2244-128-18 (7045 kg/ha^{-1}), MTU 2086-9-1-1-2 (7021 kg/ha^{-1}) and MTU 2036-1-1-1-1 (6671 kg/ha^{-1}) recorded superior yield than the best check MTU 1061 (5771 kg/ha^{-1}).

In Advanced Yield Trial (Medium), the entries MTU 2284-103-1-7 (6119 kg/ha^{-1}), MTU 2337-216-1-1 (5891 kg/ha^{-1}) and MTU 2404-25-1 (5799 kg/ha^{-1}) recorded highest yield in comparison with local check MTU 1075 (5444 kg/ha^{-1}).

In Multi Location Trial (Medium), MTU II 369-72-4-1-1-1 (6329 kg/ha^{-1}), MTU II 388-44-1-1-3-1-1 (6288 kg/ha^{-1}) and MTU 2284-103-1-9 (6260 kg/ha^{-1}) recorded highest grain yield in comparison with local check MTU 1075 (5589 kg/ha^{-1}).

In MLT-Early, out of 27 entries tested the entry MTU 2261-11-3-1-2 recorded highest grain yield of 7098 kg/ha^{-1} followed by MTU 1213 (7036 kg/ha^{-1}), MTU 2347-45-1-1 (6951 kg/ha^{-1}) and MTU 1214 (6802 kg/ha^{-1}). The checks MTU 1121 and MTU 1010 recorded 5630 kg/ha^{-1} and 5547 kg/ha^{-1} respectively.

Twenty four entries (including check) were evaluated in the trial AYT-Early. Out of them, the entry MTU 2274-4-1-1-2-1-1 recorded highest grain yield of 6662 kg/ha^{-1} followed by MTU 2328-29-4-2-1 (6649 kg/ha^{-1}) and and MTU 2324A-4-2-1-2 (6564 kg/ha^{-1}), While the local checks MTU 1121 and MTU 1010 recorded 5743 Kg/ha and 5208 kg/ha^{-1} grain yield.

Entries MTU 2255-1-1-2 (5435 kg/ha^{-1}), MTU 2247-55-2 (5400 kg/ha^{-1}), MTU 2184-22-3-4 (5050 kg/ha^{-1}) gave higher yield than local check PLA 1000 (4050 kg/ha^{-1}) in advanced varietal trial semi deep water out of 20 entries evaluated.

In advanced yield trial submergence, entries MTU 2336-70-46-25-44 (4885 kg/ha^{-1}), MTU 2336-70-46-25-48 (4712 kg/ha^{-1}) gave higher yield than recurring parent MTU 1075 (1844 kg/ha^{-1}) under submerged condition and these entries gave on par yield 5065 kg/ha^{-1} and 5130 kg/ha^{-1} respectively under normal condition with MTU 1075 (5009 kg/ha^{-1}).

In Advanced Yield Trial (Medium), the entries 2411-40-3-3-1 (6297 kg/ha^{-1}), MTU 2404-25-2 (6207 kg/ha^{-1}) and MTU 2347-158-3-1-1 (6192 kg/ha^{-1}) recorded highest yield in comparison with local check MTU 1001 (5760 kg/ha^{-1}).

In MLT-Early, out of 27 entries tested, the entry MTU 2347-1-2-1 recorded highest grain yield of 7981 kg/ha^{-1} followed byMTU1001/CR2081-147-3-1(7856 kg/ha^{-1}), MTU 1214 (7852 kg/ha^{-1}) and MTU 2274-2-3-1(7845 kg/ha^{-1}).

Among 24 entries in AYT-Early trial the entry MTU 2331-45-1-1-2 topped for grain yield with 7565 kg/ha^{-1} followed by MTU 2455-1-3(7540 kg/ha^{-1}) and MTU 2331-19-1-1-2 (7524 kg/ha^{-1}) compared to check varieties MTU 1121(7025 kg/ha^{-1}) and MTU 1010 (6845 kg/ha^{-1}).

In MLT-DS-Late, out of 21 entries evaluated under direct sown conditions, the entry RM 88-95-1-1-1 highest grain yield of 6545

kg/ha^{-1} followed by MTU 1166 (6525 kg/ha^{-1}) and RM 71-42-1-1-1 (6502 kg/ha^{-1}) compared to checks MTU 1061(5204 kg/ha^{-1}) and BPT 5204(5526 kg/ha^{-1}).

In MLT-DS-Medium 23 entries evaluated, the entry RM 102-10-3-2-1 recorded highest yield of 6752 kg/ha^{-1} followed by RM 152-54-3-1-1 (6574 kg/ha^{-1}) and RM 138-54-3-2 (6547 kg/ha^{-1}) compared to the checks MTU 1075 (6210 kg/ha^{-1}) and MTU 1001 (5832 kg/ha^{-1}).

In AYT-DS trial 20 entries were evaluated under direct seeded conditions. out of them the entry MTU 2274-3-2-2 (6758 kg/ha^{-1}) recorded significantly superior yield than MTU 1121 (5867 kg/ha^{-1}).The entries MTU 2275-39-1-1-1 and MTU 1214 recorde 6516 and 6445 kg/ha^{-1} spectively.

Rabi 2016-17

In MLT-DS-Medium during rabi , the entry RM 155-122-1-1-1 recorded highest grain yield of 7563 kg/ha^{-1} followed by RM 88-95-1-1-1, RM 136-33-1-2-1 and RM 152-54-3-1-1 with 7524, 7366 and 7320 kg/ha^{-1} resp. whereas the best local check variety MTU 1121 recorded 6475 kg/ha^{-1} and MTU 1075 recorded 6470 kg/ha^{-1} grain yield.

In MLT-DS-Late trial, the entry RM 57-30-1-1-1 recorded highest grain yield of 7895 kg/ha^{-1} followed by RM 67-14-1-1-1 and RM 141-24-2-2-1 and MTU 1214 with 7524, 7565 and 7514 kg/ha^{-1} respectively. the local check entries MTU 7029, MTU 1061 and BPT 5204 recorded 5878, 5848 and 5670 kg/ha^{-1} respectively.

Out of 30 entries tested (excluding 3 check varieties) in AYT-DS, the entry E2 recorded highest grain yield of 7485 kg/ha^{-1} followed by M1 and M10 (7456 and 7365 kg/ha^{-1} resp) whereas MTU1121 and MTU 1010 recorded 7026 and 6865 kg/ha^{-1} resp.

Entries MTU 2336-70-46-25-44 (4885 kg/ha^{-1}), MTU 2336-70-46-25-48 (4712 kg/ha^{-1}) gave higher yield than recurring parent MTU 1075 (1844 kg/ha^{-1}) under submerged condition.

Under Advanced yield trial on salinity, out of 14 entries tested, DST 8-4-4 (4120 kg/ha^{-1}) and DST 9-157-6 (3736 kg/ha^{-1}) performed better than recurring parent MTU 1010 (3097 kg/ha^{-1})

Rice Research Unit, Bapatla

One hundred and eighty germplasm lines collected from various research stations are being maintained at RRU, Bapatla and data was recorded for 46 characters according to DUS testing guidelines for 15 entries.

In AYT- Late, among 14 entries along with two checks were evaluated ,BPT 2839 (6986 kg/ha^{-1}), BPT 2820 (6865 kg/ha^{-1}) and BPT 2808 (6857 kg/ha^{-1}), were the top three rankers and recorded significant yield superiority over BPT 2270 (5896 kg/ha^{-1}) and BPT 5204 (5351kg/ha^{-1}).

In AYT- Medium, 9 entries along with one check were evaluated the entries BPT 2789 (6950 kg/ha^{-1}), BPT 2798 (6880 kg/ha^{-1}), BPT 2790 (6750 kg/ha^{-1}) have recorded significant superior yield over BPT 3291 (5730 kg/ha^{-1}).

Among 36 (MLT-Late) entries along with two checks tested, MTU 2069-14-1-2-2 (7299 kg/ha^{-1}) followed by BPT 2411 (7151 kg/ha^{-1}), MTU 2035-12-2-4-1 (7136 kg/ha^{-1}) and MTU 2244-119-83-65 (7077 kg/ha^{-1}) recorded significantly superior yield over the local check BPT 5204 (5486 kg/ha^{-1}).

In MLT- Saline tolerant lines, 9 entries along with one check were evaluated. Among these, MCM 6-11 (6667 kg/ha^{-1}) followed by MCM 16-7 (6546 kg/ha^{-1}) and MCM 16-3 (6485 kg/ha^{-1}) showed significantly superior yield over the check BPT 3291 (5546 kg/ha^{-1}).

Among 20 direct sown late in multi location testing, the entry RM 67-60-1-1-1 (7.28 t/ha)

followed by RM 88-2-1-1 (7.26 t/ha) and RM 141-24-2-2-1 (7.22t/ha) have significantly out yielded the check MTU 1061 (5.84 t/ha).

Under estimation of nutritional and biochemical parameters in rice, among 17 genotypes tested, BPT 2848 recorded maximum protein content (10.6%) while BPT 5204 recorded the lowest (6.02%). The Fe content in brown rice ranged from 6.7 ppm in BPT 2411 to 19.4 ppm in BPT 2858. Likewise, the Zn content also ranged from 8.7 ppm (BPT 3291) to 27.1 ppm (BPT 2848). Total phenol content and anti-oxidant activity were analyzed for 13 rice varieties and advanced cultures in both brown and white rice samples. The total phenol content in brown rice ranged from 279.46 mg/100g brown rice in BPT 2660 to 170.83mg/100g brown rice of MTU 1010. In white rice, it varied from 43.82mg/100 g (BPT 2231) to 95.63mg/100g (BPT 2660). Other varieties which possess high phenol content include BPT 2595 (94.37 mg/100g) and BPT 2571 (93.96 mg/100g). Likewise, in brown rice, the anti-oxidant activity ranged from 1.47 mg/AAE/100g (BPT 2231) to 7.35 mg/AAE/100g in BPT 2595 while in white rice, the anti-oxidant activity was maximum in BPT 2595 (3.67 mg/AAE/100g) followed by BPT 2571(2.03 mg/AAE/100g)and BPT 2411 (1.95 mg/AAE/100g).

Agricultural Research Station, Machilipatnam

In an AVT among 17 entries evaluated the entry MCM 218-5-1-1-1 recorded superior grain yield of 6450 kg/ha^{-1} followed by MCM 58-1-1-2 with 6302 kg/ha^{-1}, MCM 203-12-1-1 (6070 kg/ha^{-1}), MCM 216 - 6 - 2 - 1 (5309 kg/ha^{-1}), MCM 223 - 5 - 1 - 1 (4857 kg/ha^{-1}), as against the check MCM 103 (3855 kg/ha^{-1}).

In a multilocation trial out of 9 saline tolerant rice cultures tested against MTU 1061 as check MCM 103 recorded highest mean yield over the locations. The other minikit entries MCM 100 (5855 kg/ha^{-1}) and MCM 101 (5085 kg/ha^{-1}) recorded good yields over the locations.

In an MLT- early, 25 entries with checks MTU 1010 and MCM 101,the entry BPT 2741 recorded 4991 kg/ha^{-1} of grain yield and ranked No. 1 followed by NLR 3407 with 4965 kg/ha^{-1} while check MTU 1010 record1587 kg/ha^{-1}

In an MLT – medium duration, out of 25 entries tested including checks MCM 100 and MTU 1001, the entry LR5758-89-1-1-2-1 recorded 5251 kg/ha^{-1} of grain yield and ranked No. 1 followed by MTU 2284-103-1-9 (5213 kg/ha^{-1}) while check MTU 1001 recorded 2562 kg/ha^{-1}

Thirty six late duration entries including cheks MTU 1061 and MTU 7029 checks tested in an MLT, the entry MTU 2404-52-3 recorded highest yield of 5873 kg/ha^{-1} followed by MTU 2197-12-1(5309 kg/ha^{-1}) while check MTU 1061 recorded 1848 kg/ha^{-1}.

Out of thirty four IIRR test entries with MTU 1061 as check were tested for their tolerance to saline conditions (CVTVT), entry 2407 recorded 5504 kg/ha^{-1} of grain yield and ranked No. 1 followed by 2411 with 5288 kg/ha^{-1} while the check MTU 1061 recorded 2985 kg/ha^{-1} of grain yield.

In AVT-CSTVT, 31 test entries received from Indian Institute of Rice Research, Hyderabad with MTU 1061 as were tested for their coastal saline tolerance, the entry 2303 recorded superior grain yield of 5174 kg/ha^{-1} followed by 2308 (4395 kg/ha^{-1}) while the check MTU 1061 recorded 2075 kg/ha^{-1}.

Regional Agricultural Research Station, Nandyal

NDLR 7 (Nandyal Sona) was released during 2016 to Andhra Pradesh state by AP varietal releasing committee as an alternative to BPT 5204 (Kurnool Sona) which had attributes

like slender grain,non loding, non shattering, good quality, tolerant to BPH, leaf folder and blast and also suitable for late transplantationsand good grain yield (25-30 q/acre).

Out of 328 germplasm collections maintained at RARS, Nandyal, 3 extra early duration accessions viz., IVT 113, IVT 117 and IVT 120 (110 days) and long duration entry sigappi (169 days) were identified.

In short duration multi location trial, E 496 (9843 kg/ha^{-1}), E 480 (9142 kg/ha^{-1}), E 497 (9076 kg/ha^{-1}), E 475 (8842 kg/ha^{-1}), E 492 (8542 kg/ha^{-1}), E 479 (8509 kg/ha^{-1}) and E 495 (8442 kg/ha^{-1}) recorded higher grain yields over check entry M.T.U 1010 (7241 kg/ha^{-1}).

During medium duration paddy multi location trial, M 539 (9286 kg/ha^{-1}), M 541 (9286 kg/ha^{-1}), M 517 (8801 kg/ha^{-1}), M 519 (8663 kg/ha^{-1}), M 528 (8628 kg/ha^{-1}), M 518 (8143 kg/ha^{-1}), M 540 (7970 kg/ha^{-1}) and M 525 (7970 kg/ha^{-1}) recorded higher grain yields over check entry MTU 1001 (7866 kg/ha^{-1}).

In an MLT-long duration trial, L 564 (8697 kg/ha^{-1}), L 561 (8663 kg/ha^{-1}), L 544 (8559 kg/ha^{-1}), L 549 (8418 kg/ha^{-1}), L 539 (8212 kg/ha^{-1}), L 560 (8212 kg/ha^{-1}), L 558 (7866 kg/ha^{-1}), L 542 (7866 kg/ha^{-1}), L 563 (7843 kg/ha^{-1}) and L 529 (7796 kg/ha^{-1}) recorded higher grain yields over check entry MTU 7029 (6923 kg/ha^{-1}).

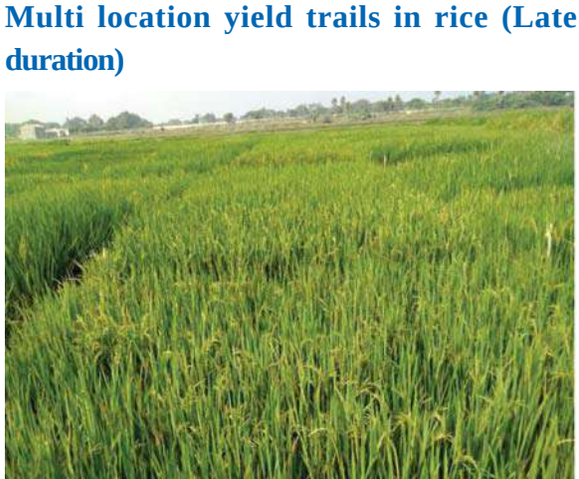
Agricultural Research Station, Jangamaheswarapuram

In PYT out 17 entries tested against check, the entries JMP 144 (7361 kg/ha^{-1}), JMP 130 (7250 kg/ha^{-1}) recorded significantly superior yield over check BPT 5204 (5561 kg/ha^{-1}).

In AVT twelve entries were tested against one check, the entries JMP 166 (6167 kg/ha^{-1}) and JMP 153 (5944 kg/ha^{-1}) recorded significantly superior yield over the check BPT 5204 (5316 kg/ha^{-1}).

In multi location trial, out of 38 long duration entries were evaluated,the entry L-540 was showed highest yield of 7511 kg/ha^{-1} compared to common check MTU 7029 (5928 kg/ha^{-1}) & local check BPT 5204 (5189 kg/ha^{-1}). The entries L-539 (7472 kg/ha^{-1}), L-558 (7361 kg/ha^{-1}) and L-554 (7055 kg/ha^{-1}) are on par.

Multi location yield trails in rice (Late duration)



Agricultural Research Station, Nellore

In AICRP trial ,out of Seven entries tested in AVT-2-Bio-fortification trial, one entry viz., NLR3238 (IET24336) (4775 kg/ha^{-1}) performance was top ranking in Kerala (11890 kg/ha^{-1}), Punjab (6141 kg/ha^{-1}), 2nd in Maharashtra & Gujarat (5426 kg/ha^{-1}) and it recorded 53% HRR, 3 ASV, 24.37 % Amylose content & 43 mm Gel consistency quality

parameters.. It recorded 19.06 ppm of Zinc, 4.4 ppm of Iron and 8.43 % of Protein in polished rice. Due to its consistent performance for three years it was found promising in Gujarat and Chhattisgarh states.

Out of fifteen entries tested against four checks in AVT-Late, only one entry, NLR 3374 (6640 kg/ha^{-1}) was found significantly superior over best check NLR 33892 (5967 kg/ha^{-1}).

Thirteen entries were tested against 3 checks in AVT-Medium, out of which seven entries were recorded significantly superior yield over check. Three entries viz., 5813-15-3-1-2 (5456 kg/ha^{-1}) followed by 5812-7-2-1-1 (5603 kg/ha^{-1}) and 5813-7-1-1-1 (5745 kg/ha^{-1}) recorded higher yield.

In AVT (early) out of 16 entries were tested against 3 checks, two entries viz., NLR 3408 (6411 kg/ha^{-1}) and NLR3412 (6395 kg/ha^{-1}) have recorded significantly superior yield over the best check NLR 40024 (5648 kg/ha^{-1}). However, based on 3 years performance NLR 3412, NLR 3450, NLR 3407 and NLR3448 were going to be tested in MLT and co-ordinated trials.

Under INGER (International Network for Genetic Evaluation of Rice) programme, obtained 49 lines under International Rice Brown Plant hopper Nursery (IRBPHN-2015), 69 BLB germplasm lines under International Rice Bacterial Blight Nursery (IRBBN-2015) and 16 lines for heat tolerance under International Rice Heat Tolerance Nursery (IRHTN-2015).

Thirty five entries were evaluated in Multilocation variety trial against check Swarna. Among them, the entry L 540 (NLR 3432) recorded highest grain yield of 8149 kg/ha followed by L 557 (MTU 2022-8-3-3) (6979 kg/ha) and L 542 (MTU 2111-13-1-2) (6868 (kg/ha) respectively.

In Multilocation varietal trial (early),twenty five entries were tested against two checks The best three entries were E 480 (6736 kg/ha^{-1}), E 488 (6589 kg/ha^{-1}) and E 475 (6468 kg/ha^{-1}). None of the entries were found to be significantly superior over the best check (Local Check NLR 34449: 6245 kg/ha^{-1}).

Twenty three entries were tested against two checks in Multilocation variety testing trial (medium duration) out of which the entries were M 533 (5979 kg/ha^{-1}), M 529 (5754 kg/ha^{-1}) and M 536 (5694 kg/ha^{-1}) have recorded higher yield over check (M 521) (4694 kg/ha^{-1}). None of the entries were found to be significantly superior over the best check (Local Check NLR 145:5607 kg/ha^{-1}).

Agricultural Research Station, Utukur

In Advanced varietal trial (long duration) out of ten entries tested, one entry, UTR 56 (12853 kg/ha^{-1}) recorded significantly higher grain yield over the check

Out of 38 entries tested in MLT (long duration), eight entries viz., L 548 (6912 kg/ha^{-1}) followed by L 542 (6852 kg/ha^{-1}), L 540 (6841 kg/ha^{-1}), L 558 (6797 kg/ha^{-1}), L 559 (6678 kg/ha^{-1}), L 537 (6623 kg/ha^{-1}), L 545 (6580 kg/ha^{-1}) and L 529 (6558 kg/ha^{-1}) recorded significantly higher grain yields against the check L 553 (6144 kg/ha^{-1}).

In Advanced varietal trial (medium duration) out of eight entries tested against three checks, three entries UTR 73 (8266 kg/ha^{-1}) followed by UTR 61 (8265 kg/ha^{-1}) and UTR 95 (7744 kg/ha^{-1}) recorded significantly higher grain yields against the best check NLR 34449 (6144 kg/ha^{-1}).

In Multi Location Trial (Medium duration) out of 26 entries tested, 20 entries (M 523, 528, 516, 533, 531, 525, 526, 537, 539, 519, 532, 534, 524, 540, 535, 517, 536 and 529) recorded significantly higher grain yields against the check M 521 (4706 kg/ha^{-1}). M 523 (5893 kg/ha^{-1}) followed by M 528 (5871 kg/ha^{-1}) and M 516 (5861 kg/ha^{-1}) were the top three entries.

In Multilocation trial(early duration) of the twenty seven entries tested, fourteen entries (E 489, 480, 479, 473, 494, 488, 475, 495, 496, 484, 472, 486, 485 and 478) recorded significantly higher grain yields against the check E 477 (2943 kg/ha^{-1}). E 489 (4773 kg/ha^{-1}) followed by E 480 (4686 kg/ha^{-1}) and E 479 (4523 kg/ha^{-1}) were better performers.

Agricultural Research Station, Ragolu

In Multi-location Yield Trial (Late), out of 38 entries evaluated during kharif, entries MTU 2197-12-1 (8833 kg/ha^{-1}), MTU 2111-13-1-2 (8750 kg/ha^{-1}), MTU 2022-8-3-3 (8736 kg/ha^{-1}) and MTU 2086-9-1-1-2 (8667 kg/ha^{-1}) have recorded significantly superior grain yield compared to other entries and local check RGL 11414 (7576 kg/ha^{-1}).

In Multi-location Yield Trial (Medium), 26 entries were studied during kharif, 2016 out of which RM 168-28-1-1-1 (8769 kg/ha^{-1}), RM 146-36-1-1-1 (8241 kg/ha^{-1}), BPT 2618 (8231 kg/ha^{-1}) and MTU 2284-103-1-9 (8074 kg/ha^{-1}) were found to be significantly superior compared to other entries and check variety RGL 2538 (6574 kg/ha^{-1}).

In Multi-location Yield Trial (Early), 27 entries were studied during kharif, out of which RM 7-61-3-1 (8306 kg/ha^{-1}), MTU 2274-74-2-2-1 (8273 kg/ha^{-1}), MTU 2223-5-2-2-1-1 (8259 kg/ha^{-1}), MTU 1214, MTU 2261-11-3-1-2, 2347-45-1-1, MTU 2274-3-2-2, MTU 2274-2-3-1, MTU 1213 and MTU 2274-8-1-1 were found to be significantly superior compared to other entries and local check RGL 1880 (6481 kg/ha^{-1}).

In Multi-location Yield Trial (Direct sown Late),among 20 entries evaluated during kharif, entries RM 67-60-1-1-1 (7250 kg/ha^{-1}) and RM 135-105-2 (6567 kg/ha^{-1}) were found to be superior in yield compared to other entries and on par with the local check RGL 11414 (5800 kg/ha^{-1}).

In Multi-location Yield Trial (Direct sown Medium), out of 23 entries tested during kharif, the entries RM 152-54-3-1-1 (6883 kg/ha^{-1}), RM 88-95-1-1-1 (6617 kg/ha^{-1}), RM 155-122-1-1-1 (6617 kg/ha^{-1}), RM 135-51-1 (6600 kg/ha^{-1}) and RM 154-26-5 (6517 kg/ha^{-1}) have recorded significantly superior yield compared to other entries and local check RGL 2538 (5225 kg/ha^{-1}).

In Advanced Variety Trial-1 (MS), out of 32 entries were studied, the entries RGL 7011 (7579 kg/ha^{-1}), AD 13121 (7041 kg/ha^{-1}) and MTU 1190 (6655 kg/ha^{-1}) were found to be significantly superior compared to other entries and the local check RGL 2538 (5462 kg/ha^{-1}).

Crop Production

Regional Agricultural Research Station, Anakapalle

In a trial on influence of pre kharif crops on improvement of system productivity crop in rice – maize system, dhaincha as preceding crop to rice has produced the highest crop residue on fresh weight basis (16.67 t/ha) followed by Pillipesara (11.81 t/ha) and both of them improved the grain yield of the succeeding crop of rice (6743 and 5800 kg/ha

In rice – maize system, Dhaincha as preceding crop to rice produced the highest crop residue on fresh weight basis (16.67t/ha) followed by pillipesara(11.81 t/ha) and both of them improved the grain yield of the succeeding crop of rice (6743 and 5800 kg/ha respectively) than all other pre kharif crops.). In all the three years (2014 to 2016), dhaincha as preceding crop has improved the yield of both rice (5410 kg/ha) and maize(5580 kg/ha) than all the other pre kharif crops.

APRRI & RARS, Maruteru

In a long term organic farming experiment in Kharif and Rabi seasons indicated that significantly higher tiller count, panicle count and grain

yieldswere realized organic farming experiment and highest mean system grain yield was recorded with 100% RDF + micronutrients (10.22 t/ha/yr) followed by 50%RDF + 50% N as FYM (9.96 t/ha/yr).

Studies on identification and establishment of paddy-paddy-pulse cropping system using selective mechanization during Kharif, 2016 season revealed that machine transplanting was recorded significantly higher average grain yield of 6996 kg/ha^{-1} compared to normal line transplanting (5429 kg/ha^{-1}) and farmers practice (5587 kg/ha^{-1}). During Rabi, 2016-17 season normal transplanted plot recorded significantly higher grain (5463 kg/ha^{-1}) and straw yields (6185 kg/ha^{-1}).

Natural Farming practices during Kharif, 2016 revealed that, more root length of 15.0 cm at nursery stage and 16.2 cm at harvest was observed in natural farming treatment compared to ICM treatment 13.5 cm and 16.0 cm respectively. Highest grain yield of 3960 kg/ha^{-1} and straw yield of 4100 kg/ha^{-1} was recorded with ICM treatment compared to natural farming treatment (2500 kg/ha^{-1} grain and 3600 kg/ha^{-1} straw yields). During Rabi, 2016-17, similar trend was observed .

In the Identification of need based cropping systems for different agro ecosystems during Kharif, MTU 1075 recorded highest yield of 6867 kg/ha^{-1} compared to MTU 1112. Maize and sorghum after kharif rice cropping system performed well among Rice - ID crops.

Among eight AVT-2E-TP cultures tested in kharif season against 2 standard checks, the culture IET – 24705 recorded higher yield of 6.58 t/ha followed by IET - 24075 (6.17 t/ha) compared to AVT entries and standard checks. All entries were found suitable for increased levels of N application.

Out of three AVT SDW cultures were tested against 2 standard checks. Maximum grain yield was recorded by the checks MTU 1140 (5.72 t/ha, local) followed by PLA 1100 (5.42 t/ha) compared to all AVT SDW cultures. All entries found suitable for increased levels of N.

Among four AVT ASG (Aromatic Short Grain) cultures were tested along with 2 local checks. Maximum grain yield was recorded by IET – 24613 (5.79 t/ha) followed by IET – 24619 (4.77 t/ha) compared to other entries. All entries were found suitable for increased levels of N.

Among eight AVT Bio-fortified cultures were tested for suitability increased levels of N application, maximum grain yield was recorded by IET-24440 (5.79 t/ha) followed by IET-24774 (5.43 t/ha) compared to other entries. All entries were found suitable for increased levels of N application.

During Kharif, 2016 Six AVT-Late cultures were tested in kharif with 2 standard checks, maximum grain yield was recorded by IET - 24395 (6.38 t/ha) followed by IET – 24284 (5.98 t/ha) compared to other entries under test and standard checks.

Studies on Yield maximization of rice through different sources of nutrients during Kharif, 2016 indicated that highest grain and straw yields were registered with RDF + Vigore application @ 625 g/ha as basal application (5821 kg/ha^{-1} and 7017 kg/ha^{-1}) followed by RDF + Vigore application as basal application and spray at PI stage(5494 kg/ha^{-1} and 6497 kg/ha^{-1}) compared to other practices.

Studies on Climate Resilient Management Practices in Rice and rice based cropping systems during kharif, 2016 revealed that 75% RDF along with Azospirillum + PSB responded well and recorded highest grain yield of 5923 kg/ha^{-1} followed by farmers practice (5313 kg/ha^{-1}). 50% RDF along with Azospirillum + PSB + FYM recorded significantly lower grain yield of 3460 kg/ha^{-1}.

The effect of liquid Bio-stimulant formulation (LBS6) of Sea 6 energy on growth and yield of rice during Kharif, 2016 revealed that, highest grain yield of 5528 kg/ha^{-1} and straw yield of 6250 kg/ha^{-1} was recorded with RDF + LBS6 @ 1 ml/lt spraying during transplantation, at 30 DAT and 60 DAT followed by RDF + LBS6 @ 0.75 ml/lt spraying during transplantation, at 30 and 60 DAT compared to recommended dose as well as absolute control.

Fertilizer management for machine planted rice during Kharif, 2014 and 2015 indicated that, highest mean grain yield of 6369 kg/ha^{-1} was realised with application of 120-90-60 Kg NPK/ ha which was on par with 120-90-90 kg NPK/ ha (6341kg/ha^{-1} grain yield) application compared to lower dosage treatments. Increase in graded levels of fertilizer dose of N, P and K beyond recommended dose of 90-60-60 Kg NPK/ha there is a significant response up to 150-90-60 Kg NPK/ha, beyond that there is not much significant yield increase was observed.

Agricultural Research Station, Ragolu

Among organic, INM and inorganic rice production practices, the INM practices registered maximum grain yield of 6625 kg/ha^{-1} with Swarna variety followed by organic production practices (6297 kg/ha^{-1}) and inorganic practices (6410 kg/ha^{-1}).

Study on nutrient management in MSRI revealed that, application of NPK @150-60-75 kg per ha in MSRI recorded significantly superior grain yield (7502 kg/ha^{-1}) over application of NPK @ 90-60-50 kg per ha.

In semi dry rice, among different chemical weed management practices, post emergence application Bis-pyribac sodium @ 25 g ai/ha at 20 DAS fbEthoxysulfuron @ 20 g ai/ha+ FenoxapropPEthyl with safenor (Rice star) @ 625ml/ha at 40 DAS recorded higher grain yield(6567 kg/ha^{-1}) and BC ratio (2.85).

Study on effectiveness of neem coated urea (NCU) with and without organic manures revealed that Green manure(6804 kg/ha^{-1}) and FYM application@10t/ha(6632 kg/ha^{-1}) significantly increased the grain yield of rice over no manure(6293 kg/ha^{-1}). Application of RDN through NCU proved effective over prilled urea.

In dry direct sown aerobic rice, among different chemical weed management practices, pre emergence application of Pendimethalin 30% @ 2500ml/ha followed by Rinskor 2.5% EC @ 1500 ml/h as post emergence application within 2 days of sowing fb 4-7 leaf stage of weeds registered higher grain yield (5369 kg/ha^{-1}) and gave on par yield to that of weed free condition.

Agricultural Research Station, Nellore

Among different varieties and nitrogen levels tested during early kharif, highest grain yield was recorded with test variety NLR 40024 (7052 kg/ ha^{-1}) and with 160 kg N/ha (6589 kg/ha^{-1}) and on par with NLR 3242(6839 kg/ha^{-1}) fallowed by NLR 3217 (5602 kg/ha^{-1}) and 200 &120 kg N/ha (6285 & 6119 kg/ha^{-1}) respectively.

During rabi (2016), highest grain yield was recorded with test variety NLR 40024 (7173 kg/ha^{-1}) and with 200 kg N/ha (6781 kg/ha) and on par with NLR 3217(6949 kg/ha^{-1}) and with 160 kg N/ha (6694 kg/ha^{-1}) respectively.

Highest grain yield of 5977 kg/ha^{-1} was obtained with inorganic cultivation compared to organic cultivation (5099 kg/ha^{-1}) during kharif. Among the varieties tested, highest grain yield was obtained with NLR 40024 (6098 kg/ha^{-1}) which was on par with NLR 34449 (5518 kg/ha^{-1}), NLR 30491(5319 kg/ha^{-1}) and NLR 33358 (5118 kg/ha^{-1}). Similar trend was observed during rabi season (5632 kg/ha^{-1} in inorganic cultivation, 2812 kg/ha^{-1} with organic cultivation) and NLR 40024 (4913 kg/ha^{-1}),NLR 34449 (4922 kg/ha^{-1}), NLR 30491(4157 kg/ha^{-1}) and NLR 33358 (2897 kg/ha^{-1}).

Highest grain yield (6684 kg/ha^{-1}) was recorded with application of 200 kg N/ha which was on par with 160 kg N/ha (6334 kg/ha^{-1}) and the lowest yield was observed at 120 kg N/ha (5940 kg/ha^{-1}). Split application of nitrogen from 3 to 5 splits has no significant influence on grain yield during rabi.

Regional Agricultural Research Station,Nandyal.

In organic paddy cultivation, grain yield 3970 kg/ha^{-1} (net returns Rs.55366/- ha) was realized over chemical method 5020 kg/ha^{-1} (net return Rs.79480/- ha). Similarly all attributes associated to grain yield recorded high in chemical method than organic method of cultivation.

In achieving target yields, soil test based fertilizers + vermicompost at 2 t/ha obtained highest grain yield of 6520 kg/ha during kharif out of different fertilizer dosage teststed.

Agricultural Research Station, Seethampeta

Rice-Rice cropping system, the farmers practice of higher dose of NPK(102-65-62 kg/ha^{-1}) recorded the system equivalent yields of 10299 kg/ha^{-1} compared to the NPK+Zn application (7349 kg/ha^{-1}) and reaped higher returns (Rs. 67500/-/ha).

Crop Protection

Insect Pest Management

Rice Research Unit, Bapatla

In light trap studies, peak activity stem borer moths and leaf folder were observed during the month of December and BPH catches were maximum during the last week of November.

The grain yield in in inorganic plot was comparatively higher (4250 kg/ha^{-1}) than semi-organic (3900 kg/ha^{-1}) and organic plots (3880.5 kg/ha^{-1}). The Leaf folder and BPH were also comparatively less in Organic plots and spiders were more in organic plots.

APRRI & RARS, Maruteru

Entries Chinsaba (ACC 33016), PTB 33 and Rathuheenati recorded "1" score to plant hoppers in special screening trial.

Out of the 70 entries field screened against gall midge, the entries JGL 25154 a recorded 0 score. based on the % damaged plants.

During Kharif 2016, among the insecticides tested, rynaxypyr 20 SC @ 150 ml/ha recorded significantly less no. of white ears followed by dinoteduran 20 SG @ 200 g/ha and acephate 95 SG @ 526 g/ha and theses are on par with each other. DPX - RAB 55 recorded lowest no. of planthoppers followed by dinotefuran at 80 DAT. DPX - RAB 55 recorded higher grain yields (7359 kg/ha).

During Rabi 2016-17, rynaxypyr 20 SC @ 150 ml/ha recorded significantly less no. of white ears (3.14%) At 70 DAT .DPX - RAB 55 recorded lowest no. of planthoppers and highest grain yield (5568 kg/ha^{-1}).

Studies on population dynamics indicated that the yellow stemborer was found more active during 43th and 48th SW. In 48th SW, YSB catches were highest (622+384). Gallmige peak catches (1491) were recorded in 38th SW. The GLH, BPh and WBPH catches were more in 39th SW.

In pesticide compatibility studies, the percent white ears were lowest in Chlorantraniliprole 20 SC @ 0.3ml/l in combination with Azoxystrobin 25 SC application and the planthoppers population was low with application of Flonicamid 50 SG @ 0.4 g/l in combination with Tebuconazole 25.9 EC @ 2.0 ml/L and Azoxystrobin 25 SC @ 1.0 ml/l.

Spraying of Azoxystrobin 25 SC @ 1.0 ml/l and Tebuconazole 25.9 EC @ 2.0 ml/l, Chlorantraniliprole 20 SC @ 0.3ml/l in combination with Azoxystrobin 25 SC and Tebuconazole 25.9 EC @ 2.0 ml/l alone were

recorded lowest incidence of sheath blight than untreated control.

In Rabi, Flonicamid 50 SG @ 0.4 g/l in combination with Tebuconazole 25.9 EC @ 2.0 ml/L and Azoxystrobin 25 SC @ 1.0 ml/l water recorded significantly lowest number of planthoppers than fungicides alone and untreated control.

During 2016-17, two new rodenticides (Flocoumafen and Difenacoum) were tested against B. bengalensis in lab. The results indicated that that the mean mortality time taken for 100% mortality by Flocoumafen and Difenacoum are 4.01 and 4.72 days respectively which is on par with the Bromadiolone 0.005% i.e.5.21 days.

Among the bait additives tested in multi-choice test, dry fish powder and dry prawn powder recorded high per cent consumption by the test animals followed by dry coconut powder and chopped onion additives over the loose bromadiolone 0.005% bait. Dry fish powder additive bait has resulted in highest population reduction of 77.7% among the baits as it has highest bait acceptance over the others.

Agricultural Research Station, Nellore

Efficacy studies of zinc and chelated zinc along with pesticides during Rabi revealed that, per cent reduction in damage due to stem borer is highest (82.48 %) with zinc and profenophos which is at par with all the other treatments, and in case of leaf folder, it is with spinosad and chelated zinc at 74.47 percent followed by Chlorantraniliprole with zinc (70.9). Highest yield is recorded in cartap hydrochloride with chelated zinc (6373 kg/ha^{-1}).

Insecticide resistance study in field population of Brown Plant Hopper collected from farmers fields of Nellore district recorded 4.54 folds of resistance for Imidacloprid during 2016-17 compared to 2013-14. The LC50 of imidacloprid against BPH during 2013-14 was 0.211 whereas 0.958 during 2016-17. In case of Buprofezin BPH developed 2.07 folds of resistance from 2013-14 to 2016-17.

Light trap studies revealed that, peak yellow stem borer catches (582 moths) were recorded during 38th std week, gall midge catches (21) during 38th std week, green leaf hopper catches (91) at 26th std week, Peak Brown plant hopper catches (2620) and white backed plant hopper catches (2150) were recorded at 38th st std week (Table 7). Peak leaf folder catches (382) were recorded at 14th std. week.

Population dynamics studies revealed that, leaf folder had significant negative correlation (-0.3858**)** with maximum temperature and significant positive correlation with relative humidity (0.6136) and sunshine hours (0.3290), Brown Plant hopper hopper and white backed plant hopper had significant negative correlation with Morning relative humidity (-0.4107 and -0.4483, respectively) and Sunshine hours (-0.4947 and -0.5530, respectively). Mirid catches had significant negative correlation with sunshine hours (-0.5266).

Agricultural Research Station, Ragolu

Entries RP 2068-18-3-5, JGL 27353, KNM 1632, KNM 2213, KNM 1623 and WGL-1062 found resistant to gallmidge with nil incidence.

In GMPM trial High level of virulence were observed in Purple (44.1%) followed by W1263 with 34.06% and RP2068-18-3-5 with 21.83% where Aganni recorded nil damage.

In multiple resistance screening trial, 2 entries (MRST 10,25) showed resistance to gallmidge with nil incidence, whereas the 3 entries (MRST 3,17,19) showed resistance to stem borer at reproductive stage with nil damage.

In NSN- H, four entries viz., 61, 66, 67, 70 showed multiple resistance to gallmidge and stem borer at reproductive stage and in NSN-1

four entries viz., 57, 99,101, 130 were found resistant to both gallmidge and stemborer.

In Insecticide Evaluation trial, rynaxypyr 150 ml/ha and acephate have significantly reduced stem borer incidence at reproductive stage with 0.48% WE followed by flubemdamide 480 SC 50 ml/ha with 0.5%WE. Flubemdamide 480 SC 50 ml/ha was only treatment significantly reduced the gallmidge incidence 0.56%SS. Highest yield recorded in plots treated with rynaxypyr 150 ml/ha with 6.86t/ha.

In Botanical Insecticide Evaluation trial at reproductive stage rynaxypyr 150 ml/ha was significantly reduced the stem borer incidence with 1.67%WE followed by neem oil 5 ml/l with 2.24%, neembaan with 2.67%WE.

Spraying DPX-RAB 55 237.5ml/ha, Spinetoram 6% w/v (5.66% w/w) + Methoxyfenoxide 30% w/c (28.3%w/w) SC 400 ml/ha., Flubemdamide 480 SC) 50 ml/ha, Acephate) 526 g/ha and Rynaxypyr 150 ml/ha at 56 DAT significantly reduced the incidence of stem borer (3.21, 3.25, 3.46, 3.5, 3.75 %DH respectively). For gallmidge at 56 DAT, Flubemdamide 480SC significantly reduced the incidence (7.83%SS) followed by Dinetofuran 200 g/ha (9.62%SS) and at 80DAT Flubemdamide 480SC only reduced the incidence (20.5% SS).

Disease Management

APRRI & RARS, Maruteru

Out of 373 entries screened for leaf blast resistance under NSN 1, three entries viz. IRH 103, TR 13-069, TM10085 has scored 0 score under Standard Evaluation System (SES). Under NSN 2, out of 663 entries, 86 entries viz., 610, 202, 212, 213, 214, 216, 217, 220, 222, 232, 237, 239, 1127, 1128, 1135, 1137, 1140, 1141, 1151, 1153, 1159 etc. have given resistant score of 1 under SES. Under DSN four entries viz., VL-31802, VL-31817, KMP 220 and IR-64 recorded score of 1. Under NHSN nine entries viz., IHRT-E-31, IHRT-E-33, IHRT-ME-11, IHRT-ME-14, IHRT-ME-23, IHRT-ME-34, IHRT-M-17, IHRT-M-27 and IR-64 recorded score of 1. Of 638 Plant Breeding entries screened, 10 entries viz., AST 68, AE 670, AE 672, BE 529, E476, M527, L 537, AE 734, AE 780, CE 441 recorded resistant score of 1.

Out of 373 entries screened for neck blast resistance under NSN 1, four entries i.e, CR 3612-1-4-2-1, CR 3838-1-2-1-4-2, IIRRH-105 (Hybrid), TRC 2014-14/IR 82589-B-B-2-2 were found resistant by recording score 0, 5 entries i.e., OR 2434-4, OR 2437-11, MTU 1184 (MTU 20601-1-1-1-1), Tetep, Vikramarya recorded <5% incidence under Standard Evaluation System (SES) for neck blast.

Out of 663 entries screened under NSN 2, eight entries i.e, CR 3696-5-2-1-1-1, AD 14136, OR 2412-5, AD 12074, BPT 2774, R 1919-537-1-160-1, SKL-03-5-14-28-32-28-38, CR 3813-4-4-4-2-2-5 were found complete resistant and recorded 0 score. Under NHSN, two entries i.e., IHRT-MS-26 and Rasi recorded 0 score. Under DSN, two entries i.e., CB 12132 and CB 12122 recorded <5% incidence.

Of the 641 entries tested under Plant breeding, 13 entries (AL 831, 834, BL 383, 384, 385, L 529, 532, 534, 537, 541, 545, 550) and AL 791 have recorded score 0.

For sheath blight resistance out of 373 entries screened under NSN 1, one entry (MTU 1191 (MTU 2035-18-1-2-1); out of 663 entries under NSN-2, seven entries (CR 2748-15-5-4, CR 3036-3-1-21-1, OR 2438-2, CR 3606-1-6-1-3-1, CR 3898-113-4-2-1, CST 7-1 (Coastal Saline check) and MGD-1601) recorded resistant score of 3 under SES.

Out of 373 entries screened for bacterial leaf blight resistance under NSN 1, Three entries (RP 5898-138-14-9-8-4-2, Huang-Hua-Zhan and Improved Samba Mahsuri (RP); out of 663

entries under NSN-2, one entry (PAU 2K10-23-54-14-52-107-0-1) recorded score 3. Out of 109 entries under DSN, two entries (CB 05022 and RP Bio-226) gave resistant score of 3 in SES. Out of 655 plant breeding lines screened, three entries (RS 102, RS 131 and RS 137) were found moderately resistant recording score 5.

As many as 325 entries in NSN 1 and 568 entries in NSN 2, 102 entries in DSN and 87 entries in NHSN were completely free from sheath rot incidence.

Leaf blast incidence & severity was found maximum in 1st date of sowing i.e 2.12.2016 (86.28% & 6.28) in RDR-763, whereas it was increased from 1st date of sowing (80.22% & 6.42) to 3rd date of sowing (93.94% & 7.07) in case of swarna variety. Neck blast incidence was decreased from 1st date of sowing (99.58%) to 3rd date of sowing (50.08%) in case of RDR-763 and swarna (70.46% to 67.26%).

Among the new fungicides tested, standard recommended fungicide, hexaconazole 5 EC was found effective against sheath blight of rice (16.39%) at par with tebuconazole 25% EC (24.69 %) as against control (64.34%) sheath blight incidence. Similarly, disease severity was also significantly low in hexaconazole 5 EC (24.22%) as compared to the untreated control (60.67%). While, New fungicide tricyclazole 20% + tebuconazole 36% SC @ 2.25 ml/lit was found moderately effective against sheath blight of rice (36.65%, 48.99%).

Among the new fungicides tested, tricyclazole + tebuconazole 36% SC @ 2.25 ml/lit was found moderately effective against leaf blast of rice (74.60%) at par with tricyclazole 75% WP (80.56 %) as against control (99.02%) leaf blast incidence. Similarly, disease severity was also significantly low in tricyclazole + tebuconazole 36% SC @ 2.25 ml/lit (2.66) treatment as compared to the untreated control (4.18). While, New fungicide, tricyclazole + tebuconazole 36% SC @ 2.25 ml/lit was found effective against neck blast of rice (7.00%) compared to control (52.77%).

In chemical control of false smut studies per cent infected panicles with false smut was low (3.54%) in case of Amistar (azoxystrobin) 25 SC @ 1.0 ml/litre closely followed by Amistar Top (azoxystrobin 18.2 %+ difenoconazole 11.4 % w/w SC) @ 1.0 ml/litre (4.75%). Increased grain yield (6096 kg/ha) was also recorded in case of Amistar Top closely followed by Amistar (6025 kg/ha).

In studies on the etiology and management of red stripe disease on rice (kharif & rabi), fresh isolations were carried out by using PDA, NA, Leaf extract media (MTU 2077, MTU 1187, MTU 1156, PLA 1100)during kharif. Pathogenicity studies were carried out on MTU 2077. SDS-PAGE for proteins was carried out from infected red stripe leaf samples and healthy leaf samples of varieties MTU 1187, MTU 1061, MTU 1166 and MTU 1226. Common protein bands of size 55 KD and 25 KD were found in healthy samples of all varieties which is absent in infected samples

Soil application of poultry manure @ 2 t/ha + Spray application of Trifloxystrobin + tebuconazole 75% WG @ 0.04% spray at 30 and 60 DAT resulted in significantly less stem rot incidence (33.17%) compared to control (66.17%) under field conditions.

In studies on identification of blast resistance genes in rice genotypes presence of Pi1 blast resistance gene was detected in MTU 1156, Betichican, Swarna, NLR 34449, MTU 1010, IR 64, C 104 PKT, Raminad STR 3, Zenith, Shi-tia-rao, MTU 1226, MTU 1229, MTU 1210 and MTU 1194 through SSR marker with primer RM224 (157 bp). Presence of PiKh blast resistance gene was detected in Betichican, Tetep, MTU 1121, Raminad STR 3, MTU 1184 and

MTU 1194 through SSR marker with primer RM206 (147 bp). Presence of Pi5(t) blast resistance gene was detected in MTU 1121, IR 64, A 57, Calaro, MTU 1226, MTU 1210, MTU 1194 and MTU 1187 through SSR marker with primer RM21 (157 bp). Presence of Piks blast resistance gene was detected in C 101 LAC, Zenith, Dular, Shi-tia-rao, Calaro, Tadukan, MTU 1226, MTU 1229, MTU 1184, MTU 1194 and MTU 1187 through SSR marker with primer RM1233 (175 bp).

Agricultural Research Station, Nellore

A total of 334 cultures were screened against rice diseases, among which 5 cultures were resistant and 35 cultures were moderately resistant to sheath rot ; 92 cultures were resistant and 98 cultures were moderately resistant to neck blast; 49 cultures were resistant and 104 cultures were moderately resistant to Bacterial leaf blight.

A total of 334 entries were screened against leaf blast disease out of which 27 entries were found to be resistant and 51 entries were found to be moderately resistant to the disease.

Among the biocontrol treatments during rabi, neck blast was significantly reduced (8.57%) with four sprays *Pseudomonas fluroscens* @10 g/l with 1% milk powder and was at par with four sprays with *Pseudomonas fluroscens* @10 g/l at 15, 30, 45 and 60 DAT. Leaf blast significantly reduced with three sprays of *Pseudomonas fluroscens* @10 g/l at 15, 30 and 45 DAT and with four sprays with P. fluorescens @10 g/lat 15, 30, 45 and 60 DAT.

Among different fungicides tested against post flowering diseases in rice, Isoprothiolane 40EC @1ml/l was proved to be effective in reducing sheath rot disease (9.67%) and was on par with Isoprothiolane 40 EC +Tebuconazole 25.9% EC@1.5 ml + 1.5 ml .Stem rot was most significantly reduced by tryfloxystrobin 25%+ tebuconazole 50% WG, isoprothiolane 40 EC + tebuconazole 25.9% EC and kasugamycin 3l + tebuconazole 25.9% EC treatments. There was singnificant reduction in grain discolouration due to all the fungicidal treatments over the control treatment.

1.2 Maize

Crop Production

Regional Agricultural Research Station, Chintapalle

Influence of natural farming in filed crops during 2016-17, indicated that ICM package registered higher yields of Maize during kharif (78.2 q/ha) and Wheat during rabi (22.3 q/ha) than natural farming practice (70.1 q/ha and 19.6 q/ha, respectively).

Soil properties like bulk density was reduced in natural farming followed plots after the harvest of *rabi* crop from 1.23 to 1.19 gcc^{-1}, Water holding capacity (from 36% to 36.9%), p^H (from 6.2 to 6.4) and organic carbon (from 0.40 to 0.46%) values were increased as compared to the initial soil sample in natural farming plots after harvest of the rabi crop

Agricultural Research Station, Vizianagaram

Among different pre and post emergence herbicide tested at 20 DAS, highest weed control efficiency of 85% and 82% were recorded by atrazine (50%WP) @ 1kg a.i per ha as pre emergence and atrazine (50%WP)@ 0.5 kg a.i per ha + Alachlor (50%EC) @ 0.5kg a.i per ha) as pre emergence.Hand weeding twice at 20 and 40 DAS recorded 96% with high grain yield (8700 kg/ha^{-1}).

Regional Agricultural Research Station, Lam

In rice fallows maize, the highest C: B ratio of 2.13 was recorded with atrazine @ 1.0 kg/ha^{-1} + paraquat @ 0.60 kg/ha^{-1} as PE followed by topramezone @ 0.025 kg/ha^{-1} at 25-30 DAS (seed yield-10400 kg/ha^{-1}) followed by atrazine @ 1.0 kg/ha^{-1} + paraquat @ 0.60 kg/ha^{-1} as PE followed by tembotrione @ 0.100 kg/ha^{-1} at 25-30 DAS with 2.11 (seed yield-10135 kg/ha^{-1}).

Crop protection

Insect Pest Management

Regional Agricultural Research Station, Lam

Whorl application of chlorantraniliprole 0.4 G @ 10 kg/ha^{-1} and fipronil 0.3 G @ 12.5 kg/ha^{-1} at 22 DAS was found to be effective against pink stem borer in rice fallow maize compared to control (25.68%).

Out of 67 Maize inbreds evaluated during *rabi* 2015-16, PDM1450, 1458, 1461, 1462, 1469, 1472, 1473, 1495 and 1498 recorded low % dead hearts of 8.33, 7.89, 8.33, 5.88, 9.09, 5.71, 5.4, 5.88, 6.25 and 6.25 respectively. PDM 1439 recorded highest % dead heart of 70.58%.

Nylon net fencing and circular wire fencing prevented the wild boar damage (1.5% and 0.7% plant damage respectively) over 100% plant damage in control plot as well as in castor which was grown around the maize.

Regional Agricultural Research Station, Anakapalle

Field release of *Trichogramma chilonis* @1,00,000 per ha from 15 days after seedling emergence three times at weekly interval (2.04% DH) and field release of *T. chilonis* @ 75,000 per ha from 15 days after seedling emergence three times at weekly interval recorded less dead heart incidence of maize stem borer (2.4%DH) and stem tunneling (1.13 cm/plant) compared to field release of *T. chilonis* @75,000 per ha from 25 days after seedling emergence three times at weekly interval (5.41% DH and 5.3 cm/plant) and field release of *T. chilonis* @ 1,00,000 per ha from 25 days after seedling emergence three times at weekly interval (4.52% DH and 5.8 cm/plant). from 25 days after seedling emergence three times at weekly interval (66.26'000/ha) indicating the effectiveness .

Maize stem borer damage was significantly low in all the NBAIR entomopathogenic Beauveria strains i.e., Bb -19 (1.5 % DH) , Bb 23 (2.32%DH), Bb -7 (2.58 %DH), Bb -5a (2.64 % DH), Bb 14 (3.14% DH) and Ma 35 (1.8%DH) as compared to Carbofuran whorl application (6.34 %DH) and untreated control (12.48%DH). Cobs yields showed that the strain Bb 5a and Bb19 registered significantly higher cob yields (71.37 thousands/ha and 68.94 thousands/ha respectively) compared to untreated control (50.62 thousands /ha).

Disease Management

Regional Agricultural Research Station, Lam

Out of 12 maize hybrids tested, 8 hybrids *viz*., IR 9126, IR 9133, IR 9140, IR 9144, IR9149, IR 9190, DKC 81012 and pioneer 30 V 92 were found resistant to stalk rot disease caused by *Fusarium verticelloides* and 6 hybrids viz., IR 9126, IR 9133, IR 9140, IR 9145, IR 9190 and HISHEEL had shown resistance to *Macrophomina phaseolina*.

1.3 Sorghum

Crop Improvement

Regional Agricultural Research Station, Nandyal

Entry N2647 (white grain sorghum)and N2446 (yellow sorghum) have completed minikits for 3 years successfully and also completed multi location trial. These varieties are ready to be released soon.

To control sorghum stem borer different pesticides were tested out of which spinosad 70 ml/acre, chloranthraniliprole 18.5 SC @ 60 ml/l and whole application of carbofuran granules 3G 4 kg/acre effectively controlled the pest with incidence of 23.9, 26.4 and 28.2 %, respectively.

AICRP on Sorghum, Bapatla

Out of twenty five F1s were evaluated, four crosses viz., 2219A/R-91014 (8550 kg/ha^{-1}), AKMS 28A/R-91012 (7885 kg/ha^{-1}), AKMS 27A/R3777 (7575 kg/ha^{-1}) and ICSA 467/R-49 (5667 kg/ha^{-1}) have significantly excelled the best check CSH 14 (4357 kg/ha^{-1}).

A total of 1000 germplasm lines were received from IIMR, Hyderabad under Crop – Agro Biodiversity Project during Kharif 2016 for maintenance and evaluation.

In AHT – GS, among eleven entries, SPH 1779 (7148 kg/ha^{-1}) and SPH 1789 (5477 kg/ha^{-1}) were the top entries over the national and local checks.

In JMLT, six entries were evaluated during Rabi 2016-17 under rice fallow situation .The entry NJ 2647 (white pericarp jowar) recorded highest grain yield of 4906 kg/ha^{-1} than NTJ2 (3501 kg/ha^{-1}), whereas NJ 2446 (yellow pericarp entry) yielded numerically significant (5573 kg/ha^{-1}) over N-14 (5088 kg/ha^{-1}).

During Rabi, 2016-2017 about 50 Front line demonstrations (FLD's) were organized to demonstrate the productivity potentials of released high yielding sorghum hybrids viz., CSH 14, CSH 16, CSH 25 and CSH 30 under rice fallow situation at Nandivelugu and Chilumuru villages of Tenali , Guntur District. The hybrid CSH- 25 has showed 9.3% improvement in grain yield over the Mahalakshmi 296 (local check) followed by CSH16 (8.8%), CSH 14 (2.4%) and CSH 30 (1.8).

Crop Production

AICRP on Sorghum, Bapatla

Application of 80 kg N/ha registered 3826 kg/ha grain yield which was significantly increased with 120 kg N/ha (4259 kg/ha^{-1}).Further increase in nitrogen to 160 and 200 kg/ha^{-1} did not increase the yield significantly. Among the hybrids, CSH 25 recorded the highest grain yield of (4848 kg/ha^{-1}) followed by CSH 16 (4455 kg/ha^{-1}), Mahalakshmi 296 (4267 kg/ha^{-1}) and CSH 14 (3581 kg/ha^{-1}).

Among the four hybrids grown in black soils of farmer's fields in Tenali sub-division on different dates, CSH 16 and CSH 25 recorded the highest mean yields of 6770 and 6720 kg/ha^{-1} respectively. The sorghum sown on 15th Dec, 26th Dec and 6th January recorded the yields of 6528, 6455 and 6345 kg/ha^{-1} respectively. It clearly showed that rice fallow sorghum can be sown up to 1st week of January without much reduction in yields.

Crop Protection

Insect Pest Management

Regional Agricultural Research Station, Lam

Among 73 sorghum germplasm entries, entries; PEC 8, EP 59, EP 70, EP 95, EP 104, EP 106, EP 107, EP 112, EP116 and IS 29872 were found promising against sorghum shootfly as they recorded less than 10 per cent dead hearts and PEC 2 was found promising against stem borer.

1.4 Pearlmillet (*Bajra*)

Crop Improvement

Agricultural Research Station, Ananthapuramu

Among the 35 hybrids tested in initial hybrid trial (medium) entry No. IHT 215 (PB 1852) recorded 3270 kg/ha^{-1} grain yield and ranked first followed by IHT 220 (JKBH 1326) recorded 2963 kg/ha^{-1}, IHT 217 (TNBH 121289) recorded 2868 kg/ha^{-1}.

Among the entries tested in advance hybrid trial (medium),the entry AHT 408 B (DHBH 1389) recorded 4579 kg/ha^{-1} grain yield followed by AHT 404 B (86 M 38) (4249 kg/ha^{-1}) and AHT 410 B (GHB 558) (3876 kg/ha^{-1}).

In advanced Hybrid trial (Late) the entry AHT 508 B (Kaveri Super Boss) recorded highest grain yield of 4118 kg/ha^{-1} followed by AHT 506 B (PRBH 99) (4007 kg/ha^{-1}) and AHT 502 B (KBH 3590) (4000 kg/ha^{-1}).

In released hybrid and varietal trial, the hybrid Pratap recorded highest grain yield (3374 kg/ha^{-1}) followed by PAC 909 (3175 kg/ha^{-1}), 86 M 86 (3064 kg/ha) and NBH 5061 (3059 kg/ha^{-1}).

In Multi-Location Trial, among six hybrids tested, ABH 11 hybrid recorded significant grain yield superiority over the check ICMH 356. Among the four varieties / populations tested, the variety ABV 04 recorded highest grain yield (3062 kg/ha^{-1}) followed by ABV 05 and ICMV 155.

Among 24 hybrids tested in advanced pearl millet hybrid and varietal trial, medium check 86 M 01 ranked first for grain yield (2461 kg/ha^{-1}) followed by BH 16101 and BH 16112 and registered 7-15% increase in grain yield over the best late maturing check NBH 5061.

Agricultural Research Station, Vizianagaram

In Multi Location Yield Trial among ten entries were tested during kharif season, ABH-11 (39.67 q/ha) and ICMH-356 (38.25 q/ha registered highest grain yieldcompared to local check pitta ganti (28.0 q/ha).

Agricultural Research Station, Perumallapalle

Out of thirty five entries were tested including three checks in initial hybrid trial (medium duration) during Rabi 2016,entries DHBH 1503 (37.56 q/ha), RHB 241 (36.44 q/ha) and HHB 317 (35.94 q/ha), recorded significantly higher grain yields compared to check GHB 905 (29.71 q/ha).

Among ten entries were tested including three checks in multi location trial during Kharif 2016, none of the tested entries recorded higher grain yields than checks. Check entry ICMV 155 (27.42 q/ha) recorded higher grain yields when compared to the other tested entries.

Crop Production

Regional Agricultural Research Station, Lam

In pearlmillet, atrazine @ 0.75 kg/ha^{-1}, pendimethalin @ 1.0 kg/ha^{-1} and alachlor @ 1.0 kg/ha^{-1} as pre-emergence recorded a grain yield of 13.75 q/ha, 12.50 q/ha and 12.50 q/ha, respectively compared to 7.50 q/ha recorded in weedy check. Among the post emergence herbicides metsulfuron 0.0015 kg/ha^{-1} + chlorimuron 0.0015 kg/ha^{-1} at 20 DAS recorded a grain yield of 18.75 q/ha followed by 2, 4-D Na salt @ 0.80 kg/ha^{-1} at 20 DAS with 17.50 q/ha.

1.5 Fingermillet (*Ragi*)

Crop Improvement

Agricultural Research Station, Perumallapalle

The promising ragi culture PPR 1012 (yield 32 –35 q/ha) with tolerant to all the three types of blast disease completed three years of minikt testing and will be proposed for release.

Among ten entries tested in preliminary yield trial including check during *Kharif* 2016, entries PPR 1080 (44.28 q/ha) and PPR 1078 (36.58 q/ha) have recorded significantly higher grain yields compared to the check Vakula (27.53 q/ha).

Out of ten entries tested in preliminary yield trial including check during Rabi 2016-17, entry PPR 1078 (52.44 q/ha) recorded significantly higher grain yields compared to the check Vakula (45.92 q/ha).

Out of ten entries tested in Multi Location Trial along with three checks (Vakula, Godavari and Sri Chaitanya) during *Rabi* 2016-17, Check Vakula (55.98 q/ha) was the highest grain yielder followed by BR 36 (51.62q/ha).

Agricultural Research Station, Vizianagaram

Among seven entries including two checks, Bharathi (VR-762) and GPU 28 in advanced varietal trial I & II, national check, GPU 45 recorded highest grain yield (30.04 q/ha) followed by another check GPU 28 (29.31 q/ha), whereas the local check Bharathi (VR-762) recorded 28.87 q/ha.

Out of nine entries tested with three local checks Sri Chaitanya (VR 847), Champavathi

(VR 708) and VR 900 in advanced yield trial, VR 1099 (39.74 q/ha) recorded highest grain yield followed by VR 1101 (39.62 q/ha). Local checks VR 900, VR 847 and VR 708 recorded 36.06, 30.94 and 22.12 q/ha respectively.

Among ten entries tested in Multi Location Trial, the entry Sri Chaitanya (38.28 q/ha) recorded highest grain yield followed by PR 1035 (36.83 q/ha) and Godavari (35.74 q/ha).

Agricultural Research Station, Peddapuram

One hundered and eighty three(183) fingermillet germplasm lines were evaluated and maintained during kharif 2016.

In Advanced Varietal Trial-I&II (Early and medium duration group), out of 5 entries tested VL-379 (30.10 q/ha) than the check VL-352 (29.80 q/ha) and the other check PR 202 (28.50 q/ha).

Seven promising entries of fingermillet were evaluated in Advanced Yield Trial (Station Trial) for yield and lodging resistance in which PR 1434 (25.63 q/ha), PR 1424 (23.67 q/ha) and PR 1435 (23.39 kg/ha) performed significantly over better check PR 202 (20.94 q/ha).

In Multi Location Trial, out of ten entries tested PPR 1027 (40.00 q/ha) and BR 36 (38.30 q/ha) were superior in yield than the trial better check PR 202 (Godavari) (31.30 q/ha).

PR 10-45 which has completed testing as pre released culture under coordinated trials has been given for fourth year minikit testing in Andhra Pradesh. The entry was reported to have shown 14.9% yield advantage over the check PR 202 in addition to lodging tolerance.

PR 10-35 which was nominated for national level multi location testing (MLT) has gained second rank among 13 entries tested during kharif, 2016. In addition the entry has exhibited resistance against banded sheath blight against which no resistance source available in the present germplasm.

Three cultures viz., PR 1014 (PR202/GPU26), PR 1035 (GE 4971/GPU 26/GE 559) and PR 1507 (DM-7/PR202) were nominated for state level multi location testing during kharif 2016

Regional Agricultural Research Station, Chinthapalli

Among the ten entries including check tested in Multi Location Trail during Kharif 2016, entry Srichaitanya recorded the highest grain yield (4667 kg/ha^{-1}) followed by BR 36 (4329 kg/ha^{-1}), PR1035 (4089) than Vakula (2178).

Crop Production

Agricultural Research Station, Vizianagaram

Studies on response of pre release fingermillet varieties (Long duration) to different levels of NPK fertilizers under rainfed conditions during kharif, 2016 revealed that grain (2204 kg/ha^{-1}) yield and straw (6308 kg/ha^{-1}) yield were significantly higher in 125% RDF compared to 100%, 75% and 50% RDF. Among the varieties, grain yields of VL-379 (2037 kg/ha^{-1}) and VL-352 (1989 kg/ha^{-1}) were on par with national check variety VR-708 (1959 kg/ha^{-1}). Both the pre release varieties were far superior to local check variety in terms of growth and yield characteristics.

Among different intercrops, fingermillet equivalent yield (6721 kg/ha^{-1}) was significantly high in Finger millet + Bhendi (8:2) system with high net returns (Rs.118926.00) and B:C ratio(4.11), followed by Fingermillet + Pigeon pea system (8:2) .

The performance of Fingermillet varieties in Rice-fallows during rabi 2016-17 revealed that all growth, yield attributes and grain yield were significantly high in VR-900 (110-117days) (2503.3 kg/ha^{-1}) and it was on par with VR-762 (110-115 days) (2436.7 kg/ha^{-1}) with significantly high net monetary returns and B:C ratio VR-900

(Rs. 41525.33 and 3.07 respectively) followed by VR-762 (2.96) and VR-847 (2.87).

Among the 13 rescheduling of fertilizers doses tested, highest straw yield was found in fertilizers are applied based on STCR equation for 40 q/ha +5 t ha^{1}FYM (88.7q/ha) and grain yields were found highest in 200% RDN+ 100%RDP+100%RDK+25%RDZn+25% RDS+ 25%RDB + 5 t ha^{1} FYM (38.12 q/ha). However it was on par with fertilizers applied based on STCR equation for 40 q/ha+5 t ha^{1} FYM (37.4 q/ha).

The effect of zinc and iron nutrition on fingemillet shows that higher straw and grain yields were obtained with150% RDF+ ZnSO4 0.5% foliar spray + FeSO4 0.2% foliar spray (82.96 kg/ha and 37.28 q/ha) which was on par with 150% RDF+ZnSO4 soil application + FeSO4 0.2% foliar spray. Whereas the highest available Zn in the soil was found in 150% RDF+ZnSO4 soil application + FeSO4 0.2%foliar spray (3.17 ppm), and the highest available Fe in 150% RDF+ ZnSO4 0.5% foliar spray + FeSO4 0.2% foliar spray (19.7 ppm).

Studies conducted to explore the possibility of enhancing the zinc content of fingermillet variety GPU28 revealed that through soil application of ZnSO4 @ 12.5 kg/ha showed a significant increase in the grain (48.29 kg/ha) and straw (72.32kg/ha) yields compared to the control plot (39.87 kg/ha and 60.29 kg/ha, respectively) .

Nutrient management in fingermillet under Zero tillage conditions conducted in Rabi 2016 indicated that, the grain and straw yields of fingermillet were found to be highest in 150 % RDF (20.56 q/ha and 54.25 q/ha respectively) which was on par with 125% RDF(17.90 q/ha and 45.63 q/ha respectively) .

Regional Agricultural Research Station, Lam

In fingermillet, pre-emergence application of pendimethalin @ 1.0 kg/ha^{-1}, atrazine @ 0.75 kg/ha^{-1} and oxadiargyl @ 0.060 kg/ha^{-1} as recorded a grain yield of 7.5 q/ha, 6.5 q/ha and 6.25 q/ha, respectively compared to 5.0 q/ha recorded in weedy check. Among the post emergence herbicides metsulfuron 0.0015 kg/ha^{-1} + chlorimuron 0.0015 kg/ha^{-1} at 20 DAS recorded a grain yield of 10.63 q/ha^{-1} followed by 2, 4-D Na salt @ 0.80 kg/ha^{-1} at 20 DAS with 9.38 q/ha.

Regional Agricultural Research Station, Anakapalle

Transplanted white ragi recorded significantly highest grain yield (1508 kg/ha^{-1}) compared to broadcasting and transplanting in puddle soil. Among the nitrogen levels, the highest grain yield was recorded with NPK 60-40-25 + 0.2% Zn spray (1236 kg/ha^{-1}).

Pre emergence application of bensulfuran methyl + pretilachlor @ 2 kg/acre on 2nd day after sowing controlled weeds effectively and recorded highest grain yield of 1371 kg/ha^{-1} followed by pretilachlor @ 400 ml / acre (1168 kg/ha^{-1}) while unweeded check gave lowest grain yield of 436 kg/ha^{-1} in direct sown white ragi.

Agricultural Research Station, Perumallapalle

Among different weed management practices, hand weeding at 20 and 40 days after planting recorded higher grain yield (36.3 q/ha) followed by pre- emergence application of Pendimethalin 0.5 kg a.i/ha+ one hand weeding at 20 DAP recorded (33.0 q/ha) compared to control

Effect of organic manures and inorganic fertilizers on yield and quality of finger millet indicated that the higher grain yield of 28.72 q/ha^{-1} was recorded with inorganic treated plot compared with organic treated plot (25.14 q/ha^{-1}). Significantly higher N,P and K uptake by grain was recorded with inorganic treated plots.

Crop Protection

Disease Management

Agricultural Research Station, Perumallapalle

In Multi locational yield trail for blast resistance, entries BR 36, VR1066 and PPR 1014 showed least incidence of neck blast (14.59%, 16.56%, 19.76 % respectively) and BR-36, PPR1027 and PPR 1035 showed least incidence of finger blast (17.86%, 17.94 and 19.62% respectively) as against the check variety Champavathi (neck blast: 44.9% and finger blast 49.2%).

Among the 74 finger millet entries screened for blast resistance, 3 entries IE 6221, IE 4565 and PCGF23 showed moderately resistant reaction to both neck blast and finger blast.

Agricultural Research Station, Vizianagaram

Plant Pathology

Survey for important diseases of finger millet and other small millets was conducted during October on three forms of blast, highest neck blast(12.05%) and finger blast (15.64%) were recorded at Rambilli, Visakhapatnam district followed by Parvathipuram, Vizianagaram district. Where as the lowest neck blast (4.55%) was recorded at Palakonda, Srikakulam district and the lowest finger blast (7.90%) at Dumbriguda, Visakhapatnam district.

Among 6 entries screened along with the check in advanced varietal trial (early & medium), the lowest intensity of neck blast (14.82%) and sheath blight (32%) was recorded in VL 379 and finger blast (13.7%) in GPU 45.

1.6 Foxtail Millet (*Korra*)

Crop Improvement

Regional Agricultural Research Station, Nandyal

The foxtailmillet variety SiA 3222 with 58 days duration completed the minikit testing and ready for release.

In foxtailmillet multi location trial, SiA 3223 (3777 kg/ha^{-1}) recorded the highest grain yield.

In advanced varietal trial, entries SiA 3159 (3536 kg/ha^{-1}) and SiA 3163 (3510 kg/ha^{-1}) have registered more grain yields than the check SiA 3156 (2721 kg/ha^{-1}).

Agricultural Research Station, Vizianagaram

Among thirteen entries including one check (Srilakshmi) were tested in Advanced Varietal Trial, entry DHFT 5-6 (31.85 q/ha)recorded highest yield followed by DHFT 77-3 (30.29 q/ha) whereas National check SiA 3156 recorded 27.55 q/ha, while local check Srilakshmi recorded 19.96 q/ha grain yield.

Out of six entries evaluated in Multilocation Yield Trial, the entry SiA 3156 (32.24 q/ha) registered highest yield followed by SiA3055 (31.81 q/ha) and check Suryanandi (29.78 q/ha).

Crop Production

ARS,Reddipalli

Among the different crops sown in the month of June, foxtailmillet has recorded highest yield of 644 kg/ha, higher net returns (5842/- per ha) and B: C ratio of 1.83.

Among different contingent crops sown in the month of August, foxtailmillet has recorded highest yield of 529 kg/ha compared to other crops with higher net returns of Rs. 2558/- and B:C ratio of 1.32.

Regional Agricultural Research Station, Nandyal

In zinc fortification of foxtailmillet, soil application of zinc sulphate either @ 12.5 or 25 kg/ha produced higher net returns (26223 /-) and higher B:C ratio (1:1.99). Foliar application of zinc sulphate was also found equally good as that of soil application as regards to net returns and B:C ratio are concerned.

In organic farming research INM practice (100 % RDF along with FYM @ 5 t/ha) gave

higher grain (2038 kg/ha) and straw yield (3161 kg/ha) there by higher net returns (11697/- per ha).

In evaluation of pre and post emergence herbicides in foxtailmillet during summer under irrigated conditions, pre- emergence application of oxadiargyl @ 70 g/ha or pretilachlor @ 0.75 kg/ha and post-emergence application of either 2,4-D @ 1.0 kg/ha or bispyribac sodium @ 25 g/ha effectively controlled the weeds compared to weedy check with high weed control efficiency of 72.6 by oxadiargyl followed by 2,4-D and pre emergence application of pretilachlor followed by bispyribac sodium (72.0 %).

Disease Management

Regional Agricultural Research Station, Nandyal

In evaluation of foxtailmillet advanced varietal trial (FAVT) entries against diseases, entries RFM-68, SiA 3163, SiA 3159 have escaped the blast incidence due to their early maturity.

In evaluation of foxtail Donor Screening Nursery (DSN-1) against major diseases, highest incidence of blast (grade 2.3) was noticed in SiA 3297, SiA 3298, and Prasad (C). In SiA 3275, SiA 3278, SiA 3307 and SiA 4155, there was no leaf shedding symptom of downy mildew where as in prasad (control) the percent leaf shedding was 6.6.

Among 24 entries along with two checks (prasad susceptible and suryanandi resistant) evaluated in Donor Screening Nursery (DSN) – 2, highest incidence of blast (grade 3) was noticed in ISe 1488 and Prasad (control). In ISe 2863 and ISK 74A there was no leaf shredding symptom of downy mildew where as in Prasad (c) the percent of leaf shredding was 6.5.

Agricultural Research Station, Vizianagaram

Among 28 entries were screened for sheath blight in Donor Screening Nursery -1 along with the check, lowest disease intensity (47.33%) was recorded in SiA 3212 followed by SiA 3159 (52.67%) compared to 94.67 % in the check.

Out of 11 entries screened in Donor Screening Nureary -2 along with the check, lowest sheath blight intensity was recorded in TNSi 351 & TNSi 355(29.33%) followed by TNSi 360 (39.67%).

Among 13 entries tested in Advanced Varietal Trial, the lowest disease severity of 40.00% was recorded in H-46 and highest (90.67%) was recorded in SiA 3205 and DHFT 77-3 while check 94.67% disease severity.

1.7 Little Millet (*Sama*)

Crop Improvement

Agricultural Research Station, Perumallapalle

Under germplasm thirty six entries were maintained during 2016-17 at the Research Station.

In Littlemillet Advanced Varietal Trial, among fourteen entries tested, the entry TNPSU174 (6.55 q/ha) was significantly superior to the high yielding check JK8 (5.82 q/ha).

Agricultural Research Station, Vizianagaram

Fourteen entries were evaluated along with one check , VS 9 in Advanced Varietal Trial . Among them, TNPSU 171 was found to be high in grain yield(17.34q/ha) followed by KOPLM 53 (14.64 q/ha) compared to National check(14.00 q/ha) and local check, VS 9(11.5 q/ha).

Among thirteen entries tested along with two checks VS 11 and Pedda Sama in Multilocation Yield Trial, the entry LM-289 topped in grain yield with an average of 21.26 q/ha, followed by LM-73 (16.85 q/ha), LM-95 (16.18 q/ha) and LM-512 (15.93 q/ha), while checks, Pedda Sama and VS 11 recorded 14.71 and 7.69 q/ha grain yield respectively.

Crop Production

Agricultural Research Station, Vizianagaram

The long term organic fertilizers experiment indicated that, the grain and straw yields of organic plot (6.59 and 56.85 q/ha) are significantly lower than conventional plot (8.58 and 70.32 q/ha).

Among the eleven integrated nutrient management practices tested, highest straw and grain yields were recorded in 100 % RDF + Neem cake @ 1 t/ha(106.45 q/ha and 11.39 q/ha) followed by 75 % RDF + Neem cake @ 1 t/ha + Azospirillum @ 5kg/ha+ PSB @5kg/ha(91.82 q/ha and 10.37 q/ha), 100 % RDF + Vermicompost@ 2 t/ha(103.98 q/ha and 10.84 q/ha), 75 % RDF + Vermicompost @ 2 t/ha + Azospirillum @ 5kg/ha+ PSB @5 kg/ha (93.06 q/ha and 10.34 q/ha) and 100% RDF+ FYM@ 5t/ha (100.73q/ha and 10.76 q/ha).

1.8 Banyardmillet (Ooda)

Crop Improvement

Agricultural Research Station, Vizianagaram

Among nine entries evaluated in Advanced Varietal Trial of Barnyardmillet along with one check, the entry VMBC 331, the DHMB 99-6 recorded highest grain yield (32.03 q/ha) followed by VL 249 (27.17 q/ha) and National check VL 172 (27.04 q/ha), where as the check VMBC 331 recorded 16.17 q/ha.

1.9 Prosomillet

Agricultural Research Station, Vizianagaram

Crop production

Among the nutrient management practices, grain yield was significantly high in 125 kg Neem+1250kg Vermi compost per ha or 12.5 tons FYM per ha+50kg Urea+ 50 kg SSP and 50kg MOP per ha + Top dressing urea at 3-4 weeks after transplanting + 2% Borax spray (918kg/ha).

Among the seed priming methods, on par grain yield was attained in seed priming with 20% liquid Pseudomonas fluorescence for 6 hrs by adopting seed to solution ratio of 1:1 (and then mixing in 2.5-3g/kg of Carbendazim with the seeds and leaving the mixture for 24 hrs before owing)(825kg/ha) and seed priming with 2% KH2PO4 for 6 hrs by adopting seed to solution ratio of 1:1(and then mixing in 2.5-3g/kg of Carbendazim with the seeds and leaving the mixture for 24 hrs before sowing) (789 kg/ha).

Crop Protection

Among 11 entries screened against sheath blight along with the check, lowest sheath blight intensity was recorded in TMPm 255 (24.0%) followed by TNPm 255 (28.33%).

Among eleven entries screened for sheath blight in Advanced Varietal Trial, the lowest disease intensity (64.0%) was recorded in TNAU 145, while it was 90.67% in the check.

2. Pulses

2.1 Redgram

Crop Improvement

Regional Agricultural Research Station, Lam

Out of 16 entries tested in Advanced Yield Trial with check variety LRG 41, the entry LRG 281 recorded highest yield of 2449 kg/ha^{-1} than high yielding check.

In Advanced Evaluation Trial 1 (medium early), among the seven entries tested, six entries recorded higher yields above General Mean value of 2222 kg/ha^{-1}. The top three high yielding entries were viz., ICPL 87119 (2378 kg/ha^{-1}), PVSA 7-17(2,326 kg/ha^{-1}) and WRP 1 (2268 kg/ha^{-1}).

A total of 245 germplasm lines were maintained and fifty lines were studied for yield and other characters during 2016-17..

Agricultural Research Station, Darsi

In MLT, out of 13 entries tested, highest

yield was recorded by LRG-158 (866 kg/ha^{-1}) followed by Maruti (650 kg/ha^{-1}).

Regional Agricultural Research Station, Tirupati

The variety TRG-59 (ICP7035x ICPL-87119) tolerant to wilt and SMD completed second year minikit testing during 2016 by recording an seed yield of 2092 kg/ha^{-1} against check LRG-41(1828 kg/ha^{-1}) in State level MLT and also tested in AICRP during 2015 in 8 locations, where it registered 1412 kg/ha^{-1} (6% increase) seed yields over ICPl8863 (1334 kg/ha^{-1}).

Among 17 entries tested in IVT, entries TRG-99,104,106,113,111,108 (160 days duration) gave significant seed yield of 1490,1465 and 1460 kg/ha^{-1} over check LRG-41(1025 kg/ha^{-1}) with 185 days duration.

In multilocation trial, thirteen lines were tested with LRG-41 as check during kharif-2016 , LRG-151,TRG-87 and LRG-202 gave significantly higher seed yield of 1668,1549 and 1509 kg/ha^{-1} as against check LRG-41 (1210 kg/ha^{-1}).

In AVT(M), seven lines were tested along with LRG-41 check, highest seed yield of 2122 kg/ha recorded by 506 in 163 days as against check LRG-41 with 1602 kg/ha^{-1} in 180 days.

Agricultural Research Station, Anantapuramu

Among 13+1 entries evaluated in Multilocaion Trial for seed yield in kharif, the entry MLTR-16-1 (LRG-158) recorded more seed yield (1018 kg/ha^{-1}) compared to check PRG-100 (879 kg/ha^{-1}).

Agricultural Research Station,Utukuru

Among the entries tested in Multilocaion Trial, the entry LRG 208 (1905 kg/ha) recorded significantly higher seed yield than the checks ICPL 8863 (1400 kg/ha^{-1}) and LRG 41 (1283 kg/ha^{-1}).

Crop Production

Agricultural Research Station, Anantapuramu

In clusterbean + redgram intercropping, groundnut+ redgram intercropping system recorded higher groundnut equivalent yield of 1041 kg/ha^{-1}, net returns of Rs. 31280/ha and B:C ratio of 1.48 followed by groundnut + castor intercropping system with groundnut equivalent yield of 975 kg/ha^{-1}, net returns (28292/ha) and B:C ratio (1.34).

Among Moisture conservation practices, conservation furrow + mulching recorded the highest seed yield (610 kg/ha^{-1}), net returns (Rs.36754/ha) and B:C ratio (3.05).

Regional Agricultural Research Station, Tirupati

In rain water management in redgram based cropping system for climate resilience (kharif & rabi), ground nut + Red gram 7:1 recorded the highest redgram equivalent yield of 2215 kg/ha^{-1} with higher net returns of Rs 40,135/ ha followed by cluster bean + redgram in 5:1 ratio(2113 kg/ha^{-1} and Rs.33,899/-).

Regional Agricultural Research Station, Lam

The maximum grain yield (1022 kg/ha^{-1}) of pigeonpea was recorded in conventional method of pigeonpea cultivation than organic method of cultivation(682 kg/ha^{-1}).

In studies on profitability of intercropping system with Redgram under paired row planting system, higher groundnut equivalent yield, net returns and B:C ratio were recorded with groundnut + Redgram (8:1) which was on par with groundnut + Redgram (14:2) and are significantly superior to other intercropping systems.

Among seven redgram genotypes for physiological performance studied during kharif season, genotype LRG 160 recorded maximum

grain yield of 1650 kg/ha followed by LRG 105 (1580 kg/ha^{-1}) compared to LRG 158 (1350 kg/ha^{-1}).

Crop Protection

Insect Pest Management

Regional Agricultural Research Station, Lam

Among 10 germplasm lines screened, the pod damage due to *Helicoverpa armigera, Maruca vitrata* and *Melanagromyza obtusa* was low in ENT 11, ICPL 332WR and ICPL 20115 recorded 14.4, 17.5 and 18.0%), respectively over rest of the germplasm lines.

Monitoring of pod borers revealed that peak population of *H. armigera* was recorded during 37, 38 and 45th SMW with significant correlation with rainy days and sunshine hours (correlation coefficient (r) 0.578 and -0.583, respectively) and peak population of *S. litura* was observed during 37, 38, 42nd and 46th SMW Moderately significant correlation was obtained between adults of *S. litura* and RH-II and rainy days (correlation coefficient (r) 0.510 and 0.518, respectively).

The insecticidal schedule i.e., chlorantraniliprole followed by flubendiamide and dimethoate at 15 days interval starting from flower bud initiation was superior in recording less larval population and pod damage due to pod borer complex (14.7%) with highest yield (1836.3 kg/ha^{-1}) and highest incremental cost benefit ratio (9.87).

Regional Agricultural Research Station, Tirupati

Management of podfly with monocrotophos @ 1.6 ml + dichlorvas @ 1.0 ml/l (4.05%) recorded highest per cent reduction of pod fly over untreated control (20.55%) followed by monocrotophos 1.6 ml/l (4.67%) and rynaxypyr @0.3 ml/l (5.45%).

Agricultural Research Station, Utukur

Studies on population dynamics of pod feeding insect pests of pigeonpea in LRG-41, TRG-59 and TRG-87 varieties indicated high incidence of *Helicoverpa* during third week of December (51st SMW) in TRG-87 (4.84) followed by TRG-59 (4.68). Similarly, *Maruca* spotted pod borer incidence was high during last week of December (52nd Standard week) in LRG-41 (22.18 larvae per plant) followed by TRG-59 (13.20), while Pod fly maggots and pupae were high during first week of January 1 st standard week) in TRG-87 followed by LRG-41 and TRG-49.

Agricultural Research Station, Darsi

In population dynamics of major insect pests of Pigeonpea indicated that, the leaf hopper population reached a peak (6.4 hoppers / leaf) during 47th standard week, peak occurrence of plume moth was (1.6 larvae / plant) during 2nd standard week. *M. vitrata* and *H. armigera* peak incidence was recorded during 51st and 52nd standard week with 3.1 larvae / plant, respectively.

2.2 Blackgram

Crop Improvement

Regional Agricultural Research Station, Lam

During *kharif* 2016, in AVT, the entry KUG 725 recorded highest seed yield of 928 kg/ha followed by KU 14-1 (901 kg/ha) compared to the best check IPU 2-43 (831 kg/ha).

In *rabi*, the entry LBG 884 recorded highest seed yield of 1094 kg/ha followed by LBG 881(1085 kg/ha), LBG 885 (1033 kg/ha) compared to the best check LBG 752 (904 kg/ha) in AYT Trial.

The entry LBG 806 recorded highest seed yield of 1380 kg/ha followed by LBG 808 (972 kg/ha) compared to the best check LBG 752 (955 kg/ha) in Multi Location Trial.

In YMV resistance entries evaluation, the entry LBG 806 recorded highest seed yield of 1101 kg/ha followed by LBG 827 (1033 kg/ha), LBG 891 (1029 kg/ha) compared to the best check LBG 752 (898 kg/ha) during rabi.

In AVT, the entry GBG 1 recorded significantly highest seed yield of 1259 kg/ha compared to best check LBG 752 (933 kg/ha)

Agricultural Research Station, Ghantasala

The blackgram entry GBG-1 is proposed for second year of minikit testing and the blackgram entry 12 and the green gram GGG-1 were proposed for first year of the minikit testing during 2016 from this Research Station.

In Advanced Varietal Trial, the entry GBG 54 recorded highest yield of 998 Kg/ha followed by GBG 63 (974 Kg/ha) and GBG 58 (973 kg/ha) compared to the best check.

Blackgram entries LBG-645 (884 Kg/ha) and LBG 796 recorded highest yield of 925 Kg/ha followed by GBG 45(920 Kg/ha) and PBG 32-2 (915 Kg/ha) Multilocation Trial.

In Rice fallow advanced varietal trial (irigated), the entry, RFU 16-18 recorded highest yield of 807 Kg/ha followed by RFU 16-15 (703 Kg/ha) and RFU 16-17 (666 Kg/ha) compared to the best check, LBG-752 (574 Kg/ha).

In Rice fallow advanced varietal trial (non-irrigated) during *rabi*, 2016, the entry RFU 16-18 recorded highest yield of 601 Kg/ha followed by RFU 16-15 (497 Kg/ha) and RFU 16-17 (369 Kg/ha) compared to the best check, LBG-752 (337 Kg/ha) .

A total of 160 blackgram germplasm lines are maintained at the Research Station.

Agricultural Research Station, Darsi

Evaluation of suitable blackgram genotypes for rainfed conditions of Prakasam District revealed that, there was a significant difference among treatments for Plant height, TDM, SCMR, RWC and yield and yield components in blackgram.. Maximum seed yield was recorded in the GBG1 (824.1 kg/ha) followed by PU 31 (726.4 kg/ha) and the lowest was recorded in LBG 752 (569.2 kg/ha).

Agricultural Research Station, Tirupati

In multi Location Trial on blackgram, out of 13 lines tested in *rabi* 2016 ,LBG 806, LBG-811, LBG-796 and GBG45 gave significantly higher seed yield of 1682,1639,1596 and 1548 kg/ha in 85-90 days. TBG104 in 75days recorded 1399kg/ha and PU-31 gave 921 kg/ha^{-1}.

In AVT, among six entries along with check PU -31 tested during *rabi* 2016, entries RU 16-1, RU 16-6, RU 16-5 and RU 16-4 gave significantly higher seed yield of 1714,1560 1517 and 1506 kg/ha over PU-31(1025 kg/ha^{-1}).

Under AICRP (MULLaRP) programme in urdbean Advanced varietal trial, among 8 cultures studied, RU15-1 (1462 kg/ha) gave significantly higher seed yield over best check PBG-1 (1396 kg/ha^{-1}).

Among 15 urdbean cultures studied in Initial varietal trial, the cultures RU 15-18 (1910 kg/ha^{-1}) and RU 15-17 (1889 kg/ha^{-1}) gave higher seed yields over best check LBG-752 (1317 kg/ha^{-1}).

Crop Production

Regional Agricultural Research Station, Lam

In land configuration studies, among the different treatments in Urdbean, broad bed & furrow method of land configuration recorded significantly superior grain yield of 610 kg/ha compared to flat bed method (482 kg/ha^{-1}). The highest grain yield (824 kg/ha^{-1}) was observed in pre-emergence application of pendimethalin followed by post emergence application of Imazethapyr at 15-20 DAS than other treatments.

Among all the weed management practices, two manual weedings at 20 and 40 DAS recorded the highest grain yield (891 kg/ha^{-1})

which was on par with application of Iris @1.0 l/ ha at 25-30 DAS (808 kg/ha^{-1}) and pre-emergence application of vallore 32 followed by hand weeding at 30 DAS (798 kg/ha^{-1}).

The weed management practices in urdbean during *rabi* season indicated that, significantly superior grain yield (825 kg/ha^{-1}) was recorded with two hand weedings at 20 and 35-40 DAS followed by application of Clodinofoppropergyl 8%+aceflorfen sodium 16.5 % @187.5 g a.i. / ha at 25-30 DAS (725 kg/ha^{-1}) compared to other treatments and the check.

Among the varieties tested, the maximum grain yield was recorded with TBG104 (505 kg ha^{-1}) and it was significantly superior over rest of the varieties (LBG752, LBG787 and GBG1) and early sown crop (15th Oct) resulted significantly higher grain yield (932 kg ha^{-1}) than late sown crop (1st Nov and 15th Nov).

Crop Protection

Insect Pest Management

Regional Agricultural Research Station, Lam

Out of 12 + 2 entries screened for resistance to YMV during *rabi*, the entries IPU 12-20, OBG 39, VBG 12-0-34 and TJU 258 were found promising against YMV.

Among 30 + 2 entries screened for YMV during summer,10 entries viz., SUE 17-41, 42, 50, 51, 54, 55, 56, 59, 61, 67 have recorded less than 5% incidence. Per cent bud necrosis/ leaf curl incidence ranged from 2.9% in SUE17-48 to 39.4% in SUE 17-56.

Per cent damage due to Maruca pod borer was high (36%) was observed during 1st week of February (4th St. week).

IPM module (Seedtreatment with imidacloprid 600 FS @ 5 g/kg seed, sorghum as border crop, yellow and blue sticky traps 20 each/ acre and spraying azadirachtin 10000 ppm@ 200 ml/acre) realized a CB ratio of 1: 2.8 against 1:1.15 in famers practice (non-IPM).

Disease Management

Regional Agricultural Research Station, Lam

Based on natural field screening the genotypes P 716, P 12-80, P 12-87, P 12-30, P 12-72, P 12-78, BG 1, BG 2, BG 3, P 512, P 20, P 109, P 110, P 105, SSUP 15-51, SSUP 15-74, SSUP 15-52, SSUP 15-73, SSUP 15-53, SSUP 15-55, SSUP 15-68, LBG 808, LBG 806, LBG 794, KPU 16-54, KPU 16-56, KPU 16-70, KPU 16-79, KPU 16-69 and KPU 16-68 were identified as YMV resistant.

Regional Agricultural Research Station, Tirupati

Developed agroinoculation technique for screening blackgram germplasm /advanced breeding lines for YMV resistance using cloned full dimers of MYMV-A and MYMIV-B genomic components of begomo viruses in pCAMBIA 2301 vector.

Nine ANGRAU blackgram genotypes were screened with MYMIV-A and MYMIV-B clones and no YMV symptoms were observed with TBG 104, PU 31 and GBG 1.

Developed protocol for screening blackgram germplasm for YMV under by agroinoculation techniques. Found TBG104 and GBG1 are resistant YMV.

Agricultural Research Station, Utukur

For management of foliar diseases in blackgram, Carbendazim @1.0g/l and propineb@1.5g/l were found effective in reducing the incidence of powdery mildew disease.

2.3 Greengram

Crop Improvement

Regional Agricultural Research Station, Lam

In YMV trial, no entry was found superir over the best check ie., LGG 460 with seed yield of 1458 kg/ha during *rabi* season. However, the entry LGG-573 recorded seed yield of 1283 kg/ha.

Amon the entries tested in Advanced Yield Trial, the entry LGG 607 recorded highest seed yield of 1270 kg/ha compared to the best check LGG 460 (1195 kg/ha) during *rabi*.

In Multi Location Trial the entry LGG 595 recorded significantly highest seed yield of 1163 kg/ha followed by LGG 521 (1093 kg/ha) and LGG 594 (1025 kg/ha) compared to best check LGG 460 (851 kg/ha) during *rabi*.

The entry CO 6 recorded significantly superior yield of 1112 kg/ha followed by LGG 544 (860 kg/ha) compared to the best check LGG 460 (766 kg/ha) during *rabi* season in Advanced Varietal Trial.

Agricultural Research Station, Ghantasala

The Greengram entry LGG 574 recorded highest yield of 1062 kg/ha fallowed by GGG 1(1026 kg/ha) and check variety LGG 460 (1023 kg/ha) in Greengram Multilocation Trial.

In Rice fallow Mungbean Initial Varietal Trial (irrigated),the check variety LGG 460 recorded highest yield of 1450 Kg/ha followed by RFM 16-04 (1322 Kg/ha) and RFM 16-03 (1303 Kg/ha).

The entry RFM 16-05 recorded highest yield of 703 Kg/ha followed by RFM 16-10 (596 Kg/ha) compared to the best local check, LGG 460 (415 Kg/ha) in Rice fallow mungbean initial varietal trial (Non-irrigated).

Greengram culture GGG-1 completed first year of minikit testing. It is an extra early variety with a duration of 55-60 days, having bold and shiny seed with yield potential of 17-18 q/ha and suitable for preceding paddy and *rabi* seasons.

Agricultural Research Station, Podalakur

Out of twelve entries evaluated under mutilocation varietal trial during *rabi*, the entry LGG 595 recorded the highest seed yield of 1250 kg/ha. followed by PM-5 (1110 kg/ha) and Pusa Vishal (1030 kg/ha), whereas check LGG 460 recorded seed yield of 850 kg/ha.

Agricultural Research Station, Darsi

Among 12 entries tested in multi location trial, the entry LGG 521 (395.2 kg/ha) recorded significantly higher seed yield followed by LGG 460 (381.1 kg/ha).

Regional Agricultural Research Station, Tirupati

In a multi location trial, among 12 entries evaluated LGG-595 LGG-521 and LGG-577 are promising with seed yield of 879 kg/ha, 873 kg/ha and 798 kg/ha respectively as against check WGG 42(331kg/ha).

Among five mungbean entries tested in AVT during rabi 2016 RM16-1,RM-16-5 and RM-16-4 gave significantly higher seed yield of 1567,1542 and 1462 kg/ha in 80 days as against best check LGG-460(1346 kg/ha).

Crop Production

Regional Agricultural Research Station, Lam

Significantly highest grain yield (637 kg/ha) of kharif mungbean was recorded with hand weeding twice at 20 and 35-40 DAS and was superior to all other treatments. Among the herbicidal treatments, the maximum grain yield of 555 kg/ha was registered with post-emergence

application of Imazethapyr 55g a.i./ha at 15-20 DAS followed by pre-emergence application of Pendimethalin +Imazethapyr @1.0kg/ha (491 kg/ha).

Among the land configuration treatments, broad bed & furrow method of land configuration recorded the maximum grain yield (448 kg/ha) and it was significantly superior to that of flat bed method (385 kg/ha).

The highest grain yield (522 kg/ha) was observed in pre-emergence application of Pendimethalin followed by post–emergence application of Imazethapyr at 15-20 DAS than other treatments.

Application of acifluorfen sodium + clodinafop propargyl 160 + 80 g a.i. as post-emergence herbicide, reduced the weed growth and resulted in higher grain yield (824 kg/ha), net returns (Rs 14,367/-) and benefit cost ratio (1.43).

Crop Protection

Insect Pest Management

Regional Agricultural Research Station, Lam

Spraying acephate 75% SP @ 375 g a.i/ha (check) was found to be effective against leaf miner and recorded 61% (7.0 mines per plant) reduction in leaf mines and 122% (711 kg/ha) increase in yield over control (18.1 mines per plant and 320 kg/ha yield) followed by profenophos 50% EC @ 500 g a.i / ha, it recorded 58% (7.6 leaf mines per plant) reduction in leaf mines and 108% (667 kg/ha) increase in yield over control.

IPM module (Seed treatment with imidacloprid 600 FS @ 5 g/kg seed, sorghum as border crop, yellow and blue sticky traps 20 each/acre and spraying azadirachtin 10000 ppm@ 200 ml/acre) realized a CB ratio of 1: 2.8 against 1:1.15 in famers practice (non-IPM).

Agricultural Research Station, Darsi

Profenophos was found to be significantly superior over all other treatments by recording highest mean percent reduction in foliage damage (74.7 %) and grain yield (362.9 kg/ha) and it was on par with acephate (70.7% and 322.2kg/ha)) followed by azadirachtin 10000 ppm (49.0%).

Disease Management

Regional Agricultural Research Station, Lam

Based on natural field screening, the genotypes PM 14-19, PM 14-1, PM 14-3, PM 14-5, PM 14-11, PM 14-9, PM 14-16, PM 14-13, PM 14-17, PM 14-12, PM 14-2, GG 1, GG 4, GSMP 15-47, GSMP 15-04, GSMP 15-46, GSMP 15-05, GSMP 15-07, GSMP 15-42, GSMP 15-09, GSMP 15-10, LGG 577, LGG 578, KPM 16-16 and KPM 16-49 were identified as YMV resistant.

Regional Agricultural Research Station, Tirupati

In molecular mapping of Yellow Mosaic Virus tolerance in mungbean (Vignaradiata L.), identified an SSR marker SVGG7 loci, distinguished the YMV tolerant genotype from the susceptible genotypes. This marker can be employed in molecular mapping confirmation and further in marker assisted breeding for YMV tolerance.

2.4 Bengalgram

Crop Improvement

Regional Agricultural Research Station, Lam

In multi location Trial on Kabuli genotypes, entry NBeG 179 recorded significantly higher grain yield of 1561 kg/ha followed by VIHAR (1550 kg/ha) and KAK 2 (1249 kg/ha), while the entry NBeG 780 recorded significantly higher grain yield of 25.76 q/ha followed by NBeG 507 (2497kg/ha) in Multilocation Trial on Desi genotypes.

In ICVT desi genotypes, the entry ICCV15117, recorded significantly higher grain yield of 2132 kg/ha^{-1} followed by ICCV15115

(2066 kg/ha^{-1}) and ICCV15107 (2062 kg/ha^{-1}) compared to local check JG 11 (2078 kg/ha^{-1}) and in ICVT Kabuli genotypes, the entry ICCV15309 recorded significantly higher grain yield of 1229 kg/ha^{-1} compared to local check LBeG 7 (1054 kg/ha^{-1}).

During *rabi* 2016-17, among seven chickpea genotypes screened for physiological characterization under rainfed conditions, maximum seed yield of 1798 kg/ha^{-1} was recorded by the entry BG 7 followed by BG 5 (1638 kg/ha^{-1}) and lowest was recorded in BG 8 (1379 kg/ha^{-1}).

Regional Agricultural Research Station, Nandyal

Ten promising entries viz., NBeG 807 (AVT 1 Desi (NEPZ)), NBeG 740 (AVT Rainfed), NBeG 507, NBeG 511 (AVT 1 Desi (Late sown)), NBeG 731, NBeG 458 (AVT 1 ELSK), NBeG 732 (AVT 1 Kabuli (WCZ)) and NBeG 506, NBeG 786 and

NBeG 1004 (AVT 1 DTIL)) were promoted to advance yield trials during 2016-17.

Ten promising entries viz., NBeG 776, NBeG 738 (IVT Desi), NBeG 620, NBeG 779 (IVT Rainfed), NBeG 778, NBeG 785 (IVT late sown), NBeG 510, NBeG 790 (IVT ELSK), NBeG 529, NBeG 440 (IVT Kabuli) were included in co-ordinated trials during 2016-17.

The entries N BeG 837 (1483 kg/ha, 53.5g), N BeG 829 (1446 kg/ha, 56.0g), and N BeG 835 (1261 kg/ha, 51.5g) were found promising and recorded significantly superior seed yield than extra-large seeded check MNK 1 (798 kg/ha, 60.0 g).

Agricultural Research Station,Utukur

Among eight desi types entries tested in multi location trial , the Check varietes JG-11 (1594 kg/ha) and NBeG-49 (1485 kg/ha) recorded significantly superior yield over the rest of the entries.

In another multi location trial, among eight Kabuli entries tested, the entry NBeG 732 (1857 kg/ha) recorded significantly superior yield followed by NBeG 529 (1687 kg/ha) and were on par with the best check variety KAK-2 (1622 kg/ha).

Agricultural Research Station, Podalakur

Among the eight desi type entries tested in Multi Location Trial during *rabi* 2016-2017, the entry NBeG-779 recorded the highest seed yield of 1040 kg/ha compared to check JG 11(820 kg/ha).

Among the kabuli types NBeG-801 recorded the highest seed yield of 1230 kg/ha whereas the check, KAK 2 recorded 1040 kg/ha. In ESLK types, MNK-1 recorded the highest seed yield of 930 kg/ha.

Crop Production

Regional Agricultural Research Station, Lam

In post-emergence herbicides evaluation for weed control in kabuli chickpea, application of acifluorfen sodium + clodinafop propargyl 160 + 80 g a.i. recorded grain yield of 1830 kg/ha^{-1} followed by hand weeding at 20 and 40 DAS (1872 kg/ha^{-1}) and resulted in higher net returns (Rs 74,075/-) and benefit cost ratio (2.07).

Crop Protection

Insect Pest Management

Regional Agricultural Research Station, Nandyal

The entry NBeG 740 recorded low *Helicoverpa* incidence (0.83 %) among the germplasm at the station. Spraying of neem oil (5 ml/l) 59.2 %, rynaxypyr (0.2 ml/l) 58.2 % and novaluron (1 ml/l) 56.83 % effectively controlled the *Spodoptera exigua*.

Disease Management

Regional Agricultural Research Station, Lam

Surveys indicated that dry root rot and wilt

diseases appeared to be of economic concern during reproductive stage of chickpea.

Integration of seed treatment and soil application with *Pseudomonas and Trichoderma* resulted in maximum reduction of wilt disease incidence in chickpea.

Regional Agricultural Research Station, Nandyal

A total of 261 entries were screened, out of which 99 entries recorded low resistant reaction to *Fusarium* wilt in wilt sick plot and 82 entries recorded low resistant reaction to dry root rot.

Out of 21 chickpea advanced breeding material screened against *Fusarium* wilt, entries NBeG-738, NBeG-785, NBeG-798, NBeG-3, NBeG-837, NBeG-529, NBeG-789, NBeG-829, NBeG-440, NBeG-119 exhibited resistant reaction.

2.5 Cowpea

Crop Improvement

Regional Agricultural Research Station, Tirupati

Variety TPTC-29 released as Tirupati cowpea -1 in 2016 and notified in 76th variety release committe meeting held on 31-1-2017. It is dual purpose variety with bold seeded long pod suitable to all seasons with 15 q/ha seed yield in 80-85 days.

In an advanced varietal trial, among ten entries tested against TPTC -29 the check, the entries CP-5 and CP-3 recorded higher seed yield of 1005 kg/ha and 994 kg/ha^{-1}, respectively over the check TPTC-29 (955 kg/ha^{-1}).

Agricultural Research Station, Anantapuramu

Out of 12 entries evaluated in Initial Varietal Trial, the entry CP-26 (VCP 12-007) recorded highest seed yield of 1063 kg/ha^{-1} followed by CP-30 and CP-29 (810 kg/ha^{-1} and 806 kg/ha^{-1} respectively).

In advanced varietal trial, among 10 entries evaluated for seed yield, the entry CP-7 (PTB 1) recorded highest seed yield of 688 kg/ha^{-1} followed by CP-5 (KBC 9) (666 kg/ha^{-1}) and CP-8 (GC 3 (Ch)) (618 kg/ha^{-1}).

Crop Production

Regional Agricultural Research StationTirupati

Studies on the performance of fodder cowpea varieties under varied phosphorus levels in rainfed conditions during *kharif* -2016 revealed that the entry EC-4216 recorded significantly highest green fodder yield of 9.5 t ha^{-1} which was comparable with Co-8 (9.5 t ha^{-1}.) Whereas significantly higher green fodder yield was recorded with 40 kg/ha (9.5 t ha^{-1}).

Among the quality parameters, highest crude protein (12.6%) and lowest crude fibre was recorded with APFC 10-1 which was comparable with Ec-4216. Application of all levels of P significantly improved the quality.

Agricultural Research Station, Anantapuramu

Among various long duration genotypes of cowpea, KBC 8 and PTB 1 genotypes produced higher number of pods per plant and is on par with KBC 7, KBC 9 and significantly superior to local check.Genotype PTB 1 recorded higher seed yield which is on par with KBC 8 and KBC 7 and significantly superior to KBC 9 and local check.

Among various short duration genotypes of cowpea, PGCP 24 genotype produced higher number of pods per plant and is on par with local check and DC 16 and significantly superior to PGCP 23. Genotype PGCP 24 recorded higher seed yield which is on par with local check and DC 16 and significantly superior to PGCP 23.

2.6 Horsegram

Crop Improvement

Agricultural Research Station, Anantapuramu

Among twelve entries evaluated in Advanced Varietal Trial during *kharif*, the check ATPHG-11 recorded highest seed yield of 633 kg/ha^{-1} followed by HG-11 (AK 42 (Ch)) (606 kg/ha^{-1}) and HG-3 (CRGH-19) (534 kg/ha^{-1}).

Agricultural Research Station, Anantapuramu

Crop Production

Among various agroforestry systems tested under rainfed conditions horsegram cultivated between amla trees recorded higher seed yield (272 kg/ha^{-1}). Whereas, horsegram grown between subabul trees given higher bhusa yield (1231 kg/ha^{-1}).

2.7 Clusterbean

Crop Improvement

Agricultural Research Station, Anantapuramu

In Guar Initial Varietal Trial (*Kharif*) 2016, a total of 14 guar gum entries were evaluated for seed yield. The entry GR-6 recorded highest seed yield of 396 kg/ha^{-1} compared to check RGC-936 (344 kg/ha^{-1}).

One hundred Guar germplasm lines were tested for different morphological characters during *Kharif*. The accession 1C 116703 recorded highest seed yield per plant (8.7 g/plant) followed by 1C 116692 (8.5 g/plant) and 1C 116682 (8.4g/plant).

Among the seven pre released clusterbean genotypes the genotype GG-1 recorded highest seed yield of 837 kg/ha^{-1} followed by PB-80 (827 kg/ha^{-1}) and RGC-1017 (824 kg/ha^{-1}).

Among the 18 station level entries tested, the entry IC 113481 recorded highest seed yield of 621 kg/ha^{-1} followed by IC 40996 and GG-1 with a seed yield of 587 kg/ha^{-1} and 583 kg/ha^{-1}respectively.

2.8 Rajmash

Regional Agricultural Research Station, Chintapalle

Crop Improvement

Among seven varieties of Rajmash crop tested, varieties, Arun (15.3 q/ha), Amber (13.2 q/ha) and Utkarsh (12.3 q/ha) have recorded higher yields and local variety CTPL Red (5.26 q/ha.).

Crop Production

Regional Agricultural Research Station, Chintapalle

Among the fertilizer doses evaluated, highest yield was recorded with application of N40:P100:K40 is significantly superior over all the treatments and on par with application of Neem cake@100 kg/ha. + N20:P50:K0 and Neem cake @100 kg/ha. + N20:P50:K20.

3. Oilseeds

3.1 Groundnut

Crop Improvement

Regional Agricultural Research Station, Tirupati

A total of about 944 germplasm accessions were maintained during *kharif* 2016. The germplasm collection included 770 Spanish bunch, 140 Virginia bunch, 16 Virginia runner and 18 were Valencia types.

Variety TCGS 1157 a short-statured Spanish bunch culture with profuse branching with high yield potential and fresh seed dormancy and higher frequency of three seeded pods with 110 days duration was identified for release and notification by the Varietal Identification Committee meeting held on 19-5-2017 at HRS,

Yercaud (Tamil Nadu) for Zone III for *kharif* season.

TCGS 1073 a high yielding water use efficient groundnut culture with bold seeds suitable for kharif and rabi (irrigated situation) maturing in 105-110 days with mean pod yield of 2371 kg/ha in kharif season 3440 kg/ha in rabi season is ready for release.

In advanced varietal trial, 1st year, out of 14 genotypes evaluated against two check varieties, only one genotype, TCGS 1707 (2370 kg/ha) was found to be statistically superior over the best check variety, i.e.,Dharani (1828 kg/ha).

In advanced varietal trial, II year, out of 15 genotypes tested against five check varieties, two genotypes, TCGS 1694 (2419 kg/ha) and TCGS 1653 (2351 kg/ha) recorded significantly higher pod yield with 44 % and 40 % increase over the best check Dharani (1681 kg/ha).

Out of 13 genotypes evaluated against check variety Narayani in Multi Location Trial (SB), four entries, MLTG (SB)-2015-4 (K 1725) (2754 kg/ha), MLTG (SB)-2015-1(K 1805) (3088 kg/ha), MLTG (SB)-2015-9 (TCGS 1156)(2583 kg /ha), MLTG (SB)-2015-7 (K1789) (2613 kg /ha) recorded significantly higher pod yield over the local check variety, Narayani (1956 kg/ha).

In multi-location trial on groundnut (VB), out of ten genotypes evaluated , genotype MLTG (VB)-2015-9 (3077 kg/ha), followed by MLTG (VB)-2015-7 (2858 kg/ha), and MLTG (VB)-2015-8 (2581 kg/ha) were found to be promising with higher pod yield.

Among the 10 genotypes evaluated during *rabi* 2016-17, two genotypes, TCGS 1694 (3339 kg/ha pod yield and 2310 kg/ha kernel yield) recorded significantly higher pod and kernel yields in comparison with the best check, Greeshma (2103 kg/ha pod yield and 1472 kg/ha kernel yield).

In AICRP initial varietal trial (SB) Stage-I, out of 16 genotypes evaluated against check variety Dharani, only one genotype ISK-I-2016-14 (3304 kg/ha) registered significantly higher pod yield with increase yield of 31 % over the best check variety Dharani (2513 kg/ha). None of the genotypes recorded significantly higher kernel yield over Dharani (1789 kg/ha).

In Initial varietal trial (VB) Stage-I, out of 13 genotypes evaluated, only one genotype IVK-I-2016-8 (2318 kg/ha) registered significantly higher pod yield over local check, Jyothi (1859 kg/ha).

In Initial varietal trial (VB) Stage-II, out of 11 genotypes evaluated, only one genotype, IVK-II-2015-21 (3728 kg/ha pod yield and 2258 kg/ha) registered significantly higher pod and kernel yield over Jyothi (2626 kg/ha pod yield and 1766 kg/ha kernel yield.

Out of 18 genotypes evaluated during rabi, genotype INS-I-2016-13 recorded significantly higher pod yield of 4398 kg/ha closely followed by INS-I-2016-12 (3865 kg/ha) which was 150 % and 120 % higher than the check Dharani (1756 kg/ha).

In ISOPOM advanced varietal trial (1st year) during *kharif*-2016, two entries viz., TCGS-1814 (2097 kg/ha) and TCGS-1819 (2076 kg/ha) gave significantly higher pod yield of 30% and 29% over the check variety Dharani (1615 kg/ha).

In advanced varietal trial-drought (2nd year) during *kharif*-2016, only one entry viz., TCGS-1546 (pod-1852 kg/ha, kernel-1296 kg/ha) gave significantly higher pod (23%) and kernel yield (24%) over the check variety Dharani (pod-1467 kg/ha, kernel-1041 kg/ha).

In advanced varietal trial (1st year) during rabi-2016-17, nine entries viz., TCGS-1872 (3689 kg/ha), TCGS-1855 (3633 kg/ha), TCGS-1877 (3592 kg/ha), TCGS-1849 (3260 kg/ha)

TCGS-1862(3181 kg/ha) TCGS-1876 (3041 kg/ha) TCGS-1845 (3040 kg/ha), TCGS-1839 (2492 kg/ha) and TCGS-1838 (2465 kg/ha) gave significantly higher pod yield (99%, 97%, 95% 77%, 72%, 65%, 65%, 36% and 35% respectively) over the check variety Dharani (1845 kg/ha).

In advanced varietal trial (2nd year) during rabi-2016-17, two entries viz., TCGS-1826 (2634 kg/ha) and TCGS-1814 (2394 kg/ha) gave significantly higher pod yield (37% and 24%) over the check variety Dharani (1926 kg/ha).

In development and identification of varieties suitable for *rabi* season, advanced varietal trial (2nd year) during 2016-17, two entries viz., TCGS-1517 (2212 kg/ha) and TCGS-1511 (2148 kg/ha) gave significantly higher pod yield over the check variety Narayani (1418 kg/ha).

During *rabi*, 2016-17, TCGS 1425 recorded highest SCMR, lowest SLA, highest RWC and total chlorophyll with moderate yields under stress conditions. Narayani recorded high gas exchange parameters under stress conditions. Pod yields recorded highest in TCGS 1694 followed by TCGS 1696, 1543 under stress conditions. Under irrigated conditions TCGS 1694 recorded highest followed by TCGS 1425.

Subsoiling significantly increased yields in groundnut (28%) compared to conventional tillage during khari due to higher root length, total plant dry matter, shelling per cent and higher plant population.

Out of 387 SSR markers were screened, 40 were found to be polymorphic markers between parental lines viz., CS19 and Narayani. Out of 40 polymorphic markers, five SSR markers viz., Seq10D04, PM45, Seq8H01, TC11A04, TC4G02 and GM698 are associated with RGAs/NBS-LRR gene clusters. With proper validation, these can be successfully employed in MAS by molecular breeders for stem rot resistance.

In identification of SSR markers linked to drought related traits in advanced breeding lines of groundnut, 321 diverse advanced breeding lines generated over 15 years from RARS, Tirupati and ARS, Kadiri were raised in augmented block design and will be used for association mapping of genes involved in drought tolerance and yield in stress environment. This will give breeder a handy tool to bring major drought resistance loci into a single genetic background with limited linkage drag.

In development of gene based markers for MAS of drought tolerance in groundnut, eleven groundnut genotypes viz., TCGS-1398, Kadiri-9, TCGS-1157, TCGS-1073, TCGS-1173, MLTG-4, Kadiri-6, Narayani, TPT-1, ICGV-07132 and ICGV-0707 were screened for drought tolerance in pot culture experiment and also in rainout shelter in Kharif 2016. MLTG4 and TCGS 1157 were turned out to be more drought tolerant and in contrast Kadiri 6 and Narayani are more sensitive to water stress.

To identify differentially expressed genes, cDNA synthesized in the respective periods was subjected to PCR amplification using RAPD markers. cDNA-RAPD profiles were developed with RAPD markers like OPA18, OPA4, OPC4, OPC5, OPC7, OPC16, OPD7, OPD10 and OPD11 between contrasting genotypes for moisture stress tolerance in comparison with control. Differential expression was observed in transcripts amplified with OPA18 at 80 DAS, OPA4 at 60 and 80 DAS, OPC5 and OPC7 at 70 DAS.

Agricultural Research Station, Kadiri

In Initial Evaluation Trial (earliness), four genotypes were evaluated against five checks Viz., Kadiri Harithandra, Kadiri-9, Anantha, Kadiri-6 and JL, genotype K2341recorded significantly higher pod yield (1408 kg/ha^{-1}) than better check Kadiri Harithandra(910 kg/ha^{-1}).

Among eleven genotypes evaluated in Advanced Varietal Trial (earliness) against five checks viz., Kadiri-6, Kadiri-9 Anantha, Kadiri Harithandra and JL-24, genotype K2270(E) genotypes gave significantly higher pod yield than the better check Kadiri Harithandra (833 kg/ha) and the pod yield increase was 47.3 %.

Agricultural Research Station, Anantapuramu

Among thirteen genotypes evaluated in Multi Location Trial (SB) during *Kharif*, 2016, the highest pod yield was recorded in MLTG (SB)-15-13 with 1417 Kg/ha followed by MLTG (SB) 15-7 (1324 Kg/ha) and MLTG (SB) 15-1 (1287 Kg/ha.).

In Multi Location Trial (VG), ten genotypes were evaluated during *kharif*, 2016.The entry MLTG (VG) 15-8 recorded highest pod yield of 1051 Kg/ha followed by MLTG (VG) 15-8 (1030 Kg/ha) and MLTG (VG) 15-9 (1023 Kg/ha).

The variety K 1809 has recorded highest yield of 1141 Kg/ha followed by K 1535 (1082 Kg/ha) and K 1802 (1023 Kg/ha) over three years (*kharif* 2014-2016) study for suitable variety for drought affected areas.

Agricultural Research Station, Peddapuram

In multi location trial (SB), the entries MLTG (SB)-04 (29.5 q/ha) and MLT (SB)-07 (26.7 q/ha) were found promising out of twelve entries.

In Multilocation Trial (VG), the entries MLTG (VG)-01 (33.1 q/ha) and MLTG (VG)-09 (32.9 q/ha) were found promising out of 10 entries.

Agricultural Research Station, Utukur

Multi Location Trial in groundnut with Virginia cultures indicated that the entry MLTG (VG) 2015-9 was the top performer with a pod yield of 2893 kg/ha and kernel yield of 1997 kg/ha followed by MLTG (VG) 2015-2 with respect to shelling percentage (74%) and pod yield (2394kg/ha).

Multi Location Trial with Spanish bunch group indicated that the entries MLTG (SB) 2015-4, MLTG (SB) 2015-1 and MLTG (SB) 2015-13 recorded significantly higher pod yields of 2245 kg/ha, 2405 kg/ha and 2247 kg/ha with a shelling percentage of 60, 56 and 58% respectively. However, MLTG (SB) 2015-3 and Dharani have recorded highest shelling percent of 71 and 70 respectively.

Agricultural Research Station, Yelamanchili

In Multi Location Trial (SB), out of 13 entries tested, the entries MLTG-1 and MLTG-13 (1835 kg/ha), were found promising.

Out of 10 entries tested in Multi Location Trial (VG) during rabi season, the entries MLT(VG)-1and MLT(VG)-10 were found promising.

Agricultural Research Station, Amadalavalasa

In Multi Location Trial of groundnut(SB), among thirteen entries evaluated during *Kharif*, 2016; entry MLTG(SB)2015–7 (25.56 q/ha), MLTG(SB)2015–13 (21.62 q/ha) and MLTG(SB)2015–5 (20.09 q/ha) have recorded highest pod yields than the other entries.

Out of nine entries evaluated during *Kharif*, 2016 in Multi Location Trial (VB), the entries MLTG(VG)2015-7 (28.61 q/ha), MLTG(VG)2015–9 (24.54 q/ha) and MLTG(VG)2015–8 (23.61 q/ha) have recorded highest pod yield over the other entries.

Agricultural Research Station, Vizianagaram

In Multi Location yield Trial (SB), among 13 entries tested, the entry GNS-7 (35.74 q/ha) recorded highest pod yield followed by GNS-1 (33.33 q/ha) and GNS-5 (32.44 q/ha).

Ten virginea bunch entries were tested in Multi Location Trial including three checks,

among them, the entry GNV-7 (34.44 q/ha) recorded highest pod yield followed by GNV-3 (31.47 q/ha), the checks GNV-9 (29.29 q/ha).

Crop Production

Agricultural Research Station, Kadiri

The antibiotic diacetylphloroglucinol (DAPG), a product of different isolates of the beneficial bacterium *Pseudomonas fluorescens* was tested in groundnut for its efficacy in disease incidence and yield. Among them, P-86 has recorded significantly higher pod yield (948 kg/ha) than all other treatments but on par with DAPG-2. Dry root rot was significantly lowest with DAPG-2, which was on par with DAPG-4, FP-86 and *Trichoderma spp* compared to other treatments. Stem rot incidence was also significantly lower with DAPG-2, but on par with DAPG-, FP-86 and FP-98.

Among two post emergence herbicides, Imazethapyr significantly reduced weed density, including both narrow and broad leaf weeds and there by enhanced pod yield significantly over Quizalofop ethyl.

Among different herbicidal treatments, Pendimethalin @ 1.5 kg ai/ha (pre-emergence) + Imazethpyr (60%) + Quizalofop ethyl (40%) resulted in lowest weed density, weed dry matter, highest weed control efficiency, which was on par with two other tank mix applications along with Pendimenthalin as pre-emergence and Pendimethalin @1.5 kg ai/ha (pre-emergence) + Imazethpyr @ 75 g ai/ha .

Among different nutrient management practices, application of FYM @ 5t/ha+100% P + DGRC 2 resulted in significantly higher pod yield (664 kg/ha) and was on par with two other 100 % P applied treatments and FYM @ 5t/ha + 50% P + DGRC 2. Higher gross and net returns were also recorded with FYM @ 5t/ha+100% P+DGRC 2, whereas beneft cost ratio was higher with FYM @ 5t/ha + 50% P+DGRC 2.

Among twelve crops evaluated for September sowings, groundnut resulted in negative returns. Highest groundnut pod equivalent yield was recorded with foxtailmillet followed by littlemillet and clusterbean for vegetable purpose with highest net returns (foxtailmillet :Rs. 8,969 /ha, littlemillet: Rs. 7,097 /ha, cluster bean:Rs.7,640 /ha) in both the dates of sowing in September. .

Agricultural Research Station, Anantapuramu

In an experiment on insitu moisture conservation through conservation furrows in groundnut + redgram (8:1) intercropping system, formation of conservation furrows after every row of groundnut at 25 DAS produced more number of filled pods per plant, shelling %, total groundnut equivalent yield (1099 kg/ha) which is on par with formation of conservation furrow after every 2nd row (1000 kg/ha) and after every 4th row (1026 kg/ha) of groundnut and significantly superior to formation of conservation furrow after every 8th and 12th row of groundnut.

In studies on evaluation of profitability of intercropping system with Redgram under paired row planting system, higher groundnut equivalent yield was recorded with groundnut + Redgram (8:1) which was on par with groundnut + Redgram (14:2) intercropping system and both of them are significantly superior to other intercropping systems. Higher net returns were recorded with groundnut + Redgram (8:1) followed by groundnut + Redgram (14:2), korra + Redgram (8:1) and korra + Redgram (14:2), whereas korra + Redgram (8:1) and korra + Redgram (14:2) intercropping systems given higher B: C ratio compared to other intercropping systems.

Integration of both organics (FYM @ 4 t/ha) and inorganics (Half RDF @ 10-20-20 N-P_2O_5-K_2O kg/ha) over 32 years, average pod yield recorded 948 kg/ha compared to RDF

@20-40-40 N-P_2O_5-K_2O kg/ha (929 kg/ha). However the control recoded 720 kg/ha of groundnut pod yield. The treatment with half the recommended dose of fertilizer (10:20:20 kg N, P_2O_5, K_2O) along with FYM @ 4 t/ha recorded higher Soil Organic carbon stocks (13.45 mg/ha) and Microbial biomass carbon (1035.5 µg/g)at surface soil depth.

Regional Agricultural Research Station, Tirupati

Studies on influence of natural farming on soil properties, crop protection and production of quality produce (natural farming network) during k*harif* 2016 indicated that average pod yields recorded for ICM and Natural farming are 742 kg/ha and 664 kg/ha respectively. Results of *rabi* 2016 revealed that pod yield of 2039 kg/ha was recorded under ICM and 2153 kg/ha in natural farming.

Studies conducted on the compatibility of herbicides (Imazethapyr and Quizalofop-p-ethyl) with the insecticides (Monocrotophos and Imidachloprid) indicated that, both the herbicides and the insecticides were highly compatible with one another at the recommended doses after dilution with water.

In the evaluation of DAPG-producing fluorescent *Pseudomonas* for enhancing nutrient use efficiency, biocontrol of soil-born diseases and yield of rabi groundnut revealed that seed inoculation of groundnut seeds with DAPG-2 produced significantly higher per hectare pod yield (3013 kg), kernel yield (2000 kg), haulm yield (5953 kg) than the control, DAPG-1, FP-86 and *Trichoderma spp.* which was statistically at par with the seeds inoculated with DAPG-2 and FP-98.Seed inoculation with DAPG-2, DAPG-4, FP-98 has suppressed and effectively controlled the soil born fungal diseases like collar rot etc., and resulted in the higher pod, kernel and haulm yields. Significantly highest net monetary returns (Rs.1,05,683/-) were realized with DAPG-2 , but at par with DAPG-4 (Rs.99922/-) and FP-98 (Rs.93200/-).

In Agronomic management of AVT entries of AICRP on Groundnut, among the entries, ICGV-03042 has recorded significantly higher pod yield (3668 kg/ha) over local check Dharani (3064 kg/ha). Irrigation levels significantly influenced the pod yields of the entries. Irrigation scheduling based on 1.0 IW/CPE ratio has given significantly higher mean pod yield (3594 kg/ha) over 0.8 IW/CPE ratio (3138 kg/ha). Fertilizer levels beyond recommended fertilizer level significantly increased the mean pod yield over recommended fertilizer level (3171 kg/ha) but 125% RDF (3368 kg/ha) and 150% RDF (3559 kg/ha) are at par with each other.

In Organic farming in groundnut among different organic sources , the highest pod yield of 1470 kg/ha was recorded in FYM @ 10t/ha applied treatment followed by Press Mud Cake applied treatment (1446 kg/ha) and on par with RDF (1531kg/ha).

Among twenty genotypes screened for P efficiency, TCGS 1624,1616, 1622,1517 and Greeshma are found to be P efficient and determination of Acid phosphatise activity can be used as indicator for identifying P deficiency in groundnut crop.

In screening of groundnut genotypes for P efficiency (ICRISAT Trial)ICGVs 00350, 05155 and 06146 showed higher leaf P-content by about 307 % compared to ICGV 06040 genotype in rabi season. The leaf P-content of these genotypes varied between 0.80 to 0.94% in rabi season.

Agricultural Research Station, Ananthapuramu

In studies on effect of herbicide application on groundnut under rice fallow, complete weed free situation recorded higher pod yield (42 q ha^{-1}) in rice fallow groundnut and was on par with two hand weedings at 20 and 40 DAS

(39 q ha^{-1}) and pre-emergence application of pendimethalin and post-emergence application of imazythapyr at 20-30 DAS (39 q ha^{-1}).

Crop Protection

Insect Pest Management

Agricultural Research Station, Kadiri

In monitoring of pests through pheromone traps, highest male moth catches of *Spodoptera* (10.07 to 25.20) was recorded at 27th to 29th, 33 rd to 35th and 47th to 49th std weeks and *Helicoverpa* (3.12 to 7.46) at 28th to 29th, 39th to 40th and 47th to 49th std weeks with coincidence of cloudy weather (minimum, maximum temperatures of 23.4^{0C} to 33.50^{0C} and relative humidity 34 % to 85 %).

Similarly, under light trap maximum white grub adult catches (10.23-18) were recorded at 44th to 47th Std.weeks and leaf miner adult catches (18 - 49) at 43rd to 46th Std.weeks.

IPM module 1 (Seed treatment with tebuconazole 2 DS @ 1.5 g/kg seed + Border crop with bajra (3 or 4 rows) + Need based spray of thiodicarb 75 WP @ 1 g/l for defoliator at 50-70 DAS + Need based spray of hexaconazole 5 EC @ 1 ml/l at 50-70 DAS) was found promising against *Spodoptera*). Module 2 (Seed treatment with *Trichoderma* @ 4 g/kg seed + Need based spray of imidacloprid 17.8 SL @ 0.3 ml/l + Need based spray of novaluron10 EC @ 1 ml/l for defoliator at 50-70 DAS + Need based spray of tebuconazole 25.9 EC @ 1.5 ml/l at 50-70 DAS) was found promising against sucking pests, defoliators and free from collar rot, dry root rot and stem rot in groundnut.

Among 63 stage-I genotypes screened against major pest under normal field conditions, 33 genotypes i.e.,ISK-I-016-1,2,3,4,5,6,7,14, 15,40;ASK-I-016-2,4,5;IVK-I016-2,3,5,10,20,25,26;LSVT-I-016-2,3,4,6,11,12,14;DTWUE-016-1,3,4,6,8,9 were showed resistant reaction to thrips, 23 genotypes i.e.,ISK-I-016-3,4,13,14,27,35,39; ASK-I-016-1,2,4; IVK-I-016-2,3,5,8,13, 17,21; LSVT-I-016-4,11,12; DTWUE-016-2,3,5 were resistant to leaf hopper, 20 genotypes i.e.,ISK-I-016-2,5,6,35,38,39,40; ASK-I-016-3,4; IVK-I-016-5,6,7,19,20; LSVT-I-016-3,4,12,13; DTWUE-016-5,8 were resistant to *Spodoptera* and 27 genotypes i.e.,ISK-I-016-2,5,6,9,35,38,39,40; ASK-I-016-2,3,4,5; IVK-I-016-1,7,8,10,13,17,18; LSVT-I-016-3,4,12,13; DTWUE-016-1,5,6,8 were resistant to leaf miner compared to susceptible checks Kadiri 3 and Kadiri 6.

Out of 50 stage II genotypes screened against major pest under normal field conditions, 16 genotypes i.e.,ISK-I-015-13,23,26,27,31, 34;ASK-015-8;IVK-015-24,26;AVK-I-015-3,4,6,7,9,11,12 were showed resistant reaction to thrips, 21 genotypes i.e.,ISK-I-015-5,6,7,8,9,10,11,23,26,34; ASK-I-016-5,6,8; IVK-015-1,3,4,5,11,21; AVK-I-015-6,7 were resistant to leaf hopper, 7 genotypes i.e.,ISK-I-015-23,26; IVK-015-1,13; AVK-I-015-6,7 were resistant to *Spodoptera* and 9 genotypes i.e., ISK-I-015-23,26,34; ASK-I-016-2,8; IVK-015-1,13; AVK-I-015-6,7 were resistant to leaf miner compared to susceptible checks Kadiri 3 and Kadiri 6 respectively.

Border crop with bajra (4 rows) + seed treatment with imidacloprid 600 FS @ 1 ml/ kg seed + foliar sprays using thiocloprid 480 SC @ 150 ml//ha at 20 - 25 DAS followed by fipronil 5 SC @ 2 ml/l at 40 DAS and acetamiprid 20 SP @ 100 g/ha at 35-40 DAS were effective against thrips (5.36%) and recorded high pod yield (1034 kg/ha) in the management of PBND.

Investigation on effectiveness of new insecticide formulation, clothianidin 50 WDG (@ 2g kg-1seed and gaucho 600 FS (@1 g kg-1 seed) were significantly superior and effective against white grub and termite pest and protected groundnut up to 30 days after germination this was followed by soil drenching with chlorpyriphos

20 EC (@ 8 ml 10-1 l of water) and soil drenching with urea + phorate 10 G (@ 1 kg+1 kg10-1 l of water protected groundnut crop up to harvest.

Out of 25 germplasm, four genotype viz., 447-IC-308005, 449-IC-308023, 467-IC-308128 & 490-IC-308203 were shown resistant reaction to thrips and leaf hopper, three genotype 890-IC-498096, 896-IC-498106 & 901-IC-498117 were resistant against leaf miner and three genotype 908-IC-498124, 922-IC-498153 and 967-IC-498239 were resistant to defoliators compared to susceptible checks Kadiri 3 and Kadiri 6 which recorded 31-40 % leaf damage.

Among different concentrations of nano zinc oxide particles against peanut stem necrosis disease, maximum incubation period (localized infection: 7 days post inoculation; systemic infection: 15 days post inoculation) coupled with less % of PSND (53 .0 %) at 21 DPI (days post inoculation) and less virus titer (0.83) were recorded by spraying nano zinc oxide @ 1000 ppm.

Agricultural Research Station, Utukur

Studies on population dynamics of leaf hoppers, thrips and leaf miner during *kharif* 2016 revealed that, peak foliar damage of leaf hopper (25.68%) was observed in 36th standard week and thrips damage (27.67%) in 32nd standard week .

Seed treatment with imidacloprid 600FS @ 2.0 ml + 2.0 ml water per kg seed was found to be effective with low cumulative plant mortality of 3.26 %, highest pod yield of 1613 kg/ha with highest C:B ratio of 1:1.61 against root grub followed by soil application with chlorantriniliprole 0.4 GR @ 4 kg/ha (3.94% plant mortality, 1567 kg/ha pod yield and 1:1.40 C:B ratio) and seed treatment with imidacloprid 600FS @ 2.0 ml + 4.0 ml/kg seed (4.30 % plant mortality, 1562 kg/ha pod yield and 1:1.52 C:B ratio).

Pooled analysis among 35 entries screened for insect pest resistance against thrips and leaf hoppers conducted during *Kharif*, 2014, 2015 and 2016 revealed that lowest percent thrips foliar damage of 6.30 % recorded in TCGS 1327 followed by SB 5 (6.62 %) and SB-10 (7.48 %). Lowest percent leaf hopper foliar damage of 3.17 % recorded in TCGS 1097 followed by SB-5 (4.16 %) and TCGS 1157 (5.28 %).

Agricultural Research Station, Darsi

In groundnut among the newer insecticides tested, Diapenthiuron 50% WP (58.2%) and Bifenthrin 10% EC (54.9%)against jassids and Fipronil 80% WG(63.7%) and Fipronil 5% SC(59.6%) against thrips were found effective. Highest dry pod yields of 2222.2 kg/ha was recorded with fipronil 80% WG which was significantly followed by fipronil 5% SC (1861.1 kg/ha), acephate 95% SG (1750 kg/ha) and diapenthiuron 50%WP (1722 kg/ha) which were at par.

Regional Agricultural Research Station, Tirupati

The studies on incidence of groundnut insect pests through light trap catches during *Kharif,* 2016 revealed that, root grub adults were ranged from 6 to 25 beetles/ week, more number of adults were noticed during June month only, thereafter the catches were decreased.Similar trend was noticed with leafhopper population and it was ranged from 18 to 326 adults per week. The earwig catches were ranged from 6 to 25 No./week and more number of catches were observed during June and July months, more or less similar population was noticed throughout the season.

Weather based fore-warning models for groundnut pests during *kharif*, 2016, indicated that moth catches in groundnut was recorded from 27th (2-8, July) standard week to 45th (5-11, Nov) standard week. *Spodoptera litura* moth catches were very low i.e., 0 to 4 No./trap/week, whereas the moth catches of leaf miner was low to moderate 9-32 No. of adults /trap/week.

Correlation studies on influence of weather parameters on incidence of moth catches revealed that, minimum temperature showed significant negative influence (-0.665), while remaining parameters were non-significant. All the weather parameters influenced moth catches to the extent of 74 per cent (R^2= 0.74).

Among the 13, IVK stage I entries, the leaf hopper score was ranged from 1 to 6. Three entries (IVK-I-6, 8 and 20) recorded lowest leaf hopper score of 1, two entries (IVK-I-21 and IVK-I-26) recorded 2 scale, four entries with 3 scale(IVK-I-1, 3, 22 and 28), two entries with scale 4 (IVK-I-5 and 7) one each of scale 5 (IVK-I-4) and scale6 (IVK-I-2).

Monocrotophos + dichlorvas @ 1.6 ml+1 ml/lt (4.05%) recorded highest per cent reduction of pod fly over untreated control, followed by monocrotophos 1.6 m/lt (4.67%) and rynaxypyr @0.3ml/l (5.45%). In untreated control, the damage was 20.55 per cent.

Among the AVT-I, 1807 and 1809 recorded lowest leafhopper score of 1 as against 5 score in AVT-1818. The check variety, Narayani recorded 7 scale of leaf hopper incidence.

Compatibility of insecticides and fungicides in groundnut ecosystem" revealed that, five insecticides novaluron @1ml/l, thiodicarb @1g/l, chlorfenapyr@2m l/l, chlorpyriphos@2.5ml/l, Indoxacarb @ 1.0 ml/l, were physically and chemically compatible with three fungicides viz., Tebuconazole@1g/l, Chlorothalonil@2g/l and Hexaconazole@2 ml/l.

In evaluation of new seed treatment chemicals against groundnut insect pests, imidacloprid 600FS @ 2 ml +4 ml water /kg seed recorded lowest foliar damage by thrips (18.88%), (14.80%) at 30 DAS and 37DAS, followed by thiamethoxam 35FS @ 2 ml + 2 ml water with 19.21 and 28.31 per cent foliar damage caused by thrips.

Leafy vegetable samples were collected from Narayanavanam mandal and analyzed for residue content of various insecticide and found rynaxypyr residues at 0.073 mg/kg weight which is below MRL prescribed by CODEX.

Agricultural Research Station, Anantapuramu

In pheromone trap catches, highest trap catch (29.1/trap) of *Helicoverpa armigera* was observed in 35th SMW. where as the highest trap catches of *Spodaptera litura* (26.63 moths/trap) were observed in 34th Std.week followed by 17.9 moths/trap in 35th Std.week. The leaf miner highest trap catches were observed in 35th Std.week and 38th Std.week.

In the large scale field demonstration on pheromone mediated mass trapping, the installation of pheromone traps in groundnut resulted not only the reduction in the pest incidence but also the insecticide sprays. In Anantapur district, the benefit to the farming community was estimated in *Rabi* to be Rs. 17,230/- per ha during 2016-17 due to pheromone mediated mass trapping; which was mainly due to reduced plant protection cost and increased yield.

Disease Management

Agricultural Research Station, Kadiri

Significant reduction of PSND and high yield was recorded by seed treatment with imidacloprid 600 FS @ 1 ml/ kg seed (1:7 water) + foliar spray using Imidacloprid 17.8 S.L @ 0.3 ml/l at 20 DAS. The next best treatment was T3 (Foliar spray with neem seed kernel extract @ 5 % four times at 10 days interval from 10 DAS).

Among different concentrations of nano zinc oxide particles tested against peanut stem necrosis disease, maximum incubation period (local: 7 DPI; Systemic: 15 DPI) coupled with less % of PSND (53 .0 %) at 21 DPI and less virus titer (0.83) were recorded by spraying nano zinc oxide @1000 ppm. But, at par with @ 800 ppm and 600 ppm.

Among 50, IVT and AVT stage II genotypes, screened against major diseases under natural conditions, the genotypes viz., ISK-I-2015-11 and 12; IVK-I-2015-24 were free from stem rot disease against highest incidence of 6.9 % of stem rot disease. Similarly, the genotypes viz., ISK-I-2015- 4, 7, 9, 10 and 13; IVK-I-2015-11: AVK-2015-9 and 12 were recorded below 5.0 % incidence against highest incidence of 13.7 % dry root rot disease. The genotypes ISK-I-2015- 8 and 27; IVK-I-2015-13; AVK-I-2015-6 were free from incidence of collar rot disease consistently for two consecutive seasons. Similarly, ISK-I-2014-4 recorded low score of dry root rot disease consistently for two seasons.

In management of foliar diseases of groundnut, significantly less PDI of Alternaria blight (43.7 %) coupled with high pod (790 kg/ha) and haulm yield (1585 kg/ha) were recorded by treating the seed with Tebuconazole 2DS @ 1.5 g /kg seed, followed by foliar spray of Tebuconazole 25.9 % EC @ 1ml/l at 40 and 65 DAS.

Adoping IPM module i.e., seed treatment with bijamrita + foliar spray of panchgavaya (3%) at 30-60 days + foliar spray of fermented butter milk @ 75 days) recorded less incidence of collar rot (0.9 %), dry root rot (3.9 %) and stem rot (2.7 %) and high pod (720 kg/ha) and haulm yield (1440 kg/ha) followed by seed treatment with Trichoderma viride @ 4 g/kg seed + Need based spray of Imidacloprid 17.8 SL @ 0.3 ml/l + Need based spray of Novaluron 10 EC @ 1 ml/l for defoliator 50-70 DAS + Need based spray of Tebuconazole 25.9 EC @ 1.5 ml/l 50-70 DAS.

In management of peanut bud necrosis disease, high reduction of both PBND (4.7 %) and thrips damage (33.2 %) and high pod (937 kg/ha) and haulm yield (1816 kg/ha) were recorded by adopting practices of border crop with bajra (4 rows) + seed treatment with imidacloprid 600 FS@ 1 ml/kg seed + foliar sprays using thiocloprid 480 SC @ 150 ml//ha at 20 - 25 DAS followed by Fipronil 5 SC @ 2 ml/l @ 40 DAS and Acetamiprid 20 SP @ 100 g/ha at 35-40 DAS.

Regional Agricultural Research Station, Tirupati

Among the fifty genotypes screened for various diseases, TCGS-1522, 1844, 1857, 1864,recorded low incidence of early leaf spot and rust.

In the management of foliar diseases, spraying with combination fungicide of Tebuconazole50 % + Trifloxystrobin 25 % WG @ 1.32 g/l (0.035%) at 40 and 65 DAS was foundeffective in controlling of early leaf spot and rust.

Among the three different modules evaluated for the management of PBND and PSND, Module II i.e., Border crop with bajra (4 rows)+ seed treatment with Gaucho 600 FS @ 1ml /kg of seed+Foliar sprays using Thiocloprid 480 SC @ 0.3 ml/l at 20-25 DAS followedby Fipronil 5 SC @ 1 ml/l at 40 DAS and Acetamaprid 20SP @ 0.2 g/l at 60 DAS recordedlowest incidence of PBND (1.2%) and PSND (2.8%).

Agricultural Research Station, Vizianagaram

In Management of major foliar diseases of groundnut, significantly less PDI of early and late leaf spot were recorded inTebuconazole 50% + trifloxystrobin 25% WG @ 1.32 g/l (0.035%) at 40 and 65 DAS, whereas less PDI of rust and Alternaria Leaf Spot were recorded in Carbendazim 12% + Mancozeb 63% @ 2 g/l at 40 and 65 DAS.

3.2 Sunflower

Crop Improvement

Regional Agricultural Research Station, Nandyal

Variety NDSH-1012 (Prabhath) with higher grain yield (20-25 q/ha), high oil % (40-41 %) and tolerant to downy mildew with 90-95 days duration was released for different districts of

Andhra Pradesh state during the year 2016. In addition, this hybrid got notified during January, 2017.

In All India Sunflower Hybrid Varietal Trial, entries IHT 1030 (1124 kg/ha), IHT 1036 (1085 kg/ha) & AHT 9 (1047 kg/ha) have recorded high grain yield during *kharif* 2016.Similarly, IHT 255 (1821 kg/ha), IHT 253 (1809 kg/ha), IHT 259 (1807 kg/ha) and IHT 2 (1644 kg/ha) recorded top yields during *rabi* 2016-17.

Agricultural Research Station, Utukur

Among seven hybrids tested against four checks in Multi Location Trial, the hybrid SF 1032 (3097 kg/ha) recorded significantly higher seed yield against all the checks KBSH 44 (1557 kg/ha), DRSH 1 (1343 kg/ha), NDSH 1012 (2048 kg/ha) and Kaveri 618 (1899 kg/ha).

Crop Production

Regional Agricultural Research Station, Nandyal

In sunflower cropping system, blackgram crop mulching and application of *Trichoderma viride* in addition to soil test based fertilizers recorded higher grain yields of 1320 kg/ha and net returns Rs.23,182 /- per ha.

Under best management practices, 125 % of recommended fertilizers with 45 x 30 cm spacing realized grain yield of 1550 kg/ha and net returns Rs.15,200 /- compared to 60 x 30 cm spacing (1440 kg/ha and Rs.13200 /- per ha.)

Pre-emergence application of pendimethalin (1 kg/ha^{-1}) followed by spraying fenoxypropethyl 37.5 g/ha at 15-20 days after sowing during *rabi* 2016, effectively controlled broad leaved and grassy weeds.

Disease Management

Regional Agricultural Research Station, Nandyal

Pooled data for three consecutive years on Alternaria leaf spot disease control indicated that seed treatment with 10 g of *Pseudomonas flourescens* @ 10g/ kg seed, spraying propiconazole 0.1% at 45 days and *Pseudomonas flourescens* (1 %) at 60 days were effective in reducing the disease with higher grain yield (1193 kg/ha).

Application of flonicamid 0.3 g/l (78.8 %) & fipronil 2 ml (72.1), against thrips, flonicamid 0.3 g/l (96 %) and thiomethaxam 0.2 g/l (84.6 %) against jassids and diafenthiuron 1.25 g/l (66.2 %), acetamiprid 0.2 g/l (65.3 %) and flonicamid 0.3 g/l (63.97 %) against white fly controlled effectively.

In an on farm validation of Integrated disease management of sunflower, seed treatment with carbendazim 0.1 % + thiomethaxam 5 g/kg, once thiomethaxam 0.2 g/l spray, second spray with propiconazole@ 1g/l was effective and realized good yield(1368 kg/ha).

Seed treatment with new insecticides i.e., imidacloprid 5 ml/kg of seed, spray with spiromesifen 1 ml/l at 30 & 45 days after sowing during *rabi* effectively reduced the incidence of necrosis (5.88%) and leaf curl (7.14%) whereas control recorded 6.96% and 17.2%, respectively with a yield of 1717 kg/ha and net returns Rs.28,020 /- per ha.

3.3 Sesamum

Crop Improvement

Agricultural Research Station, Yelamanchili

Out of 100 germplasm lines including the released varieties evaluated during *kharif* 2016, the entries IC 277001 (11g) IC 260760 (14g) SKL-4 (13g) SKL -6 (13g) SKL -7 (12g) SKL-8 (10g) SKL -10 (11g) SKL-13 (10g) SKL-14(13g) SKL -15 (10g) SKL -18 (11g) VZM-9 (11g) VZM-12 (10g) EC370360 are found promising with low incidences of phyllody disease .

Out of 10 entries tested against the checks YLM 17 and YLM 66 in Advanced Varietal Trial, the cultures YLM 136 (1072 Kg/ha and 47.75%), YLM 139 (1072 kg/ha and 47.95%), YLM 142 (1042 kg/ha and 48.44%) and YLM 146(1054 Kg/ha and 48.61%) found promising in seed yield and oil percent over better check YLM 66 (816 kg/ha and 48.96%.).

The entries RT 168 (777 kg/ha and 50.2%), PT-10 (777 kg/ha and 48.0%) and RT 346 (728 kg/ha and 48.3%) were found promising in seed yield and oil percent in OVT.The duration of these entries recorded 76, 76 and 77 days respectively. Generally white seeded sesamum varieties are not flowering in Kharif season in coastal areas while the above entries performed well.

Crop Production

Regional Agricultural Research Station, Lam

Among the sesame varieties tested, YLM 17 recorded highest grain yield (1219 kg/ha) followed by Sarada and significantly superior over other varieties . Further, RDF with 2% urea spray at capsule development recorded highest grain yield (1194 kg/ha) over other treatments while the interaction between varieties and nutrient management was found non significant.

Agricultural Research Station, Yelamanchili

Two hand weedings at 15 and 30 DAS significantly reduced weed population,weed dry weight and increased weed control efficiency followed by Pendimethalin @ 0.5 kg a.i/ha and Quizalofop-ethyl @ 40 g a.i / ha at 20 DAS . Two hand weedings at 15 and 30 DAS registered significantly high seed yield Kg/ha(427) over rest of the treatments.

Among the different organic sources applied, application of farm yard manure @ 10 t/ha recorded significantly higher number of capsules per plant (102.9), test weight (2.89) and seed yield (342.4 kg/ha) and is on par with application of press mud cake@12.5 t/ha. When different nitrogen levels tested, application of 150% recommend dose of nitrogen (RDN) gave significantly higher number of capsules/plant 9109., test weight (2.78) and seed yield of 361kg/ha followed by application of 125% RDN.

Crop Protection

Disease Management

Regional Agricultural Research Station, Anakapalle

A total of 119 germplasm lines were screened during early *kharif* 2016 for their reaction to Phyllody, Stem blight and Alternaria leaf spot, out of them, 7 entries recorded no phyllody incidence and 20 entries showed less than 10% incidence.

Among the 103 lines screened during late *rabi*, 8 entries showed less than 10% incidence' where as highest stem rot was seen upto 53.8%.

Agricultural Research Station, Utukur

In the management of powdery mildew, carbendazim @ 1.0 g/l and wettable sulphur @ 3.0 g/l recorded lowest PDI of 20.56 per cent and 22.98 per cent with seed yields of 604 kg/ha and 579 kg/ha, respectively.

Agricultural Research Station, Darsi

Spraying had no significant effect on the rate of phyllody infection although the mean yield was significantly decreased at 5% level in untreated plot (158 kg/ha) compared to treated main plot (254.5 kg/ha). Date of sowing had significant effect on the leaf hopper population, disease incidence rate and yield at 5% level. Highest seed yield (256.3 kg/ha), lowest disease incidence (0.06%) and leaf hopper population (0.78 per leaf) were obtained with the early sowing date (15th December) plus spraying with systemic insecticide.

3.4 Castor

Crop Improvement

Agricultural Research Station, Anantapuramu

Among 11+1 entries evaluated in Castor Advanced Varietal/ Hybrid Trial (AVHT) the entry AVHT-1658 recorded highest (345 Kg/ha) seed yield followed by AVHT 1659 (309 Kg/ha) and AVHT 1651 (291 kg/ha).

Crop Production

Regional Agricultural Research Station, Lam

In a rice fallow castor trial, seed treatment with sulphuric acid @ 0.1%) recorded highest germination percent of 91, while pendimithalin @ 1.0 kg a.i /ha +paraquat @ 0.6 kg a.i /ha as pre-emergence application followed by quizalofop ethyl @ 50 g a.i /ha + chloromuron @ 8 g/ha at 25 DAS recorded lower weed growth and relatively higher seed yield compared to other treatments.

Post emergence application of pendimethalin followed by chlorimuron ethyl @ 10 g reduced the weed growth significantly and gave higher kernal yield (1054 kg/ha), net returns (Rs. 12,015/-) and benefit cost ratio (1.295) than the hand weeding twice in castor

Regional Agricultural Research Station, Chintapalle

JNS 30 variety recorded higher yield (16.55 q/ha) followed by JNS 6 (16.35 q/ha), JNS 28 (15.86 q/ha), JNS 9 (15.19 q/ha) and local check KGN 2 recorded 15.17 q/ha at Chintapalle.

MUSTARD

Regional Agricultural Research Station, Nandyal

Among the 18 mustard varieties evaluated IVT 10 (1157 kg/ha), IVT 18 (1111 kg/ha) & IVT 1 (1055 kg/ha) recorded higher grain yield.

Agricultural Research Station, Reddipalli

The delayed sowings beyond December 1st significantly reduced the mustard seed yield. Significantly higher seed yield was with November 16th sowing date.

Optimum sowing date for mustard is from October 16th to November 16th for realizing higher yields

4. Commercial Crops

4.1 Cotton

Crop Improvement

Regional Agricultural Research Station, Lam

Out of six entries tested in Br. 04 (a) CVT trials, the entry viz., GSHV 177 (2632 kg/ha) recorded significantly higher Seed Cotton Yield (kg/ha) over the Zonal Check (Suraj) (2147 kg/ha).

Among 18 entries tested in Br. 05 (a) CHT trial the entries viz., GTHH 217 (3087 kg/ha) and RAHH 690 (2903 kg/ha) recorded significantly higher Seed Cotton Yield (kg/ha) over the Zonal Check (Bunny, 2468 kg/ha).

Out of seven entries tested in Br. 15 (a) Co-ordinated hybrid Trial of Inter-specific cotton hybrids the entries viz., DHB 1009 (2370 kg/ha), RHB 1008 (2238 kg/ha) and DHB 1501 (2070 kg/ha) recorded numerically superior Seed Cotton Yield (kg/ha) over the Local Check (TCHB 213, 2065 kg/ha).

Among nine entries tested in Br. 06 (a) PVT of Compact Genotypes G.hirsutumL. the entry LHDP 1 (3794 kg/ha) recorded significantly highest total seed cotton yield/ha (130+160 DAS) over Local Check (L 604) (2561 kg/ha). The entries LHDP 1 (1385 kg/ha) and RS 2814 (968 kg/ha) recorded significantly highest lint yield/ha (130+160 DAS) over Local Check (L 604, 813 kg/ha).

About 643 American cotton germplasm lines *(G.hirsutum L.)* and 28 lines of *G.barbadense* were maintained further studies.

In station Initial Hybrid Trial, Out of 75 crosses studied during 2016-17 including checks, the crosses viz., C 24 (3532 kg/ha), C 26 (3472 kg/ha), C 66 (3452 kg/ha), C 67 (3393 kg/ha), C 44 (3353 kg/ha), C 16 (3294 kg/ha), C 38 (3234 kg/ha), LAHH 29 (3194 kg/ha) and LAHH 28 (3135 kg/ha) recorded significantly superior seed cotton yield/ha over Local Checks LAHH 7 (2539 kg/ha) & LAHH 5 (2440 kg/ha).

Out of 137 genotypes were screened for high density planting and mechanized harvesting, 42 genotypes were found suitable for high density planting and these lines will be evaluated during 2017-18 crop season in 60 x15 cm spacing.

In Advanced Varietal Trial during 2016-17, among 8 entries tested along with two checks L 604 and NDLH 1938, the entry L 1516 (2304 kg/ha) recorded highest seed cotton yield followed by L 1514 (2200 kg/ha), L 1534 (2169 kg/ha) compared to checks L 604 (1460 kg/ha) and NDLH 1938 (1660 kg/ha).

In Multi location Varietal trial, out of 11 entries tested along with three checks L 604, NA 1325 and NDLH 1938, the entry HS 292 (2803 kg/ha) recorded significantly superior seed cotton yield followed by L 1384 (2597 kg/ha) and L 1511 (2466 kg/ha) over checks L 604 (1585 kg/ha), NA 1325 (1699 kg/ha) and NDLH 1938 (1705 kg/ha).

Out of 5 entries tested in Multi Location Hybrid trial, along with three checks LAHH 5, LAHH 7 and Jaadu BG II), the check Jaadu BG II (2932 kg/ha) recorded significantly higher yield followed by LAHH 26 (2767 kg/ha) and LAHH 29 (2656 kg/ha) compared to other two checks LAHH 5 (2063 kg/ha) and LAHH 7 (2193 kg/ha).

Regional Agricultural Research Station, Nandyal

In Advanced varietal trial among 12 entries tested against the check Sri Rama. Among the entries tested three entries i.e. NDLH-2005-4 (3047 kg/ ha) followed by NDLH -2005 (3040 kg/ha) are found statistically significant compared to the check Sri Rama (2183 kg/ha).

In Multi-location Varietal trial of *G. hirsutum* cotton, out of 14 varieties tested from different centers of ANGRAU, entry MLT 16-10 (2385 kg/ ha) recorded highest seed cotton yield followed by MLT 16-5 (2322 kg/ ha) and MLT 16-1(2029 kg/ha) compared to General mean (1558 kg/ha).

In Multi-location Hybrid trial of *G. hirsutum* cotton, among 8 hybrids tested , the entry MLT 16-1 (2184 kg/ ha) recorded highest seed cotton yield followed by MLT 16-8 (1456 kg/ ha) and MLT 16-4 & MLT 16-5 (1324 kg/ha) compared to General mean (1292 kg/ha).

In Advanced varietal trial eleven entries were studied along with check yaganti. Among the entries tested, entries NDLA 3086 (3396 kg/ha), NDLA 3020 (3102 kg/ha) and NDLA 3095 (2586 kg/ha) were found statistically significant in recording higher seed cotton yield over local check yaganti (2413 kg/ha).

In Advance Hybrid Trial , among twelve hybrids tested against the check NDLHH-240, 6 hybrids i.e. NDLHH 458 (2350 kg/ ha followed by NDLHH 442 (2320 kg/ha^{-1}) and NDLHH 455 (2293 kg/ha) were found significantly superior to the check NDLHH 240 (1730 kg/ha^{-1}).

In evaluation of 19 promising *G.hirsutum* Cotton varieties for high yielding under high density population, the entries Bhakthi Bt (NS) (3923 kg/ha) followed by NDLH 1863 BPO (2759 kg/ha) and NH-615 (2352 kg/ha) entries were found statistically significant compared to the check NDLH 1938(NS) (1719 kg/ha).

Crop Production

Regional Agricultural Research Station, Lam

Agronomic evaluation of pre released hirsutum cotton varieties (AICCIP) indicated that significantly superior seed cotton yield was recorded in TSH04/115 (3074 kg ha^{-1}) and HS 292 (2861kg ha^{-1}) compared to CCH-13-2 (1297 kg ha^{-1}). Application of fertilizers at 125% RDF recorded significantly higher seed cotton yield and was on par with 150% RDF.

In agronomic evaluation of pre released *hirsutum* cotton hybrids (AICCIP) the entry SHH 818 (3449 kg ha^{-1}) recorded highest seed cotton yield followed by RHH 1007 (3106 kg ha^{-1}) and lowest was recorded in BGDHH 821 (1667 kg ha^{-1}).

Among 24 Bt cotton varieties *(G.hirsutum)* evaluated under HDPS with popular BG II hybrid Jaadoo as check with normal spacing, the entries 219 (3561 kg ha^{-1}) 222 (3342 kg ha^{-1}) recorded significantly superior yield over the check entry Jaadoo (2763 kg ha^{-1}).

Out of 12 Arboreum cotton varieties (G.arboreum) under HDPS evaluation with popular BG II hybrid Jaadoo as check with normal spacing, the entries Phule Dhanwantari (4278 kg ha^{-1}), PA 528 (4085 kg ha^{-1}) and PA 255 (3961 kg ha^{-1}) recorded similar yield with check entry Jaadoo (4009 kg ha^{-1}).

Under organic cotton production, highest seed cotton yield of 2214 kg/ha and 2171 kg/ha was recorded with RD of nutrient through organic based P equivalent and RD of nutrient through organic based N equivalent respectively and was on par with raising of sunhemp in rows and incorporated before flowering.

Regional Agricultural Research Station, Nandyal

Agronomic requirements of promising pre-release/ recently released *hirsutum* varieties of Cotton revealed that, significantly higher seed cotton yield (2367 kg ha^{-1}) was recorded with spacing of 90 cm x 45 cm compared to 60 cm x 30 cm spacing (2026 kg ha^{-1}).Significantly higher seed cotton yield was registered with application of 150% RDF(2280 kg ha^{-1}) and is on par with 125 % RDF (2230 kg ha^{-1}) compared to100 % RDF(2080 kg ha^{-1}).

Significantly higher seed cotton yield (2966 kg ha^{-1}) was recorded with spacing of 90 cm x 60 cm compared to 90 cm x 45 cm spacing (2746 kg ha^{-1}) in agronomic requirements of promising pre release/ recently released *hirsutum* hybrids of cotton. There was significant effect of different fertilizers levels on seed cotton yield. Higher seed cotton yield (3080 kg ha^{-1}) was observed in 150% RDF and is on par with 125 % RDF (2813 kg ha^{-1}) where as lower seed cotton yield (2675 kg ha^{-1}) was recorded in 100 % RDF .

Adoption of 60x30 cm spacing for promising pre release/ recently released *arboreum* varieties of cotton significantly realized higher seed cotton yield (1562 kg ha^{-1} than 60 cm x 20 cm spacing (1412 kg ha^{-1}).

Significantly higher seed cotton yield (3595 kg ha^{-1}) was recorded with Bt hybrid sown at 90 cm x 45 cm with application of 125 % recommended nutrients with soil application of micro nutrient and recommended foliar sprays and location specific measures for control of redening compared to (1982 kg ha^{-1}) Bt hybrid with 90 cm x 60 cm (1982 kg/ha).

Higher weed control efficiency (62.0 %) was observed at 90 DAS with treatment of Pendimethalin @ 1.0 kg a.i/ha as pre-emergence followed by glyphosate @ 5 ml/lit as spray at 2-4 weed leaf stage + one hoeing.Where as lower weed control efficiency (27.6%) was observed at 90 DAS with treatment of Chlorimuron Ethyl @ 4.0g a.i/ha at 2-4 leaf stage weed + one hoeing.

In HDPS with compact cultures, significantly higher kapas yield (3854 kg ha^{-1}) was recorded with spacing of 45 cm x 10 cm which was on par with spacing of 75 cm x 10 cm (3355 kg ha^{-1} kg/ha). Application of Fertilizers at 125% RDF recorded highest kapas yield of 3724 kg ha^{-1}. Significantly lower kapas yield of 3181 kg/ha was observed in 100 % RDF.

Crop Protection

Insect Pest Management

Regional Agricultural Research Station, Lam

Under advanced screening, the entries such as GJHV 517, GJHV 497, GSHV 173 and GISV 267 were found tolerant to jassid with grade I and II.

Among the different insecticidal treatments, Spinetoram 10% w/w + Sulfoxaflor 30% w/w WG was found highly effective against all the sucking pests in cotton at 300 and 350 g/ha followed by Sulfoxaflor 30% w/w WG @ 350 ml/ha. While, Fenpropathrin 15% EC @ 750 ml/ha, either alone or in combination with Pyriproxyfen 5% EC @ 750 ml/ha was found effective against pink bollworm in cotton.

Inundative release of *T. bactrae* twice at flowering and thrice at boll formation stage helps in reducing the pink bollworm when compared to untreated control.

Evaluation of insecticides against pink bollworm revealed that, bifenthrin 10 % EC @ 800 ml/ha and cypermethrin 25 % EC @ 500 ml/ha were found effective with less larval population as well low per cent locule damage in cotton.

Among the 14 ANGRAU varieties, L 1511, L 1506, L 1384, L 1493, L 1231 and NDLH 2005-4 were found promising with low jassid incidence and high yield potential.

Regional Agricultural Research Station, Nandyal

In Cotton varietal trial GBHV 185, GBHV-195, GTHH-217, CNH-09-62 & GSHV-180 found tolerant to jassids.

Jassids severity recorded high in second fortnight of August (20.66/3 leaves) and first fortnight of November (20.88/3 leaves).

Pink bollworm severity was more with high ETL during second fortnight of November to January last fortnight.

Spinetoram + sulfoxaflor 300-350 ml/ha and sulfoxaflor 300-350 ml/ha, monocrotophos 800 ml/ha, flonicamid 150 g/ha and acetamiprid 100 g/ha effective against jassid control.

Disease Management

Regional Agricultural Research Station, Lam

Alternaria leaf spot was the major disease in farmers' fields (0 to 25%) and at RARS, Lam (0 to 39%) followed by grey mildew 0 to 19% in farmers' fields and 0 to 27%, at RARS, Lam.

Minimum temperature and number of rainy days influenced the progress of Alternaria leaf spot at 5% level of significance, while maximum temperature, relative humidity, rainfall, sunshine hours, wind speed and evaporation were significant at 1%.

Multiple linear regression analysis revealed that maximum temperature, wind speed (at 1%) and RH II (at 5%) significantly influenced the progress and intensity of grey mildew.

Progress of TSV disease incidence (%) was in the range of 0.35% to 12.46% in RCH 2 BG II.

Entries L 799, TCM 1716, DB 1502, ARBD 27, GSB 44 and GSB 43 showed resistant reaction to grey mildew during 2nd consecutive year.

Seed treatment fungicides viz., carbendazim, trifloxystrobin, thiram, captan, mancozeb, penflufen, streptocyclin and carboxin, were compatible with imidacloprid treated Bt cotton seed.

4.2 Mesta

Crop Improvement

Agricultural Research Station, Amadalavalasa

A total of 53 germplasm accessions of *Hibiscus sabdariffa* were maintained, studied and found that nine accessions exceeded fibre yield over the best check variety HS-4288 (9.46 g). The lines, R-230, R-219, 6294-4078/68 and 6283-4044 were among the top fibre yielders.

Entry JRHS-4 (28.98 q/ha) from Advanced Varietal Trial-I and AHS-255 (30.05 q/ha) from Advanced Varietal Trial-II of *Hibiscus sabdariffa* were found to be superior than check HS-4288.

Entry JRK-2014-5 (21.78 q/ha) in Advanced Varietal Trial-I of *Hibiscus cannabinus* L. was found over the check variety AMC-108 (20.00 q/ha) for fibre yield.

In Initial Evaluation Trial with roselle for calyx the entries AHC-2 (22.11 q/ha) and AHC-1 (21.94 q/ha) were found to be superior than check variety, HS-4288 (4.03 q/ha).

The entries HSLV-1 (7.19 kg/plot) and HSLV-2 (6.66 kg/plot) were found to be superior than check variety, HS-4288 (4.19 kg/plot) in Initial Evaluation Trial with roselle for leafy vegetable evaluated.

Crop Production

Agricultural Research Station, Amadalavalasa

The results on performance of new roselle genotypes under different fertilizer management schedule revealed that, the test entry of roselle AHS 249 recorded significantly higher plant height (372 cm), basal diameter (2.33 cm) and fibre yield (22.70 q/ha) over the other test genotype JRR 2012-1 and also over the check varieties. The plant height, Basal diameter and fibre yield of roselle increased significantly upto NPK dose of 80:17.5:33.3 kg/ha level and the maximum values of said parametere were 360 cm, 2.38 cm and 25.62 q/ha respectively.

Sowing of mesta seed crop in 1st week of August with 45 cm x 10 cm spacing and topping at 45 DAS has given maximum seed yield of mesta (28 q/ha) and is recommended for the region.

Mesta (Kenaf) variety JRK 2011-1 recorded highest fibre yield (36.90 q/ha) at higher fertilizers level (80:40:40 kg/ha NPK) followed by check variety HC 583 (33.11 q/ha). Test variety JRK 2011-2 recorded lowest yield (26.35 q/ha). The experimental results also revealed that increasing fertilizer levels there by increasing the fibre yields in all varieties.

In Mesta based intercropping system, Mesta intercropped with mungbean, urdbean and groundnut in 3:4 row ratio recorded highest equivalent fibre yield of 22.97, 22.09 and 21.52 q/ha, respectively against 20.9 q/ha in sole mesta.

Organic farming on mesta, revealed that application of vermicompost @10 t/ha in two equal splits recorded highest fibre yield of 13.96 q/ha and seed yield (3.38 q/ha).

Crop Protection

Insect Pest Management

Agricultural Research Station, Amadalavalasa

Among the six entries tested in AVT-II, significantly lowest incidence of aphids (1.93 no. / plant),mealybug (1.08%) and highest fibre yield(30.6q/ha in AHS-255) was found in AHS-255 and AHS-267, respectively.

Seed treatment with imidacloprid 600 FS (2 ml + 4 ml water)/ kg seed gave protection upto 50 DAS against sucking insect pests with fibre yield of 26.29 q/ha.

Influence of organic manures on incidence of insect pests reveals that, application of poultry manure @ 3t/ha, recorded significantly lowest incidence of aphids (0.12 per plant) and semilooper (0.56 %) and recorded highest seed yield (3.51q/ha).

Under field conditions, the entries AR-46, AS-80-23 and ER-27 were tolerant to aphids; the entries AR-20, R-96 and AMV-5 were tolerant to leaf hoppers; entries AR -16, AR-20, AS-80-26, R-225 and R-321 tolerent to whiteflies, AR-128, AR-80-23, REX-6, ER-27, ER-38, R-77 and R-88, against semiloopers and entry AR-20 was tolerant.

Disease Management

Agricultural Research Station, Amadalavalasa

Among the 43 entries of *H. sabdariffa* germplasm screened against diseases under field conditions, one entry, AS-81-12 reacted as moderately resistant (3.03%) to foot and stem rot disease and seven entries, viz., AS-80-9, AS-80-12, AS-80-19, AS-80-31, AS-81-5, REX-6 and ER-14 showed moderately susceptible reaction to Foot and Stem rot disease (6.4% to 25.0%).

In Advanced Varietal Trial-II, out of six varieties tested for foot and stem rot disease incidence, the variety AHS-255 recorded less disease incidence of 16.67% (moderately susceptible) and high fibre yield (30.06 q/ha) followed by HS-4288 and JRHS-2 (23.39% and 24.37%) respectively.

Metalaxyl MZ as seed dresser and foliar spray against *Phytophthora parasitica var. sabdariffae* in mesta recorded less incidence of disease (2.73%) at the time of harvest followed by Trifloxystrobin (2.94%), Cymoxanil (3.0%), Copper oxychloride (3.43%) and Azoxystrobin (3.56%).

4.3 Sugarcane

Crop Improvement

Regional Agricultural Research Station, Anakapalle

During 2016-17, a total quantity of 1245g of fluff was received from Sugarcane Breeding Institute, Coimbatore. A total number of 6965 seedlings were transplanted from 29 crosses (station crosses and zonal crosses) 12PCs and 10 GCs. Out of which, 5931 seedlings survived in the main field with an average survival percent of 85.15.

Seventy six clones along with two standards (87 A 298 and Co 86249) were evaluated during 2016-17 in selection nursery, of which twenty five clones were selected based on cane yield and other quality parameters. The clone 2015 A 275 has recorded highest percent juice sucrose of 22.16 and CCS percent of 16.16, while the clone 2015 A 51 has recorded highest cane yield of 140.00 t/ha and CCS yield of 21.06 t/ha when compared to the best standard Co 7219 has recorded 20.02%, 14.42%, 105.00 t/ha and 15.15 t/h,a respectively.

In Main Yield Trial (Early)- I Plant crop, out of six promising clones evaluated in comparison with three standards. the clone 2012 A 319 significantly recorded with a high number of millable canes (123.70 thousands /ha) and cane yield (130.99 t/ha) followed by 2012 A 340 (113.72 and 124.13) and 2012 A 249 (113.28 and 125.0) compared to standard 87A 298 (105.03 000'/ha and 108.16 t/ha).

In Main Yield Trial (Early)- II Plant crop, among seven clones evaluated against three standards. the clone 2011 A 262 has significantly out yielded the best standard in terms of cane yield (133.6 t/ha), NMC of (109.38 thousands /

ha), percent juice sucrose (20.18) and CCS yield (19.38 t/ha) compared to the best standard, 87 A 298 for cane yield (114.58 t/ha) and NMC (99.22 000,/ha), 2001 A 63 for sucrose (19.21%) and CCS yield ((15.33 t/ha).

Among seven clones studied against a standards in MYT (early)-Ratoon, the clone 2011 A 262 has recorded significantly high cane yield of 141.41 t/ha, NMC of 112.85 thousands /ha, percent juice sucrose of 20.82 and CCS yield of 21.04 t/ha compared to check 2001 A 63 (cane yield of 111.29 t/ha, NMC of 102.61 thousands/ha , percent juice sucrose of 17.90 and CCS yield of 14.27 t/ha).

In Main Yield Trial (Midlate) first plant crop out of six entries tested against three checks , the genotype 2012A335 recorded higher Cane yield, CCS yield and jaggery yield (112.33 t/ha,15.27 t/ha and 14.34 t/ha respectively) followed by 2012A264 (110.67 t/ha,15.18 t/ha and 14.20 t/ha respectively) and were significantly superior over the best standard Co7219 (00.33 t/ha,14.50 and 12.46 t/ha respectively).

In Main Yield Trial (Midlate) second plant crop,seven clones evaluated along with three standards for their performance, the genotype 2011A222 recorded significantly higher Cane yield, CCS yield and jaggery yield(122.68t/ha,15.60 t/ha and 16.02 t/ha respectively) followed by 2011A67 (120.72 t/ha,15.49t/ha and 15.15 t/ha respectively) and significantly superior over the best standard Co7219 (104.00t/ha,13.20 t/ha and 11.52 t/ha respectively).

Among seven entries tested against three cheeks viz.,Co7219, 83V15 and Co 86249 in Main Yield Trial (Midlate) ratoon crop, the genotype 2011A 67 recorded higher Cane yield, CCS yield and jaggery yield (88.00 t/ha,12.88 t/ha and 10.30 t/ha)respectively followed by 2011A222 (80.91 t/ha, 10.52 t/ha and 9.28 t/ha) and were significantly superior over the best standard Co7219 (63.67 t/ha, 9.28 t/ha and 9.0 t/ha) respectively.

Out of 15 entries along with the check 87A 298 evaluated under rainfed conditions during 2016-17, the entries 2000A213 (68.00 t/ha and 8.51 t/ha),2000A56 (66.33 t/ha and 8.40 t/ha) and 2003A 255 (64.00 t/ha and 8.38 t/ha respectively) recorded higher Cane and CCS yields and were found to be significantly superior over the best standard 87A 298 (60.00 t/ha and 7.85 t/ha respectively).

A total of 160 sugarcane germplasm clones comprising of Anakapalle, Coimbatore, Vuyyur, Rudrur, Perumallapalle, Cuddalore and Maharastra were grown and maintained under field conditions during 2016-17 season.

Among 20 energy clones studied in Main Yield Trial –Energy canes - ratoon crop, the clone 2011 A 294 has recorded medium sucrose content of 16.75, fibre percent of 16.12 and high biomass of 1295 g per stool.

Under Micro-propagation of elite sugarcane clones, a total of 20,000 tissue culture seedlings of 2003 V 46, 87A298, 2006 A 223, 2009 A 107 and Co 7805 were produced and supplied to the various disciplines for experimental purpose.

Regional Agricultural Research Station, Tirupati

Screening of 4 promising sugarcane varieties (2003T129, 2004T68, 2005T16, 83 V 15) for salinity tolerance indicated that, at 4 EC and 5EC the growing tip stopped further growth and dried in all the 4 genotypes. The genotypes 2003T129 and 2004 T 68, the growing tip dried even at 3 EC level, whereas in 83V15 and 2005 T 16 at 3 EC level the plant growth was observed.

Among 140 genotypes evaluated for high WUE and heat stress tolerance, SPAD readings range from 28.1- 48.0, SLA ranges from 45-123 gcm^2 and relative injury from 8.1-61%.

Agricultural Research Station, Perumallapalle

A total of 165 germplasm accessions were

maintained at ARS, Perumallapalle during 2016-17. Among the new accessions, 2011 T 70, 2011 T 111 and 2011 T 88 were found to be drought tolerant along with 2003 V 46.

During 2016-17, about 13,386 seedlings were raised from 27 station crosses, 7 zonal crosses, 13 poly crosses and 19 general collections. Out of them 12,121 seedlings accounting to 90.55% survived.

Thirty three clones were evaluated in selection nursery against two checks and eighteen clones were selected based on yield and quality parameters and reaction to natural incidence of pests and diseases and promoted to Preliminary Yield Trial of 2017-18. Highest CCS yield (18.9 t/ha) was recorded by 2014 T 70, whereas highest cane yield (129 t/ha) was recorded by 2014 T 51.

Out of nine clones evaluated against four checks in MYT early (plant crop), three clones viz. 2012 T 81 (143.59 t/ha, 17.08 t/ha), 2012 T 183 (139.10 t/ha, 16.47 t/ha) and 2012 T 115 (137.64 t/ha, 16.02 t/ha) have registered sinificantly superior cane yields and CCS yields over the best checks i.e. Co 94008 for cane yield (103.69 t/ha) and 2003 V 46 for CCS yield (13.19 t/ha).

In Main yield trial (early) – Plant crop II, six clones were evaluated against two checks for cane yield and quality parameters. Clone 2011 T 161 has recorded significant cane yield and CCS yield (126 t/ha, 15.0 t/ha) over the best check Co 94008 (102.5 t/ha, 12.7 t/ha). The clone 2011 T 24 was on par with cane yield and CCS yield (111.9 t/ha, 14.8 t/ha).

Eight clones were evaluated against two checks in Main yield trial (Midlate) – Plant crop II . The clone 2011 T 104 has recorded significant cane yield (139.40 t/ha) over the best check 83 V 15 (116.52 t/ha) followed by 2011 T 88 (cane yield 137.75 t/h and CCS yield 16.9 t/ha). 2011 T 70 (132.47 t/ha, 16.6 t/ha) and 2011 T 51 (123.14 t/ha, 15.6 t/ha).

In Main yield trial (early) – Ratoon crop, six clones were evaluated against two checks for cane yield and quality parameters. Clone 2011 T 161 has recorded significant cane yield and CCS yield (124.7 t/ha, 16.6 t/ha) over the best checks i.e. Co 94008 (103.1 t/ha) for cane yield and 2003 V 46 (14.2 t/ha) for CCS yield.

In Main yield trial (Mid late) – Ratoon crop, eight clones were evaluated against two checks for cane yield, quality parameters. The clones 2011 T 70 (126.5 t/ha, 15.6 t/ha), 2011 T 104 (113.2 t/ha, 13.2 t/ha) and 2011 T 88 (107.5 t/ha, 13.1 t/ha) have recorded significant cane and CCS yields over the best check 83 V 15 (82.8 t/ha, 10.4 t/ha).

Among the eleven clones tested in Advanced varietal trial (Early) Plant Crop-II, CoT 10366 recorded significantly superior cane yield of 153.6 t/ha and clone CoT 10367 recorded significantly superior sugar yield of 20.4 t/ha over the better standard Co 85004.

In the Advanced Varietal Trial (Mid late)-Plant Crop II, among the thirteen clones tested, CoT 10369 clone recorded significantly superior cane yield and CCS yield of 153.1 t/ha and 22.5 t/ha over the better standard Co 99004.

Out of thirteen clones tested in the Advanced varietal trial (Mid late) Ratoon, during 2016-17, clone Co 10033 recorded significantly superior cane yield of 125.2 t/ha and CCS yield of 18.5 t/ha over the better standard Co 86032.

A total of 3744 virus free seedlings of 2003V46, 2005T16, 2003T121, Co 86032, 87A298 and CoT8201 were produced through micropropagation and planted to raise breeder seed.

A total of 2,458 somaclonal seedlings produced from 2003V46 and Co86032 were visually screened for YLD symptoms and 386 somaclones were screened through RT-PCR method.

Agricultural Research Station, Vuyyuru

In Seedling nursery (2016-17), a total of 689.5 g of fluff from 18 Station Crosses, 8 Zonal crosses, 8 GCs and 13 PCs was sown. Of which 6,754 seedlings were obtained. About 2,750 seedlings were survived in the main field with an average survival per cent of 40.72.

In Main Yield Trial (Early) – Second Plant crop (2016-17), the clone 2010 V 50 recorded higher cane yield of 121.88 t/ha, compared to the standard 87 A 298 recorded 108.42 t/ha. The clone 2011 V 226 recorded higher CCS yield of 15.63 t/ha followed by 2011 V 127 (15.50 t/ha) than the standard 2003 V 46 recorded 13.68 t/ha CCS yield.

In Main Yield Trial (Mid-late)- Second Plant crop (2016-17), the clones 2011 V 115 (115.19 t/ha), 2011 V 159 (113.28 t/ha) and 2011 V 154 (111.46 t/ha) recorded significantly higher cane yield over the standard Co 7219 recorded 89.84 t/ha. The clones 2011 V 159 (17.25 t/ha) and 2011 V 154 (16.77 t/ha) recorded higher CCS yield.

In Main Yield Trial (Mid-late)- Ratoon (2016-17), the clone 2011 V 115 recorded significantly higher cane yield of 112.58 t/ha followed by 2011 V 159 (93.90 t/ha) and 2011 V 27 (90.35 t/ha) compared to the standard Co 7219 (83.07 t/ha). The clones 2011 V 115 (15.15 t/ha), 2011 V 159 (14.25 t/ha) and 2011 V 27 (13.48 t/ha) recorded higher CCS yield.

In Advanced Varietal Trial (Early) - II plant (2016-17), the standard Co C 01-061 recorded higher followed by the clone Co V 12-356 with 16.02 percent juice sucrose. The clone Co A 12-321 recorded higher cane yield of 115.43 t/ha while the standard Co C 01-061 recorded 101.95 t/ha cane yield, higher per cent juice sucrose (16.37) and CCS yield (11.74 t/ha).

In Advanced Varietal Trial (Early) - Ratoon (2016-17), the clone Co A 12-321 recorded higher cane yield of 91.67 t/ha where as the standard Co C 01-061 recorded cane yield of 84.67 t/ha. The clone Co V 12-356 (2006 V 51) recorded higher CCS yield of 11.75 t/ha.

One hundred and seventy four germplasm clones were maintained under field conditions. The clone 2010 V 68 recorded higher H.R- Brix value of 26.0. The clones 2000 A 241 (3.42 cm), 2007 V 36 (3.39 cm), 2007 V 121 (3.31 cm), 2007 V 102 (3.20 cm), 2006 V 87 (3.12 cm), 2009 V 66 (3.09 cm), 2009 V 29 (3.06cm), 2008 V 177 (3.05 cm) recorded higher diameter.

Among the 12 clones under water logged conditions, the clone 2010 V 50 was found tolerant to waterlogging with highest cane yield (139.86 t/ha) per cent juice sucrose (18.37) with more superoxide dismutase enzyme activity (0.96**)** and more SPAD (39.6), whereas the standard Co 6907 recoded cane yield (110.85 t/ha) & per cent juice sucrose (17.06).

Sugarcane early maturing clone 2008 V 240 performed well by recording highest cane yield 90.8 t/ha with 20.20 percent juice sucrose and less dead canes / plot with SOD value of 1.30 and also tolerant to soil moisture stress(leaf sheath moisture :78.00) under moisture stress conditions. The standard Co 6907 recorded 72.3 t/ha with 18.90 per cent juice sucrose.

Studies on post-harvest deterioration losses indicated that the clone 2007 V 127 maintained less loss in quality (0.516) and cane weight (1.91%) even after **72** hours after harvesting. TAI was less in 2007 V 127 and dextran formation was less in 2007 V 127 when compared to other clones**.**

Crop Production

Regional Agricultural Research Station, Anakapalle

Application of organics and in-organics in improving soil health and sugarcane productivity of ratoon crop indicated that application of FYM @ 10 t/ha + Biofertilizer+ 100% inorganic nutrient

(89.9 t/ha) or application of FYM @ 10 t/ha+ Biofertilizer+ inorganic nutrient application based on soil test (89.6 t/ha) registered significantly higher cane yield as compared to application of trash and 50% RDF registered lowest cane yield of 76.4 t/ha.

Among different intercrops tried in sugarcane crop raised with single node seedlings, Sugarcane + Greengram registered higher sugarcane equivalent yield of 83.8 t/ha followed by Sugarcane + Bhendi (81.3 t/ha) and found superior to Sugarcane + Clusterbean (75.7 t/ha). Sole sugarcane registered higher cane yield of 78.3 t/ha.

In ratoon crop under seedling cultivation, higher ratoon cane yields were recorded at paired row planting (75.1 t/ha) as compared to wider row planting (56.8 t/ha) and on par with to normal row planting (73.2 t/ha). Sugarcane ratoon crop recorded more cane yield with 150% RDN (69.1 t/ha) as compared to 100% RDN(64.0 t/ha). With increase in nitrogen dose upto 175% RDN, juice sucrose values decreased significantly (16.18%) when compared to 100% RDN (16.95%).

In standardization of agrotechniques for sugarcane raised with overaged seedlings, planting of 30 days aged seedlings (72.5 t/ha) or 45 days aged seedlings (71.3 t/ha) registered higher cane yield as compared to 60 days seedlings (63.2 t/ha). Similarly, population density of 24,700 seedlings /ha (60/120 x 60cm) registered higher cane yield of 71.7 t/ha and found on par with 18,500 seedlings /ha (60/120 x 45cm) (70.2 t/ha).

Agronomic Management for late planted (May) sugarcane raised with seedlings under irrigated conditions indicated that , significantly higher cane yields were recorded at higher plant density of 37,000 seedlings/ha i.e. 90 x 30 cm spacing (58.5 t/ha) or 27,700 seedlings /ha i.e. 60 x 60 cm (60.5 t/ha) compared to lower plant density of 18,500 seedlings /ha (54.2t/ha) or 24,700 seedling /ha (57.0t/ha).

Studies on Standardization of agrotechniques for micro propagated plantlets of sugarcane showed during 2016 that, cane yield was highest at a spacing of 60 x 45 cm (52.24 t/ha) and with nitrogen level of 200 % RDN (54.66 t/ha) i.e., 224 kg N/ha and their interaction has recorded significantly highest cane yield (58.33t/ha). Sugar yield (9.63 t/ha) was highest at a nitrogen level of 200% RDN.

Efficacy of liquid bio fertilizers in comparison with carrier based bio fertilizers in sugarcane (ratoon) revealed that, shoot population at harvest (85815/ha), cane yield (82.65 t/ha) and sugar yield (11.11 t/ha) were the highest with 100 % Recommended Dose of Fertilizers + liquid Azospirillum + liquid PSB (T9) indicating the efficacy of liquid biofertilizers than the solid biofertilizers.

Efficacy of halosulfuran for the management of *cyperus* sps in sugarcane under seedling cultivation indicated that, the conventional practice of hand weeding thrice at 30, 60 & 90 DAP recorded highest cane yield of 125.6 t/ha under seedling cultivation. Post emergence application of halosulfuran 75% WG at 40 days after planting controlled the weeds effectively (72% WCE) and gave cane yield (123.9 t/ha) and is on par with three hand weedings and proved significantly superior over weedy check (77.8 t/ha)

Revisiting of Fertilizer doses for sugarcane in North Coastal Zone revealed that the highest cane (83.40 t/ha) and sugar yield (10.73 t/ha) of sugarcane ratoon was recorded with 150, 100 & 100 % RDNPK + 25 % of recommended dose of zinc and sulphur with farm yard manure 10 t/ha compared to recommended dose of chemical fertilizers

Cane and sugar yields (Ratoon crop) recorded after 6 years of organic farming in a Plant – Ratoon sequence were 72.90 and 9.82 t/

ha, respectively, where as in 100 % chemical fertilizer treatment it was 72.15 and 9.42 tha-1, respectively. Results of post harvest soil analysis showed that the amount of organic carbon status was raised to 0.76 %, where as in 100 % chemical fertilizer treatment the organic carbon status was increased (0.67 %) from its initial value of 0.52 percent.

Agricultural Research Station, Perumallapalle

Among type of sugarcane seedlings, single node seedlings recorded higher number of millable canes (79688/ha) and cane yield (95.5 t/ha) compared to bud chip seedlings. Among three different months of planting, January month of planting recorded higher NMC (79093/ha) and cane yield (96.2 t/ha).Between two doses of nitrogen viz., 100%, RDN, 125%, RDN 125 % RDN at four splits recorded higher cane yield (92.6 t/ha) compared to 100 % RDN at four splits (89.8 t/ha)

Among fertigation treatments, 125% RDN + 125 % RDK in 12 equal splits through drip from 30-150 DAP recorded highest cane yield (107.8 t/ha) followed by application 100% RDN + 100 % RDK in 12 equal splits through drip from 30-150 DAP (104.2 t/ha) and 75% RDN + 75 % RDK in12 equal splits through drip from 30-150 DAP (102.4 t/ha).

Inorganic treated plot recorded higher cane yield (126 t/ha), CCS % (11.89) and jaggery yield (108 kg/t) compared to organic treated plot recorded(119 t/ha cane yield). The organic carbon % (0.46%) was higher with application of organic manures.

Among 15 entries (eight early and seven midlate entries) tested for yield and quality of jaggery, the entries 2012 T 115 , 2012 T 72 and 2012 T 88 recorded the highest jaggery yield of 114, 113.2 and 112 kg / t of sugarcane, respectively with golden yellow colour than other entries.

Among eleven sugarcane entries with two checks tested for salt tolerance, the entries 2009 T 5, 2010 T 58, 2010 T 175 and 2010 T 172 recorded less reduction in cane weight and sucrose % in salt treated plot compared with other entries.

Agricultural Research Station, Vuyyuru

In sugarcane ratoon crop, pre-emergence application of Atrazine, Metribuzine and post-emergence application of Topramezone, Tembotrione and Halosulfuron methyl at 30 days recorded significantly higher cane yield as compared to check (54.33 t/ha).

In a Network project on revisiting of fertiliser recommendations to sugarcane in Krishna Zone (Ratoon), cane yield and quality were more in organic matter (FYM) added plots compared to without organic matter added plots. In plant crop-II, cane yield and quality were more in organic matter (FYM) added (89.16 t/ha and 18.81 % sucrose in juice). STCR based equation production-II recorded highest cane yield (94.52 t/ha).

Among eleven promising pre-release clones were screened for tolerance to saline irrigation water in farmer's field at Ayodhya, Challapalli mandal, in early group genotype 2009 V 127 recorded highest population at different stages of crop growth, sucrose (22.31 %), nutrient availability in the post harvest soils and was on par with 2008 V 312. Among the midlate genotypes tested, 20010 V 146 recorded highest population at different stages of crop growth and nutrient availability in the post harvest soils while 2010 V 89 recorded more quality (21.14 % juice sucrose).

The early maturing clone 2010 V 50 was found tolerant to water logging with higher cane yield (139.86 t/ha) and higher per cent juice sucrose (18.37) and superoxide dismutase enzyme activity (0.96) and SPAD (39.6). The standard Co 6907 recoded cane yield of 110.85 t/ha and per cent juice sucrose of 17.06.

Under water logging conditions 2011 V 102 (mid late) recorded higher cane yield (127.43 t/ha) and higher per cent juice sucrose of 17.50 against the standard Co 7219 which recorded a cane yield of 77.93 t/ha and percent juice sucrose of 17.51.

In early group, 2008 V 240 recoded higher cane yield (90.8 t/ha) percent juice sucrose (20.20) and less number of dead canes/plot under soil moisture stress. The standard Co 6907 recorded cane yield of 72.3 t/ha with 18.90 per cent juice sucrose.

Crop Protection

Insect Pest Management

Regional Agricultural Research Station, Tirupati

The moth catches of sugarcane borer pests in pheromone traps during 2016-17, indicated that, early shoot borer catches were high in 3rd SMW(13.4 No./trap/week). In case of internode borer, the catches were high in 33rd SMW. The moth catches of top borer was high in 1st SMW (20 No./trap/week).

Among the 40 IVT clones, clone CoTL14112 recorded lowest dead hearts (0.43%), followed by CoN14072 (0.48%), CoN14061 (0.52%), PI.14.131 (0.54%), Co13021(0.59%), Co14016(0.62%), PI14.132 (0.68%) as against 15 per cent in Co14003.

Regional Agricultural Research Station, Anakapalle

Application of entomopathogenic nematode, Heterorhabditis indica @ 20 kg in 150 kg moist sand/ha reduced the white grub damage (2.8%) over phorate (16.41%) and neem cake application (9.17%) compared to control (44.12%). Cane yield recorded was high in EPN application (99.8 t/ha) compared to phorate (69.74 t /ha), neem cake application (86.02 t/ha) and control (47.12 t/ha).

In IPM Module Module 6 i.e., trash mulching + *Trichogramma chilonis* release @ 75,000/ha from 30 DAP for 6 times and 2 releases after node formation (9.48 %) and Trash mulching+ *Trichogramma chilonis* release @ 50,000/ha from 30 DAP - 6 releases at 7-10 day interval and 2 releases after node formation (9.85%) were found effective in managing shoot borers in sugarcane with high cane yield (125.51 t/ha and 114.72 t/ha).

Among the test entries, lowest incidence of early shoot borer (1.95%DH) was recorded in Co A 12 322 (1.95 %DH) in Advanced Varietal Trial (early)-II plant . While two entries viz., Co Or 13 346 (16.1%) and Co A 12 321 (16.7) have showed least susceptible reaction and four (4) entries viz., Co A 14 324 (25. 80%), Co C 13 336 (26.1%) , Co V 13 356 (33.3%), Co A 12 322 (33.3%) showed moderate susceptible reaction towards internode borer compared to susceptible checks, Co A 99082 (55.8%) and Co A 92081 (61.9%).

Soil application of chlorantraniliprole 0.4G @ 22.5kg/ha (5.8%DH), fipronil 0.3G @ 25 kg/ha (5.87 %DH) at planting and 60 days after planting, spraying of chlorantraniprole18.5SC @ 375ml/ha (5.95%DH) at 30 & 60 days after planting found effective in controlling the early shoot borer compared to untreated control (20.58%DH).

Sett treatment with imidacloprid 600FS @ 1ml/lt + soil application of chlorantraniliprole 0.4G @ 22.5kg/ha (6.21%DH;19%;110.84t/ha) and fipronil 0.3G @ 25kg/ha at the time of transplanting and 60 days after transplanting significantly reduced the incidence of early shoot borer and internode borer and recorded superior cane yield (7%DH; 35.45%; 110.00t/ha) compared to untreated control (15.72%DH; 53.33%; 99.54t/ha).

In an on-farm trial soil application of chlorantraniliprole 0.4G @ 20 kg/ha (11.19%DH;

24%) and fipronil 0.3G @ 25 kg/ha (16.95%; 36%) were found effective in reducing the incidence of early shoot borer and internode borer and recorded 15.0% and 9.38 % increase in cane yield with a cost benefit ratio of 1:2.65 and 1:2.54 respectively, compared to check insecticide, carbofuran 3G @ 33 kg/ha (24.58%; 50%; 80t/ha).

Agricultural Research Station, Vuyyuru

Among 68 genotypes screened against early shoot borer all the genotypes reacted as less susceptible (below 15% incidence).

Application fertera 0.4 G @ 20 Kg /ha as basal, at 120 DAP and 180 DAP was effective in reducing the incidence of early shoot borer, internode borer and scale insect.

In sugarcane sett treatment with imidaclorid 600 FS @ 1 ml/ l + soil application of chloratraniliprole 0.4 G @ 20 Kg / ha at the time of transplanting and 60 days after transplanting was effective in reducing early shoot borer incidence.

Disease Management

Regional Agricultural Research Station, Anakapalle

Among 44 entries evaluated against smut under artificially inoculated conditions, eleven entries viz. Co 13023, Co 13024, CoC 14336, Co 13025, Co 13028, 2013 A27, 2013 A27, Co 13030, Co 13031 Co 13032, and CoA 14323 (2009 A 252) exhibited moderately resistant reaction.

Out of 44 entries, six entries viz.,87 A 298, Co 13028, Co 13030, Co A 14323 (2009 A 252), 2013 A 18 and 2013 A206 exhibited resistant reaction to the established pathotypes (Cf 419, Cf 671 and Cf 997) of red rot fungus under plug method of inoculation and 11 entries (Co 419, Co C 671, Co 997, Co 6907, Co A 14322 (2009 A 235), Co V 14356, Co 13032, Co A 14324 (2009 A 385), PI 14376, 2013 A177 and 2013 A212) under nodal cotton swab method of inoculation.

Out of 37 entries screened against YLD under natural conditions, 3 entries i.e., 2006 A 64, CoA 14323 (2009 A 252), Co A 14322 were recorded resistant reaction and the remaining are susceptible.

Eco friendly management of red rot indicated that the Rhizobacteria 7 and 19 are highly antagonistic to *C. falcatum* under in vitro conditions and sett treatment with *Rhizobacteria* increased sett germination and seedling vigour when compared to control.

The germination of virus infected single budded setts was enhanced by hot water treatment at 50^0C for 20 minutes or 51^0C for 10 minutes followed by carbendazim treatment.

Agricultural Research Station, Perumallapalle

Among the seventeen entries tested, the entry 2010 T 83 showed moderate resistant reaction against three red rot pathotypes, Cf 419, Cf 671 and Cf 997 both in plug method and cotton swab method while 2010 T 344 showed highly susceptible reaction to all the three pathotypes tested.

Agricultural Research Station, Vuyyuru

Sett treatment with propiconozloe @ 0.1 % was found to be effective in elimination of sett – born infection of smut which is primary source of inoculum.

Soaking of single noded setts of red rot susceptible cultivar, Co 997, in a suspension of *B. subtilis* and *B. siamensis* (2x109 cfu/ml) for one hour prior to planting in portrays enhanced the sett germination and seedling vigour index compared to control.

Spraying of sugarcane ratoon stubbles with 0.2% propiconazole and spraying of propiconazole 0.1% at 25 days after ratooning was found effective in control of smut in ratoon crop.

In red rot screening trial, the varieties 2010 V 32, 2010 V 146, 2011 V 127, 2011 V 226, 2011 V 154, 2012 V 19 and 2012 V123 were found to be promising in respect of yield and quality with additional advantage of horizontal resistance to all the three distinct pathotypes of red rot pathogen.

Out of 43 varieties evaluated to Smut disease, the varieties 2010 V 32, 2010 V 146, 2011 V 127, 2011 V 164 and 20129 V 127 were promising in yield and quality along with resistance to smut.

4.4 Tobacco

Crop Improvement

Regional Agricultural Research Station, Nandyal

The entry NyBTH 121 has exhibited good performance and included in IHT of All India Coordinated trials.

In advanced varietal trial II of bidi tobacco, the entries ABD-146 (2520 kg/ha), NyBD56 (2503 kg/ha), ABD-152 (2359 kg/ha), NBD277 (2355 kg/ha) & NBD 276 (2298 kg/ha) recorded significantly higher cured leaf yield compared to the checks A 119 (1831 kg/ha) & NBD 119 (1883 kg/ha).

The entries NyBTH-148 (2391kg/ha), NyBTH-147 (2328 kg/ha^{-1}) & NyBTH-140 (2218 kg/ha) recorded significantly higher cured leaf yield and are on par with the entries NyBTH-141 (2062 kg/ha), NyBTH-138 (2035 kg/ha) & NyBTH-143 (1972 kg/ha) compared to the checks MRGTH-1 (1592 kg/ha), A 119 (1480 kg/ha) & NBD 119 (1709 kg/ha).

Crop Production

Regional Agricultural Research Station, Nandyal

In ridge method of bidi tobacco transplantation recorded more yield (1673 kg/ha) than in flat bed method (1360 kg/ha).

In bidi tobacco, application of 110 kg nitrogen and 70 kg phosphorous once in every two years recorded cured leaf of 1350 kg/ha as against application of 110 kg nitrogen (1046 kg/ha) alone and without fertilizer application (713 kg/ha).

Cured leaf yield of bidi tobacco was significantly higher when foliar application of KNO_3 done twice at 45 and 60 days after transplanting (1783 kg/ha) than foliar spray with Ammonium Sulphate done twice at 45 and 60 DAT (1743 kg/ha). Whereas supplementation of N & K fertilizer twice at 45 and 60 DAT through Ammonium sulphate + Sulphate of potash has recorded maximum net returns of Rs. 80169 /- ha and Rs. 69645/- ha than was with KNO_3 spray done twice at 45 and 60 DAT.

Crop Protection

Insect Pest Management

Regional Agricultural Research Station, Nandyal

Spodoptera litura population was observed from 41st SMW to 43rd SMW, peak number of larva was noticed during 49th SMW (5.2 larvae/10 plants in 5 locations) and rynaxapyr (0.3 ml/l) was effective against *S. litura*.

B. DISCIPLINE ORIENTED RESEARCH

1. Agronomic Research

1.1 Cropping Systems and Farming Systems

Agricultural Research station, Utukur

Among the crops and cropping systems tested for performance under delayed monsoon conditions, castor crop recorded higher net returns (Rs 70,664) followed by cowpea as vegetable (Rs 65,175) and redgram (Rs 59,585) during August II fortnight, while at September I FN sowings , cowpea as vegetable (Rs 60,950) followed by castor + korra recorded higher net returns (Rs 47,552) and castor (Rs 42,764)

followed by horsegram (Rs 33,025) recorded higher returns during second fortnight sowings.

Among the treatments tested for nutrient dynamics in rice, application of recommended dose of fertilizers (80-60-40 kg NPK ha^{-1}) recorded higher grain yield (4756 kg ha^{-1}) followed by Farmers practice (150-60-40 kg NPK ha^{-1})(4516 kg/ha^{-1}).

Agricultural Research Station, Seethampet

In Rice-Rice system, the farmers practice of higher dose of NPK(102-65-62) recorded the higher system equivalent yields of 10299 kg/ha and net returns (Rs.67500/- per ha) compared to the zonal NPK+Zn treatment (7349kg/ha).

On farm diversified farming system module of Crop + Dairy + Vermicompst across 24 marginal tribal households indicated annual higher returns (Rs.55,600) over the bench mark value of farm returns (Rs.48,400) with the effective recycling of the residues in the systems by minimizing, the external inputs.

Introduction of small ruminant and back yard poultry are best enterprises in adding the returns of Rs.19,300 to 23,000 income of marginal and small tribal households in Srikakulam.

In Rice-sunflower cropping system, adoption of improved practices recorded 26 per cent increased seed yield over farmers practice with higher B:C ratio (3.65) and (2.13) respectively.

In Rice-pulse-Sesame cropping system, adoption of improved practices recorded 20-48 per cent increased seed yield over farmers practice. Similarly, the B:C ratio was higher in improved practices(5.73) than farmers practice(4.34).

1.2 Agro-Forestry

Agricultural Research Station, Kavali

Among the spacings adopted for Eucalyptus, higher plant girth (28.7cm) was recorded with 3.0 m x 1.5 m and application of 300 g nitrogen per tree recorded higher plant girth of 29.2 cm.

Among the Eucalyptus clones planted and maintained at ARS, Kavali, the clone BCM-23 recorded highest girth of 42.3 cm followed by BCM-571(41.9 cm). The lowest Girth was recorded with BCM-27 (21.1 cm). The average girth of clones was 21.8 cm.

In Simarouba adopting a spacing of 4 m x 4 m recorded higher plant height of 3.65 m followed by 6 m x 6 m (3.69 m) and application of 300 g N/plant recorded higher mean plant height of 3.66 m followed by 200 g N/plant (3.56 m).

1.3 Saline Water Management, Bapatla

Effect of sea water intrusion on ground water quality in coastal belt of Krishna Zone. A P

The analytical data of ground water samples collected from sea coast to 50 km inward indicated that a slight reduction in EC was observed in post monsoon samples, particularly in areas with high rainfall and the ionic ratios indicated that the seawater mixing is more towards inland than near coast due to high recharge of groundwater in coastal sandy soils.

Delineation and mapping of salt affected soils of Andhra Pradesh (Kurnool district)

Soil samples (0-25 and 25-50 cm) representing salt affected soils of Kurnool district (53 locations) revealed that the soils were slightly acidic to strongly alkaline (5.5 to 10.3) in reaction with normal to very high saline in nature(EC ranged from 0.3 to 33.0 dS m-1)

Studies at benchmark locations in Guntur district to monitor the changes in ground water quality and soil properties

Studies at benchmark locations in Guntur District to monitor the changes in ground water quality and soil properties indicated that, pH and EC were in the range of 7.9 (Potarlanka) to 8.60 (Nidubrolu I) and from 0.51 dS m-1

(Angalakuduru) to 1.8 dS m-1 (Nidubrolu I), respectively. Low sodium hazard (SAR) was observed in all soil profiles whereas, medium sodium hazard was observed with increase in depth.

Survey and characterization of ground water of West Godavari district (Revisiting the sites)

The results of characterization of ground water samples collected during survey from west Godavari district revealed that pH and EC of the pre monsoon samples ranged from 6.5 to 8.6 and from 0.3 to 26.0 dS m-1, respectively. The quality of irrigation water was found to be deteriorated as compared to earlier studies. Per cent good quality water declined to 58.3 as compared to 81.9 (1989-90) while, while the per cent of alkali water increased to 8.8 as compared to 0.1 (1989-90).

Screening of Newly released rice varieties for salinity tolerance

Among the varieties tested for salt tolerance at Bavanam varipalem village in Guntur , the highest grain yield was recorded by CSR 27 (6017 kg/ha^{-1}) followed by MCM-110 (5850 kg/ha^{-1}) whereas, the maximum straw yield was noticed with the variety CSR 36 (6150 kg/ha^{-1}) followed by MCM 110 (5500 kg/ha^{-1}).

Reclamation of abandoned aqua ponds

Adaption of reclamation practices in soil having the pH ranging from 7.9 to 8.5 and EC ranging from 30 to 74 dS m^{-1}, low in available N, medium in available phosphorus and high in K in Nizampatnam, Guntur during kharif, 2016-17, resulted in 17 to 18 % increase in yield over control, compared to non reclaimed soil.

Demonstration of reclamation technologies for Black Alkali Soils

Adaption of reclamation technology such as insitu incorporation of green manure @ 12 kg ac^{-1} at 50 % flowering stage, application of gypsum @ 2.5 t ac^{-1} and zinc sulphate @ 20 kg ac^{-1} to reduce the adverse effects of alkali soil in Rice crop (NLR-23334) , 6.25 to 31.25 % increase in yield was observed compared to non-reclaimed soil.

Effect of chemical and organic amendments in reclamation of salt affected soils under rice

Application of chemical and organic amendments like Bio compost @ 4t ha^{-1} along with gypsum recorded higher yield (5000 kg ha^{-1}) over only bio compost treatment (4630 kg ha^{-1})

Effect of neem coated urea on performance of rice crop

Application of 150% N through neem coated urea in rice crop, performed well over other treatments. The highest yield (4887 kg ha^{-1}) was recorded in the treatment received 150% N through NCU.

Agronomy

Studies on performance of safflower in alkali soils with different agronomic management practices

Performance of safflower in alkali soils with different agronomic management practices indicated that, the application of gypsum + FYM + 25% extra nitrogen in safflower grown in alkali soils resulted in better yield attributing characters and yield (seed and biological yield 1114 and 2477 kg ha^{-1}, respectively) followed by gypsum+25% extra nitrogen application treatment while, the lowest seed yield (530 kg ha^{-1}) was recorded in farmers' practice.

Influence of silicon on alleviation of salinity effect on rice

Among different sources of silicon nutrient tested on alleviation of salinity effect on rice , potassium silicate application recorded significantly higher grain yield (5686 kg ha^{-1}) and

straw yield (6237 kg ha^{-1}) when compared to control (grain yield 4631 kg ha^{-1} and straw yield:5118 kg ha^{-1}) and was on par with calcium silicate application in both grain and straw of paddy.

Agril. Engineering:

Micro (Drip) Irrigation system with saline water for different vegetable crops in coastal sandy soils.

The results indicated that the highest yield of cabbage, cauliflower and drumstick recorded with best available water (BAW) whose EC is 0.6 dS m^{-1} followed by 2 and 4 dSm^{-1}. Physiological damage of crops was observed with EC of irrigation water beyond 4.0 dS m^{-1}.

Use of saline water in shade nets for different vegetable crops in Krishna Western Delta

The mean yield of cabbage and cauliflower grown in shade nets (50% shade) followed the inverse linear equation with the salinity of irrigation. The production functions of cabbage and cauliflower were found to be following linear relationship in shadenets, whereas the same in open field cultivation followed exponential relationship, which presents a possibility of better control over irrigation water salinity stress in shade nets cultivation over open field cultivation.

Investigation, design, installation and evaluation of mole drainage systems in black soils of Andhra Pradesh for control of waterlogging

The results of one year study mole drainage systems revealed that, the temporarily waterlogged soils can be reclaimed with low cost mole drainage systems and addition of soil oxygenation agents (placement of Calcium peroxide granular powder @2 g/plant at 15 cm deep and 15 cm away from the plant) during monsoon season will ensure good aeration. The combined effect of mole drainage and soil oxygenation resulted in 25-38% increase in the sugarcane yields of Co 86032 variety.

2. Agricultural Engineering

Agricultural Research Station, Anantapuramu

In catchment – storage – command relationship for enhancing productivity results revealed that the pod yield increased to 12.2% and 33 % by giving supplemental irrigation by 10 mm and 20 mm, respectively.

Evaporation losses of water from farm ponds were effectively minimized by using bamboo mat or spray with steryl alcohol or silicon oil.

Higher pigeonpea equivalent yield was obtained with subsoiling at 1 m distance (331 kg/ha^{-1}) and was on par with subsoiling at 2 m distance (293 kg/ha^{-1}) and significantly superior to no subsoiling. Among crops tested, castor produced higher pigeonpea equivalent yield (396 kg/ha^{-1}), which is on par with Bajra (347 kg/ha^{-1}) and were significantly superior to other crops. Where as, subsoiling at 1 m distance produced higher net returns and among crops, Bajra produced higher net returns.

AICRP on Farm Implements and Machinery, College of Agricultural Engineering

The planter cum herbicide applicator developed as per design and specifications, was evaluated at farmers field in clay loamy and black cotton soils for direct sowing of paddy and It is completing planting of paddy seeds and herbicide application in single pass of operation with a field capacity of 0.4ha/h and field efficiency of 90% in both soils at 15-20 %(db) moisture content. Missing rate was observed as 4% for paddy seeds. Fuel consumption of 34 KW tractor while operating planter cum herbicide applicator was observed as 3 l/h. Cost of operation for planter cum herbicide applicator was observed as Rs.1200/ha.

Fig: Planter cum herbicide applicator working in field

Field evaluation of 7-row paddy weeder developed in terms of field capacity, field efficiency, percent of plant damage and weeding efficiency indicated that, the field capacity of weeder was observed as 0.16 ha/h at 1.2 KMPH with field efficiency of 64% in sandy soils. Percent palnt damage was observed as 15% as the all plants comes under machine wheels got damaged. Weeding efficiency was observed as 76%. The total manufacturing cost of the weeder was Rs 54000/-.

Field evaluation of developed paddy fertiliser applicator was conducted at Research farm at College of Agricultural Engineering, Bapatla in terms of field capacity, Field efficiency, and discharge rate. The discharge rate of fertiliser from applicator was observed as 1.45 kg/min at operating speed of 2 KMPH. Field capacity of applicator was observed as 0.16 ha/h at 2 KMPH with field efficiency of 62% in sandy soils as the lot of time was wasted in turnings. The total manufacturing cost of the self propelled fertilizer applicator is Rs 30000/-.

Fig: Self Propelled Fertilizer applicator

Developed Spraying applicator attachment and evaluated under field conditions at Research farm at College of Agricultural Engineering, Bapatla in terms of field capacity, Field efficiency, and discharge rate.The results indicated that the discharge rate of sprayer was observed as 9.5 lt/ min. at operating speed of 2.5 KMPH. Field capacity of applicator was 0.86 ha/h at 2.5 KMPH with field efficiency of 72% in sandy soils as the more time was wasted in turnings.

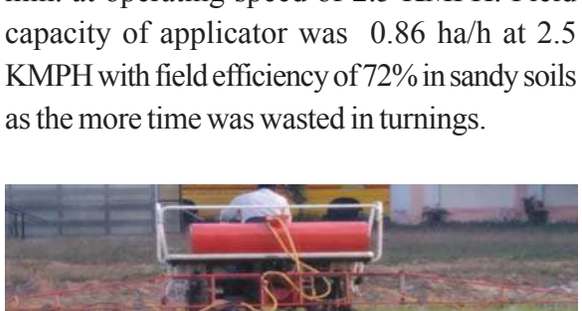


Fig: Self proplelled Paddy sprayer

Feasibility testing of CIAE Pneumatic planter for sowing cotton with popular BT varieties indicated that, seeds can be sown at 4-5 cm desired depth with recommended spacing of 90 x 30 cm at suction pressure of 2 kg/cm2. Field capacity of planter was observed as 0.3ha/h with field efficiency of 80% in clay loamy soils at 10%(db) moisture content. Fuel consumption of 34 KW tractor while operating planter was observed as 3 lt/h. Cost of operation for planting the cotton with the planter was observed as Rs.1500/ha.

Fig: CIAE Pneumatic Planter in Planting of Cotton

Feasibility testing of Commercial available Sonalika multi crop thresher was conducted for threshing blackgram in farmers fields for 30h in terms of, threhser output, seed damage percent , threshing efficiency and cost of operation.It was obtained that, at 13.4 percent seed moisture content, cylinder speed should be 12.2 m/s with 10 mm concave clearance while at 10.3 to 11.4 percent seed moisture content, cylinder speed should be kept 9.5 m/s with concave clearance of 15 mm. At 10.3 percent seed moisture content, the visible seed damage was higher (3.1%) while at 11.4 to 13.4 percent seed moisture content the breakage was in the range of 1.5 percent. It is therefore recommended that the blackgram crop should be threshed between 13.4 to 11.4 percent seed moisture content. The threshing efficiency was observed as 89% for blackgram at 12% moisture content. The average output of thresher was 4.8 q/h while the cost of threshing was Rs. 50 per quintal.

Fig: Multicrop thresher in working condition

Regional Agricultural Research Station, Tirupati

Complete mechanization of groundnut cultivation, the proper tillage with primary tillage implement has given better results and gave 15.9% more yield. The crop sown with control track system of sowing reduced about Rs. 1,400/acre expenditure on groundnut intercultural operations.

In sugarcane mechanization, standardization of technologies and development of suitable machinery for complete mechanization registered higher cane yield of 18% in main crop and 12% in ratoon crop.

Under feasibility testing of wet pod thresher, Proto type combine harvester was developed but requires lot of modifications.

4. Agrometeorology

Regional Agricultural Research Station, Tirupati

During 2016-17, ninety four weather based Agro-Advisory bulletins covering various aspects on different crops were prepared and disseminated to farmers of Chittoor, Kadapa and Nellore districts through phone, local newspapers, e-media and other channels to DAATTC, KVKS, NGO's and farmers, uploaded in several websites and broadcasted through All India Radio, Tirupati and Kadapa.

On verification of forecast during south west monsoon period the error structure for rainfall forecast both correct and usable put together was found to be 62%, whereas during North east monsoon period it is 91%.

Groundnut varieties (Narayani, TCGS1043, K-6,TMV-2, TCGS-1073, TCGS-1157 and TCGS-1416) sown during second fortnight of June performed better (1402 Kg/ha) compared to the crop sown during first fortnight of July (1164 Kg/ha) and second fortnight of July (1059 Kg/ha). Among the varieties TCGS-1073(1716 Kg/ha) recorded highest yield followed by TCGS-1157 (1479 Kg/ha) which is on par with each other. The heat use efficiency and heliothermal use efficiency was highest in June second fortnight sown crop compared with July first and July second fortnight sown crops. PNUTGRO Model under predicted the yield with error per cent ranging from -6.7 in TMV-2,-8.8 in Narayani and -18.7 per cent in Dharani.

Crop yield forecasting was carried out for Anantapur, Kurnool, Chittoor, Prakasam and Nellore districts under FASAL project during Kharif season for rainfed Groundnut crop in major Kharif growing districts of Andhra Pradesh for 2016. The F_2 forecasted yield ranged from 183 kg/ha in Anantapur district to 278 kg/ha in Nellore district in the state and the F3 forecasted yields ranged from 282 kg/ha in Anantapur district to 2782 kg/ha in Nellore district in the state.

Under Crop Weather Relationship in Sesamum, during *Rabi* 2016-17, sesamum varieties (Madhavi, Swetha til and YLM 66) sown during December II F.N has given highest yield (484 Kg ha-1) which was on par with crop sown during January I F.N (11-01-2017). Among different varieties YLM 66 recorded highest yield (409 Kg ha-1) which is similar to Swetha thil (407 Kg ha-1).

Under verification of Legume Crop Sequence in Southern zone of Andhra Pradesh, among different legume crops tried during summer, the highest *Kharif* groundnut yields (1405 kg/ha) were recorded when cowpea was taken as base legume crop before groundnut followed by farm yard manure applied treatment before sowing of groundnut (1363 kg/ha).

Regional Agricultural Research Station, Anakapalle

During 2016-17 , a total of 104 Agro Advisory bulletins were prepared district wise and communicated to farmers of Visakhapatnam, Viziangaram and Srikakulam and also communicated to the JDAs, Programme Coordinators of KVKs and Coordinators of DAATTC of respective districts for further dissemination to the farmers and local News papers and All India Radio and sent the weather forecast through mkisan portal and also uploading the advisory bulletins in IMD website.

Verification of weather forecast for rainfall was revealed that the rainfall prediction for the period from April, 2016 to March, 2017 was correct to the tune of 48.10 % while the prediction was correct to the tune of 64.81 % during South West monsoon.

Organised Farmers Awareness Programme on Climate, Weather and Crops to the Farmers

of Visakhapatnam district in all plain agricultural subdivisions (Total 7 programmes) with an amount of Rs. 70,000/- sanctioned by ATMA, Visakhapatnam.

In identification of suitable poly cropping system to rainfed areas of North Coastal Zone revealed that, intercropping of maize, bhendi, ragi, korra, greengram and groundnut with redgram in strips gave higher gross returns of Rs. 69, 285 /- per ha followed by intercropping of all crops in-between redgram in 1:1 ratio (Rs.60,873 per ha). Where as sole crop of ragi gave gross returns of Rs. 28,730/- per ha.

Agricultural Research Station, Anantapuramu

Analysis of rainfall during south west monsoon 2016 for the state of Andhra Pradesh revealed that out of 670 mandals, 142 mandals received excess rainfall, 319 mandals received normal rainfall, 189 mandals received deficit rainfall and 20 mandals received scanty rainfall.

In establishment of relationship between weather and incidence of leaf miner on groundnut and validation of prediction model indicated that, the intensity of leaf miner incidence was less in all the sowing environments. The no. of webs observed in all the sowing environments is less than 50 per m^2 both under control and protective irrigation treatments.

Pooled analysis of 2012-2016 revealed that the no. of webs per m^2 shown positive significant correlation with sunshine hours, rain free days and negative significant correlation with minimum temperature, afternoon relative humidity, wind speed and rainfall received during the previous 7 days.

Estimation of actual evapotranspiration and crop coefficients for groundnut revealed that highest pod yield was recorded with 0.8 IW/CPE ratio under all sowing environments and hence the crop coefficients developed by irrigating the crop at 0.8 IW/CPE can be used for realizing higher yields along with saving of irrigation water.

SMSs were communicated for 153 times to the farmers, different stake holders of the scarce rainfall zone farmers through m-kisan portal. Out of which 22, 79,243 farmers have been benefitted by these agro advisory services. In collaboration with reliance foundation 378 voice messages were communicated to the 24619 farmers of this zone on every Tuesday and Friday. These Agro advisory bulletins were telecasted in local cable in Kurnool district to around 234 villages covering 211 AAS bulletins.

During this year 2016-17, 93 weather based Agro-advisory bulletins were issued to the farmers through mass media (Newspaper and Radio), ATP channel, Project Director, Velugu, District Collector, NGOs and extension agencies and feedback from the farmers being collected.

5. Post-Harvest Technology

Post-Harvest Technology Centre, Bapatla

Designed and fabricated a single free standing, cylindrical in shape with conical hopper bottom with 2.5 ton capacity on-farm aeration bin.

Mechanical dried chilli bagging cum compaction machine and chilly calyx removal machine has been fabricated

The estimated storage (weight) losses for parboiled rice at FSD, Nalgonda in closed warehouse were found to be 4.18% after 36 months. At FSD, Nalgonda, the estimated storage losses were 2.48 % after 18 months for wheat in closed warehouse. At SWC, Vadlakonda, the estimated storage losses for parboiled rice in closed warehouse were 1.96 % after 24 months.

Biochemical changes in the organic and inorganic BPT 5204 Rice samples indicated that

there were no differences among the samples with respect to their primary metabolites viz., total sugar, protein, starch, amylose, amylopectin, rice bran oil content. However, the contents of secondary metabolites viz, Total phenols, tannins, flavonoids and ortho di-hydric phenols have been found more and also total anti oxidative activity is also considerably high in organic samples.

Among 18 rice genotypes of black, red and brown hull colour estimated total phenol content (TPC) and total antioxidant activity (AOA), the genotypes possessing black hull recorded high values for both TPC and AOA.

During storage mixing of black pepper powder @ 0.4% (no adults emergence) found very effective in controlling pulse bruchid in greengram compared to the untreated control (1530 adults emerged).

Efficacy of certain botanicals was tested. Among the plant powders tested for control pulse bruchid in blackgram, clove (3.5 adults), sweet flag rhizome (1.5 adults), and tobacco leaf powders (1.5 adults) were found effective as grain mixing at 0.4 compared to untreated control (587 adults).

Keeping sand layer of 3 cm over redgram, blackgram and greengram by filling the inter grain spaces successfully prevented bruchid infestation when stored in plastic bins (50 l capacity).

Model Agro Processing Centre for Rice, Pulses, Turmeric, Chillies have been established at PHETC, Bapatla.

Blackgram varieties TU 103, PU 31 and LBG 794; greengram variety LGG 595 and redgram variety LRG 117 were less preferred by the bruchids as oviposition and adult emergence recorded were less compared to other varieties.

Germination (93 %) and Milling Quality (55.8 %) of rice grain stored in hermetic bag (Grain Pro Grainsafe II TM) capsule of one tonne capacity were found superior than the grain stored in gunny bags (82 % and 47.6 %, respectively). Microbial load and insect infestation were also significantly less in hermetic storage compared to gunny storage.

Regional Agricultural Research Station, Anakapalle

Jaggery tablets prepared with and without binders met the India pharma Geopesia (I.P.) standards. To reduce cost and also to minimize usage of external binders, tablets prepared without using any binder for compression of jaggery into tablets will reduce cost and also minimizes the use of external binders. The jaggery tablets prepared without binder can be kept for storage for a period of 3 months under ambient temperature (28±2°C) at 60% RH..

Fabrication of vacuum pan including top pan, bottom cones, pan tube plate, calandria, catch-all, condenser and manhole for production of solid and granular jaggery was completed. The installation of the system is being under progress.

The fabrication of modified semi-mechanized edible films *(pootharekulu)* making machine was completed and was tested in West Godavari District. It was observed that, the machine was able to produce 1200 films per day of 8 hours, which is three times higher than traditional method of preparation of edible films for pootharekulu sweet and also the length of the films was double the size of the film, which was produced in traditional method and was able to produce the films under hygienic and smoke free environment. The thickness of the film was the same in both the systems. The cost of the machine is Rs.32,000-00. The cost economics shows that, net profit of Rs.1629-00 can be obtained by making edible films with the modified semi-mechanized edible films making machine, whereas net profit of Rs.450-00 can be obtained with the traditional method.

Fabrication of vibro siever, rotary juice filtration system, and pre heater, as a part of modernization of jaggery industry for production of export oriented solid and free flowing jaggery granules was completed.

Standardized the process technology for the preparation of various value added products from jaggery under value chain i.e., jaggery chocolates, oats-jaggery cookies, jaggery cakes, jaggery based mouth fresheners and jellies, and sold to the public at the Sale Counter, which was established by AICRP on PHET, RARS, Anakapalli.

Modified the steam boiling system by providing automatic water control and glass wool insulation for using bagasse and tested its efficiency. It was noticed that, the thermal efficiency of the steam boiling system was found to be 51%, where as thermal efficiency of traditional boiling system was found to be 41.6% in first boiling. Also, it was observed that, the thermal efficiency of the steam boiling system was found to be 60.1%, where as thermal efficiency of traditional boiling system was found to be 43.4% in second boiling.

6. Seed Research

Seed Technology Research and Production Center, Thangadancha, Kurnool

Germination percent of 80% was recorded in blackgram and greengram seed when stored upto for 10 months using 6 % wood powder or 2 % neem kernel powder or 6 % neem leaf powder at farmer level.

Soyabean seed treated with Hexane extract of Neem seed kernel @ 2.5ml/kg or Methanol extract of Neem seed kernel @ 2.5 ml/kg or Dithane M-45 @ 3g/kg or Calcium hypochlorite @ 2g/kg and stored either in cloth bag or polythene covers recorded germination above 70% at a room temperature of 25^{0}C and R.H 70.5%

Germination percentage was found to increase in Quinova seed treated with 1% P_4KH_2 for 6 hours in 1:1 ratio (Seed :Solution).

Seed Production

A quantity of 14,443 quintals of breeder seed was produced during 2016-17 against the target of 12401 quintals. Large quantity of breeder seed (3076 q) was produced in rice particularly in five varieties viz., BPT 5204, MTU 1001, MTU 1010, MTU 7029 and NLR 34449. Groundnut breeder seed 10297 quintals was also produced during 2016-17 against the target of 9140 quintals. In addition, 10,646 quintals of foundation seed was produced in different crops during the year 2016-17.

7. Agricultural Statistics

Regional Agricultural Research Station, Tirupati

"Fertilizer Planner based on Soil test values" was developed for the major crops, which will useful in finding the required quantities of fertilisers as per the university recommended nutrients instantly. Another programme in MS-Excel is developed to compute PIC (Polymorphic Information Content) for various markers with several varieties/lines in which one can get PIC value in a single cell and that can be simply dragged over markers to get PIC s for all markers simultaneously. Applied for copyrights for the software "ANGRAU Fertiliser Planner 2015" .

The outcome of study on Optimum Allocation of Agricultural Land to the Major Crops would be directly helpful to farmers who have multiple crops based on their available resources in order to achieve high profit at the face of uncertain prices/profits.

An automatized TM calculator for SSR markers using three methods viz., shortcut, Salt

adjustment and thermodynamics was developed. Similarly Fertilizer cost calculator cum planner as per the soil test values was developed and kept in RARS website for public use.

Under Capacity building Programme six one day training programmes were conducted on latest Statistical applications for scientists of Southern Zone.

8. Agricultural Biotechnology

Regional Agricultural Research Station, Tirupati

In rice crop the validation of the drought-specific markers between the donor, DrtIR64 and recipient variety, MTU1010 has been completed. The SSR markers linked to the drought tolerant QTLs RM279 for qDTY2.2 and RM555 for qDTY4.1 have showed clear polymorphism between donor and recipient lines. These polymorphic markers will be used as foreground markers for introgression of the drought tolerant QTLs into MTU1010.

In molecular breeding of rice (Oryza sativa L.) for heat tolerance, Temperature Induction Response (TIR) technique has been standardized using N22, Nipponbare and Dular, the three reported heat tolerant genotypes. Acquired Heat Tolerance studies conducted on 106 genotypes at sub-lethal (SL) temperature range of 38-55^{0}C, identified 14 extreme genotypes each under heat-tolerant and heat-sensitive classes were selected based on their survival of 80 -100% and 0-20%, respectively.

In molecular tagging study for the 'Mungbean Yellow Mosaic Virus In greengram molecular mapping of Yellow Mosaic Virus tolerance, an SSR marker SVGG7 loci, distinguished the YMV tolerant genotype from the susceptible genotypes unambiguously was identified. This marker can be employed in molecular mapping confirmation and further in marker assisted breeding for YMV tolerance.

MYMV tolerance' in mungbean, an SSR marker CEDG305 was identified to be distinguished the tolerant genotypes.

In groundnut as the DNA finger printing is mandatory for varietal registration, unique finger print profiles were developed for TCGS 1073, a groundnut variety with seven SSR markers to facilitate the breeders for the varietal registration at NBPGR.

In development of gene based markers for MAS of drought tolerance in groundnut, eleven groundnut genotypes viz., TCGS-1398, Kadiri-9, TCGS-1157, TCGS-1073, TCGS-1173, MLTG-4, Kadiri-6, Narayani, TPT-1, ICGV-07132 and ICGV-0707 were screened for drought tolerance in pot culture experiment and also in rainout shelter in Kharif 2016. MLTG4 and TCGS 1157 were turned out to be more drought tolerant and in contrast to Kadiri 6 and Narayani, which are more sensitive to water stress.

CDNA-RAPD profiles were developed with RAPD markers like OPA18, OPA4, OPC4, OPC5, OPC7, OPC16, OPD7, OPD10 and OPD11 between contrasting genotypes for moisture stress in comparison with well watered control. Differential expression was observed in transcripts amplified with OPA18 at 80 DAS, OPA4 at 60 and 80 DAS, OPC5 and OPC7 at 70 days.

9. APICULTURE

Agricultural Research Station, Vijayarai.

Highest *Tetragonula* workers with pollen loads were recorded at 1.00 pm (4.99/5 min) and with nectar were at 3.00 pm (18.31/5 min).The number of outgoing forages were highest at 9.00 am (17.08/5 min).

Highest brood development was recorded during April,2016 in colony no:3 (9141.00cm3) followed by November & December , 2016

(5784.48 & 5183.55 cm3) of of *A.cerana* super chamber colonies due to the availability of more space for brood expansion . Lowest brood rearing was observed during February,2017(553.41 cm3) and September , 2016 (684.93 cm3).

Highest Honey pots were recorded during the month of May, 2016 (4758.00 cm^3) & August, 2016 (3143.44 cm^3) in *A.cerana* super and brood chamber colonies. Lowest honey stores (pots) were recorded during November, 2016 (100.22 cm^3) in A. cerana super chamber colony and June, 2016 (198.24 cm^3) in Bamboo node hive.

Highest incoming *A.mellifera* workers were recorded at 10.00 am(26.45/5 min) in natural pollen fed colonies followed by PAU pollen substitute fed colony workers at 1.00 pm (25.22/ 5 min).The number of outgoing forages were highest at 1.00 pm in PAU pollen substitute fed colonies (23.91). Highest number of incoming workers were recorded at 10.00 am (20.31) in sugar syrup fed colonies.

Apis mellifera consumed 91.09% of natural pollen , where as the percent consumption of PAU pollen substitute was 73.58%.Cent percent of sugar syrup was consumed by the colonies fed with sugar.

10. Agro-Economic Research

Regional Agricultural Research Station, Anakapalle

For North Coastal Zone, the cost of cultivation per hectare was worked out for crops such as sugarcane (Irrigated- plant crop Rs 1,81,610, ratoon crop Rs 1,32,280), rice (Rs78,,852), maize (Rs 1,00,452), groundnut (Rs 59,110), ragi (Rs 63,050), redgram (Rs 29,750), Rice fallow Blackgram (Rs 13,738), Rice fallow Green gram (Rs 14875), sesame (Rs 22,000) and mesta (Rs 71,320).

Forecasted monthly price range of jaggery (per quintal) in Anakapalle Market for April 2017 to March 2018 are Rs 3562 to 4792, Rs. 3227 to 4329, Rs. 3284 to 4510, Rs. 3691 to 4901, Rs. 3391 to 4725, Rs. 3215 to 4467, Rs. 3449 to 4915, Rs. 3590 to 4840, Rs. 3456 to 4843, Rs. 3645 to 5185, Rs. 3438 to 5138 and Rs. 3505 to 5034 respectively.

Regional Agricultural Research Station, Lam

The area of Rice fallow blackgram was 17.32 per cent more when compared to previous year (2,21,625 ha) and 25.97 per cent more to normal area (2,06,406 ha) in the zone and the areas of Rabi rice and greengram was shifted to the blackgram to some extent due to better remunerative price realized by the farmers during 2015-16

The Return on rupee of investment of paddy-paddy, Rice-Blackgram, Rice-Greengram, Rice-Maize and Rice-Jowar were 0.05, -0.21, -0.22, 0.06 and 0.12 and the cost of production (Rs/ q) were 1799.91/-, 2364.23/-, 2352.14/-, 1672.14/-, 1655.13/- respectively

In paddy, the labour costs accounts 47-50 percent to total costs. The variable and fixed cost accounts 70.21 and 29.79 percen,t respectively. The paddy farmers recorded 65.20 q /ha and realized Rs 8084 per ha as net returns. The cost of production was Rs. 1763.06 per quintal. Return on rupee of investment was 0.07.

During 2016-17, in cotton, sugarcane, bengalgram, chillies, redgram, turmeric and tobacco, the farmers realized 0.10, -0.26, 0.25, -0.24, -0.43, 0.02 and -0.36 as Return on rupee of investment, respectively.

The per quintal cost of production of cotton, sugarcane, bengalgram, chillies. redgram, turmeric and tobacco was Rs.4700.82/- ,Rs.3383.34/-, Rs.4140/-, Rs.6923.37/- , Rs.7489/-, Rs.5279/- and Rs.18980/-, respectively

The cost of production per quintal of paddy in Direct seeded Rice was Rs.1463/- where as in traditional transplanting paddy, it is 1750/- The additional benefit of Rs.21211/- per ha. For DSR adopted farmers due to less cost of cultivation and slight increase in yields.

The cost of production per quintal and return on rupee of investment of Transplanted paddy ,Farm Mechanization in Paddy Rs 1775.23 /- ,Rs.1551.16/- and -0.08, 0.11 respectively

11. AINP on Biofertilizers, Amaravathi

A total of 208.6 Metric tons of Powder biofertilizer formulations and 39.0 Metric tons of liquid biofertilizer formulations to a worth of Rs. 200.8 lakhs were produced and supplied to the farming community of Andhra Pradesh during the year 2016-17.

All the biofertilizers were produced with high quality standards and performed well against quality control tests.The Bacterial population in the Biofertilizer packets ranged from 5.0 x 108 to 5.7 x 109 per gram of inoculums.

Highest the plant growth and yields were obtained in cluster bean with application of Rhizobium + PSB+ FYM and chemical fertilizers at 75% and 25% RDF.The yield and growth parameters were reduced without any biofertilizers except in case of 100% RDF.

Isolated and purified a potential Rhizobium strain for inoculating Biofuel plant of Pongamia. The Rhizobial strain of APG -2 has nodulated 55% more than uninoculated plants. The dry matter production has been increased by 36% over control.

In Redgram crop, liquid inoculants of Rhizobium + PSB with 50% RDF(2086.5kg/ha) gave 24% higher grain yield over powder biofertilizers + 50% RDF treatment(1624.4 kg/ha^{-1}) during 2016-17.

Over all by application of biofertilizers we could able to save 50% of chemical fertilizers with an extra benefit of 14.7% yield increase over 100% RDF in pigeonpea crop during 2016-17.

Application of liquid Biofertilizers *(Rhizobium+PSB)* enhanced blackgram grain yields by 32.8% over the control whereas with the carrier based inoculants the enhancement was 22.8% over the control.

Developed two microbial consortia of "Decompo A and Decompo B. " containing compatible bacterial and fungal cultures respectively.Maize straw was decomposed with in a period of 50 days and compost reached to full maturity stage by application of microbial cultures of Decompo A and Decompo B.

A novel thermophilic facultative anaerobic bacterial strain has been developed for effective decomposition of agricultural crop residue

Among five potash releasing bacterial isolates, KRB 111 isolate showed the maximum solubilisation index of 6.33 and released maximum quantity of Potassium in the liquid broth.

12. Agricultural Extension

Regional Agricultural Research Station, Tirupati

A mobile application "Mana Verusanaga" was developed on Android plat form with all the cultivation practices of Groundnut from seed to seed in Telugu language. The app was developed with complete technological packages with pictorial naviation.The app can be downloaded from GOOGLE PLAY STORE by searching "mana verusanaga" or "angrau". So far, 2000 farmers, extension personnel and others downloaded the mobile application.

Regional Agricultural Research Station, Lam

Perception and adoption of soil health cards (SHCs) by the farmers in Krishna zone revealed

that majority of the respondents (75.49%) had medium level of adoption followed by low (14.71%) and high (9.80%) levels of adoption, respectively in Guntur. Forty six per cent of the respondents had medium level of adoption followed by low (39. 2%) and high (14.4%) levels of adoption respectively, in Krishna and majority of the respondents (40.54%) had low level of adoption followed by medium (36.49%) and high (22.97%) levels of adoption respectively in Prakasam.

Regional Agricultural Research Station, Anakapalli

A demonstration was conducted on zero tillage maize in the adopted village after harvest of kharif paddy. The results showed net returns of Rs6,718/acre with B:C ratio of 1.40:1 with zero tillage technique in maize crop.

Demonstration on "Profitability of Mary gold cultivation" in the adopted village at Lakkavaram showed higher net returns (Rs48,200/- per acre) with B:C ratio of 2.60:1.

Overall Perception of Farmers, towards Impact of Climate change on Agriculture, Human health and Animal Husbandry, majority of the respondents come under Low category fallowed by medium and high. Most of the farmers know that there is an adverse effect of climate change on decreased yield and increased temperatures. Very less percentage of people know about the mitigation strategies to climate change.

V. EXTENSION

Extension is one of the three mandates of the ANGRAU which reads "Assist the Development Departments of Government in the process of dissemination of the improved agricultural technologies to the farmers of the State". Education of rural people in agriculture and allied areas is one of the main functions of agriculture extension through frontline demonstrations/on-farm trials/extension services.

The organogram of the University extension services is given in the Fig. 8. The extension services and activities of the ANGRAU are described in figure 8.

I. EXTENSION SERVICES

The extension services of ANGRAU are being offered through the following extension centers.

1. District Agricultural Advisory and Transfer of Technology Centres (DAATTCs)
2. Krishi Vigyan Kendras (KVKs)
3. Farmers Call centre
4. Agricultural Information & Communication Centre (AI & CC)
5. Extension units in RARSs

1. DISTRICT AGRICULTURAL ADVISORY AND TRANSFER OF TECHNOLOGY CENTRES (DAATTCs)

In ANGRAU, 13 DAATTCs are functioning one each at 13 district headquarters of Andhra Pradesh located either in Agricultural Market Committees or Regional Agricultural Research Stations/Agricultural Research Stations with a multidisciplinary team of 3 Scientists mainly consisting of Crop Production, Crop Protection and Agricultural Extension.

2. KRISHI VIGYAN KENDRAS (KVKs)

Krishi Vigyan Kendra (Farm Science Center) is a science / technology led, farmer centric institution, established with the purpose of providing knowledge and skill training to the farmers, rural youth and field level extension workers. Vocational training in agriculture and allied fields through KVK has become the need of the hour for ensuring livelihood security and enhancing farm income which envisages to be doubled by 2020. The farmers not only require knowledge and understanding of intricacies of new technologies but also more skills to adopt the same in varied and complex field situation on their farms. In view of this, the role of KVK was further enhanced by adding the responsibility of on-farm testing and front line demonstrations of major agricultural technologies to dovetail the same with location specific environment. In order to equip the present day farmers to face the challenges of information explosion and to bridge the digital divide, KVKs were also given the other responsibility of acting as knowledge and resource centre of agriculture and allied technologies. The use of ICT by KVKs has been substantial to provide necessary and timely information on weather, markets and solutions to various day to day problems faced by the farmers. ICAR has sanctioned 13 KVKs under the administrative control of ANGRAU in Andhra Pradesh. A new KVK in Visakhapatnam district was sanctioned under the control of ANGRAU started its functioning from December 2016.

3. FARMERS CALL CENTRE

Andhra Pradesh is the First and foremost state in the country to establish "Farmers Call Centre" on July 1st, 2003 with an innovative idea of transferring scientific agriculture technology to

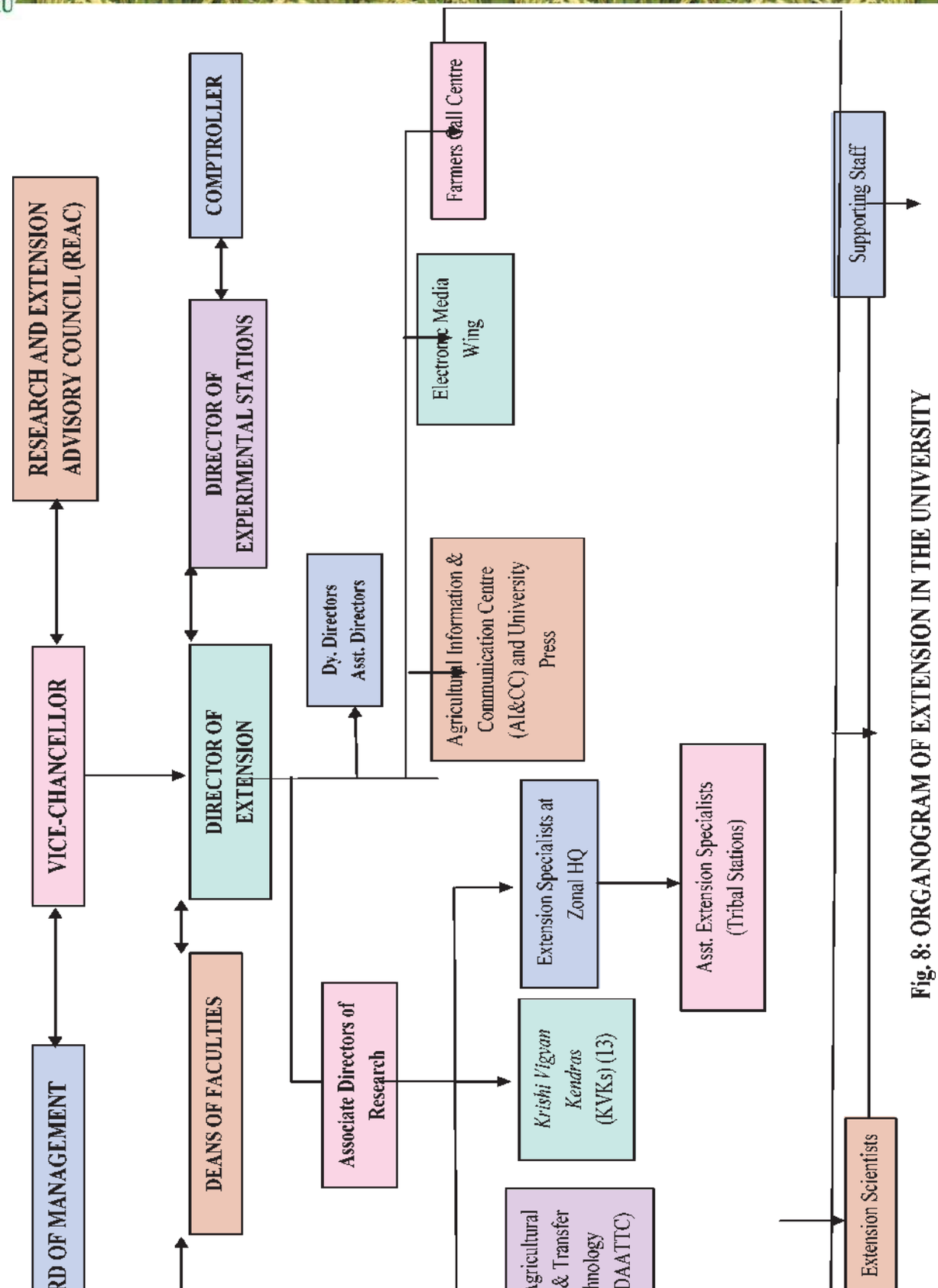


Fig. 8: ORGANOGRAM OF EXTENSION IN THE UNIVERSITY

the farming community. The Govt. of Andhra Pradesh launched "Parishkaram Call Centre" with agriculture service as its pilot project in cooperation with scientists of Acharya N.G. Ranga Agricultural University. It is accessible to the farmers of Andhra Pradesh on toll free numbers 1100 or 1800 425 4440. There are three specialists of Crop production, Crop protection, Horticulture and one from Department of Agriculture for answering the queries of farmers. Presently call centre is functioning from 10:00 am to 5:00 pm on University working days.

Since inception of the call centre, farmers from different districts of Andhra Pradesh utilized its services and benefited by taking suggestions from the Scientists of Acharya N.G. Ranga Agricultural University on various crops.

During 2016-17, 2137 calls received from different districts of Andhra Pradesh and utilized the services and benefited by taking suggestions from the Scientists of Acharya N.G. Ranga Agricultural University on crop production technologies.

Agricultural Information & Communication Centre (AI&CC):

This centre is responsible for processing of latest agricultural information generated by the university and transfer of technology to the farming community in the state through various publications and media combinations.

Electronic Wing:

After bifurcation of the University, the Electronic wing started its functioning during 2016 to promote e-extension and support TV channels and develop DVDs on various crops and technologies.

II. EXTENSION ACTIVITIES

The significant highlights of the extension activities carried out during 2016 – 17 are presented below

1. TECHNOLOGY ASSESSMENT AND REFINEMENT (TAR)

Minikits :

During the year 2016-17, the District Agriculture Advisory & Transfer of Technology Centres (DAATTCs-13 no.) and Krishi Vigyan Kendras(5 no.) together have tested 47 minikit cultures of 12 crops i.e., Jowar, Bajra, Ragi, Korra, Redgram, Blackgram, Greengram, Bengalgram,Groundnut, Cotton and Chillies at 1773 locations covering all the districts of the state.

On-Farm Trials (OFTs):

"On Station Research-assessment on farmer fields-extension" is a continuum culminating in the assessment and dissemination of profitable technologies to the farmers. Technology assessment and validation are crucial intermediate steps between research and extension to promote location specific/relevant technologies for adoption. Hence technology assessment under farmer's field conditions assume greater importance to validate the technologies generated at research stations so that appropriate feedback may be provided to the research scientists for suitable modification.

During 2016-17, a total of 122 technologies in field crops (62), Horticultural crops (38), Fisheries (13) and Homescience (9) assessed in 613 locations by KVKs and DAATT Centres assessed about 107 technologies in field crops (106) and in Horticultural crops (1) in 347 locations.

Front Line Demonstrations (FLDS):

KVKs and DAATTCs organized frontline demonstrations (FLDs) to disseminate the

production potential of important varieties and various production technologies at several locations-specific farming agro–ecological situations. Training programmes and field days were organized to the farmers and extension functionaries for rapid dissemination of improved technologies.

During the year 2016-17, a total of 1215 frontline demonstrations covering 670.40 ha under pulses, cereals, oilseeds, commercial crops, horticulture crops, fodder crops and livestock areas.

2. DIAGNOSTIC FIELD VISITS

Periodic diagnostic surveys during the crop growth period and providing timely advices to overcome the maladies identified were the most important activity of the DAATTCs, KVKs and Extension Specialists. In order to make the diagnostic surveys effective, capacity building programmes were organized regularly to the scientists working in the TOT centres on latest technological developments, survey and surveillance procedures and diagnosis of pests and diseases in different crops. During 2016-2017, a total of 2508 diagnostic surveys were undertaken in different districts of the state. Out of 2508, 738 surveys were undertaken by the DAATTC scientists and ESs alone and 956 by KVKs alone while 814 surveys were conducted jointly by the DAATTC, KVK, ARS Scientists and Officers of DOA.

Major biotic and abiotic stresses identified in different crops and handled through diagnostic surveys are given below

Rice	Leaf folder, panicle mite, blast, sheath blight, stem borer and BPHBPH, leaf folder, sheath blight, blast and false smut, leaf blast, neck blast, sheath rot, stem rot, bacterial leaf blight, annelids, moisture stress in nursaries,znic deficiency,gallmidge.
Maize	Stem borer, pink stem borer in rice fallow maize, Shoot borer, *Tursicum* blight sheath blight), leaf blight, wilt, charcoal rot, banded leaf and sheath blight.
Jowar	Aphids in rice fallow Jowar
Greengram & Blackgram	*Spodoptera*, Flea beetles, *Maruca* pod borer, aphids, stem fly, white fliesPowdery mildew, C*ercospora* leaf spot, *corynospora* leaf spot, YMV, bud necrosis, leaf curl.
Redgram	Pod borers (*Helicoverpa* and *Maruca*), pod fly, leaf folder, wilt, sterility mosaic disease, rust, YMV, moisture stress, aphids
Bengalgram	pod borers (*Helicoverpa*, *Spodoptera exigua*, *S. litura*), wilt and dry root rot
Cotton	Sucking pests (Aphids, Thrips, Leaf hoppers, Whiteflies, Mealy bugs), mites, pink boll worm, *Earias*, *helicoverpa* damage, *Spodopetra* damage, root rot, *Fusarium* wilt, boll rot, desiccation,Tobacco streak virus, para wilt and micro-nutrient deficiencies.
Groundnut	Leaf miner, root grub, *Spodoptera*, thrips, mealy bugs, aphids, jassids, leaf webber, thrips, red hairy caterpillar, dry root rot, collar rot, tikka leaf spot, stem rot, bud necrosis, late leaf spot, PBND, PSND and micro-nutrients deficiency.
Sesame	*Alternaria* leaf spot, thrips and leaf webber.
Castor	Sucking pests and capsule borer

Sugarcane	Early shoot borer, mealy bugs, rust, whip smut, yellow leaf syndrome, mosaic, top rot, grassy shoot, wilt, scale insect, red rot and Fe deficiency.
Chillies	Leaf curl virus, sucking pests, Gemini and cucumber virus, fruit rot,die back, tobacco caterpillar, fruit borer.
Tomato	Bacterial wilt, early and late blight, South American leaf miner, bacterial leaf and fruit spot, fruit borer and viral diseases.
Brinjal	Shoot and Fruit borer, white fly, ash weevil, red spider mite, bacterial wilt, root rot.
Onion	Thrips, purple blotch and blight.
Cashew	Thrips,Tea mosquito bug, root and stem borer.
Mango	Leaf hoppers, thrips,mealybugs, powdery mildew and fruit fly.
Banana	Rhizome weevil, nematodes, *Spodoptera*, Panama tegulu, sigatoka leaf spot, soft rot, root rot, bunchy top, bract mosaic virus, K, Zn deficiencies.
Papaya	White fly, sucking pest, red palm weevil, mealy bugs, leaf curl virus, ring spot virus, Zn, B deficiency.
Guava	Mealy bug, white fly, Fruitfly.
Watermelon & Musk melon	Mite damage, red pumpkin beetles, *Spodoptera*, sucking pest, leaf miner, Fruit fly, Bud necrosis, downy mildew, viral diseases, B deficiency (fruit cracks).
Sweet orange	Mites, white scales, root rot, Micro nutrient deficiencies.
Acid lime	Aphids, mites, black flies, thrips, mealy bugs, leaf miner, citrus butterfly, canker.
Sweet orange	Gummosis
Turmeric	Rhizome fly, rhizome rot, leaf spot.
Marigold	Tobacco caterpillar
Water melon	Sucking pests and bud necrosis
Fisheries	Fish mortality due to Argulus disease

3. CAPACITY BUILDING PROGRAMMES

Various capacity building programmes viz., trainings, skill teachings, vocational trainings, group discussion, fields days and rythu saddassus were organized to build the capacity of clientele groups covering crop production and protection technologies of field and horticulture crops, home science and fisheries by DAATTCs, ESs and KVKs during 2016-17. About 157 capacity building programmes to Extension Personnel, 668 programmes to Farmers and farm women,116 programmes to NGO's, 478 Method demonstrations,52 Vocational training programmes, 23 AMC level farmers training, 102 Rythu sadassus, 1063 Group discussions and 189 Field days organized for the benefit of the farmers etc.

3.1 Extension Personnel

The DAATTCs and KVKs conducted 157 training programmes and trained altogether 8507

Extension Personnel. The training programmes included IPM, INM and IWM in maize, groundnut, pulses and oilseeds; soil test based fertilizer application; soil health and fertility; water use management and weed management in different crops; alternate ID crops to rice etc.,

3.2 Farmers

A total of 668 training programmes were conducted, covering 21736 farmers and farm women by the DAATTCs and the KVKs. These programmes have focused on latest production technologies in crops such as rice, maize, sunflower, pulses, groundnut, fiber crops and vegetables. They also included aspects like soil test based fertilizer application, climate resilience agriculture, value addition to millets, use of bio-fertilizers, vermi compost, sheep and goat rearing, integrated farming system, farm mechanization, formation and management of Self Help Groups, farmers' organizations, preparation of low cost nutritious diet, preparation of value added multi grain products, weaning foods for infants and amylase rich food preparations etc.,

3.3 NGOs

One hundred sixteen (116) training programmes were conducted benefitting 4919 personnel of NGOs, Banks and others. The training programmes covered particularly aspects like soil test based fertilizer application, plant protection measures in vegetables, critical interventions in production technologies and cost reduction technologies in agriculture, horticulture and animal husbandry, vermicompost, bee keeping, soil health management, seed village programme, integrated storage pest management and long term-storage of cereals.

3.4 Skill Development Trainings :

Agriculture and allied activities accounts for about 15.7 per cent of country's GDP and is estimated to employ about 124.7 million people as cultivators and 106.8 million as agricultural labour. Besides this agriculture industry employs a large number of people in the organized and unorganized sector where there is huge demand for human resources with specific set of skills. Agriculture Skill Council of India (ASCI) under with a vision of creating a sustainable industry aligned eco system for robust skill and entrepreneurship development in agriculture & allied sector is promoting skill development programmes in agri and allied sectors in the country on several job roles.

KVK, Undi, West Godavari with the financial assistance of ASCI, New Delhi conducted skill training programmes of 200 hours duration on two job roles viz., quality seed grower and organic grower each with 20 participants. The details of the trainees were entered into the Skill Data Management System (SDMS) to facilitate lending by banks and placement/wage earning of the trainees.

3.5 Vocational Trainings

One of the important mandates of the Krishi Vigyan Kendras is to organize vocational training for self-employment. During the year 2016-17, ANGRAU KVKs (13) together organized 52 vocational training programmes benefitting 1972 participants (farmers, farm women & rural youth). The areas of vocational training include value addition to millets, fruits & vegetables (18 no.),

nursery raising for seedling production of vegetables and fruits (6 no.), mushroom production (6 no.), bakery products preparation (3 no.), vermi compost preparation (2 no.), jute bag making (2 no.), tailoring (2 no.), value addition to fish and prawn (1 no.), bee keeping (1 no.), seed production (1 no.), integrated farming system (1 no.), friends of coconut trees (1 no.), hydroponic fodder production (1 no.), rejuvenation of old orchards (1 no.), soil sampling, testing and analysis (1 no.), efficient water management practices for higher water productivity (1 no.), water quality management (1 no.), feed and disease management in fish and prawn (1 no.), bio-char production (1 no.), tie & die of fabrics (1 no.) and home needs (1 no.) .

3.6 Group Discussions

The DAATTCs and KVKs had altogether conducted a total of 902 group discussions for 15462 farmers, which included topics like Green manure crops before rice, weed management in direct sown rice, zero tillage in maize, management of YMV in pulses, production technology for summer pulses, IPM in groundnut, management of Botrytis grey mildew in castor, good agricultural practices in cotton, budchip method of planting in sugarcane, seed production at farmers level, *kharif* contingency plan, management practices in vegetable crops, plant protection in mango, Nutritional gardening, Techniques in Vannamei culture, feed management in carp culture, management of acidic and alkaline soils, agriculture farm machinery, importance of drudgery reducing implements etc.

3.7 Field Days

A total of 151 field days were conducted by DAATTCs and KVKs and benefited 4396 farmers. These included field days on varieties of rice (MTU 1061, NDLR 47,), sugarcane, groundnut (Dharani, TCGS 1073), redgram, blackgram (LBG 752), MSRI in rice, sunflower, drum seeder technology in rice, zero tillage cultivation in maize, soil test based fertilizer application in paddy, management of foliar diseases in cotton, liquid bio fertilizer in rice, captive rearing of fish etc.

4. KISAN MELAS:

The Acharya N.G. Ranga Agricultural University has been organizing Kisan Melas at various research stations and colleges throughout the state to create awareness and to educate farmers about latest farming technologies and developments. Kisan Melas provide an opportunity to see the latest technologies, live demonstrations, informative agricultural exhibitions, interaction with the scientists, input agencies and inculcate the habit of visiting research stations frequently for timely advices. Kisan Melas were organized at RARS, Maruteru, Nandyal and Chintapalli during the period under report. on the occasion of World Soil Day on 5th December, 2016, eight, Kisan Sammelans (pre-*rabi*) were organized at viz., KVKs Rastakuntubai, Undi, Garikapadu, Ghantasala, Darsi, Nellore, Kalikiri, Banavasi

5.NFDB SPONSORED HRD PROGRAMMES IN FISHERIES

In order to enhance the skills of the farmers and farm women involved in aquaculture, a collaborative programme with National Fisheries Development Board, Hyderabad organized six training programmes on various aspects of fisheries involving three KVKs (Amadalavalasa, Undi and Nellore) in the University with financial support from NFDB.

A total of 120 fish farmers and farm women gained knowledge and skills during the human resources development training programmes on culture, capture, value addition, disease management, breeding of fish, water quality management in fish ponds and integrated farming etc.,

6. DISTANCE EDUCATION

With globalization and highly diverse micro-farming situations present in the state, electronic media with wider reach need to be exploited to educate farmers on situation specific technologies viz., efficient use of inputs in sustainable and export oriented agriculture, post-harvest handling, market information etc. The ANGRAU is one of the few Agricultural Universities in the country to start distance education through a private TV channel, ETV under "Annadata- Velugubata" programme from 2nd October, 1998 twice a week, Tuesday and Friday. To facilitate these efforts, initially 'Electronic Media Wing' was established during 2001 to promote e-extension, however after bifurcation of the University it again became functional from July, 2016.

7. PHONE IN LIVE PROGRAMMES:

Phone in live programmes were telecast through the following chanels.

I.Pasidipantalu (Doordarshan):

On Wednesday and Friday, Pasidipantalu Phone–in-Live programme on agriculture and allied subjects is being organized by Doordarshan in which a scientist from the university will answer the questions asked by the farmers on a pre-informed topic for the day from 6.00-6.55 PM. The Electronic Wing identified the topics and the resource persons for 28 programmes telecasted on Doordarshan phone-in-live programme during the year 2016-17.

II.Annapurna (TV5): The phone in live programme was initiated in September, 2009 as part of Annapurna programme of TV5. The programme will run for three days in a month on first three Thursdays on agriculture and allied subjects in which a scientist from the university will answer the questions asked by the farmers on a pre-informed topic of the day, from 5.30 to 6.00 PM. Five prorgammes were telecasted during the year 2016-17.

III.Vyavasaya Patasala in All India Radio (AIR)

The Vyavasaya Patasala programme was broadcasted on every Monday in All India Radio (AIR) and a total of 9 programmes were broadcasted using the services of ANGRAU scientists.

IV.Electronic Wing Blogspot (www.angrauew.blogspot.in)

A blog has been designed for the Electronic Wing, Guntur with main objective of providing an

opportunity to the viewers to see the advisories and other resources digitally for quick access across the globe.

V.Vyavasaya Suchanalu in Telugu Dailies

In order to have wider dissemination of the technologies generated by the University, ANGRAU is regularly contributing technical content for Vyavasaya suchanalu weekly for publication in telugu daily newspapers in 13 districts of Andhra Pradesh since 2014.

Farming community have been alerted on weekly about the measures to be taken up in different crops through Sagubadi Column of Sakshi daily on every Monday from 2014 and in Andhra Jyothi and Agri plus column of Prajasakti from 2017.

8.TECHNICAL PUBLICATIONS

Agricultural Information and Communication Centre (AI & CC), Guntur has brought out the following publications during the year 2016-17.

Vyavasaya Panchangam 2017-2018

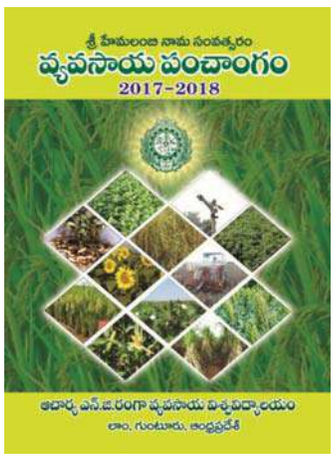
Journal of Research, ANGRAU (Quarterly)

Vyavasayam – Monthly Telugu Farm Magazine

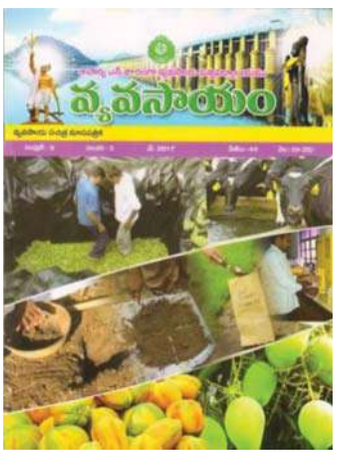
Research & Extension Highlights 2015-2016

The Vyavasaya Panchangam 2017-18 was released by the Hon'ble Chief Minister of A.P Shri.N.Chandrababu Naidu, on the eve of Ugadi day celebrations held at Vijayawada.

Release of Vyavasaya Panchangam 2017-18 by Sri. N. Chandrababu Naidu, Hon'ble Chief Minister of Andhra Pradesh on UGADI day celebrations held at Vijayawada



Vyavasaya Panchangam



Vyavasayam monthly magazine

The Journal of Research ANGRAU

9. DIPLOMA IN AGRICULTURE EXTENSION SERVICES FOR INPUT DEALERS (DAESI)

Three KVKs namely Reddipalli, Banavasi and Nellore have organized one year long duration training under DAESI programme for 120 inputs dealers organized during 2016-17 to transform them as para-extension professionals. The trainings were organized as classroom teaching and field visits during Sundays or on local market holidays. The field visits intended to acquaint the input dealers with location-specific field problems and expose them to relevant technologies. The programme is spread over a period of 48 weeks, with 40 classroom sessions and 8 field visits to various institutions and farmers' fields. Study material in local language is provided and multi-media instructional devices are used in the classrooms.

Training to input dealers under DAESI at KVK, Nellore

Field visit to the input dealers

10.TECHNOLOGY WEEKS

In order to sensitize the farmers about the technologies at Instructional farm and inculcate the habit of visiting KVKs and also for direct interaction of farmers with the scientists, technology week for a duration of 3-5 days were organized at KVKs of Amadalavalasa, Rastakuntubai and Reddipalli, benefitting 1926 farmers and created awernesss on soil health management, farm mechanization, entrepreneurial activities, home science technologies, horticulture, animal health camps and fisheries technologies.

11.ATTRACTING AND RETAINING YOUTH IN AGRICULTURE (ARYA)

Attracting and Retaining Youth in Agriculture (ARYA) is a flagship project of ICAR that was launched during March 2015 as one of the components of National Agricultural Innovations Fund. KVK, Nellore of the ANGRAU is the only entre where this project is being implemented in the state.

KVK, Nellore has established 33 enterprise units (mushroom production units in 10 villages benefiting 50 rural youth, vermicompost production units in 6 villages benefiting 24 rural youth and fruit and vegetable nurseries in 17 villages benefiting 38 rural youth) in the year under report. Training programmes were also organized by this KVK to impart skills to rural youth related to enterprises included in the project. KVK, Nellore organized skill training programmes on mushroom cultivation, vermicompost production and fruit and vegetable nurseries covering 710 rural youth and imparted skills to enable the youth to establish enterprises in their villages. Functional

demonstration units of the earmarked enterprises were established and run at KVK premises to provide hands on training and also exposure to the rural youth involved in the project. Critical inputs, both capital and recurring were provided to rural youth (individual or group) to support initially. Market linkages were established for effective and timely marketing of the produce from the enterprise units.

12.VIDEO /TELE CONFERENCING:

With a view to have timely and effective review and monitoring of various University extension activities, online review was done through 'Google hangout' and through teleconference.

The Director of Extension, ANGRAU reviewed the progress of activities of DAATTCs and KVKs every month with Coordinators of DAATTCs and Programme Coordinators of KVKs during the period under the report.

13,VILLAGE ADOPTION PROGRAMME

The major research stations and agricultural colleges of ANGRAU have adopted one village each during the year with an objective of direct transfer of technologies to the practicing farmers and to get the feedback on technologies. This enables the adoption of technologies without time lag between technology generation and adoption and with least technology dissemination losses. The village adoption programme was taken up at RARS, Tirupati,RARS, Lam, Guntur,RARS, Anakapalle, SV Agricultural College, Tirupati and at Agriculture College, Bapatla.

Activities of RARS, Lam, Guntur at adopted village

Activities of Agriculture College, Bapatla at adopted village

14. T & V MEETINGS

The Training & Visit meetings are being conducted on 1st Saturday of every month at 13 lead Research Stations of ANGRAU.The problems identified by the Agricultural Officers and Assistant Directors of Agriculture of the concerned district are thoroughly discussed jointly by the scientists of research stations, extension units and suitable measures to tackle the problems are given in the meetings. Every meeting is followed by the field visit in the afternoon.

The impact points to be disseminated to the farmers through the extension functionaries for the next month are also discussed in these meetings.

15. POLAM PILUSTONDI

All the Scientists of DAATTCs and KVKs of ANGRAU have actively participated in the POLAM PILUSTUNDI organized by the State Government in all the districts of AP held on Tuesday and Wednesday of every month during the year under report

16.AMC LEVEL INTERACTION MEETINGS:

All the Scientists of DAATTCs and KVKs of ANGRAU have actively participated in the AMC level interaction meetings organized by the State Government in all the districts of AP held on 1st and 16th of every month during the year under report.

17.JANMABHOOMI – MAAOVURU

All the Scientists of DAATTCs and KVKs of ANGRAU have actively participated in the Janmabhumi – Maa Ooru programme during 2016-17

18.NATIONAL INITIATIVE ON CLIMATE Rsilient Agriculture (NICRA)

The Technology Demonstration Component (TDC) of NICRA is being implemented at three Krishi Vigyan Kendras (Amadalavalasa, Undi and Reddipalli) of ANGRAU. To mitigate the climatic vulnerabilities, during the year 2016-17 KVKs conducted 11 demonstrations under NRM interventions viz., in-situ moisture conservation practices, improved drainage in flood prone area, and various resource conservation technologies benefitting 175 farmers. A total of 24 crop production demonstrations were conducted on drought, flood tolerant and short duration varieties, location specific inter cropping systems, crop diversification, disease and pest management, nutrient management etc., covering 268 farmers. Under livestock and fisheries interventions, KVKs covered 49 farmers with 5 demonstrations on fodder production, hydroponic fodder production, improved birds for backyard poultry, management of fish ponds etc. Custom hiring of farm implements under institutional interventions covered 341 farmers. Extension activities (101 nos.) covering 3576 participants on soil health management, cost saving technologies, farm mechanization, pest and disease management, live stock management, etc were organised.

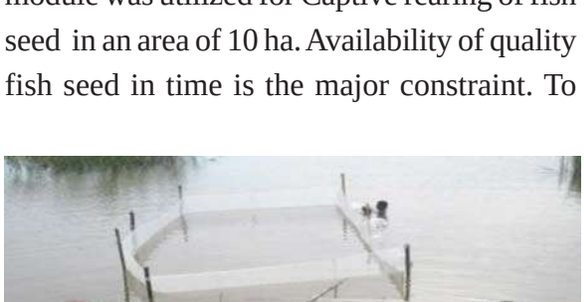
KVK, Amadalavalasa, Srikakulam District

a) Horizontal spread of flood tolerant varieties

Flood tolerant rice varieties viz., MTU-1061, MTU-1064 and RGL-2537 were demonstrated in NICRA adopted village Sirusuwada from 2012-13 to 2016-17. These varieties performed well in flood and high inundation conditions compared to normally cultivated varieties like Swarna, and BPT 5204. The observations were presented to the officials of department of agriculture during T&V meetings and pre-kharif interaction meetings, and as a result of the combined efforts, the varieties were spread vertically and horizontally in the district.

MTU-1061 at harvesting stage

Community tank renovated under NRM module was utilized for Captive rearing of fish seed in an area of 10 ha. Availability of quality fish seed in time is the major constraint. To overcome this problem captive nursery rearing of fish seed was taken up. By rearing of fish fry upto fingerling size in captivity, it was observed that the cost invested on fingerlings was reduced by Rs 0.96 paisa on each fingerling compared to fingerlings purchased from outside market. On release of 8830 fingerlings through captive rearing an amount of Rs. 8444.00 was saved.



KVK, Undi, West Godavari District

By deepening of the irrigation and drainage channels, proper supply of irrigation water and drainage during heavy rains were resulted and rice yields were improved in the subsequent years inspite of heavy rains due to cyclones.

During kharif 2016 though there was no significant events in the climatic conditions, the flood tolerant varieties fared well and recorded significant yield improvement in MTU 1061 (27.27%) and MTU 1064 (27.72%) over the traditional Swarna (MTU 7029).

Spread of flood tolerant varieties in NICRA Village

In 2011, MTU 7029 was the major variety covering 95 per cent of the acreage. With the intervention of NICRA, the area occupied by other varieties increased to considerable level by replacing MTU 7029 (Swarna) in kharif 2016.

c. **Mechanical transplanting in Rice:** Machine planting resulted in 35.6 per cent yield increase in kharif 2016 compared to manual transplanting. Mechanical transplanting also helped in timely planting and matured 10 days earlier. It has reduced the cost on labour and the cost of cultivation was reduced by Rs. 5750 ha^{-1}.

Machine transplanting in rice

KVK Reddipalli, Ananthapuramu

By adopting conservation furrow at 3.6 m interval, the pod yield in groundnut was enhanced by 19.9 per cent compared to farmers' practice. Groundnut crop was sown in second fortnight of June due to early receipt of rains.

Conservation furrows at farmers field at Chamalur and Peravali

19. AWARENESS ON PROTECTION OF PLANT VARIETIES &FARMERSIGHTS ACT 2001

With an objective of creation of awareness among farmers and other stakeholders about the provisions of Protection of Plant Varieties and Farmers Right Act 2001, three (3) Krishi Vigyan Kendras viz., Nellore, Reddipalli and Utukur have organizing training programme during the year 2016-17. A total of six awareness cum training programmes on provisions of PPV and FR act 2001 were organized and 324 farmers and 35 extension personnel have participated.

20.DISASTER MANAGEMENT

During the year 2016-17, the state of Andhra Pradesh experienced severe drought in Rayalaseema districts, severe incidence of pink boll worm in cotton growing areas and occurrence of bud necrosis and leaf curl disease on pulses in the coastal districts during rabi. In Anantapuramu district, prolonged dry spells were observed and as a result groundnut sown in 3.2 lakh hectares was affected. While in Kadapa the drought affected the crops in an area of 53443 ha and the damage was to the extent of 33 per cent. The university officers and scientists of ANRAU made visits to these affected areas and suggested measures to mitigate the drought affect on crops. Accordingly, farmers were alerted about precautions to be taken in different crops through different methods of extension.

Bud necrosis appeared in a severe form on blackgram and greengram causing severe loss to the pulse farmers in coastal districts. In Prakasam district the disease was appeared in the rabi season in several thousands of hectares. KVK, Darsi popularized the viral disease management technology among the farming community by organizing training programmes and using mass media. In Krishna district upland mandals, the bud necrosis was appeared in 70 per cent of total pulse area.The KVK, Garikapadu and Ghantasala created awereness among the farmers on management of the disease.

Field visit of the Hon'ble Chief Minister of Andhra Pradesh, Shri. N. Chandrababu Naidu and Agriculture Minister Sri.P.Pulla Rao to the drought and bud necrosis affected areas

21. PARTNERSHIP ACTIVITIES OF ANGRAU AND RELIANCE FOUNDATION

During the year 2016-17 technical information was disseminated through news bulletins (2616) on seasonal based & need based validated content through 11 Cable Channels of Coastal Andhra Pradesh, audio conferences (61),

face to face interactive programmes (113), knowledge on wheels (49), live TV phone in programmes (55), plant clinics (43), cable TV scrolls (364) and cable TV weather advisory bulletins (2616), voice SMS (1463) and WhatsApp messages (560) with technical support from ANGRAU scientists.

More than 6,09,854 users received voice advisories on season based and dynamic content for 8 different crops (rice, sugarcane, back gram, greengram, cotton, chillies, maize and mango) which occupy larger area in Andhra Pradesh. A total of 91767 users utilized the toll free help line services across Andhra Pradesh and got the advisories from different thematic experts to reduce the crop losses and increase the crop yields and taking the decision on the different crop cultivation.

Participation of ANGRAU scientists in different ativites of Reliance Foundation Information Services

22. FARM SCIENCE CLUBS

Krishi Vigyan Kendra, Rastakuntubai has been conducting "Farm Science Clubs" as an innovative extension methodology. The main objective of Farm Science Clubs is providing student mediated extension services to the tribal farming community for transfer of technology and reaching the unreached. High school and College students (Science group) are formed into clubs and were given orientation trainings and other activities to encourage and motivate them to take up agriculture in future. These Farm club members in turn disseminate knowledge to the farmers in their villages and families. The activities include fortnightly interaction on recent agricultural technologies,distribution of agricultural information material,organization of guest lectures to the members on topics related to agriculture and allied sectors and organization of quiz & essay writing competitions on important days

Activities of farm science club at KVK, Rastakuntubai

23.TRIBAL YOUTH NETWORKS

The Krishi Vigyan Kendra, Rastakuntubai selected tribal youth from remote tribal villages formed as 'Tribal Youth Network'. The main objectives of tribal youth network are to empower & educate the tribal youth on farm activities, to make them as change agents for transfer of technology in remote areas, to promote agri enterprenuership among tribal youth and

KVK facilitates these groups by establishing linkages with the line departments. These groups actively take part in various welfare and developmental activities at village and mandal level.

Training to the tribal youth Training programme on vermicomposting

24.WORLD SOIL DAY- SOIL HEALTH CARDS

World soil day celebrations and distribution of soil health cards at Krishi Vigyan Kendras

The KrishiVigyan Kendras celebrated World Soil Day on 5th December, 2016 involving technical personnel, local ministers, members of parliament, MLCs, MLAs and other public representatives and farmers. Soil health cards are aimed to help farmers to improve productivity through judicious use of inputs.Eight KVKs of ANRAU viz., Rastakuntubai, Undi, Garikapadu, Ghantasala, Darsi, Nellore, Kalikiri and Banavasi organized world soil day and distributed 2000 soil health cards to the farmers and . during the year 2016-17 a total of 7327 soil health cards were distributed to famers after analyzing 8521 soil samples

25.TRIBAL SUB PLAN (TSP)

Three KVKs (Amadalavalasa, Darsi & Rastakuntubai) implemented TSP in their respective operational areas during 2016-17. The total number of tribal farmers covered under TSP was 881, of which 529 were practicing farmers, 240 rural farmers and 112 extension functionaries. Activities like Soil samples collection from tribal villages and analysis for nutrient status and distribution of soil health cards and creation wareness creation on use of soil health cards, about introduction of sweet corn and YMV tolerant greengram variety WGG-42, training on cashew best management practices viz., pruning, fertilizer management and inter cropping etc, skill oriented training programmes, nursery management under shade net & use of liquid bio fertilizers in vegetables, promotion of backyard poultry and integrated farming system for improving income, creation of awareness on importance of millet consumption &value added products, vocational trainings to tribal women on value addition of cashew apple, exposure visit to RARS, Lam, Guntur and distribution of Rajasri and Vanaraja birds to tribal farm families for backyard poultry improvement were taken up.

FLD on cashew orchard management

Training on cashew orchard management

Vocational training programme to tribal women on value addition to minor millets

Training to tribal farmers on nursery management under shade net

Exposure visit of Tribal farmers to RARS, Lam, Guntur

Rajasri birds under Backyard poultry

26. CFLDS ON PULSES UNDER NFSM

In order to increase the production and productivity of the pulses, the Cluster Frontline Demonstration (CFLD) Programme was initiated by Ministry of Agriculture and Farmers Welfare, Government of India during rabi 2015-16 under National Food Security Mission (NFSM). During the year 2016-17, the programme was continued and the CFLDs on pulses and oil seeds were conducted by all the Krishi Vigyan Kendras of ANGRAU during kharif and rabi seasons in their respective districts of the State. The programme was implemented in a total area of 538 ha by organizing 1065 demonstrations on redgram, greengram, blackgram and bengalgram crops.

27. CFLDS ON OIL SEEDS UNDER NMOOP

The cluster frontline demonstrations on oilseeds under NMOOP during kharif and rabi 2016-17 on groundnut, sunflower, sasamum and safflower crops at Krishi Vian Kendras,Darsi,Banavasi and Amadalavalasa. In Kharif the technologies demonstrated on Groundnut are improved variety,weed management and nutrient management. At Drsi recorded 2100 kg/ha over control (1750 kg/ha), at Banavasi during rabi variety Dharani gave higher average yield of 3650 kg/ha compared to check variety yield of 3158 kg/ha, an increase of 15.58 per cent and at Amadalavalasa with K-6 gave an average yield of 2531 kg/ha compared to check yield of 2108 kg/ha, an increase of 20.07 per cent. In Sunflower during rabi season with hybrid Sunbred 275, bio-fertilizer, boron application twice, planting of trap crop by the KVK, Darsi in Prakasam district gave an average yield of 3950 kg/ha compared to check yield of 3400 kg/ha, an increase of 16.18 per cent. In Sesamum KVK, Darsi during kharif season with variety Hima gave an average yield of 875 kg/ha compared to check yield of 560 kg/ha, KVK, Undi during the rabi with variety Hima and recommended package of practices gave highest average yield of 870 kg/ha as against check (670 kg/ha). KVK, Amadalavalasa with YLM 17 and ICM practices, gave an yield of 651 kg/ha compared to check (520 kg/ha). In summer at KVK, Garikapadu in clay loams with irrigation and improved variety YLM 66 and integrated crop management gave higher yield of 1434 kg/ha compared to the check (743 kg/ha). With the same variety and ICM practices, the KVK, Rastakuntubai an average yield of 1045 kg/ha was recorded compared to the farmer practice (620 kg/ha), an increase of 68.55 per cent.

CFLD on bengalgram at KVK, Kadapa

CFLD on sesame at KVK, Darsi

CFLD on groundnut at KVK, Undi

CFLD on blackgram at KVK, Ghantasala

Field visit to CFLDs on sunflower

Visit of monioring team to CFLD redgram plots

28. ON PULSES SEED HUBS

"Seed Hub Project" on pulses was initiated by Ministry of Agriculture and Farmers Welfare, Govt. of India during 2016-17, with an aim of increasing the indigenous production of pulses. Under this project funds were allocated Rs. 1.5 crores ie., Rs. 50.0 lakhs for seed processing and infrastructure development and Rs. 1.0 crores as revolving fund to each centre. In ANGRAU three KVKs implementing Seed Hub programmes viz., KVK, Reddipalli, KVK, Ghantasala and KVK Amadalavalasa. Targets were fixed to each centre to produce good quality seed of pulses.

29. REACH EVERY PANCHAYAT

Reach every Panchayat is a unique programme formulated and implemented by ANGRAU with a goal of reaching every Panchayat of the state to disseminate improved technologies developed by the University. As a part of the programme one key informant farmer is identified in each Panchayat who will influences other farmers' decisions in farming. The key farmer along with Sarpanch of the Panchayat are trained and oriented with the best management practices, critical interventions for increasing the productivity of major crops grown in that area, government schemes and ICT applications. They were provided with prestigious publication of the University Farmers' Almanac 'Vyavasaya Panchangam' and subscription to 'Vyavasayam' telugu agriculture magazine published by University for one year to place them in the village Panchayat library to facilitate their access to the farmers in the village. This programme was implemented in four districts initially viz., Srikakulam, Prakasam, Anantapuramu and YSR Kadapa. The DAATTCs and KVKs organized the training programme benefitting 1175 farmers including Sarpanchs of Gram Panchayat covering 574 villages.

30. FLAG METHOD OF EXTENSION

The DAATTC/KVK scientists during their field visits, visit the road side / nearby farmer's fields and the yellow / conspicuously visible 'Flag' labelled with Name of the centre, Contact no, Date of visit, Crop, Problem identified and Remedial measures, is placed in the farmers field with the help of a twig / stick / support of plant material at a strategic point to be visible to the farmer.

Whenever the flag is seen by the concerned farmer, he / she read the message written on the flag, he/she can take instant action based on the recommendations. If the farmer requires any clarification, he / she may call on the Scientists / Extension functionary and clarify their doubts.

31. DEVELOPMENT OF FARMER MASTER TRAINERS

It is the process wherein an identified 15-20 farmers selected from different villages spread over 2-3 Mandals of a district, are being provided training (knowledge & skills) at critical stages of the identified crop. The training is staggered over the crop season to the same farmers who will be exposed to technologies at different critical stages of crop cycle, (4-5 trainings of 1 day duration) facilitating the Farmers as Master Trainers. Once they have developed mastery over the crop selected, they are inturn used as Resource Farmer for training other farmers of their locality.

32. INNOVATIVE FARMERS NETWORK

The Innovative Farmers Network was initiated by ANGRAU in 2012. One innovative farmer among the five farmers felicitated by the DAATTC during its Foundation day celebrations was identified as Coordinator of the Innovative Farmers Network. The Coordinators of network were provided with technology support by the DAATTCs and KVKs to update their knowledge and skills, who in turn need to share their skills and knowledge to other farmers of the network (30 members) in the district. The main objective of this network is to promote farmer to farmer extension. During 2016-17 two review meetings were conducted with innovative farmers.

33. ANNAPURNA - AN ALTERNATE ICT MODEL

Interactive Information Dissemination System (IIDS) is an integrated model to address the problems of farmers by using ICT applications. IIDS is a Web, Mobile and IVRS based application, where the farmers are required to be registered with their farm and other details. The expert would provide the personalized solutions based on the inputs provided by the farmers and his available farm profile. There is a mobile (Toll free No. 1800 425 3141) interface at front end and web interface at the back end. Data will be transmitted through voice, text, images and videos from both ends (farmers to expert and back) i.e. it would allow farmers to send images/videos of the field along with their queries by using a smart phone.

The model is operational in all 13 districts of Andhra Pradesh through eight KVKs and five DAATTCs (KVKs – Nellore, Amadalavalasa, Utukur, Reddipalli, Darsi, Garikapadu, Undi, Kalikiri and DAATTCs Kurnool, Guntur, Vizianagaram, Kakinada, Anakapalle) during 2016-17.During the year under report the progress is total number of farmers registered are 9,994, no of Queries solved centre and discipline wise 3889, no.of messages messages (Text and Voice) are 580 (Text messages) and 137 (voice messages).

34. MOBILE APPLICATIONS

Several android based mobile applications were developed and kept for downloading by the farmers free of cost from Google play store. The applications developed /supported from ANGARU are

- **Eruvaka**: Developed at DAATT, Visakhapatnam in 2015 and provides information on complete package of practices for rice, sugarcane, pulses, cotton, maize and oil seeds in telugu and English and about 1200 downloads were made during 2016-17 with a rating of 4.8. The app is updated with additional features of IMD weather forecast & AKPS toll free number.

- **Greeshma:** Developed at RARS, Tirupati in 2015 with disease management practice for rice, maize, groundnut sugarcane and sunflower in telugu and english.

- **Krishi Vigyan:** Developed at KVK, Amadalavalasa in 2016 and provides information on complete package of practices for rice, blackgram and greengram, coconut and maize in telugu with photographs, video clips with additional feature of telephone directory of research and extension centres of ANGRAU and about 24867 download were made with a rating of 4.8/5.

- **Mana verusanaaga:** Developed at RARS, Tirupati in 2016 and provides information on complete package of practices for groundnut in telugu with photo graphs and about 2812 downloads were made during 2016-17 with a rating of 4.8/5.

Plantix: Developed by PEAT, Germany, made available to telugu farmers with the involvement of ANGRAU and ICRISAT for plant disease diagnosis & monitoring.

Pocket Cards

An innovative low cost extension methodology in transfer of technology was introduced by the KVK. Garikapadu. The critical crop interventions were published on a single small pocket card of size 3"X4", printed in multi colour on either side highlighting the technologies impacting the productivity with attractive pictures. its smartness, farmers had shown interest in possessing them and to keep them for reference.

Release of post cards at KVK, Garikapadu

Agricultural Technology Hub (Ag Tech Hub)

An ICT initiative was inaugurated on 16-3-2016 at RARS, Tirupati to provide mobile based agro advisory services through mobile voice calls, SMS, existing social media networks like (WhatsApp). For this purpose a smart phone bearing number 9441670829 was made popular among the farmers in the Southern Zone. About 1162 querries 92 calls were answered through WhatsApp, 167 SMS were replied and about 32 push messages were sent to the farmers.

35. ZONAL LEVEL PRE-ACTION PLAN WORKSHOPS

For the first time, three zonal-level pre-action plan workshops were organized at RARS, Tirupati (for Southern and scarce rainfall zones), RARS, Anakapalle (for North Coastal and High Altitude & Tribal Area Zones) and at RARS, Lam, Guntur (for Krishna and Godavari zones) with a purpose to identify suitable location specific emerging technologies developed by Researchers for on farm assessment under OFTs (on-farm trials).

36.WORKSHOPS ON STRENGTHENING OF EXTENSION SERVICES

During the year 2016-17, the Directorate of Extension organized two workshops on 'Strengthening of Extension Services in ANGRAU' at DAATTC, Vijayanagaram and KVK, Utukur with the involvement of the Scientists of KVKs, DAATTCs, innovative farmers and progressive farmers.

37. SWACHHTA PAKHWADA

At the behest of Hon'ble Prime Minister of India cleanliness campaign was launched in the country on 2nd October, 2014. Since then 'Swachhata Shapath and Swachhta Pakhwada were observed with emphasis on clean and fast disposal of official work in our system. With this objective, Swachhata Pakhwada was observed in KVKs from 16-31 October 2016 and a Swachh Bharat pledge was taken by all the staff of KVK with farmers and students.

Swachhta pakhwada activities at Krishi Vigyan Kendras

38. JAI KISAN JAI VIGYAN

Keeping in view of the contribution of Shri. Atal Bihari Vajpayee and Late Shri. Chaudhary Charan Singh, two former prime ministers of India for promoting science for the welfare of the farmers, "Jai Kisan and Jai Jawan" week are celebrated every year from 23rd to 29th December. During this period all KVKs of ANGRAU organized various farmer and student oriented activities such as group discussion, method demonstrations, awareness programmes, farmers-scientists interactions and field visits.

Group discussion at KVK, Utukur

Students visit to shade net cultiation of vegetables KVK, Garikapadu

39. EXTENSION STUDIES

Extension Scientists of RARSs, ARSs, DAATTCs and KVKs have undertaken 12 extension studies during 2016-17 to draw some valid conclusions while preparing action plan of the concerned centres.

40. RECOGNITIONS AND AWARDS

KVK, Utukur, YSR Kadapa received "Pandit Deen Dayal Upadyay Rashtriya Krishi Vigyan Protsahan Puraskar" - Zonal level Best KVK (Zone-X) for the year 2016-17. The award was presented by the Hon'ble Union Minister for Agriculture Shri. Radha Mohan Singh.

ANGRAU Received best exhibition stall in Krishi Unnati Mela 2017 at IARI, New Delhi.

DAATTC, Kakinada and KVK, Utukur were awarded BEST DAATTC and BEST KVK (university level) for the year 2015-16 in REAC meeting held at RARS, Nandyal on 4-5th, December, 2016.

VI. PLANNING AND MONITORING CELL

The Planning and Monitoring Cell, headed by the Director (Planning and Monitoring), was established in the year 1986 with the objectives of planning, monitoring and evaluation of various developmental programmes and activities of the University.

The Cell helps in preparing the outcome budget of the University prior to the budget session of Legislative Assembly every year. It also assesses and monitors the demand for human resources required to carryout teaching, research and extension activities of the University. It also provides the information pertaining to the ANGRAU to the State Legislative Assembly through the address given by His Excellency the Governor of Andhra Pradesh and the Budget Speech of the Hon'ble Minister of Finance, Government of Andhra Pradesh.

The Cell also attends to preparation of Annual Report of the University; maintenance and upgradation of human resource data base of the University; collection, compilation and submission of data and information in various formats to different agencies within the Country and outside; furnishing information required by other statutory bodies; preparation of the Convocation Report of the Vice-Chancellor reflecting the achievements and objectives of the University; submission of monthly reports of the ANGRAU to His Excellency the Governor of Andhra Pradesh and the Chancellor of the University; compilation and preparation of significant events of the ANGRAU to be presented at the Meetings of Board of Management, ANGRAU, etc. It also acts as the liaison office between the University and other Government and Non-Government Institutions.

The Director, Planning and Monitoring acts as the Transparency Officer of the University under the RTI Act 2005 and oversees the implementation of Section (4) obligations of RTI Act, 2005 and maintains due transparency in implementation of the Act.

Noda Officer (ICAR)

The Director (P&M Cell), ANGRAU, Guntur was nominated as Nodal Officer for ICAR under Strengthening and Development of Higher Agricultural Education Division. The Nodal Officer has to look after the day to day correspondence of the ICAR, All India Survey of Higher Education (AISHE), Indian Rankings, Preparation and submission of ICAR Annual Report also submitting the information to the ICAR pertaining to the questions raised in Parliament etc.

Website Maintenance

P&M Cell also attending the University Website Maintenance. Updated information like circulars/results/exams/admissions/interviews/jobs/tenders/quotations etc., as information provided by the faculty needs, is being uploaded by the Planning and Monitoring Cell.

In addition, the Planning and Monitoring Cell attending the following activities during the period under report.

Reports Prepared and Activities taken up during the Year

- University Outcome Budget (2017-18) for Andhra Pradesh
- University Monthly Reports to His Excellency the Governor of Andhra Pradesh
- 48th Annual Convocation Report

VII. FINANCE AND BUDGET

The oajor financial grants to the University come from the Andhra Pradesh State Government under Plan and Non-Plan Schemes. The Non-Plan assistance is by way of block grants for running the University. The block grant approved in the budget for the year 2016-17 was Rs. 29512.13 lakh.

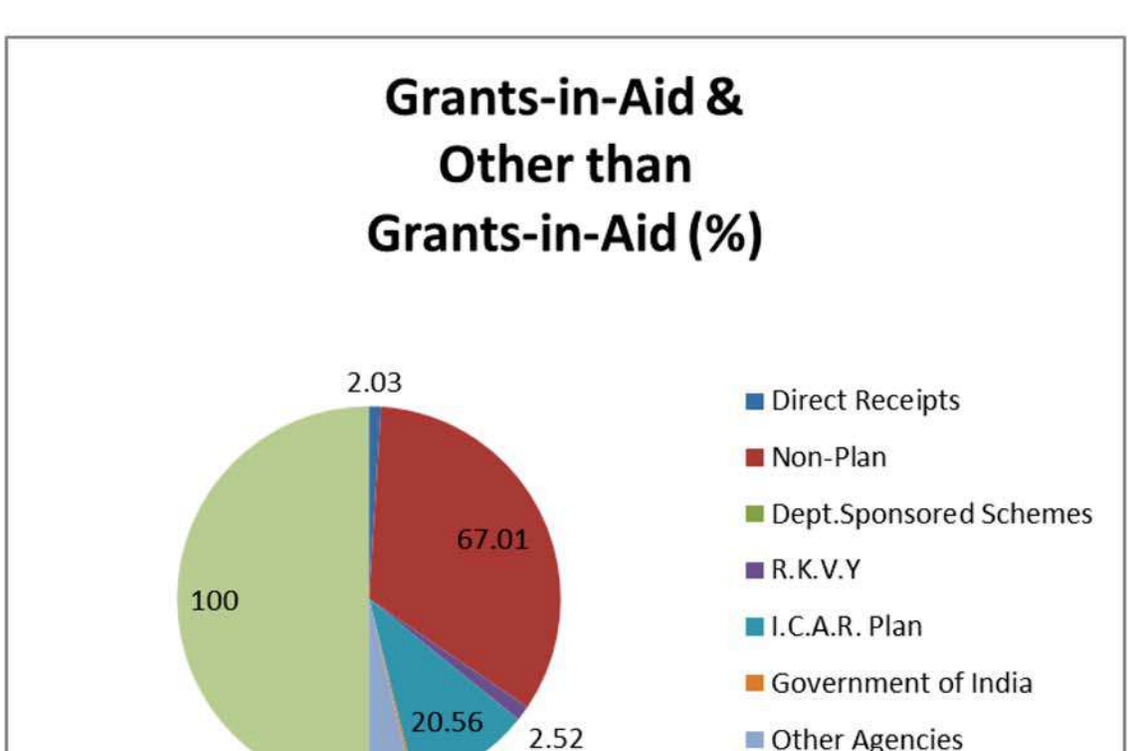
The ICAR assistance was Rs. 9055.62 lakh (including an amount of Rs. 4998.88 released by the ICAR under establishment of new Agricultural University in the residuary State of Andhra Pradesh due to bifurcated the State of Andhra Pradesh into two States i.e., State of Telangana and Andhra Pradesh) and the Government of India assistance was Rs. 208.68 lakh. During the year, an amount of Rs. 1109.82 lakh was received from RKVY. During the financial year 2016-17 an amount of Rs.3263.51 lakh released under other agencies (including NABARD – RIDF).

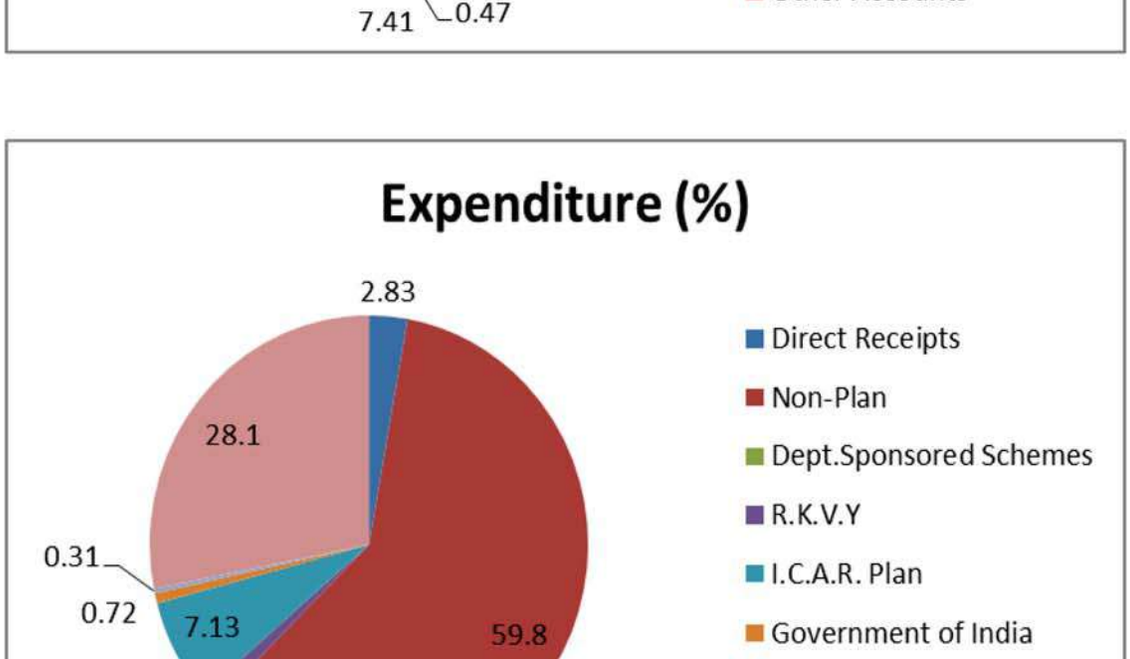
Thus, the total Finances of the University during the year 2016-17 was Rs. (29512.13+14531.58**) = 44043.71** lakh as detailed below.

Funding Sources - 2016-17

(Rupees in lakhs)

Sl.No.	Particulars	Grants-in-Aid & Other than Grants-in-Aid	(%)	Expenditure	(%)
1.	Direct Receipts	893.95	2.03	1419.28	2.83
2.	Non-Plan	29512.13	67.01	30006.42	59.80
3.	Dept. Sponsored Schemes	---	---	---	---
4.	R.K.V.Y	1109.82	2.52	557.84	1.11
5.	I.C.A.R. Plan	9055.62	20.56	3579.76	7.13
6.	Government of India	208.68	0.47	362.66	0.72
7.	Other Agencies	3263.51	7.41	153.38	0.31
8.	Other Accounts	---	---	14103.20	28.10
	Total	44043.71	100.00	50182.54	100.00


Grants-in-Aid &
Other than
Grants-in-Aid (%)
2.03
67.01
100
20.56
2.52
7.41
0.47
Direct Receipts
Non-Plan
Dept.Sponsored Schemes
R.K.V.Y
I.C.A.R. Plan
Government of India
Other Agencies
Other Accounts


Expenditure (%)
2.83
28.1
0.31
0.72
7.13
59.8
1.11
Direct Receipts
Non-Plan
Dept.Sponsored Schemes
R.K.V.Y
I.C.A.R. Plan
Government of India
Other Agencies
Other Accounts

Budgetary Support to the University:

(Rs. in Lakhs)

Funds Released under Development Grants of ICAR – 2016-'17

Budget Heads	Total Funding from State Government			Funding support from ICAR (Rs. Lakh)					Any other central funding**	Grand Total
	Plan	Non-Plan	Total 1+2=3	Education Division	AICRP	KVK	Any other ICAR support*	Total ICAR support		
	1	2	3	4	5	6	7	(4+5+6+7) =8	9	3+8+9
Salary	-	25505.17	25505.17	21.43	1631.86	1555.13	-	3208.42	1318.50	30032.09
Capital	-	-	-	848.31	-	-	4998.89	5847.20	-	5847.20
Revenue	-	4006.96	4006.96	-	-	-	-	-	-	4006.96
Total	-	**29512.13**	**29512.13**	**869.74**	**1631.86**	**1555.13**	**4998.89**	**9055.62**	**1318.50**	**39886.25**

* including Network Project, Extra Mural, etc.

**including DST, DBT, ICMR, RKVY

- An amount of Rs. 1109.82/- lakhs (included at 9) released under RKVY during the year 2016-17.

A. All New/Existing Civil Works Repair & Renovation under taken out of the Development Grant (Rs. in lakh)

The following works were taken up under civil works repairs and renovation.

1. College of Agricultural Engineering, Bapatla:

Works worth Rs. 32.69 viz., providing toilet blocks in main building, false ceiling to class rooms in first floor, balance work completion of first floor slab, girl hostel first floor 3 rooms and balance rooms including bathrooms.

2. S.V. Agricultural College, Tirupati:

Providing a new sewage pipe lines and repairs to all toilet blocks and remodeling of the toilets at main building, providing tiles to the ground floor corridor both sides and repairs, renovation to the existing boys hostel mess. A total of Rs. 57.9 lakhs was spent for the above said works.

3. Agricultural College, Mahanandi:

An amount of Rs. 56.00 lakhs were spent towards civil works at Agricultural College, Mahanandi.

B. Details of Sports Facilities Strengthened by ICAR:

The sports facilities strengthened under ICAR are as follows.

1. Agricultural College, Bapatla (Physical Education):

An amount Rs.0.99 lakhs was spent for purchase of sports material, one Thread Mill unit, Aero Fit Cycles (3 nos.), one Multi Stepper and one set Weight Training Set.

2. Agricultural College, Naira:

Foot Ball Mini Pool, RMEL 459 Grass Cutter, Volley Ball Post, Ball Badminton Post, Cricket Full Mat for cricket ground, English

Willow cricket bat for boys, foot ball shoes for boys, and one Laptap for the department. An amount of Rs.1.218 crores were spent.

C. All Equipment purchased/replaced under Development Grants

1. College of Agricultural Engineering, Bapatla:

An amount of Rs. 20.72 lakhs was utilized for purchase and replace of the equipment viz.,Metacentric Height apparatus for Hydraulic laboratory, Hand held GPS – 3 Nos, Electronic theodolite – 3Nos.for Surveying and levelling laboratory, Drip irrigation system, Soil moisture probe set, Weather monitoring station and accessories for weather monitoring station, Proto type watershed model for field irrigation laboratory and WMS premier software, Battery 150AH under Department of Soil and Water Engineering.

Under department of Processing and Food Engineering, an amount of Rs. 23.64 lakhs was spent towards purchase of equipment or replacement of equipment. The particulars are Automatic Nitrogen lab/Protein Estimation System in food engineering, Freezee Dryer Ultrasonic Probe Sonicator, Direct Drive Stirrer with Brushless Motor with LCD Display of Speed & Torque, Exide Tubular Batteries, PC Based Double Beam UV-Visible Spectrophotometer, Ripening Chamber, Ultrasonic Cleaner, Swiri Mini Microcentrifuge, Thermocouple Probe Thermometer, Datalogger, Clevenger Assembly compressing of 1000 mL flask, Oil separating tube and condenser, Hollow Fiber Membrane Setup, Digital Viscometer, Unibloc Moisture Analyzer, Infra-Red Non-Contact Digital Thermometer, Electrical items, Silicon gasket etc., were purchased. Practical manuals of Post-Harvest Engineering, Dairy and Food Engineering of Department of Processing and Food Engineering were prepared and printed for students use.

In, the Department of Farm Machinery and Power Engineering, about 14.9 lakhs were spent towards purchase of equipment or replacement of equipment which include digital meters, SRM 6 Ratoon Manager/ Rotary Mulcher Shaktiman and Shaktiman mobile shredder, Teak sizes, Workshop tools and materials etc., for students practical classes at workshop. Practical manuals in the Dept. of FMP are prepared and Printed.

2. S.V. Agricultural College, Tirupati:

An amount of Rs.43.67 lakhs was spent towards improvement of facilities in Agril. Engineering, Horticulture, Soil Science and Agril. Chemistry, Genetics & Plant Breeding, Ag in Crop Physiology department. The materials purchased are Godrej metel perforated chairs (17 No's Agronomy, Plant Pathology, and Entomology departments). The following are the equipment purchased viz., Logitech R 800 Professional wireless present or, Logitech Mk 345 wireless combo and Dell vastro desk top(1no.),printer(1 no.), Fruit pulper and Sod maker, Single stage distillation set, pH meter, Flame photometer, Centrefuge, Analytic balance, Monocular inclinable student microscopes (4 No's.), SPAD Chlorophyll meter (1 no.), RO Water plant, Monocular microscope with lenses (3 No's.), Portable Automatic Autoclave, Monocular microscope with lenses (3 No's.), Monocular Mag Master HM 100 Microscopes (14 No's.), R-12 Plus micro centrifuge with accessories, PCR and Gel documentation system, Hot air oven (1 No.) and Hot air oven in Agronomy Green House, CM-12 Plus compact bench top cooling micro centrifuge, Digital vernier caliper, Hot Air oven, Micropipette and Mimi Rotary shaker, Air Conditioner, Digital electronic weighing balance, Spectrophotometer and its accessories, Aqua

deminealiser, Cooling centrifuge, Soxhelet extraction unit, Distillation unit (Double stage), Air sampling system, and Vertical freezer.

3. Agricultural College, Bapatla:

An amount of Rs. 33.58 lakhs was spent towards purchase of equipment and Books/ Journals for Library. The list of equipment purchased include pH meter, EC meter (pocket type) for UG Lab-II, UV Spectrophotometer, Electronic Precision Balance, BSA 423 S –CW, BOD Incubator 280 ,Wooden stools (30 nos.),one horizontal and one vertical Electrophoreses unit, Humidity controller for Environmental chamber (Make laptop India), Information KIOSK, UV-Visible Spectrophotometer, Hot air oven (2 Nos), Autoclave, Refrigerated centrifuge, Inlab incubator, Equitron BOD incubator, Air conditioners (2 Nos) ,Electrical Weighing Balance (2 No), Monocular Microscope with MICAPS with Laptop, Labomed Stereo Microscope, Compact Digital Moisture meter, Advance analysis kit, Portable Humidifier, Seed Analyser Software, Acer Desktop Computer, Beng MX 806 PST Short Throw Projector, Seed Germinator (Double door) etc., Lab Manual of Fundamentals of Genetics are prepared.

4. Agricultural College, Naira:

An amount of Rs.77.63 lakhs was spent by the College for purchasing equipment, materials and towards other works, which include, Laptop, Horizontal Laminar Airflow Cabinet, Cooling Incubators, Hot Air Oven, LCD Projector, Binocular Laboratory Microscope, Digital pH Meter, Analytical Balance, Micro Processor Flame Photometer, Soil Tensiometer, Soil sampler, GPS Instrument, Soil Hydrometer, pocket photometre, Waterproof TDS Tester, Double Ring Inhillrometer, Microprocessor Based CON 700 MTF with Conductivity, Soil Thermometer, Portable Leaf Area meter & Microtone Digital Balance, Chlorophyll Meter, Labtop Micro Controller, Binocular Laboratory Microscope, Seed Germinator, UV Visible Spectro meter, Water Purifier, Centrifuge model, Magnetic stirrer with hot plate & digital speed indicator, Thermostatic Water bath, Hot air oven brand KEMI, Autoclave-vertical, Electrical Digital Balance, Micro Syrange applicator, BOD Incubator, Specto Photometer, Paper Chromato graphy cabinet, Labomed Trinocular Research Microscope with Digital Imaging, Camera and Software, Labomed Microscope Sterio Master, LED TV 32", LCD Projector, Weighing Machine, installation of Shade Net house etc,.

5. Agricultural College, Mahanandi:

A total of Rs. 39.59 lakhs were spent for purchase of various equipments viz., Magnetic stirrer – 1No, Horizontal gel electrophoresis system, Refrigerator, EPSON multimedia projector EB-S31, PCR Sure cycler, Electronic balances, BOD incubator Centrifuge, Digital flame photometer, Automatic N analyzer, Air-Conditioner, Insect Cabinets, Insect boxes, Cooling orbitor shaking incubator, Soil Thermometers, FPR Rainguage, Flame photometer, pH meter, Conductivity meter, Portable grain moisture meter, LED TV hand held farm implements etc., Books/Journals foy Library are also purchased.

6. Acharya N.G. Ranga Agricultural University, Lam, Guntur:

About Rs. 4.00 lakhs was spent for books and journals in University Library.

VIII. BUILDINGS AND CONSTRUCTION PROGRAMMES

During the period under report, the following civil works were completed by the Engineering Department of the University.

- Construction of Liquid Bio-fertilizers unit at ARS, Amaravathi and providing internal partitions to the Laboratory and bore wells at ARS, Amaravathi, Guntur District for an amount of Rs. 63.00 lakhs.
- Construction of Bio-fertilizers unit at ARS, Amaravathi, Guntur District for an amount of Rs. 41.58 lakhs.
- Construction of Bio-fertilizer Lab at Anakapalle, Visakhapatnam District for an amount of Rs. 51.50 lakhs.
- Construction of Laboratory cum Conference / Seminar Hall for Advanced Post Graduate Centre at Lam, Guntur District for an amount of Rs. 32.00 lakhs.
- Construction of Girls Hostel for Agricultural Polytechnic at J.M. Puram, Gurazala, Guntur District for an amount of Rs. 95.00 lakhs.
- Construction of Boys Hostel for Agricultural Polytechnic at J.M. Puram, Gurazala, Guntur District for an amount of Rs. 95.00 lakhs.
- Construction of Girls Hostel at College of Agricultural Engineering, Bapatla, Guntur District for an amount of Rs. 50.00 lakhs.
- Construction of Examination Hall at S.V.Agricultural College, Tirupati, Chittoor District for an amount of Rs. 109.88 lakhs.

IX. OTHER EVENTS OF THE YEAR

During the year 2016-17, several important events have occurred at different institutes of the university. An account of significant events, workshops, conferences, meetings, extension activities and other events that took place during the period under report is as follows.

Significant Events

Laying of Foundation Stone

- Unveiling of Pylon with Rs. 156.33 crores through NABARD-RIDF-XX by the Hon'ble Chief Minister, Government of Andhra Pradesh, Shree Nara Chandrababu Naidu Garu at Agricultural College, Bapatla on 26th September, 2016 under Infrastructural Development in the Colleges of ANGRAU.
- Laying of foundation stones for NABARD-RIDF-XX works at Agricultural College, Mahanandi during Silver Jubilee Function on 04-12-2016 by Hon'ble Chairman, A.P. Legislative Council, Dr. A. Chakarapani Yadav garu in the presence of Sri Budda Rajasekhara Reddy M.L.A, Srisailam, Sri B.C. Janardhan Reddy, M.L.A., along with Hon'ble Board Members and University Officers.
- Bhoomipuja was performed for construction of Electronic Media Centre Building at RARS, Nandyal on 19.01.2017.

Inauguration

- **Farmers Call Centre** was inaugurated on 18.10.2016 by Sri Mekala Lakshminarayana, Hon'ble BoM Member, ANGRAU in the presence of Director of Research and Scientists of RARS, Lam.
- **"Food Processing Unit"** was inaugurated by Sri. Prathipati Pullarao, Minister for Agriculture, Agri Processing, Marketing and Warehousing, Animal Husbandry, Dairy Development and Fisheries, Govt. of A.P. on 09.12.2016 at Faculty of Home Science at RARS, Lam, Guntur.
- The newly constructed **University Faculty Block at RARS, Lam, Guntur** was inaugurated on 24.03.2017 by Sri Prathipati Pulla Rao Garu, Hon'ble Minister for Agriculture in the presence of Sri Ravela Kishore Babu Garu, the Hon'ble Minister for Social Welfare & Empowerment, Sri B. Rajsekhar, IAS, Special Chief Secretary (Agri) and Vice-Chancellor, Hon'ble Board Members, University Officers and Staff of Acharya N.G. Ranga Agricultural University.

48th Annual Convocation

The 48th Annual Convocation was held on the 26th of September, 2016 at Dr. B.V. Nath Auditorium, Agricultural College, Bapatla. The Hon'ble Chief Minister of Andhra Pradesh Shree

Nara Chandrababu Naidu Garu was the Chief Guest. Sri P. Pulla Rao, Hon'ble Minister for Agriculture and Farmers Welfare was also participated as the Guest of Honour.

Agricultural College, Mahanandi Silver Jubilee Celebration

On the eve of completion of 25 years of service in Agricultural Education, the Agricultural College, Mahanandi celebrated its Silver Jubilee Celebrations on 4th December 2016 in a befitting manner. Sri A. Chakrapani Yadav, Chairman, Legislative Council of Andhra Pradesh participated as a Chief Guest and Sri B.C. Janardhan Reddy, Member of Legislative Assembly as presided over the function along with Hon'ble Board Members and University Officers.

Significant Events

- KVK, Amadalavalasa, Srikakulam district has been selected for ICAR Zonal Level BEST KVK 2015 among the KVKs of Zone V (Andhra Pradesh, Telangana and Maharashtra States). Dr. K. Raja Reddy, Directror of Extension, Dr. D. Chinnama Naidu, Programme Coordinator, Dr. N.Venugopal Rao, Associate Director of Research, RARS, Anakapalle have received the award on 16th July 2016, the ICAR Foundation Day at New Delhi.
- 116th Birthday of Acharya N.G. Ranga was celebrated on 7th November, 2016 at all Campuses of the University. ANGRAU celebrated Acharya N.G. Ranga Jayanthi in collaboration with Ranga Trust, ATMA-Guntur and International Society of Farm Scientists on the occasion of "Agriculture Technology Day" at RARS, Lam, Guntur. Dr. Kodela Siva Prasada Rao, Hon'ble Speaker of Govt. of Andhra Pradesh was the Chief Guest and Sri Galla Jayadev, Hon'ble Member of Parliament, Guntur gave the key note address on the occasion. Sri Ravela Kishore Babu, Hon'ble Minister, Social Welfare & Empowerment, Smt. Nannapaneni Rajakumari, AP Women's Commission Chief, Sri Yalamanchili Sivaji, Ex-MP, Sri Alapati Rajendra Prasad, MLA, Sri D. Manikya Vara Prasad, Ex. Minister and Freedom Fighter Sri Pavuluri Siva Ramakrishna were narrated the services of Acharya N.G. Ranga towards farming community and their welfare.
- **Best Exhibition Stall Award** was conferred on ANGRAU at Krishi Unnati Mela 2017 held at IARI, New Delhi from 15-17 March 2017.
- Agricultural Research Station, Vizianagaram received the best AICRP centre award in Millets at the Annual Millets workshop held at Bangalore on 15.04.2017.

Other Significant Events

S. No.	Event	Date	Venue
1	Nava Nirmana Deeksha	02.06.2016	All Centres of the ANGRAU
2	World Environment Day	05.06.2016	All Centres of the ANGRAU
3	Brain Storming Session on Soil Health Management	10-06-2016	RARS, Lam
4	University Foundation Day	12.06.2016	All Centres of the ANGRAU
5	Eruvaka Purnami	20.06.2016	All the DAATTCs and Krishi Vigyan Kendras (KVKs) of ANGRAU
6	International Yoga Day	21.06.2016	All Centres of the ANGRAU
7	World Population day	11.07.2016	College of Home Science, Guntur
8	KVK, Banavasi has organized awareness programme on "Pink bollworm in Cotton" with the participation of DAATTC, Kurnool and the Department of Agriculture.	01.08.2016	Roudur village, Kowthalam Mandal
9	Krishi Vigyan Kendras of Reddipalle and Kalyandurg have participated and arranged exhibition on the various technologies on the occasion of launching of 'Farmers Producer Organizations' by the Hon'ble Chief Minister Shri N. Chandrababu Naidu Garu.	06.08.2016	Bukkarayasamudram
10	Awareness programme on "Pesticides usage in Agriculture" to the Input dealers and Progressive farmers of the Srikakulam Division	24.08.2016	DAATTC, Srikakulam
11	Organized 'Annapoorna Krishi Prasara Seva (IIDS) farmers sensitization programme' to the farmers	22.09.2016	DAATTC, Kakinada
12	DAATTC, Kakinada has organized two Field Days on Rice Minikits & pulses	9.11.2016 and 22.11.2016	Kaikavolu village and Rangannapeta village

S. No.	Event	Date	Venue
13	"Agricultural Education Day" was conducted on 03.12.2016 in a befitting manner on the eve of the birthday of Bharat Ratna Dr. Rajendra Prasad, the first President of Independent India.	03.12.2016	All Colleges and Polytechnics of Acharya N.G. Ranga Agricultural University
14	Celebrated "World Soil Day" and distributed the Soil Health Cards to the farmers.	05.12.2016	All Krishi Vigyan Kendras, ANGRAU
15	"Kisan Sammelans" for Pre *Rabi* season	05.12.2016	KVKs of Rastakuntabai, Undi, Garikapadu, Darsi, Nellore, Kalikiri, Banavasi
16	Celebrated 'Jai Kisan Jai Vigyan week'	23.12.2016 to 29.12.2016	All KVKs, ANGRAU
17	National Dietetics Day awareness programme	10.01.2017	College of Home Science, Guntur
18	KVK, Reddipalli has organized Field day in redgram plot variety PRG-176	18.02.2017	Krishnamareddipalli village, Ananthapuramu Dt.
19	KVK, Ghantasala has organized Field day on Pulses (Blackgram varieties LBG 752 and GBG-1) under NFSM	25.02.2017	Tarakaturu
20	*Kisan Mela*	09.12.2016 to 11.12.2016 11.01.2017 09.02.2017 28.03.2017 04.04.2017	RARS, Lam RARS, Nandyal RARS, Chintapalli KVK, Kalikiri RARS, Maruteru
21	Technology Week	1.2.2017 to 4.2.2017 15.02.17 to 19.02.17	KVK, Amadalavalasa KVK, Rastakuntubai
22	Deliberations on the Fifth Deans' Committee Recommendations for the Faculty of Home Science on implementation of B.Sc. (Hons) Community Science Programme	10.03.2017 & 11.03.2017	College of Home Science, Guntur
23	AGRICARNIVAL, FARMER PRO- 2017	04.05.2017	Agricultural College, Bapatla

Meetings Organized

S. No.	Event	Date	Venue	Organized by
1	Review Meeting on implementation of Interactive Information Dissemination System (IIDS) – Annapoorna Krishi Prasara Seva	05.07.2016	DAATTC, Anakapalle	ANGRAU
2	Soil Health Management and Natural farming	11.08.2016	RARS, Lam	ANGRAU
3	Interaction meet of Sugarcane scientists on Vision 2030	22.09.2016	RARS, Anakapalle	ANGRAU
4	Interaction meet of Millet Scientists on Vision 2030	23.09.2016	ARS, Vizianagaram	ANGRAU
5	REAC Meeting	04.12.2016 & 05.12.2016	RARS, Nandyal	RARS, Nandyal
6	Establishment of Agricultural Market Intelligence Centre (AMIC) in ANGRAU	22.02.2017	RARS, Lam	ANGRAU & with the coordination of Department of Agriculture, Dept. of Marketing, APSSDC, CARDS, TNAU, Coimbatore, UAS Bangalore
7	Stakeholders meeting under GKMS project in collaboration with IMD	27.02.2017	RARS, Tirupati	ANGRAU
9	ZREAC Meetings	03.04.2017 & 04.04.2017 06.04.2017 & 07.04.2017 12.04.2017 &	Scares Rainfall Zone Southern Zone Krishna Zone	ANGRAU

S. No.	Event	Date	Venue	Organized by
		13.04.2017 18.04.2017 & 19.04.2017 20.04.2017 & 21.04.2017 22.04.2017 & 23.04.2017	HAZ Zone North Coastal Zone Godavari Zone	
10	Farmer Scientists Interaction Meeting	24.03.2017	KVK, Kalikiri	
11	Millet Fest	25.03.2017	Madanapalle	KVK, Kalikiri
12	State Coordination Committee Meeting for doubling the Farmer's income by March 2022	07.04.2017	Secretariat, Velagapudi	ANGRAU
13	SLTP Meetings	03.05.2017 to 20.05.2017	Maruteru, Bapatla and Lam	ANGRAU

Training Programmes / Short Courses / Orientation Programmes Organized

S. No.	Event	Date	Venue	Organized by
1	Training programme on 'Integrated Pest Management' under Unnath Bharath Abhiyan	23.05.2016 to 28.05.2016	RARS, Tirupati	RARS, Tirupati
2	Orientation programme for all the Scientists of Krishna Zone on Critical Interventions in various crops grown in the Zone Training programme on "Stress Management Techniques" to 10th Class students	28.05.2016 13.08.2016 & 14.08.2016	RARS, Lam Nirmala Girls High School, Vinukonda	RARS, Lam Dean of Home Science, ANGRAU
3	Vocational training programme on "Personality development, Communication skills and Agricultural Journalism" for RAWEP students	21.09.2016	KVK, Rastakuntubai	KVK, Rastakuntubai

S. No.	Event	Date	Venue	Organized by
4	Training programme on "Seed production in Vegetables" to the farmers	23.09.2016 & 24.09.2016	KVK, Banavasi	KVK, Banavasi
5	Training programme on "shade net nurseries"	23.09.2016 & 24.09.2016	KVK, Amadalavalasa	KVK, Amadalavalasa
7	Training programme on "IPM in redgram and cotton crops"	17.10.2016	DAATTC, Ananthapuramu	DAATTC, Ananthapuramu
8	Training programme to MPEOs of Atmakur ADA Division on 'Management Practices of Bengalgram, Jowar, rabi redgram and maize as well as pest and disease management of paddy, redgram and chillies"	20.10.2016	DAATTC, Kurnool	DAATTC, Kurnool
9	Training programme to farmers on "Production technology in maize"	21.10.2016	Gundlapalli village, Maddipadu Mandal	DAATTC, Ongole
10	Training programme on "Pest and disease management in vegetables"	24.10.2016	Pochigaani lanka, Mopidevi mandal	KVK, Ghantasala
11	Training programme to Multipurpose Extension Officers (MPEOs) of Dept., of Agriculture on "Pest management in Major crops"	17.11.2016	KVK, Kalikiri	KVK, Kalikiri
12	Training programme on "Soil Health Management" was conducted to the Crop Production and Extension Scientists of KVKs and DAATTCs	17.12.2016 & 18.12.2016	RARS, Anakapalle	ANGRAU
13	A Soil Health Management Training Programme to Extension Workers	27.12.2016 & 28.12.2016	RARS, Anakapalle	ANGRAU

S. No.	Event	Date	Venue	Organized by
14	Skill Development Training Programme on "Tie and Dye Techniques"	23.01.2017 to 25.01.2017	College of Home Science, Guntur	College of Home Science, Guntur
15	Vocational Training on "non-pesticide management" to the rural youth and farmers	31.01.2017 & 01.02.2017	Modumudi Village, Avanigadda Mandal, Krishna District	KVK, Ghantasala
16	Vocational training programme on "Water quality management in Fish and Prawn culture"	06.02.2017 to 10.2.2017	KVK, Undi	KVK, Undi under sponsorship from NFDB, Hyderabad
17	Training programme to farmers on "farm mechanization"	10.02.2017	Padmanabham mandal	DAATTC, Visakhapatnam
18	Training programme on "Tribal youth networking for the development of tribal agriculture"	17.02.2017 & 18.02.2017	KVK, Amadalavalasa	KVK, Amadalavalasa
19	Training programmes on "Pest Management in Rice" and "cultivation of summer pulses"	27.2.2017 & 28.02.2017	Satyawada & Mamidikuduru	DAATTC, Kakinada
20	Training programme on "Improved aquaculture practices in carp culture"	02.03.2017 to 04.03.2017 Srikakulam district	KVK, Amadalavalasa,	Krishi Vigyan Kendra, Amadalavalasa under sponsorship of National Fisheries Development Board (NFDB), Government of India, Hyderabad
21	Training programme on "Zero Tillage Maize"	02.03.2017	Chintalapudi of Ponnuru Mandal	Agricultural College, Bapatla
22	Training programme on "summer pulses cultivation."	13.3.2017	Adurru village of Mamidikuduru Mandal	DAATTC, Kakinada

Workshops/ Seminars / Conferences/Symposia Organized

S. No.	Event	Date	Venue	Organized by
1	Two workshops on preparation of Critical Interventions and Frequently Asked Questions	07.06.2016 & 13.06.2016	RARS, Lam	ANGRAU
2	Workshop on 'Stress Management Techniques' to students	19.06.2016	JMJ College, Tenali	ANGRAU
3	Zonal Level Pre – Action Plan Workshop	30.12.2016	RARS, Tirupati	ANGRAU
4	National Seminar on "Trends in Farm Mechanization and Engineering Interventions for Sustainable Agriculture"	19.01.2017 & 20.01.2017	RARS, Tirupati	ANGRAU
5	IIDS cross learning workshop	20.01.2017 & 21.01.2017	KVK, Amadalavalasa	ANGRAU and jointly organized by Media Lab Asia
6	Organized Joint workshop and discussed the possibilities of collaborations on different areas of Climate Resilient Agriculture, Molecular Biology and Biotechnology, Soil and Water Engineering etc.	21.02.2017	Novatel (Hitex), Hyderabad	ANGRAU and University of Western Australia
7	Organized National conference on 'Adaptation interventions for climate resilient agriculture in coastal agro-ecosystems'	09.03.2017 & 10.03.2017	RARS, Lam	ANGRAU
8	Organized a workshop on 'Extension of Extension Methodologies'	16.03.2017	DAATTC, Vizianagaram	ANGRAU
9	Organized a workshop on 'Strengthening of Extension Services of ANGRAU' with	18.04.2017	KVK, Kadapa	ANGRAU

S. No.	Event	Date	Venue	Organized by
	stake holders of agriculture and discussed about the methods for enhancing the outreach of the University to serve more number of farmers.			
10	National seminar on 'Agronomic Approaches for Climate Resilience in Agriculture'	02.05.2017	YSR Centenary Hall, RARS, Nandyal	ANGRAU

Participation / Visits of Vice-Chancellor

S. No.	Event	Date	Venue	Purpose
1	Visited Guntur and interacted with the University Officers on starting of Polytechnic at Ghantasala	23.07.2016	Guntur	Chairman
2	Discussed with Special Chief Secretary, Finance on issues pertaining to Time Scale employees and other finance related issues.	01.08.2016	—-	Chairman
3	University Officers meeting on EoI of Private Colleges.	02.08.2016	Guntur	Participation
4	Discussions were held on performance of Teachers for Awards	09.08.2016	Vijayawada	Chairman
5	Soil Health Management workshop with 30 Scientists, University Officers and NGOs	11.08.2016	Lam, Guntur	Participation
6	Discussed with the University Officers on Private Polytechnics	14.08.2016	Guntur	Chairman
7	Participated in Independence Day celebrations and also participated in workshop on Agriculture conducted at Vijayawada Ibrahimpatnam Pavitra Sangamam on the same day and interacted with farmers.	15.08.2016	Lam, Guntur & Vijayawada	Participation

S. No.	Event	Date	Venue	Purpose
8	Zero Budget Natural Farming along with University Officers, Scientists, RAWEP Students; wherein Padmasri Subhash Palekar narrated all about ZBNF	11.09.2016 to 14.09.2016	Tirupati	Participation
9	274th meeting of the Board of Management	17.09.2016	APRRI & RARS, Maruteru	Chairman
10	Visited and inspected the land of the University, along with the Registrar & Assoc. Director of Research, Lam and also examined digital map of the land prepared by CPWD	19.09.2016	RARS, Lam	Participation
11	Sri B. Rajsekhar, I.A.S., Special Chief Secretary to Government (FAC), Agriculture & Cooperation Department, Government of Andhra Pradesh, has assumed charge as Vice-Chancellor on superannuation of Sri T. Vijay Kumar, IAS., Vice-Chancellor.	01.10.2016	—	- —-
12	Interacted with the University Officers and flagged some contemporaneous issues related to sustainability of Agriculture and tenant farmers.	13.10.2016	—-	Chairman
13	275th meeting of the Board of Management	11.11.2016	Ag College, Naira	Chairman
14	National Seminar on "Trends in Farm Mechanization and Engineering Interventions for Sustainable Agriculture"	19-01-2017	Regional Agricultural Research Station, Tirupati	Participation
15	Review meeting on Architectural drawings of buildings at Lam and Bapatla in the presence of Sri Prathipati Pulla Rao Garu,	02-02-2017	A.P. Secretariat, Velagapudi	Chairman

S. No.	Event	Date	Venue	Purpose
	Hon'ble Agricultural Minister, Sri Mekala Lakshminarayana, Hon'ble Member of Board of Management, Sri K. Dhananjaya Reddy, IAS, Director of Agriculture & Member, BoM and other University Officers			
16	MoU signing on Natural Farming between Government of Andhra Pradesh and Azimji Premji for Philanthropic Initiative	08.02.2017	Lam	Participation
17	National Conference on "Adaption Interventions for Climate Resilient Agriculture in costal agro-Ecosystems"	09.03.2017 & 10.03.2017	Lam, Guntur	Chairman
18	Meeting on "Satellite Based Rice Monitoring Systems for Andhra Pradesh"	14.03.2017	Secretariat, Velagapudi	Chairman
19	Inaugural ceremony of Faculty Block	24.03.2017	Lam, Guntur	Participation
20	Release of 'Vyavasaya Panchangam' at Ugadi Puraskaralu function	28.03.2017	Tummalapalli Kalakshetram, Vijayawada	Participation
21	State-wise Coordination Committee meeting on "Doubling the Farmer's income by March 2022"	07.04.2017	A.P. Secretariat, Velagapudi	Chairman
22	Review meeting of the Hon'ble Agriculture Minister on the activities of ANGRAU.	10.04.2017	A.P. Secretariat, Velagapudi	Participation
23	Graced the College Day Function of College of Agricultural Engineering, Bapatla and distributed the certificates to GATE Awardees	14.04.2017	CAE, Bapatla	Participation
24	Foundation Stone Laying Ceremony of College buildings	06.05.2017	Agricultural College, Bapatla	Participation
25	Interface meeting on enhancing the preparedness of Agricultural Contingencies in Kharif, 2017 for Andhra Pradesh	27.05.2017	—-	Participation

Visitors

S. No.	Visitor (s)	Date	Place Visited	Remarks
1	Dr. S. Ayyappan, Director General, ICAR, New Delhi	11.06.2016	KVK, Reddipalle and its adopted	To get the information on the interventions taken by the centre in dry land villages agriculture and he interacted with the farmers and obtained first-hand information on the impact of low cost technologies and the impact of farm pond and other NRM activities taken by the KVK in the adopted villages
2	Hon'ble Minister for Agriculture, Sri P. Pulla Rao	13.10.2016	RARS, Lam	Visited and reviewed the progress of the work of University Head Quarter buildings with University and NBCC Officials
3	Dr. O.P. Sharma, Principal Investigator, NCIPM-NICRA	07.10.2016 & 08.10.2016	KVK, Reddipalli	visited to monitor the activities of the project on pest surveillance and redgram and cotton fields at KVK and NCIPM adopted villages
4	Chief General Manager, NABARD	08.02.2017	Agricultural College, Bapatla	Visited and reviewed the progress of works pertaining to the funds allotted to the University under RIDF-XX & XXI and also visited different sites proposed for construction of buildings at Agricultural College, College of Agricultural Engineering and College of Food Science and Technology, Bapatla under RIDF – XX. He also reviewed the progress of work of NABARD Chair Unit, ANGRAU.

X. RESEARCH PUBLICATIONS

A. BY TEACHING FACULTY

1. Agriculture

Books and Chapters

1. Naresh Kumar, Raghavendra M, Jayanti T and Hari R S, 2016, "Dairy in Human Health and Disease Across the lifespan", In: *Milk Proteins: Precursors and antioxidative peptides and their health benefits. Edt. By Ronald Ross Watson, Robert J. Collier and Victor R. Preddy,* 313-323pp.
2. Naresh Kumar, Raghavendra M, Jayanti T and Hari R S, 2016, "Nutrients in Dairy and Their implications for Health and Disease",In: *Flavour addition in dairy products: Health benefits and risks. Edt. By Ronald Ross Watson, Robert J. Collier and Victor R. Preddy,* 123-135pp.
3. Ravindra Reddy B, 2016, "Correlation and Regression. Recent Advances in Groundnut Production Technology", *BS Publication*, Hyderabad, 753-769 pp.
4. Reddy S R and Nagamani C, 2017, "A Text book on Introduction to Forestry", *Kalyani Publishers*.
5. Reddy S R and Nagamani C, 2017, "A Text book on Principles of crop production", *Kalyani Publishers*.
6. Reddy S R and Prabhakara Reddy G, 2016, "A Text book on Dryland Agriculture", *Kalyani Publishers*.
7. Reddy S R and Reddi Ramu Y, 2016,"Text book on Agronomy of Field Crops", *Kalyani Publishers*
8. Sudharani D, Chiranjeevi Ch, Krishnayya P V and Sairam Kumar D V, 2017, "Molecular Tools in Biological Control of Crop pests" , *Plant Biotechnology and Industrial Applications*, 57-92 pp
9. Sudhakar P, Latha P and Sujatha K, 2017, "Drought mitigation strategies for dryland agriculture with special reference to groundnut", *Groundnut Production Technology, B.S. Publications*, pp. 504-512.
10. Venkata R, Prakash Reddy, 2016, "Breeding for Crop Improvement." Satish Serial Publishing House (P) Ltd.
11. Venkata R, Prakash Reddy, 2016, "Key notes on Plant Biotechnology" *Astral International (P) Ltd*.

Research Papers

1. Abdul Rasheed V, Koteswara Rao S R, Ramesh Babu T, Murali Krishna T, Srinivasulu A and Venkata Ramanaiah P, 2017, "New record of invasive South American tomato leaf miner *Tuta absoluta* (Meyrick) (Lepidoptera: Gelechiidae) on tomato in Andhra Pradesh", *International journal of Pure and Applied Biosciences*, 5 (3): 654-656.
2. Abdul Rasheed V, Murali Krishna T and Bhaskar B, 2016, "Management of papaya mealybug, Paracoccus marginatus on papaya", *Current Biotica*, 10 (1): 9-20.

3. Sireesha A B M, Lal Ahamed M, Rama Kumar P V, Ratna Kumari S and Srinivasa Rao V, 2014 "Genetic variability of seed cotton yield and yield components in cotton", *The Andhra Agricultural Journal* , 63(2): 335-337.

4. Ammaji P, Srinivas T, Chinranjeevi Ch and Praveen N, 2014, "On-farm evaluation of drumseeded rice", *Journal of Research, ANGRAU*, 42 (3 & 4): 136-140.

5. Anand Kanatti, Kedar Nath Rai, Kommineni Radhika and Mahalingam Govindaraj, 2016, "Tester Effect on Combining Ability and Its Relationship with Line Performance per se for Grain Iron and Zinc Densities in Pearl Millet", *Crop Science*, 56: 1-8.

6. Anand Kanatti, Kedar Nath Rai, Kommineni Radhika and Mahalingam Govindaraj, 2016, "Genetic architecture of open-pollinated varieties of pearl millet for grain iron and zinc densities", *Indian of Genetics and Plant Breeding*, 76 (3): 299-303.

7. Anand Rao N, Sreekanth B, Madhav M S and S N Reddy, 2016, "Chemical Componnental Analysis of the Rice*(Oryza sativa L)* culm", *Progressive Research*, 12 (Special -1): 721-724.

8. Anand Rao N, Sreekanth B, Madhav M S and Reddy S N, 2016, "Study of the Histological Basis for Lodging Tolerance in Rice (*Oryz sativa L.)"*, *Progressive Research*, 12 (Special -1) : 853-857.

9. Anil Kumar, Sarma K, A S R, Madhumathi T and Prasanna Kumari V, 2017, "Influence of weather parameters on the occurrence of major insect pests and diseases of Paddy", *The Andhra Agricultural Journal*, 64 (1): 137-14.

10. Anitha D, Nagavani A V and Chandrika V, 2017, "Influence of crop geometry and age of seedlings on yield, nutrient uptake, postharvest nutrient status and economics of fingermillet", *Green Farming*, 8: 160-163.

11. Anitha D, Nagavani A V and Chandrika V, 2016, "Tillering pattern, light interception percentage and yield of fingermillet as influenced by crop geometry and age of seedlings", *Research Journal of Agricultural Sciences*, 7 (2): 450-453.

12. Anusha S, Prasada Rao, G M V, Sai Ram Kumar V and Srinivasa Rao V, 2016, "Impact of different levels of nitrogen on the incidence of various sucking insect pests of Bollguard II cotton", *The Andhra Agricultural Journal*, 62 (4): 890-894.

13. Anusha S, Prasada Rao, G M V and Sai Ram Kumar D V, 2017, "Influence of different nitrogen levels on the management of Bt cotton sucking pests", *Journal of Entomology and Zoology Studies*, 5 (2): 16-21.

14. Archana K, Rambabu P, 2016, **"**Profile of the MGNREGA beneficiaries – A study in Srikakularm District of A.P.", *The Andhra Agricultural Journal*, 63(2) : 465-469.

15. Aruna Kumari H and Sree Rekha M**,** 2016**, "**Plant density and nitrogen in sorghum (A review)", *International Journal of Science and Nature*, 7 (4): 702-706.

16. Arunakumari H, Prasad P V N**,** Venkateswarlu B and Prasad P R K, 2016, "Growth and yield of rice fallow sorghum as influenced by planting density and nitrogen", *The Andhra Agricultural Journal*, 63 (3): 525-530.

17. Ashok M, Reddemma K, Reddy M S, Reddy U V B and Babu P V R, 2017, Impact of climate change on rainfed agriculture. National seminar on "*Agronomic Approaches for Climate Resilience in Agriculture*" at RARS, Nandyal. pp, 41.

18. Ashok S, Jyothula D P B and Ratna Babu D, 2016, "Character association and path analysis for yield components and grain quality parameters of rice (*Oryza sativa L.*). International", *Journal of Agricultural Science and Research*, 6 (6): 251-258.

19. Ashok S, Jyothula D P B and Ratna Babu D, 2017, "Understanding diversity in rice (*Oryza sativa L.*) germ plasm using Principal Component Analysis", *Agricultural Research Journal*, 54 (2): 170-175.

20. Ashok S, Jyothula D P B, Ratna Babu D and Srinivasa Rao V, 2016, "Studies on genetic variability, heritability and genetic advance for yield components and grain quality paametres of rice (*Oryza sativa L.*)", *The Andhra Agricultural Journal*,63 (3): 575-579.

21. Ashoka Reddy Y, Prabhakara Reddy G, Sagar Kumar Reddy R V, Suresh Kumar R and Reddy PVRM, 2016, "Influence of spacings and varieties of pigeonpea on nutrient uptake and yield", *Progressive research*, 11 (III): 6159-6160.

22. Ashoka Reddy Y, Sagar Kumar Reddy R V, Prabhakara Reddy G and Pushpavathi Y, 2016, "Response of pigeonpea(Cajanus*cajan*) varieties to varying plant population during *rabi* in Southern Agroclimatic Zone of Andhra Pradesh", *International Journal of Agricultural Science and Research*, 6 (6): 73-76.

23. Mukunda Rao B, Suryamani M and Narasimha Rao V, 2016, "SWOT analysis of Bt Cotton cultivation in Andhra Pradesh", *The Andhra Agricultural Journal*, 63 (1): 219-225

24. Prasanna Kumar B, Triveni S, Subhash Reddy R and Vijaya Gopal A, 2016, "Effect of cellulolytic pretreatment of agricultural waste on organic matter degradation", *International Journal of Current Microbiology and Applied Sciences*, 5 (12): 23-35.

25. Vijya Lakshmi B, Suryanarayana Y, Ramakumar PV, Ashoka Rani Y and Srinivasa Rao V, 2017, **"**Studies in gene action and combining ability for morpho-physiological traits n rice under water stress conditions", *The Andhra Agricultral Journal*, 63 (2): 322-327.

26. Babu P V R, Reddy M S and Reddy U V B, 2017, "Climate change and Indian Agriclture, two sides of the coin "food security". National seminar on "*Agronomic Approaches for Climate Resilience in Agriculture*" at RARS, Nandyal 40.

27. Bala krishna B, Ratna Babu D, Lal Ahamed M and Bhat J S, 2016, "Characterization of maize (*Zea mays L.*) inbreds using DUS parameters", *Journal of Environment and Biological Sciences*, 30 (1): 225-235.

28. Balakrishna B, Chenga Reddy V and Lal Ahamed M, 2016, "Identification of favourable alleles in the donor parents for improving American cotton hybrid (NDLH 1928 x MCU 5)", *Plant Archives*, 16 (1): 419-422.

29. Balakrishna B, Chenga Reddy V and Lal Ahamed M, 2016, "Assessment of genotype x environment interaction (GEI) by using AMMI model for fibre quality traits in inters specific hybrids of cotton (*Gossypium hirsutum L. xG. Barbadense*)", *Environment and Ecology*, 35 (2D): 1585-1590.

30. Balakrishna B, Chenga Reddy V and Lal Ahamed M, 2016, "Character association and path coefficient analysis in Egyptian cotton (*G. barbadense*)", *Advances in Life Sciences Journal*, 5 (9): 3555-3561.

31. Balakrishna B, Chenga Reddy V and Lal Ahamed M, 2016, "Studies on genetic parameters for seed cotton yield and its contributing characters in American cotton (*Gossypium hirsutum L.*)", *Research Journal of Agricultural Sciences*, 7 (1): 198-200.

32. Balakrishna B, Chenga Reddy V and Lal Ahamed M, 2016, "Correlation and path coefficient analysis of seed cotton yield contributing and quality traits in cotton (*Gossypium hirsutum L.*)", *Research Journal of Agricultural Sciences*, 7 (3): 638-642.

33. Balakrishna B, Chenga Reddy V and Lal Ahamed M, 2017, "Heterosis and combining ability estimates through line x tester analysis in inter specific hybrids of cotton (*Gossypium hirsutum x G. barbadense*)", *Electronic Journal of Plant Breeding*, 8 (2): 444-449.

34. Balakrishna B, Chenga Reddy V and Lal Ahamed M, 2016, "Genetic variability, heritability and genetic advance in inter specific hybrids of cotton (*Gossypium hirsutum x G. barbadense*)", *Advances in Life Sciences Journal*, 5 (5): 1930-1935.

35. Bayyapu Reddy K and Chenga Reddy V, 2016, "Association analysis of yield and fibre quality characters in upland cotton [*Gossypium hirsutum L.*] over environments", *International Journal of Agricultural Sciences and Veterinary Medicine*, 4 (3): 59-65.

36. Bayyapu Reddy K and Chenga Reddy V, 2016, "Genetic variability and heritability in upland cotton (*Gossypium hirsutum L.*)", *International Journal of Agricultural Sciences and Veterinary Medicine*, 4 (3): 17-21.

37. Bayyapu Reddy K, Chenga Reddy V, Lal Ahmed M, Naidu T C M and Srinivasa Rao V, 2017, "Character association and path coefficient analysis for yield and component traits in upland cotton (*Gossypium hirsutum L.*)", *Journal of Cotton Research and Development*, 31 (1): 29-33.

38. Bayyapu Reddy K, Chenga Reddy V, Lal Ahmed M, Naidu T C M and Srinivasa Rao V, 2017, "Combining ability analysis for seed cotton yield and quality traits in upland cotton [*Gossypium hirsutum*] over environments", *Electronic Journal of Plant Breeding*, 8 (1): 142-152.

39. Bayyapu Reddy K, Chenga Reddy V, Lal Ahmed M, Naidu T C M and Srinivasa Rao V, 2017,"Study of Combining ability analysis and gene action for seed cotton yield and fibre characters in upland cotton (*Gossypium hirsutum*)", *The Journal of Research, ANGRAU*, 45 (1): 22-31.

40. Bayyapu Reddy K, Chenga Reddy V, Lal Ahmed M, Naidu T C M and Srinivasa Rao V, 2016, "Combining ability study for yield and its component traits through diallele mating design in upland cotton(*Gossypium hirsutum L.*)", *Journal of Cotton Research and Development*, 30 (2): 180-184.

41. Bayyapu Reddy K, Chenga Reddy V, Lal Ahmed M, Naidu T C M and Srinivasa Rao V, 2017, "Heterotic studies for yield and its component traits in upland cotton [*Gossypium hirsutum L.*)", *The Andhra Agricultural Journal*, 64 (1): 55-61.

42. Bayyapu Reddy K, Chenga Reddy V, Lal Ahamed M, Naidu T C M and Srinivasa Rao V, 2017 "Heterotic studies for yield and its component traits in Upland Cotton (*Gossypium hirsutum L.*)", *The Andhra Agricultral Journal*, 64 (1): 55-61.

43. Bhadre chandbashi K, Sunitha N, Nagavani A V, Ramana J V and Prabhakara Reddy G, 2016, "Growth, yield and quality of fodder maize as influenced by varied nitrogen levels and crop geometry", *The Andhra Agricultural Journal*,63 (2): 273-295.

44. Bhagavatha Priya T, Subramanyam D and Sumathi V, 2016, "Performance of groundnut (*Arachis hypogaea L*) cultivars under varied plant populations during early kharif", *Indian Journal of Agricultural Research*, 50 (4): 362-365.

45. Bhagavatha Priya T, Subramanyam D and Sumathi V, 2016, "Productivity and profitability of different groundnut (*Arachis hypogaea L*) cultivars under varied plant populations during early kharif", *Advances in Life Sciences*, 5 (8): 3398-3401.

46. Bhanu Rekha K, Jayalakshmi V, Srinivas T, Sudha rani M and Uma Maheswari P, 2017, "Genetic variability for selective tolerance to imazethpyr in chickpea", *Journal of Food legumes*, 30 (1): 33-38.

47. Bhanurekha K, Jayalakshmi V, Srinivas T, Umamaheswari P and sudha Rani M, 2016, "Genetic divergence studies for morpho physiological characters including seed yieldin chickpea (*Cicer arietinum L)*",*The journal of ANGRAU*, XIV (1&2): 31-37.

48. Bharathi D and Thirumala Rao V, 2016, "Genetic diversity studies in Sesame (*Sesamum indicum L.*)", *Progressive Research – An International Journal*, 11(1) 265-267.

49. Bharathi D, Thirumala Rao V, Venkanna V and Badru D, 2016, "Genetic analysis of yield and its components in sesame (*Sesamum indicum L.*)", *Progressive Research – An International Journal*, 11 (Special-V): 3603-3604

50. Bharathi V, Sudha Rani M, Kanakadurga K and Naidu N V, 2016, "An alternative method to protect seed health in storage in sunflower", *Ecology, Environment and conservation*, 22(June Supplement): 181-S185.

51. Bhargavi H, Reddy M S, Reddy S T, Kavitha P, Reddy U V B and Babu P V R, 2016,"Productivity of groundnut (*Arachis hypogea L.*) as influenced by varieties and plant densities", *Journal of Oilseed Research*, 32 (1): 83-86.

52. Bhaskar B, Khayum Ahammed S, Sarada Jayalakshmi Devi R, Manjula K, Rasheed V A and Prasad T N V K V, 2016, "Fungicidal action of mycogenic silver nanoparticles against Aspergillus niger inciting collar rot disease in groundnut (*Arachis hypogaea L*)", *Indian Phytopathology*, 69 (4S): 605-608.

53. Bhaskar B, Khayum ahammed S, Prasad TNVKV, Rasheed VA and Sarada Jayalaksmhi Devi R, 2016, *International Journal of Bio resource and Stress Management*,7(6spl): 443-448.

54. Bhaskar B, Khayum Ahammed S, Rasheed V A and Sarada Jayalakshmi Devi R, 2016,"Role of organic acids production in Pathogenicity of Aspergillus niger inciting collar rot disease in groundnut", *Indian Phytopathology*, 69 (4S): 172-174.

55. Bhaskar B, Vijay Kumar S, Aruna J, Rambabu R, Madhavi KR, Jahaar Singh, Prakasam V, Ladha Lakshmi D, Sarada Jayalakshmi Devi R, Rajan CPD and Prasad M S, 2017,"Injection Method: A Novel Inoculation Technique for Evaluation of Neck Blast Resistance in Rice Genotypes", *ICAR-IIRR News Letter*,15 (1) 38-39.

56. Bilquis and Mayuri K, 2016, "Situational analysis of female feticide and female infanticide inunited Andhra Pradesh, *Journal of Research, ANGRAU*.

57. Bilquis and Mayuri K, 2017,"Determinants of perception on girl child in Andhra, Rayalaseema and Telangana regions", *Journal of Research, ANGRAU*.

58. Biyyani Suman, Vijaya Gopal A, Subhash Reddy R and Triveni S , 2015, "Isolation and Characterization of *Pseudomonas fluorescens* from Rice Rhizospheric Soils of Rangareddy District in Telangana State", *Journal of Pure and Applied Microbiology*, 9 :(spl.2) 339-344.

59. Biyyani Suman, Vijaya Gopal A, Subhash Reddy R, Triveni S and Damodara Chari K, 2016, "Plant Growth Promoting Attributes of *Pseudomonas fluorescens* isolated from Rhizosphere of Rice In Rangareddy District", *Pollution Research*, 35 (1): 91-96.

60. Biyyani Suman, Vijaya Gopal A, Subhash Reddy R, Triveni S, Manasa K and Laxman Rao P, 2015, "Isolation and characterization of Native *Pseudomonas Fluorescens* isolates From Rangareddy District, Telangana, *Progressive Research*,10 (Special-III): 1865-1868.

61. Biyyani Suman, Vijaya Gopal A, Subhash Reddy R, Triveni S and Nissipaul M, 2017, "Study the efficacy of Pseudomonas fluorescens against sheath blight in rice by *Rhizoctonia solani*. *International Journal of Current Microbiology and Applied Sciences*, 6 (4): 2581 – 2589.

62. Boreddy S R and Subbiah J, 2016, "Temperature and moisture dependent dielectric properties of egg white powder", *Journal of Food Engineering*, 168 (1): 60-67.

63. Boreddy S R, Thippareddi H, Froning G and Subbiah J, 2016, "Novel Radio frequency assisted thermal processing improves the gelling properties of standard egg white powder", *Journal of food science*, 81 (3): E665-E671.

64. Santhi Priya Ch, Suneetha Y, Ratna Babu D and Srinivasa Rao V**, "**Variability, Heritability and Genetic Advance in Rice (*Oryza sativa L.*)", *The Andhra Agricultural Journal*, 64 (1): 91-93.

65. Chadrasekhar Ch, Naidu M V S, Ravi P, Madhu M, Balaguravaiah D and Ramprakash T, 2017, "Suitability evaluation for crops in Prakasm district of Andhra Pradesh", *Annals of Plant and Soil Research,* 19 (1): 1-6.

66. Chaitanya N, Gopalaswamy, S V S and Madhumathi T, 2017, "Effect of modified atmosphere on cigarette beetle Lasiodermaserricorne (F.) in stored turmeric", *Indian Journal of Entomology* 79 (2): 202-207. 5.89

67. Chaitanya N, Gopalaswamy, S V S, Madhumathi T**,** Manoj Kumar V, and Lakshmipathy R, 2016, "A study on incidence of cigarette beetle, *Lasiodermas erricorne* (Fab.) in turmeric rhizomes in storage houses at Duggirala", *The Andhra Agricultural Journal*, 63 (2): 374-378.

68. Chaithanya B H, Bhaskara Reddy B V, Prasanthi L, 2017,"RCA-PCR assay is more effective than traditional PCR assay for detecting Begomovirus in Greengram", *Environment and Ecology*, 35 (A): 1932-1935.

69. Chaithanya Kumar G, Mohan Naidu G and Ravindra Reddy B, 2016, "Forecasting of cotton behavior by ARIMA approach", *Research Journal of Agricultural Sciences*, 7 (special): 92-95.

70. Chandra Sekhar Reddy M, Rao D V S, Gurava Reddy K, Reddy G R R and Srinivasa Rao V, 2017, "Spatio- temporal variability of climate change and its impact on yield : A case study from Nagarjuna Sagar Project, Krishna River basin", *The Journal of Research ANGRAU*, 45 (1): 46-57.

71. Chandrajini Devi H, Prasanna Kumari V, Manoj Kumar V, Ashoka Rani Y and M Adinarayana, 2016, "Mungbean yellow mosaic infection and biochemical variability in blackgram genotypes", *The Andhra Agricultural Journal*, 63 (4) 852-856.

72. Chandrasekhar Reddy M, Vishnu Sankar Rao D, Raghunadha Reddy G, Gurava Reddy K and Srinivasa Rao V, **"**Climate resilient technology adaptation and expected cost of uncertainty under Nagarjuna Sagar Project, Krishna River Basin", *The Journal of Research ANGRAU*, 44 (3&4): 1-168, 104-113.

73. Chiranjeevi N, Anil Kumar P, Hari Prasad K V and Prasad TNVKV, 2016,"Testing of *Invitro* efficacy of Trichiderma against *R. solani", Andhra Pradesh Journal of Agricultural Sciences.*

74. Chiranjeevi N, Anil Kumar P, Hari Prasad K V and Prasad TNVKV, 2016, "Testing of bio efficacy of silver nano particles against sheath blight causing fungi *R. solani*", *Advances in Life Sciences*, 8: 259-264.

75. Chiranjeevi N, Anil Kumar P, Hari Prasad K V and Prasad TNVKV, 2016,"Assay of ISR enzymes in bio silver nano treated seedlings", *Bioscan*.

76. Chiranjeevi N, Anil Kumar P, Hari Prasad K V and Prasad TNVKV, 2016, "Synthesis and Characterization of silver nano particles using bio control agents and R. solani", *Advances in Life Sciences*, 8: 253-258.

77. Deepthi kiran Y, Sumathi V and Prabhakara Reddy G, 2016,"Water use efficiency and nutrient use efficiency as influenced by irrigation scheduling and levels of nitrogen", *Green farming*, 7 (5): 1-5.

78. Deepthi Kiran Y, Sumathi V, Prabhakara Reddy G, Sudhakar P and Naidu M V S, 2016, "Yield and nutrient uptake of maize as influenced by drip irrigation and nitrogen levels", *Andhra Pradesh Journal of Agricultural Sciences*, 2 (1): 22-27.

79. Deepthi kiran Y, Sumathi V, Prabhakara Reddy G, Sudhakar P and Naidu M V S, 2016, "Yield and nutrient uptake of maize as influenced by drip irrigation and nitrogen levels", *Andhra Pradesh Journal of Agricultural Sciences*, 2 (1) 22-27

80. Devi P A Vand Naidu M V S, 2016, "Land evaluation for alternate land use planning of sugarcane growing soils of Chittoor district in Andhra Pradesh", *Journal of the Indian Society of Soil Science*, 64 (1):13-24.

81. Devi P A V and Naidu M V S, 2016, "Clay mineralogy of sugarcane soils formed on Granite-gneiss parent material of Chittoor district, Andhra Pradesh", *Annals of Plant and Soil Research*, 18 (3): 189-195.

82. Dhanapal R, Sai Ram Kumar D V, Sandhya Rani C, Manoj Kumar V and Lakshmipathy R, 2016, "Pathogenicity of a native isolates of Nomuraeareleyi (Farlow) Samson against tobacco caterpillar, *Spodopteralitura Fabricius*", *The Andhra Agricultural Journal*, 63 (2): 379-382.

83. Dharani Niveditha P, Sudha rani M, Prasanna Rajesh A and Nirmala P J, 2016, "Genetic Diversity based on cluster and Principal Component analysis for yield, yield components and quality traits in peanut stem necrosis tolerant groundnut genotypes (*Arachis hypogeae L.*)", *Journal of Research, ANGRAU*, 44 (3&4): 6-12.

84. Dharani Niveditha P, Sudha rani M, Prasanna Rajesh A and Nirmala P J, 2016, "Genetic Divergence and Path Coefficient Analysis in Peanut Stem Necrosis Tolerant Groundnut genotypes (*Arachis hypogeae L.*)", *Progressive Research-An International Journal*, 11 (special-III): 1686-1690.

85. Dharani Niveditha P, Sudha rani M, Prasanna Rajesh A, 2017, "Genetic variability for kernel yield and qualitative traits in peanut stem necrosis tolerant groundnut genotypes of Andhra Pradesh", *Elecronic Journal of Plant Breeding*, 9 (1): 390-394.

86. Dhurai SY, Reddy D M, Bhatiand P K, Ravi S, 2016, "Correlation and path analysis for yield and quality characters in rice (*Oryza sativa L.*)", *Rice genomics and Genetics*, 7 (4): 12-15.

87. Dipak D E, Srinivasa Rao M, 2017**, "**Entrepreneurship: A Conceptual Framework in Entrepreneurship in Agricultural Development", *Entrepreneurship Development in Agriculture* ISBN-978-93-5124-785-2, Daya Publishing House, New Delhi.

88. Divya K, Rajeswari S, Bhavani Devi I and Sumati P, 2016, "Price atility in major pulses markets of Andhra Pradesh", *Advances in Life Sciences*, 5 (20): 9280-9282.

89. Divya M, Prasanna Kumari V, Krishna Prasadji J, Ashoka Rani Y and Srinivas T, 2016, "Efect of grain discoloration on rice grain biochemical constituents and seed germination and vigor", *The Andhra Agricultural Journal*, 63 (2) 356-363.

90. Divya V, Chandrika V, Prabhakara Reddy G, Naga Madhuri K V, Umamahesh V and Pratap Kumar Reddy A, 2016, "Energy use analysis of different food-forage based cropping systems",*Progressive research*, 11 (III): 1501-1507.

91. Divya V, Chandrika V, Prabhakara Reddy G, Naga Madhuri K V, Umamahesh V and Pratap Kumar Reddy A, 2016,"Production potential and economic viability of food-forage based cropping systems under irrigation", *Advances in Life Sciences*, 5 (19): 8449-8453.

92. Divya, S V D, Krishnayya P V, Madhumathi T, Manoj Kumar V and Prasuna Rani P, 2016, "Influence of water quality on the efficacy of certain insecticides on *Spodoptera litur*a", *The Andhra Agricultural Journal* 63 (4): 879-883.

93. DivyaBharathi T, Krishnayya P V and Madhumathi T**,** 2017, "Comparative studies on the susceptibility of different grains to pulse beetle, *Callosobruchus maculatus*", *International Journal of Science*, 6 Issue 1: 308-318.

94. Divya Bharathi T, Krishnayya P V and Madhumathi T**,** 2017, **"**Developmental Response of *Callosobruchus maculates F*. and *C. chinensis L.* on Different Pulse Host-Grains", *Chemical Science Review and Letters*, 6 (22): 786-792. 5.21

95. DivyaBharathi T, Krishnayya P V, and Madhumathi T, 2016, "Assessment of population and damage of pulse beetle, *Callosobruchus chinensis L.* on different pulse grains", *Entomon*, 41 (3): 209-216. 4.42

96. Dondapati Annekitty Deborah, Lakshminarayana R, Vemireddy, Veeraghattapu Roja, Santhosh Patil, Ganga Prasad Choudhary, Sabahat Noor, Akkareddy Srividhya, Andi Kaliappan, B

Sandhya Rani, Valluri V. Satyavathi, Ghanta Anuradha, Kommineni Radhika, Kalinati N. Yamini, Gopalakrishna M. Kadambari, Ranjith Kumar Nagireddy, Ebrahimali A. Siddiq and Javaregowda Nagaraju. 2017. Molecular dissection of QTL governing grain size traits employing association and linkage mapping in Basmati rice. *Molecular Breed*ing. 37:77

97. Effect of Water –Logging on Morphological Parameters and Yield in Maize Hybrids Tufail Manzoor, and Jayalalitha K, 43 (1) 149 – 153

98. Effect of Water Logging on Yield and Yield Components in Maize Hybrids Tufail Manzoor, Jayalalitha K, Narasimha Rao KL and Lal Ahamed Mohammed 63 (3)

99. Gireesh Kumar R, Vijaya Gopal A, Subhash Reddy R, Rani CH V, Durga Triveni S and Chari K, 2017, "Damodara.Isolation and screening for efficiency of organic phosphorus pesticide (Chlorpyriphos) degrading bacteria from different crops", *Journal of Nature Environment and Pollution Technology*, 16 (1): 169-173.

100. Girija Rani M, Satyanarayana P V, Lal Ahmed M, Ashoka Rani Y and Srinivasa Rao V, 2017,"Combining ability studies of lodging susceptible vs resistant genotypes of rice",*Green Farming*, 8 (2): 254-259.

101. Girraj Sharma, Venkateswarlu B, Prasad P V N and Madhuvani P, 2016, "Effect of varying levels of nitrogen and intercropping on growth, yield attributing characters and yield of baby corn (*Zea mays L.*)" *The Andhra Agricultural Journal*, 63 (1): 40-45.

102. Govardhan G, Reddy K H P, Reddy D M, Paramesh M and Praveen K, 2016, "Inter-Relationship Among Yield, Yield Attributes and Drought Related Traits in Mungbean (*Vigna radiate L.*) Wilczek", *Advances in Life Sciences*, 5 (18): 7755-7758.

103. Govardhan G, Reddy K H P, Reddy D M, Sudhakar P and Reddy B V B, 2017, "Heterosis and combining ability studies for yield and yield components in mungbean (*Vigna radiata L.*) Wilczek", *Green farming*, 8 (2): 260-265.

104. Govardhan G, Reddy K H P, Reddy D M, Sudhakar P and Reddy B V B, 2017, "Genetic analysis of yield and yield attributes in mungbean under irrigated and moisture stress conditions", *Ecology, Environment and conservation*, 23: 191-201.

105. Govardhan G, Reddy K H P, Reddy D M, Sudhakar P and Reddy B V B, 2017, "Impact of Moisture Stress on Yield and Yield Attributes in Mungbean", *Ecology, Environment and conservation*, 23: 269-274

106. Govardhan G, Reddy K H P, Reddy D M, Sudhakar P and Reddy B V B, 2017, "Heterosis and combining ability studies for yield and yield components in mungbean (*Vigna radiata L.*) Wilczek", *Green farming*, 8 (2): 260-265.

107. Govardhan G, Reddy K H P, Reddy D M, Sudhakar P and Reddy B V B, 2017, "Genetic studies for drought related traits in mungbean", *Green farming*, 8 (2): 276 281.

108. Govardhan G, Reddy K H P, Reddy D M, Sudhakar P and Reddy B V B, 2017, "Genetic studies for drought related traits in mungbean", *Green farming*, 8 (2): 276-281

109. Govardhan G, Reddy K H P, Reddy D M, Mallikarjuna S J and Ravi S, 2016, "Path Coefficient analysis among yield and drought related components in mungbean under irrigated and moisture stress conditions", *Advances in Life Sciences*, 5 (18): 7744-7747.

110. Govardhan G, Reddy K H P, Reddy D M, Sudhakar P, Latha P and Reddy B V B, 2017, "Physiological responses of mungbean genotypes to irrigated and moisture stress conditions", *Ecology, Environment and conservation*, 23: 259-264.

111. Govinda Rao S, Nageswara Rao C, Kondababu P, 2017, "Manpower planning model for regular and temporary employee grades in an organization", *Global Journal for Research Analysis*, 6 (5): 466-469.

112. Govinda Rao S, Nageswara Rao C, Kondababu P, 2017, "Use of E-Resources in an organization: A Study", *International Journal of Scientific Research*, 6 (5): 518-520.

113. Govinda Rao S, Kondababu P, Nageswara Rao C, 2017, "Osmotic dehydration of pineapple: A Study", *International research journal of Science, Engineering and Technology*, 7 (1): 49-63.

114. Govinda Rao S, Saritha R, Nageswara Rao C, 2017, "Evaluation of water saving system of rice intensification under tank fed System", *International Journal of Agriculture and Environmental Research*, 3 (3): 3016-3020.

115. Gowthami Krishna T, Raghunadha Reddy G, Rao D V S and Srinivasa Rao V, 2016, "Impact of mechanization on employment of agricultural labour in rice operations in East Godavari district of Andhra Pradesh", *The Andhra Agricultural Journal*, 63 (1): 212 – 214.

116. Hanumantha K, Sailaja V, Sathayagopal P V, Ravi Kumar K N, Prasad SV, 2016,"Problems and suggestions as perceived by the MGNREGS beneficiaries and strategy for the effective implementation of MGNREGS", *Progressive Research –An International Journal*, 11 (3): 1521-1524.

117. Hanumantha K, Sailaja V, Sathayagopal P V, Ravi Kumar K N, Prasad SV, 2016, "Relationship between selected profile characteristics with attitude of the MGNREGS beneficiaries", *Andhra Pradesh Journal of Agricultural Sciences*, 2 (3): 198 – 200.

118. Hareesh Babu P, Narasimha Rao K L, Jayalalita K and Lal Ahmed M, 2016,"Studies on the evaluation of the effect of dust pollution on growth and yield of blackgram (*Phaseolus mungo L.*)",*The Andhra Agricultural Journal*, 63 (4): 889-895.

119. Hari Pradsad K, 2016, "Recent advancement in the development of biopesticides from Actinomycetes for the control of insect pests. *In:* plant growth promoting Actinobacteria, A new avenue for enhancing the productivity and soil fertility of grain legumes", *Springer Publication.*

120. Haritha T , Satyanarayana Rao V, Lal Ahamed M and Ashoka Rani Y, 2016, "Genetic divergence for morphological and biochemical traits in 1% EMS treated Tomato (*Lycopersicon esculentum M.*) cv Arka vikas", *The Andhra Agricultural Journal*, 64 (1): 62-67.

121. Haritha T, Satyanarayana Rao V, Lal Ahamed M and Ashoka Rani Y, 2017, "Effect of EMS on seeding and plant characters useful for development of mutagenic resource in tomato (*Lycopersicon esculentum M.*) cv. Arka vikas", *Green Farming*, 8 (3): 541-546.

122. Haritha T, Satyanarayana Rao V, Lal Ahamed M and Ashoka Rani Y, 2017, "Identification and validation of SSR markersafter phenotypic characteriszation in M_2 mutant population of tomato", *Green Farming*, 8 (3): 535-540.

123. HarithaT, Satyanarayana Rao V, Lal Ahamed M and Ashoka Rani Y, 2017, "Identification and validation of SSR markers after phenotypic characterization in M2 mutant population of tomato", *Green Farming*, 8 (3): 535-540.

124. HarithaT, Satyanarayana Rao V, Lal Ahamed M and Ashoka Rani Y, 2017, "Effect of EMS on seedling and plant characters useful for development of mutant genetic resource in tomato (*Lycopersicon esculentum L.*) cv. Arka vikas", *Green Farming*, 8 (3): 535-540-546.

125. Hema K and Lakshmi G V , 2016, "Reclamation of abandoned aqua ponds in Krishna zone of Andhra Pradesh", *International Journal of Current Research*, 09 (8): 39104-39109.

126. Hema K, Lakshmi G V, Latha M, Sambaiah A and Meena R L, 2016, "Screening of maize (*Zea mays L.*) hybrids for salt tolerance under drip irrigation in Krishna Zone of Andhra Pradesh", *Journal of Soil Salinity and Water Quality*, 8 (1): 45-50.

127. Hema K, Lakshmi G V, Sudha Rani Y and Ratna Kumari S, 2016, "Screening of Bt. cotton hybrids (*Gossypium hirsutum*) for salt tolerance in Vertisols of Andhra Pradesh", *International journal of Pure and Applied Biosciences*, 4 (5): 48-51.

128. HemaK, Lakshmi G V, Sudharani Y, Sambaiah A and Meena R L, 2016,"Improvisation and demonstration of reclamation technologies for alkali soils of guntur district in Andhra Pradesh", *International Journal of Agricultural Sciences*, 46 (8): 1926-1928.

129. Hemalatha K, Ramana A V, Ramana Murthy K V and Jagannadham J, 2016, "Weed Management in Semidry Rice", *The Andhra Agricultural Journal*, 63 (3): 543- 548.

130. Himani, Shashi Madan, Raghavendra, Renu Munjal M amd Sethi S K, 2016. Physio-chemical and correlation studies in durum wheat (Triticum durum L.) genotypes. *Journal of Life Sciences*, 5 (16): 5109-6115.

131. Hruday Ranjan C, Satya Gopal P V, Sailaja V, Prasad S V, 2017, "Farmers perception towards farm machinery in groundnut", *The Andhra Agriculture Journal*, 64 (1): 219-225.

132. Hyma Jyothi S and Uma Maheswara Reddy S, 2017, Effect of climate change on dairy productionin coastal region of Andhra Pradesh. Published as full length paper in proceedings of National Conference on "Adaptation Interventions for climate resilient Agriculture incoastal Agro-ecosystem"

133. Imtiaz Ahmed K, Naidu N V, Raja Rajeswari V and Reddy K H P, 2016, "Genetic divergence in ragi (Eleusine coracana(L.) Gaertn.)", *Green Farming*, 7 (3): 591-594.

134. Jahnavi Keerthi Priya B, Aparna B, Sumathi P, 2016, "Analyzing compound growth rates and marketing efficiency in transacting maize in Kurnool district of Andhra Pradesh", *Andhra Pradesh Journal of Agricultural Sciences*, (1): 87-89.

135. Jayasankar M, Venkata Lakshmi N, Venkateswarlu B and Ratna Prasad P, 2016, "Response of direct seeded rainfed lowland rice to organics and zinc application", *The Andhra Agricultural Journal*, 63 (4): 747-750.

136. Jayasankar M, Venkata Lakshmi N, Venkateswarlu B and Ratna Prasad P, 2016, "Response of direct seeded rainfed lowland rice to organics and zinc application", *The Andhra Agricultural Journal*, 63 (4): 747-750.

137. Jayasankar M, Venkatalakshmi **N,** Venkateswarlu B and Ratna Prasad P, 2016, "Response of direct seeded rainfed lowland rice to organics and zinc application", *The Andhra Agricultural Journal*, 63 (4): 747-750.

138. Jeevana Jyothi K, Ramana A V, Ramana Murthy K V and Sunanda N, 2016, "Nutrient management Effects on yield and economics of rabi Maize (*Zea mays*)", *The Andhra Agricultural Journal*, 63 (2): 256-262.

139. Jogamba N S R, Srinivasa Rao V, Nafeez Umar Sk and Reddy G R, "Analysis of spatial and temporal variations in area", production and productivity of tobacco in prakasam district of andhra Pradesh" , *The Andhra Agricultural Journal*, 64 (1): 167-175.

140. Jogarao P, Prasad P R K, Lalitha kumara A, Prasuna Rani P and Pullarao Ch**,** 2016, "Yield and fiber qualities of Cotton (*Gossypiumhirsutum*) as influenced by long-term manures and fertilizers on Cotton monocropping", *The Andhra Agricultural Journal*, 63 (4): 120-122.

141. Jyothi C H, Sai Ram Kumar**,** Madhumathi T D V**,** and Adinarayana M, 2016, "Efficacy of certain newer insecticides against whitefly, (*Bemisiatabacigennadius*) in blackgram (*Vignamungo Linnaeus*)", *The Andhra Agricultural Journal,* 63 (3): 618-622.

142. Jyothi P, Madhumathi T and Sai Ram Kumar D V**,** 2016, "Studies on the effect of certain newer insecticides to natural enemies in the maize ecosystem of Andhra Pradesh during two successive seasons", *Advances in Life Sciences,* 5 (19): 8227-8232.

143. Jyothi P, Madhumathi T**,** and Prasanna Kumari V, 2016, "Studies on efficacy of certain insecticides against the damage parameters caused by maize stem borers during two successive seasons (Rabi 2013-2014 & Rabi 2014-2015)", *Advances in Life Sciences,* 5 (19): 8252-8256.

144. Jyothi P, Madhumathi T, Lal Ahmad M and Sai Ram Kumar D V, 2016, "Screening of maize genotypes against damage parameters caused by stem borers at reproductive and harvesting stages of the crop during two successive seasons", *Advances in Life Sciences,* 5 (19): 8271-8279.

145. Jyothibasu B, Venkatarao P, Kirankumar S and Kiran BVS, 2016, "Response of pop corn (*Zea mays everta*) to different fertilizer levels and plant densities in kharif season", *The Andhra Agricultural Journal*, 63 (4): 780-785.

146. Jyothiswaroopa V, Bharathalakshmi M, Venkateswarlu B and Sreenivas Ch, 2016, "Influence of levels of nitrogen and foliar nutrition on growth and yield of machine transplanted rice", *The Andhra Agricultural Journal*, 63 (3): 512-515.

147. Sudeepthi K, Jyothula D P B, Suneetha Y and Srinivasa Rao V, "Genetic Variability estimates for yield and its component characters in rice (*Oryza sativa L.*)", *The Andhra Agricultural Journal*, 64 (1): 94-96.

148. Bayyapu Reddy K, Chenga Reddy V, Lal Ahamed M, Naidu TCM and Srinivasa Rao V**,** **"**Study of genetic parameters on yield, yield contributing and fiber quality characters in cotton", *The Andhra Agricultural Journal*, 63 (2): 332-334.

149. Damodara Chari K, Trimurtulu N, Subhash Reddy R and Vijaya Gopal A, 2015, "Compatability studies of efficient plant growth promoting rhizobacterial isolates with commonly used agrochemicals", *Research Journal of Agricultural Sciences,* 6 (5): 1055-1059.

150. Kanaka Durga K, Murthy VRK**,** Nayudu NV and Ankaiah, 2016, "Response of sunflower hybrid APSH 66 to sulphur and borax under varying environment in semiarid conditions", *The Andhra Agricultural Journal*, 63 (4): 30-33.

151. Kandeeban M and Prabhavathi Y, 2017, "Marketing Efficiency and Market Competitiveness of Farmer Producer Companies (FPCs) - A Case of Telangana and Karnataka States", *The Journal of Research, ANGRAU,* 45 (2) -100-107.

152. Kandeeban M, Prabhavathi Y, Aparna B and Mohan Naidu G, 2016, "Study on marketing channels and market readiness of farmer producer companies (FPCs) in Telangana and Karnataka", *Andhra Pradesh Journal of Agricultural Sciences,* 2 (2): 87-89.

153. Kandeeban M and Prabhavathi Y, 2017, "Marketing Efficiency and market Competitiveness of Farmer Producer Companies (FPCs) - A Case of Telangana and Karnataka States, *The Journal of Research, ANGRAU,* 45 (2) -100-107

154. Karthik Reddy P, Baswana K S, Rana M K, Pahuja S K, Chug K L and Gupta A K, 2016, "Potato Apical Leaf Curl Disease: Morphological and biochemical basis of resistance in potato", *Indian Journal of Plant Protection*, 44 (2): 233-238.

155. Karthik Reddy P, Mamatha N C, Prashanth Naik, Srilatha V and Pavan Kumar P, 2016, "Applications of Nanotechnology in Agricultural Sciences", *Andhra Pradesh Journal of Agricultural Sciences,* 2: 1-9.

156. Kavitha G, Reddi Sekhar M, Hariprasad Reddy K and Ravindra Reddy B, 2016, "Correlatiion and path analysis in groundnut (*Arachis hypogaea L.*) for pod yield and drought tolerance related traits*"*, *Advances in Life Sciences*, 5 (19): print: ISSN 2278-3849, 8687-8690.

157. Kavitha P, Jeevan Rao K and Bhupa Raj G, 2016, "Direct and Residual effect of sewage sludge urban compost and FYM on Organic carbon and organic matter fractions in Tomato-Cabbage Cropping Sequence", *The Andhra Agricultural Journal*, 63 (3): 585-591.

158. Kavya Y, Vijaya Gopal A and Subhash Reddy R, 2016, "Viability of added beneficial microorganisms in the sterilized biogas slurry manures", *Research Journal of Agricultural Sciences*, 7 (4/5): 743-745.

159. Kavya Y, Vijaya Gopal A and Subhash Reddy R, 2017, "Bio gas production using cowdung as the substrate along with other agricultural wastes", *Research in Environment and Life Sciences,*10 (5): 486-490.

160. Kavya Y, Himabindu J, Vijaya Gopal A and Reddy R S, 2015, "Effect of anaerobic digestion on the nutrient composition of different agricultural wastes", *Annals of Plant and Soil Research,* 17 (5): 219-221

161. Keerthi P and Prabhakara Reddy G, 2017, "Effect of cultivars, time of sowing on growth, yield and economics of sweet corn", *Environment and Ecology*, 35 (3A): 1829-1831.

162. Keerthi P and Prabhakara Reddy G, 2017, "Growth and yield of sweet corn cultivars under different environmental conditions in Southern Agro-Climatic Zone of Andhra Pradesh", *Environment and Ecology,* 35 (3A): 1826-1828.

163. Keerthi P, Prabhakara Reddy G and Sunitha N, 2017, "Effect of sowing time on growth and yield of sweet corn cultivars", *International Journal of Current Microbiology and Applied Sciences*, 6 (4): 777-782.

164. Keerthi P, Prabhakara Reddy G and Sunitha N, 2017, "Productivity and profitability of sweet corn cultivars as influenced by different dates of sowing in Southern Agro-Climatic Zone of Andhra Pradesh", *Ecology, Environment and Conservation*, 23: 381-383.

165. Kiramai E, Prasad P V N and Venkateswarlu B, 2016, "Machine transplanted rice as influenced by varieties and age of seedlings", *The Andhra Agricultural Journal*, 63 (1): 46-49.

166. Kirankumar S, Pullarao C H, Sree Rekha M and Ratna Prasad P, 2016, "Growth and yield of finger millet (*Eleusine coracana L.*) as influenced by phosphorus management practices", *The Andhra Agricultural Journal*, 63 (4): 40-45.

167. Kranthi Kumari B, Prasad S V, Sathya Gopla P V and Mohan Naidu G, 2016, "Relationship between the profile characteristics of farmers and their perception towards climate variability", *Research Journal of Agricultural Sciences*, 7 (Special): 132-134.

168. Krishna K, Srinivasulu A S and Krishna Rao K, 2016, "Weed management in Bt.cotton with sequential application of herbicides", *The Andhra Agricultural Journal*, 63 (1): 54-57.

169. Krishna Kanth K, Prasada Rao G M V and Sai Ram Kumar D V, 2016, "Survival and development of first and second instar larvae of *Spodoptera litura* (Fab.) (Noctuidae: Lepidoptera) on different plant parts of Bollguard II (Cry1Ac + Cry2Ab) cotton", *Progressive Research*, 11 (7): 4375-4380.

170. Krishna Kanth K, Prasada Rao G M V and Sai Ram Kumar D V and V PrasannaKumari, 2016, "Incidence of tobacco caterpillar, *Spodoptera litura* (Fab.) (Lepidoptera: Noctuiidae) on BG II cotton", *The Andhra Agricultural Journal*, 63 (3): 640-642.

171. Krishna Teja I, Rajeswari S, Bhavani Devi I and Ravindra Reddy B, 2016, "Economics of FCV Tobacco cultivation in Nellore and Prakasam districts of Andhra Pradesh", *Advances in Life Sciences*, 5 (19): 8628-8632.

172. Krishna Teja I, Rajeswari S, Bhavani Devi I and Ravindra Reddy B, 2016, "Socio economic impact of tobacco cultivation in Nellore and Prakasam districts of Andhra Pradesh", *Progressive Research – An International Journal*, 11 (Special –III): 1511-1514.

173. Krishna Teja I, Rajeswari S, Bhavani Devi I and Ravindra Reddy B, 2016, "Economics of Tobacco and its alternative crops in Nellore and Prakasam districts of Andhra Pradesh", *International journal of research in applied, natural and social sciences*, 4 (10): 115-122.

174. Krishna Teja I, Rajeswari S, Bhavani Devi I and Ravindra Reddy B, 2016, "Economics of FCV Tobacco cultivation in Nellore and Prakasam districts of Andhra Pradesh", *Advances in Life Sciences*, 5 (19) 8628-8632.

175. Krishna Teja I, Rajeswari S, Bhavani Devi I and Ravindra Reddy B, 2016, "Socio economic impact of Tobbaco cultivation in Nellore and Prakasam districts of Andhra Pradesh", *Progressive research*, 11 (special 111): 1511-1514.

176. Krishna Teja I, Rajeswari S, Bhavani Devi I and Ravindra Reddy B, 2016, "Economics of Tobacco and its alternative crops in Nellore and Prakasam districts of Andhra Pradesh", *IMPACT IJRANSS*, 4 (10) 115-122.

177. Krishnaveni S, Manjula K, Murali Krishna T and Khayyum Ahmmad S, 2016, "Preparation of grain formulations of Nomuraea rileyi and testing the virulence against third instar Spodoptera litura", *The Bioscan*, 1910: 185-187.

178. Kumari Sirisha K J V, Raghunadha Reddy G, Rao D V S and Srinivasa Rao V, 2016, "Impact and determinants of credit under KCC Scheme in Guntur district of Andhra Pradesh", *The Andhra Agricultural Journal*, 63 (1): 208 – 211

179. Lakshmi bhavani G, CH Pullarao, M Srinivas and P R K Prasad, 2016, "Effect of npk application on growth and yield of machine transplanted rice", *The Andhra Agricultural Journal*, 63 (2): 521-524.

180. Lakshmi prasanna K, Madhuvani P, Prasuna Rani P and Venkateswarlu B**,** 2016, "Fertility status of soils of Narasaraopet revenue division in Guntur district", *The Andhra Agricultural Journal*, 63 (4): 107-115.

181. Lakshminarayan U, Venkateswarlu N C, Hariprasad K V, Prasad T N V K V and Sarada Jaylakshmi Devi R, 2016, "Seasonal Incidence of groundnut leafminer, Aproarema modicella (Devenrer) in different dates of sowing", *Andhra Pradesh Journal of Agricultural Sciences,* 1 (1): 43-46.

182. Lokeswar Reddy A, Srinivas T, prasanna A, Rajesh and Umamaheswari P, 2016,"Stability analysis in drought tolerant groundnut", *Advances in Life Sciences*, 5 (20): 9347-9350.

183. Ramana M V, 2017, "Performance evaluation of Groundnut Pod stripper" 51st Convention of Indian Society of Agricultural Engineers (ISAE), New Delhi & CCSH Agricultural University, Hisar, Haryana.

184. Madhumathi C, Purushotham K, Chandrasekhar R, Gopal K, Reddi Sekhar M and Gowri T, 201, "Assessment of molecular diversity in Elite Sweet Orange (Citrus sinensisL. Osbeck) accessions using RAPD markers", *Electronic Journal of Plant Breeding,* 332-340.

185. Madhumathi T and Krishnayya P V, 2016, "Influence of hermetic storage on the survival and damage caused by Sitophilusoryzae (L) (Curculionidae: Coleoptera)and Caryedonserratus (Olivier) (Bruchidae: Coleoptera)", Proceedings of 10th *International Conference organized at New Delhi,* Nov 7 -11 by CAF, 266-273.

186. Mahesh Babu T, Lakshmi P V, Satya Gopal, Vani B, Prasad S V, 2016, "Profile Characteristics of Andhra Pradesh micro irrigation project (APMIP) beneficiaries", *Andhra Pradesh Journal of Agricultural Sciences,* 2 (3): 184-189.

187. Mamatha N C, Tehlan S K, Srikanth M, Shivaprasad M K and Karthik Reddy P, 2017, "molecular characterization of fenugreek (*Trigonella foenum- graecum L.*) genotypes using RAPD markers", *International Journal of Current Microbiology and Applied Sciences*, 6 (6): 2573-2581.

188. Mamatha N C, Tehlan S K, Srikanth M, Ravikumar T, Batra V K, Karthik Reddy P and Manoj Kumar N, 2017, "Mean Performance of 150 Fenugreek (*Trigonella foenum- graecum L.*) Genotypes for Yield and Yield Contributing Traits", *International journal of Pure and Applied Bioscience*, 5 (3): 1097-1102.

189. Mamatha N C, Tehlan S K, Srikanth M, Ravikumar T, Batra V K, Karthik Reddy P and Mukesh Kumar, 2017,"Variability Studies for Yield and its Attributing Traits in Fenugreek (*Trigonella foenum- graecum L.*) genotypes", *International journal of Pure and Applied Bioscience*, 5 (3): 1075-1079.

190. Mamatha N C, Tehlan S K, Srikanth M, Batra V K and Karthik Reddy P, 2017, "Correlation and Path Coefficient Studies in 150 Fenugreek Genotypes (*Trigonella foenum- graecum L.*)", *Vegetos*: 30 (special 2):420-423.

191. Manjubhargavi M, Shanthi Priya M, Mohan Reddy D and Ravindra Reddy B, 2016,"Correlation and path analysis in groundnut (*Arachis hypogaea L.*) under organic and conventional fertilizer managements", *Journal of Research, ANGRAU*. 44(3&4): 18-26.

192. Manjubhargavi M, Shanthi Priya M, Mohan Reddy D and Ravindra Reddy B, 2016, "Variability studies in groundnut (*Arachis hypogaea L.*) under organic management", *Progressive Research*, 11: 1666-1670.

193. Manjubhargavi M, Shanthi Priya M, Mohan Reddy D and Ravindra Reddy B, 2016, "Genetic fvariability studies in groundnut (*Arachis hypogaea L.*)", *Advances in Life Sciences*, 5 (9): 8169-8172.

194. Manjubhargavi M, Shanthi Priya M, Mohan Reddy D and Ravindra Reddy B, 2016, "Correlation and path analysis in groundnut (*Arachis hypogaea L.*) under organic and conventional fertilizer managements", *Journal of Research ANGRAU*, 44 (3&4): 18-26.

195. Manjubhargavi M, Shanthi Priya M, Mohan Reddy D and Ravindra Reddy B, 2016, "Variability studies in groundnut (*Arachis hypogaea L.*) Under organic management", *Progressive Research*, 11: 1666-1670.

196. Manjubhargavi M, Shanthi Priya M, Mohan Reddy D and Ravindra Reddy B, 2016, "Genetic variability studies in groundnut (*Arachis hypogaea L.*)", *Advances in Life Sciences*, 5 (9): 8169-8172.

197. Merlin Mathew, Vani N, Aparna B, Ravindra Reddy B, 2016, "Economic analysis of Ginger. In Wayanad District of Kerala", *Asian Journal of Research in Marketing*, 5 (5) 1-8.

198. Mohan Naidu G, 2016, "Forecasting arrivals and prices of cotton with univariate ARIMA models", *International journal of Agricultural and Statistical sciences*, 12 (1): 169-172.

199. Mohan Naidu G, 2016, "Forecasting arrivals and prices of cotton with univariate ARIMA models", *International journal of Agricultural and Statistical sciences*, 12 (1): 169-172.

200. Mohan Naidu G, Ravindra Reddy B, Amarnadh V and Jothi Babu A, 2016, "Forecasting area and production of wheat by using unobserved components model", *Andhra Pradesh Journal of Agricultural Sciences*, 2 (1): 52-58.

201. Mohana Rao Puli, Prasad P R K, Ravindrababu P, Narasimharao and Subbaiah G, 2016, "Influence of different sources of nutrients on available nutrient status of soil after harvest of rice crop", *The Andhra Agricultural Journal*, 63 (1): 121-127.

202. Monsoon Khemundu and Koteswara Rao S R, 2017, "Effect of carbon dioxide treatment against angoumois grain moth *Sitotroga cerealella* (Oliver) in maize", *International Journal of Research in Applied, Natural and Social Sciences*, 5 (1): 21-30.

203. Mukesh Kumar Sheshama, SreeRekha M, Sunil Kumar, Meena R N and Vikram Kumar, 2016, "Influence of different sowing dates and varieties on seed quality of soybean in coastal Andhra Pradesh", *Journal of Pure and Applied Microbiology*, 10 (4): 3087-3091.

204. Mukeshkumar, Sheshamma, Sree Rekha M, Pullarao Ch and Ashoka Rani Y, 2016, "Effect of sowing dates and varieties on yield of soybean in coastal A.P", *The Andhra Agricultural Journal*, 63 (3): 540-542.

205. Mukunda Rao B, Ramesh G and Praveen Babu R, 2016, "Knowledge and Adoption Level of Recommended Production Technologies by Bengalgram Growers in Prakasam District of Andhra Pradesh", *The Andhra Agricultural Journal*, 63 (4) : 970-974

206. Murthy V R K, Jyothibasu B and Venkatarao P, 2016, "Extent of awareness and adoption level of MDWA and weather health indices used in roving seminars on weather climate and farmers (WcFs) in Andhra Pradesh", *The Andhra Agricultural Journal*, 63 (3): 549-551.

207. Murthy VRK, Venkatarao P, Kanaka Durga K and Jyothibasu B, 2016, "Effect of micro weather health indices on growth and yield of rice (*Oryza sativa L.*) under semi arid condition of A.P", *The Andhra Agricultural Journal*, 63 (4): 34-37.

208. Muthukumar M, Sai Ram Kumar D V, Madhumathi T and Lal Ahmed M, 2016, "Efficacy of diatomaceous earth in combination with certain entomopathogenic fungi against *Sitotrogacerealella* (Olivier) and Rhyzoperthadominica (Fab.) in paddy during storage", *The Andhra Agricultural Journal*, 63 (1): 158-162. 4.14

209. Nagarjuna Reddy P, Lakshmi T, Prasad S V, 2016, "Strategies to reduce health Hazards of Cotton farmers due to Pesticides", *Advances in Life Sciences (An International Journal)*, 5 (5): 1848-1850.

210. Nagavani AV and Subbian P, 2016, "Soil available nutrient status as influenced by various organic and inorganic fertilizers in maize-maize cropping system", *The Andhra Agricultural Journal*, 63 (4):771-775.

211. Nagavani AV and Subbian P, 2017, "Effect of poultry manure on soil physical and physic-chemical properties in maize-maize cropping system", *The Andhra Agricultural Journal*, 64 (1): 13-18.

212. Nagendrababu N, Sivanarayana G, Gopikrishna T, 2016, "Association of profile characteristics of the farmers of adopted village with the direct and indirect changes in Guntur District", *The Andhra Agricultural Journal*, 63 (2) : 464-464

213. Narasimhulu R, Naidu N V, Reddy K H P and Mohan Naidu G, 2016, "Combining ability and heterosis for yield and its attributes in Greengram (*Vigna radiata L. Wilczek*)", *Electronic Journal of Plant Breeding*, 7 (3): 784-793.

214. Narasimhulu R, Naidu N V, Reddy K H P, 2016, "Studies on heterosis and inbreeding depression for yield and its attributes in greengram [Vigna radiata (L.) Wilczek]. ", *Legume Research*, 39 (6): 896-899

215. Narayana Swamy G, Nagavani A V, Bhargavi K, Sahadeva Reddy B, Vijaya Sankarbabu M and Umamahesh V, 2016,"A short-term comparison of yield and organic carbon changes under organic production of groundnut in rainfed alfisols of Andhra Pradesh",Progressive Research, 11 (9): 6171-6173.

216. Naseeruddin R, Subramanyam D and Reddi Ramu Y, 2016, "Influence of weed management on nutrient uptake and yield in drum seeded rice", *Advances in Life Sciences*, 5 (18): 7975-7977.

217. Navya Jothi K, Sumathi V and Ravindra Reddy B, 2016, "Productivity and ergonomics of foxtail millet as influenced by varieties and nitrogen levels", *The Biioscan*, 11 (3): 1679-1682 (Supplement on Agronomy).

218. Navya Jothi K, Sumathi V, Sunitha N and Ravindra Reddy B, 2016, "Effect of nitrogen fertilization on yield and nutrient uptake of foxtail millet (Setaria italic L.) varieties", *Progressive Research*, 11 (Special –III): 1662-1665.

219. Navya Jyothi K, Sumathi V and Ravindra Reddy B, 2016, "Productivity and ergonomics of foxtail millet as influenced by varieties and nitrogen levels", *The Bioscan*, 11 (3). 1679-1682.

220. Navya Jyothi K, Sumathi V and Sunitha N, 2016, "Growth and Yield Variations of Foxtail Millet (*Setaria italica L.*) Varietiesto Different Levels of Nitrogen", *Advances in Life Sciences*, 5 (6): 2156-2160.

221. Navya Jyothi K, Sumathi V and Sunitha N, 2016, "Productivity, Nutrient balance and profitability of Foxtail Millet (*Setaria italica L.*) Varieties as influenced by levels of nitrogen", *IOSR Journal of Agriculture and veterinary sciences*, 9 (4): 18-22.

222. Navya Jyothi K, Sumathi V, Sunitha N and Ravindra Reddy B, 2016,"Effect of nitrogen fertilization on yield and nutrient uptake of foxtail millet (*Setaria italica L.*) varieties", *Progreesive research*,11 (special issue III): 1662-1665

223. Neeraja T and Bhargavi A, 2016, "Musculoskeletal Disorders and Visual Strain among Handloom Wavers", *International Journal of Information Research and Review*.

224. Neeraja T and Siresha M, 2016, "Visual and musculoskeletal problems among sewing Machine operators in a Readymade Garment Industry", *International Journal of Scientific Research*.

225. Neeraja T, 2016"Exposure to work related Musculoskeletal Disorders among workers inved in Manual Material Handling", *The Journal of Research ANGRAU*.

226. Neeraja T, Bhavya Padmini Ch and Hema Malini Ch, 2016, "Work-related musculoskeletal disorders among call centre employees", *International Journal of Information Research and Review*.

227. Neeraja T, Hema Malini Ch and Bhavya Padmini Ch, 2016, "Neck and Shoulder related Musculoskeletal Disorders among Handloom Weavers", *International Journal of Information Research and Review.*

228. Neerajyadav, Pullarao Ch**,** Martin Luther M and Ashoka Rani Y, 2016**, "**Productivity, nutrient uptake and economics of pearlmillet (*Pennisetum glaucum (L.*) as influenced by nitrogen, phosphorus and biofertilizer management", *The Andhra Agricultural Journal*, 63 (2): 263-265.

229. Neerajyadav, Pullarao Ch**,** Martin luther M and Ashoka rani Y, 2016**, "**Effect of nitrogen, phosphorus and biofertilizer management on growth and yield of pearlmillet (*Pennisetum glaucum (L.) R.Br.*)", *The Andhra Agricultural Journal*, 63 (3): 503-507.

230. Nilesh Patidhar, Subbaiah G, Pullarao Ch and Ashoka rani Y, 2016, "Influence of sowing dates and hybrids on growth and yield of rabi maize in coastal Andhra Pradesh", *The Andhra Agricultural Journal*, 63 (1): 19-23.

231. Nileshpanchbai, Mosha K, Pullarao Ch**,** and Ashoka rani Y, 2016, "NPK rate effects on growth and yield of sweetcorn", *The Andhra Agricultural Journal*,63 (2): 482-484.

232. Nireesha, Srinivasa Rao V, Rao D V S and Raghunadha Reddy G, 2016, "A study on forecasting of area, production and productivity of pearl millet in Andhra Pradesh", *The Journal of Research ANGRAU*, 3&4 (14): 162-168.

233. Niveditha M and Nagavani A V, 2016, "Performance of hybrid maize at different Irrigation levels and spacing under subsurface drip irrigation", *International Journal of Agricultural Sciences*, 12 (1): 1-5.

234. Omkar Vinay Kumar T, Prasad P R K, Ravindrababu P and Venkateswarlu B, 2016, "Fertility status of soils of Tenali division, Guntur district of Andhra Pradesh", *The Andhra Agricultural Journal*, 63 (4): 101-106.

235. Padma M, Reddy B S and Madhava M, 2016, "Evaluation of the quality parameters of the turmeric rhizomes dried on different floors and conditions", *International Journal of Agricultural Sciences*, 12 (2): 302-308.

236. Padma M, Sreenivasula Reddy B and Madhava M, 2016, "Some studies on curing and drying characteristics of turmeric rhizomes", *International Journal of Processing and Post-Harvest Technology*, 7 (1): 151-156.

237. Padmaja B, Mallareddy M, Subbaiah G, Chandra Sekhar K, Vish-nu Vardhan Reddy D, Ravindra Babu P, 2016,"Performance of no-till maize under drip-fertigation in a double cropping system in semi arid Telangana state of India", *Maydica*, 61: (1-9).

238. Padmaja B, Mallareddy M, Chandrasekhar K and Vishnau Vardhan Reddy D, 2016,"Fertigation effects on yield, water productivity and nitrogen use efficiency of aerobic rice (*Oryza sativa L.*) – zero till maize(*Zea mays L.*) cropping system",*The Bioscan*, 11 (0):

239. Pallavi Ch, Joseph B, Aariff Khan M A and Hemalatha S, 2016, "Physiological parameters, leaf nitrogen content and grain yield of fingermillet as affected by different sources of organic manures under INM in comparison with RDF", *International Journal of current Research Bioscience Plant Biology*, 3 (8): 123-130.

240. Pallavi Ch, Joseph B, Aariff Khan M A and Hemalatha S, 2017, "Effect of organic fertilizers and biofertilizers on yield and yield attributing traits of direct sown rainfed finger millet, *Eleusine coracana (L)* Gaertn", *International Journal of Farm Sciences*, 7 (3): 101-105.

241. Pallavi Ch, Joseph B, Aariff Khan M A and Hemalatha S, 2016, "Economic evaluation of fingermillet under different nutrient management practices", *International Journal of Current Microbiological Application Science*, 5 (8): 690-698.

242. Pallavi Ch, Joseph B, Aariff Khan M A and Hemalatha S, 2016, "Effect of integrated nutrient management on nutrient uptake, soil available nutrients and productivity of rainfed fingermillet", *International Journal of Science Environment*, 5 (5): 2798-2813.

243. Paramesh M, Reddy D M, Shanthi Priya M and Sudhakar P, 2016, "Selection of parents through genetic diversity studies for improvement of yield and yield components in Mungbean (*Vigna radiata L. Wilczek*)", *The Andhra Agricultural Journal*, 63 (2): 311-316.

244. Paramesh M, Reddy D M, Shanthi Priya M, Sumathi P, Sudhakar P and Reddy K H P, 2016, "GT biplot analysis for yield and drought related traits in mungbean (*Vigna radiata L. Wilczek*)", *Electronic Journal of Plant Breeding*, 7 (3): 538-543.

245. Paramesh M, Reddy D M, Mallikarjuna S J and Imtiaz Ahamed K, 2016, "Path analysis for yield, yield component and drought related traits in mungbean (*Vigna radiata (L.) Wilczek*)", *Advances in Life Sciences*, 5 (18): 8048-8051.

246. Parimala K, Murthy VRK, Swarnalathadevi I and Venkatarao P, 2016, "Impact of weather on the yield and stability of rice genotypes under sowth-west monsoon conditions", *The Andhra Agricultural Journal*, 63 (4): 38-39.

247. Parvathi Devi R, Bhavani Devi I, Aparna B, Mohan Naidu G and Prasad S V, 2016, "A Study on the Horizontal integration of selected groundnut markets of India", *International Journal of Agricultural Sciences*, 8 (34): 1715-1718.

248. Parvathi Devi R, Bhavani Devi I, B Aparna, G Mohan Naidu and S V Prasad, 2016, "Horizontal Integration of selected sunflower markets of India an analysis", *International Journal of Agricultural Statistical Sciences*, 12 (1): 135-140.

249. Parvathi Devi, Bhavani Devi I, Aparna B, Mohan Naidu G and Prasad S V, "Horizontal integration of selected sunflower markets of India: An analysis", *International journal of agricultural and statistical sciences*, 12 (1): 135-140.

250. Pavan Sankar H P, Krishna Veni B, Dayal Prasad J and Srinivasa Rao V, "Variability and association studies in dry direct sown rice (*Oryza sativa L.*)", *The Andhra Agricultural Journal*, 64 (1): 50-54

251. Pavan Shankar H P, Krishna Veni B, Dayal Prasad Babu J and Srinivasa Rao V, 2016, "Assessment of Genetic Variability and Association Studies in Dry Direct Sown Rice (*Oryza sativa L*)", *Journal of Rice Research*, 9 (2): 11-16.

252. Pavani M, Patibanda A K, Srinivas T and Ramachandra rao G, 2016, "Mycoflora population and species dynamics in selected vegetable crop nurseries", *The Andhra Agricultural Journal*, 63 (3) 611-617

253. Pavithra M, Prabhakara Reddy G, Chandrika V and Umamahesh V, 2016, "Productivity of Quality Protein Maize as influenced by Nitrogen and Sulphur nutrition", *Progressive research*, 11 (III)11: 1501-1507.

254. Pedda Swamy D, Bharathi D, Ravi S and Jayalakshmi V, 2016, "Diversity Analysis in Sorghum (*Sorghum bicolour L. Moench*)", *Advances in Life Sciences*, 5 (19): 8223-8226.

255. Pedda Swamy D, Bharathi D, Ravi S and Jayalakshmi V, 2016, "Variability Estimates for Yield and Yield Attributes in Sorghum (Sorghum bicolour L.)", *Advances in Life Sciences*, 5(19): 8197-8198.

256. Pedda Swamy D, Bharathi D, Ravi S and Jayalakshmi V, 2016, "Path Coefficient Analysis for Sorghum (*Sorghum bicolour L.*)", *Advances in Life Sciences*, 5 (18): 7892 -7894

257. Phenotyping crop plants for physiological and biochemical traits Sudhakar P, P Latha and PVReddy LayamVenkataSubbaiah, Tollamadugu Naga Venkata Krishna Vara Prasad, Thimmavajjula Giridhara Krishna, PalagiriSudhakar, BalamRavindra Reddy, Thalappil Pradeep.2016. Novel Effects of Nanoparticulate Delivery of Zinc on Growth, Productivity, and Zinc Biofortification in Maize (*Zea mays L.*). *Journal of Agricultural and Food Chemistry*.

258. Poornima N, Lal Ahamed M, Ranta Babu D and Nafeez Umar Sk, "Variability studies on Yield and Yield Contributing in Maize (*Zea mays L*)", *The Andhra Agricultural Journal* , 2950 84-86.

259. Poornima N, Lal Ahamed M, Ratna Babu D and Nafeez Umar Sk, 2017, "Variability studies on yield and yield contributing characters in maize (*Zea mays L.*)",*The Andhra Agricultural Journal* ,64 (1): 84-86.

260. Pradeep S, Satish Y, Ratna Babu D and Srinivasa Rao V**,** 2016, **"**Genetics Variability, Heritability and Advance Studies in Cotton(*Gossypium hirsutum L.*)", *The Andhra Agricultural Journal* , 63 (4):813-815,

261. Prasad Rao V, Venkateswarlu B, Rao A S, Bala Krishna yadav, Rao K L N and Prasuna Rani P, 2016, "Response of zero-till maize to sub surface drip fertigation", *The Andhra Agricultural Journal* , 63 (4) : 758-762.

262. Prasad Rao V, Venkateswarlu B, Rao A S, Bala Krishna yadav, Rao K L N and Prasuna Rani P, 2016, "Response of aerobic rice to subsurface drip fertigation", *The Andhra Agricultural Journal* , 64 (1): 3-7.

263. Prasanna Kumar B, Triveni S, Subhash Reddy R and Vijaya Gopal A, 2016, "Effect of cellulolytic pretreatment of agricultural waste on organic matter degradation", *International Journal of Current Microbiology and Applied Sciences*, 5 (12): 23-35.

264. Pratyusha P, Krishna Prasadji J, Krishnam Raju S, Prasanna kumar V and Sairam Kumar D V S, 2016, "Reaction of rice genotypes to false smut", *The Andhra Agricultural Journal*, 63 (4) .857-856.

265. Pratyusha P, Krishna Prasadji J, Krishnam Raju S, Prasanna Kumari V, and Sai Ram Kumar D V, 2016, "Reaction of rice genotypes to false smut with reference to the host factors favouring the disease", *The Andhra Agricultural Journal*, 63 (4): 857-866.

266. Praveen Babu R, Sivanarayana G, Gopi Krishna T, Raghunatha Reddy G, 2016, "Profile characteristics of paddy farmers in East Godavari District", *The Andhra Agricultural Journal*, 63 (1) : 226-229

267. Praveen Kumar N S, Paul N S R , Chandra Sekhar Reddy M, Rao D V S, 2017, "Costs and Returns of Different Rice Production Techonologies under NSP Right Canal of Guntur District of Andhra Pradesh", *The Andhra Agricultural Journal*, 64 (1): 1- 246.

268. Priyanka G, Ramana Murthy K V, Ramana A V and Jagannadham J, 2016, "Weed Management in Rice under Mechanized System of Rice Intensification", *The Andhra Agricultural Journal*, 63 (2): 291-287.

269. Priyanka K, Narayana E, Venkateswarlu B and Lakshmi G V, 2016, "Effect of nitrogen and phosphorus on growth and yield of clusterbean (*Cyamopsis teragonaloba (L.)Taubert*) in sandy loam soils of Andhra Pradesh", *The Andhra Agricultural Journal*, 63 (1): 50-53.

270. Priyanka Shinde, Prabhavathi Y, Vani N and Sumathi P, 2017, "Market Potential for Agricultural Consultancy in Vidarbha Region of Maharashtra State", *The Journal of Research, ANGRAU*, 45 (1): 75-80

271. Pullam Raju K, Rajasekhar P, Rajan C P D and Venkateswarlu N C, 2016, "Compatibility of certain new pesticides in the management of leaf folder and leaf blast in rice", *Andhra Pradesh Journal of Agricultural Sciences*, 2 (1): 32-35.

272. Pullam Raju K, Rajasekhar P, Rajan C P D and Venkateswarlu N C, 2016, "Compatibility of certain new pesticides in the management of Stem borer and stem rot in rice", *Andhra Pradesh Journal of Agricultural Sciences*, 2 (2):158-163.

273. Pushpa P, Ramana A V and Pulla Rao Ch, 2016, "Optimization of sowing window in mesta for seed production", *The Andhra Agricultural Journal*, 63 (3) 505- 511.

274. Pushpa P, Ramana A V, Pullarao Ch and Rama Rao G, 2016, "Optimization of sowing window in mesta for seed production", *The Andhra Agricultural Journal*, 63 (3): 508-511.

275. Gireesh Kumar R, Vijaya Gopal A, Subhash Reddy R and Damodara Chari K, 2016, "Screening for plant growth promoting properties of organophosphorous pesticide (Chloropyriphos and Phorate) degrading bacterial isolates", *Ecology, Environment & Conservation*, 22 (4): 277-284.

276. Gireesh Kumar R, Vijaya Gopal A, Subhash Reddy R, Durga Rani Ch V, Triveni S and Damodara Chari K , 2016, "Molecular diversity of organophosphorous degrading bacteria from different field soils", *Journal of Pure and Applied Microbiology*,10 (4): 2727-2733.

277. Gireesh kumar R, Vijaya Gopal A, Subhash Reddy R and Damodara Chari K, 2017, "Isolation and screening for efficiency of organic phosphorus pesticide (Chlorpyriphos) degrading bacteria from different crops", *Journal of Nature Environment and Pollution Technology*,16 (1): 169 – 173.

278. Praveen Babu R, Nafeez Umar Sk and Venkata Krishnaji M, "Online shopping, behavior of students in Agricultural College, Bpt.", *The Andhra Agricultural Journal* , 63 (3) 726-731

279. Rahul M. Phuke, Kotla Anuradha, Kommineni Radhika, Farzana Jabeen, Ghanta Anuradha, Thatikunta Ramesh, K. Hariprasanna, Shivaji P. Mehtre, Santosh P. Deshpande, Gaddameedi Anil, Roma R. Das, Abhishek Rathore, Tom Hash, Belum V S Reddy and A Ashok Kumar, 2017, "Genetic Variability, Genotype × Environment Interaction, Correlation, and GGE Biplot Analysis for Grain Iron and Zinc Concentration and Other Agronomic Traits in RIL Population of Sorghum (*Sorghum bicolor L. Moench*). *Frontiers in Plant Science*. 8: 712

280. Rajendra Prasad M, Vidya sagar B, Umadevi G and Koteswara Rao S R, 2017, "Survey of soil borne diseases of tomato in Rangareddy district of Telangana", *Progressive Research*, 12: 1514-1517.

281. Rajendra Prasad M, Vidya Sagar B, Umadevi G, Triveni S, Koteswara Rao S R and Damodara Chari K, 2017, "Isolation and screening of bacterial and fungal isolates for plant growth promoting properties from tomato (*Lycopersicon esculentum Mill.*)", *International Journal of Current Microbiology and Applied Sciences*, 68: 1-9.

282. Rajesh Kumar S, Reddi Sekhar M, Mohan Reddy D and Khayum Ahmmed S, 2016,"Variability, heritability and genetic advance for pod yield and its contributing traits in 15 F2 crosses of Groundnut (*Arachis hypogaea L.*)", *The Andhra Agricultural Journal* , 63 (3): 552-556.

283. Rajesh Kumar S, Reddi Sekhar M, Satish Kumar M, Varma M, Sanjebam Dayananda Singh and Suvendhu S Dutta, 2016," A Genetic model of Inheritance of Resistance to Late Leaf spot in F2 generation of Groundnut (*Arachis hypogaea L.*)", *The Bioscan*, 11 (2): 1123-1125.

284. Rajeswari S, 2016, "Impact of microfinance on income Distribution of rural households in Andhra Pradesh", *Journal of Rural Development*, 35 (4): 581-997.

285. Rama Devi B, Venkateswarlu B, Srinivasulu K and Madhuvani P, 2016, "Effect of nitrogen levels and weed control practices on growth and yield of babycorn", *The Andhra Agricultural Journal*, 63 (1): 8-13.

286. Ramadevi B, Lal Ahamed M, Ratna Babu D and Madhumati T, 2017, "Correlation and path analysis fir morphological traits in maize (*Zea mays L.*)", *The Andhra Agricultural Journal* , 64 (1): 87-90.

287. Ramana J V, Satyanarayana Rao V, Lal Ahamed M, Ashoka Rani Y and Anil Kumar P, 2016, "Genetic variability for seed yield and yield components in sesame (*Sesamum indicum L.*)", *The Andhra Agricultural Journal* , 63 (2): 328-331.

288. Ramanjeneyulu M, Srinivasa Reddy M, Ramesh Babu PV and Kavitha P, 2016,"Effect of secondary and micronutrients on yield and yield forming characters of maize (*Zea Mays L.*)", *Andhra Pradesh Journal of Agricultural Sciences*, 2 (2): 116-120.

289. Ramarao Ch, Prasad P V N, Venkateswarlu B and Prasad P R K, 2016, "Efficacy of pre and post emergence herbicides on sequential basis for weed control in maize (Zea mays L.)", *The Andhra Agricultural Journal* , 63 (3): 535-539.

290. Ramesh Babu S, Sai Ram Kumar D V, Sri Naga Satya Ch and Madhumathi T, 2017, "Evaluation of Spinosad against Malathion and Deltamethrin resistant population of Lesser Grain Borer, Rhyzoperthadominica in Andhra Pradesh, India", *International Journal of Current Microbiology and Applied Sciences* (6): 165-71.

291. Ramesh G, Mukunda Rao B, 2016, "Effect of Supplemental Irrigation on Growth and Yield of Chickpea", *The Andhra Agricultural Journal* 63 (4) : 968-969

292. Ramya H R, Sathayagopal P V, Sailaja V, Prasad S V, 2016, "Personal, socio-economic and psychological characteristics of tribal farmers", *The Andhra Pradesh Journal of Agricultural Sciences*, 2 (2): 140-145.

293. Ramya Lakshmi S B, Bhavani Devi I and Mohan Naidu G, 2016, "Forecasting prices of chilli (Dry) in major markets of Andhra Pradesh and Telangana", *Andhra Pradesh Journal of Agricultural Sciences*, 2 (2): 151-157

294. Ranga Rani A, Khayum Ahammed S, Patibanda A K and Sarada Jayalakshmi Devi R, 2016, "Characterization and rhizosphere competence of Trichoderma spp.in different cropping systems of Chittoor district(A.P)", *Indian Phytopathology*.

295. Ranga Rani A, Khayum Ahammed S, Patibanda A K, 2017,"Morphological and Biochemical Characterization of *Trichoderma* spp.in different cropping systems of Chittoor district",*The bioscan (An International Quarterly Journal of Life Sciences).*

296. Rao M S, Mallikarjuna Rao N, Gopikrishna T, 2017, "Impact of climate resilient technologies on economic development of the farmers in Khammam district of Andhra Pradesh", Proceedings of National Conference on Adoption interventions for climate resilient agriculture in coastal agro-ecosystems

297. Rao P S, Sudha Rani M, Ankaiah R, Rajasri M and Meena Kumari K V S, 2017, "Effect of seed coating with polymer, fungicide and insecticide on seed quality in sorghum during storage", *International Journal of Bio- resource and stress management*, 8 (2): 226-230.

298. Ratnakar V, Koteswara Rao S R, Sridevi D and Vidyasagar B, 2016, "Safety evaluation of certain newer insecticides to European honeybee, *Apis mellifera Linnaeus*", *Journal of Entomological Researches*. 40 (3): 261-266.

299. Ratnakar V, Koteswara Rao S R, Sridevi D and Vidyasagar B, 2016, "Safety evaluation of certain conventional insecticides at sublethal dose to European Honeybee, *Apis mellifera Linnaeus*", *Journal of Progressive Agriculture*: 7 (2): 136- 140.

300. Ratnakar V, Koteswara Rao S R, Sridevi D and Vidyasagar B, 2016, "Safety evaluation of certain conventional insecticides at sub lethal dose to European Honeybee, *Apis mellifera Linnaeus*", *Annals of Plant Protection*, 24 (2): 315-318.

301. Ratnakar V, Koteswara Rao S R, Sridevi D and Vidyasagar B, 2016,"Safety evaluation of certain new insecticides at sub lethal dose to European honeybee Apis mellifera Linnaeus", *Progressive Research*, 11: 170-172.

302. Ravi Kumar V, Prasad N V V S and Madhumathi T, 2016, "Evaluation of insecticides for the management of cotton aphid, *Aphis gossypii Glover*", *International Journal of Tropical Agricultural* 34 (5): 1277-1281.

303. Ravi S, Rao M S, Sekhar M R, Sudhakar P, Latha L M, 2016, "Genetic Divergence Studies for Yield and Physiological Traits in Pearl Millet", *Progressive Agriculture*, 16 (1).1-7.

304. Ravi S, Subba Rao M and Reddi Sekhar M, 2016, "Character association and path coefficient analysis for yield and physiological Traits in Pearl Millet", *Advances in Life Sciences*, 5 (19): 8679-8683.

305. Ravi S, Subba Rao M and Reddi Sekhar M, 2016, "Character association and path coefficient analysis for yield and yield Component traits in pearl millet",*Advances in Life Sciences*, 5 (18): 7954-7958.

306. Ravi S, Subba Rao M, Reddi Sekhar M, Sudhakar P and Madhavi Latha L, 2016,"Genetic divergence studies for yield and Physiological traits in Pearl millet", *Progressive Agriculture*,16 (1): 1-7.

307. Ravi Teja M, Srilakshmi P, Vijay Krishna Kumar K, Sudini H, Kishore Varma P and Koteswara Rao SR, 2016,"Review on the alfatoxin contamination in groundnut at trader's level and its management using PGPR",*Progressive Research*, 11: 2746-2756.

308. Ravindra Reddy B, Sumathi P and Mohan Naidu G, 2016, "Planning and application of statistical techniques in agricultural experimentation", *Andhra Pradesh Journal of Agricultural Sciences*, 2 (2):130-134.

309. Reddemma K, Ashok M, Reddy M S, Reddy U V B and Babu P V R, 2017, Climate fluctuations- A perspective on soil and plant potential related to sustainable production. National seminar on "*Agronomic Approaches for Climate Resilience in Agriculture*" at RARS, Nandyal. pp, 42. 2017.

310. Reddy M G, Raja C S, Adhithya R, Satya V K, Kokiladevi E, Sudhakar D, Rabindran R and and Velazhahan R, 2016, "Integration of a hairpin RNA-encoding gene derived from Tobacco streak virus confers resistance in groundnut (Arachis hypogaea L.) against peanut stem necrosis disease",*J Plant Dis Prot*.123:205–214.

311. Reddy M G, Raja C S, Adhithya R, Satya V K, Kokiladevi E, Sudhakar D, Rabindran R and and Velazhahan R, 2016, "Integration of a hairpin RNA-encoding gene derived from Tobacco streak virus confers resistance in groundnut (Arachis hypogaea L.) against peanut stem necrosis disease",*J Plant Dis Prot*.123:205–214.

312. Reddy M G, Kumar S G V and Swamy G S, 2016, "Thrips transmitted to spoviruses – global status and management strategies", *Current Biotica* 9 (4):396-423.

313. Reddy M S, Reddy U V B and Babu P V R, 2017, Economics and sustainability of land through improved farm implements. National seminar on "Trends in farm mechanization and engineering interventions for sustainable agriculture" at RARS, Tirupati. January 19 – 20. 2017.

314. Reddy MS, Reddy U V B and Babu P V R, 2017, Climate change on global food security. *National seminar* on "*Agronomic Approaches for Climate Resilience in Agriculture*" at RARS, Nandyal. pp, 39. 2017.

315. Reena Mahla, Shashi Mada, Vikender Kaur, Renu Munjal, Bhel R K and Raghavendra M, 2017, "Activities of sucrose ti starch metabolizing enzymes during grain filling in late sown wheat under water stress", *Journal of Applied and Natural Science*, 9 (1): 338-343.

316. Reshma A, Latha P, Umamahesh V, Vasanthi R P, Sudhakar P, 2017, "Evaluation of groundnut genotypes for physiological efficiencyand high yield to suit early kharif situation", *Legume Research*.

317. Revathi K, SreeRekha M, Venkata Lakshmi N and Prasuna Rani P, 2016, "Influence of planting densities and nitrogen levels on yield of rabi maize", *The Andhra Agriciltural Journal*, 63 (4): 751-754.

318. Revathi V, Reddi Sekhar M, Ratna Babu D and Ramana A V, 2016, "Variability and Genetic parameters for kernel yield", *The Andhra Agricultural Journal*, 63 (2): 318-321.

319. Revati K, Sree Rekha M**,** Venkatalakshmi N and Prasuna Rani P, 2016, "Influence of planting densities and nitrogen levels on yield of rabi maize", *The Andhra Agricultural Journal* , 63 (4): 751-754.

320. Sai Hima Bindhu B, Johnson M, Sailaja Rani J and Hariprasad K V, 2016, "In vitro screening of Trichoderma spp. Against Sclerotium rolfsii and Aspergillus niger in ground nut", *Advances in Life Sciences*, 5 (19): 8299-8302.

321. Sai Rekha K, Reddy D M, Reddy K H P, Rajarajeswari V and Ravindra Reddy B, 2016, "Assesment of variability parameters under moisture stress condition in mungbean (*Vigna radiate L. Wilczek*)", *The Andhra Agricultural Journal* , 63 (2): 306-310.

322. Sai Rekha K, Reddy D M, Reddy K H P, Rajarajeswari V and Ravindra Reddy B, 2016, "Assesment of variability parameters under moisture stress condition in mungbean (*Vigna radiata L. Wilczek*)", *The Andhra Agricultural Journal*, 63 (2): 306-310.

323. Sai Sravan U, Ramana Murthy K V, Ramana A V and Sunanda S, 2016, "Studies on improvement of system productivity through pre kharif crops in rice (*Oryza sativa L*) based cropping system",*The Andhra Agricultural Journal* 63 (2): 251-255.

324. Saidhar R, Uma Devi K, Vishnu Sankar Rao D and Srinivasa Rao V**, "**Constraint analysis of small farmers in agriculture in guntur district of andhra pradesh" *The Andhra Agricultural Journal*, 63 (4):962-967, 2016

325. Saidhar R, Uma Devi K, Vishnu Sankara Rao D and Srinivasa Rao V, 2016, "Viability of small farmers in guntur district of andhra pradesh", *Progressive Research – An International Journal Society for Scientific Development*. 11 (special edition 3): 1959 – 1963.

326. Saidhar R, Uma Devi K, Vishnu Sankara Rao D, Srinivasa Rao V, 2016, "Constraint Analysis of Small Farmers in Agriculture in Guntur District of Andhra Pradesh" , *The Andhra Agricultural Journal* . 63 (4): 962 – 967.

327. Sandeep Naik G, Adinarayan M, Manoj Kumar V and Madhumati T, 2016, "Management of Corynespora leaf spot of blackgram", *The Andhra Agricultural Journal*, 63 (1) 150-154.

328. Sandeep Naik G, Adinarayana M, Manoj Kumar V and Madhumathi T, 2016, "Management of Corynespora leaf spot of blackgram", *The Andhra Agricultural Journal*, 63 (1): 150-154.

329. Santhi Priya Ch, Suneetha Y, Ratna Babu D, Srinivasa Rao V, 2017, "Assessment of Genetic Divergence in Rice for Grain Yield and Quality Traits", *Environment & Ecology* 35 (3B): 2007-2011.

330. Santhi Priya Ch, Suneet Y, Ratna Babu D and Srinivasa Rao V, 2017, "Inter- relationship and Path analysis for yield and quality characters in rice(O*ryza sativa L.*)", *International Journal of Science, Environment and Technology*, . 6, No 1.

331. Sashikala G, Naidu M V S and Sreenivasulu Reddy K, 2016, "Effect of dairy Effluent on mironutrei status of soils and plant uptake green gram and pearl millet", *Progressive Research-An International Journal*, 11 (Special): 2943-2947.

332. Sathish Babu K, Subramanyam D and Uma Mahesh V, 2016, "Pre-emergence herbicide for weed management in Sesame", *Indian journal of Weed Science*, 48 (3): 345-347.

333. Satish Babu K, Ramesh Babu P V, Srinivasa Reddy M and Kavitha P, 2016, "Productivity and profitability of Maize (*Zea mays L.*) as influenced by higher levels of NPK and Zn nutrition", *Andhra Pradesh Journal of Agril. Sciences*, 2 (3): 211-217.

334. Shanthi Priya M, Reddy K H P, Hemanth Kumar M, Rajarajeswari V, Mohan Naidu G and Rupesh Kumar Reddy B, 2016, "Sugarcane for Diversified uses", *Electronic Journal of Plant Breeding*,7 (3): 677-683.

335. Sharmila P, Pratapa Reddy B, Neelakanta Sastry T V and Mohan Naidu G, 2016, "Economics of Mechanized Paddy Farms in Rayalaseema Region of Andhra Pradesh", *The Andhra Agricultural Journal* , 63 (1): 2014-207.

336. Shifa H S, Raja C S, Reddy M G, Paranidharan V and Velazhahan,2016,"Analysis of metabolite profiles in leaf tissues of transgenic groundnut plants modified for resistance against tobacco streak virus", *Biochemistry Cellular Arch.* 16.

337. Shireesha K, Satya Gopal P V, Lakshmi T, Ravindra reddy B, Prasad S V, 2016,"Attitude of Youth towards Farming –A Critical Analysis",*Advances in Life Sciences (An International Journal)*, 5 (18): 7935-7940.

338. Shireesha K, Satyagopal P V, Lakshmi T, Ravindra Reddy B and Prasad SV, 2016, "Correlates of profile and attitude of youth towards farming",*International Journal of Agricultural Science and Research*, 7 (1):42.

339. Shireesha K, Satyagopal P V, Lakshmi T, Ravindra Reddy B and Prasad SV, 2016, "A Scale to Measure the Attitude of Youth towards Farming", *The Mysore Journal of Agricultural Sciences*, 50 (4): 756-761.

340. Shireesha K, Satyagopal P V, Lakshmi T, Prasad S V and Ravindra Reddy B, 2017,"Youth in Farming – Personal, Economic, and Socio-Psychological Analysis",*The Andhra Agricultural Journal*,64 (1): 226-233.

341. Shireesha K, Satyagopal P V, LakshmiT, Ravindra Reddy B and Prasad S V, 2016,"Attitude of youth towards farming – A critical analysis", *Advances in Life Sciences*, 5(18), 7935-7940.

342. Shireesha K, Satya Gopal P V, Lakshmi T, Prasad S V, 2016, "Problems for Youth in Farming", *International Journal of agriculture Sciences*, 58 (8): 3236-3239.

343. Shireesha M, Bhavani Devi I, Vani N, Mohan Naidu G and Prasad S V, 2016, "A study on marketing practices of Turmeric in India", *Research Journal of Agricultural Sciences*, (7): 5154-5158.

344. Shireesha M, Bhavani Devi I, Vani N, Mohan Naidu G and Prasad S V, 2016, "Dynamics of future and spot market prices of Turmeric in India", *Research Journal of Agricultural Sciences*, (8): 138-142.

345. Shireesha M, Bhavani Devi I, Vani N, Mohan Naidu G and Prasad S V, 2016, "Influence of futures market on price behavior of Turmeric in India", *Advances in Life Sciences*, 5 (22): 10694-10700.

346. Shireesha M, Bhavani Devi I, Vani N, Mohan Naidu G and Prasad S V, 2016, "Dynamics of futures and spot market prices of turmeric in India", *Research Journal of Agricultural Sciences*, 7 (special): 138-142.

347. Shireesha M, Bhavani Devi I, Vani N, Mohan Naidu G and Prasad S V, 2016, "A Study on integration of turmeric markets in India", *International journal of Agricultural and statistical sciences*, 12, supplement 1: 159-164.

348. Shireesha M, Bhavani Devi I, Vani N, Mohan Naidu G and Prasad S V, 2016,"Price atility of turmeric in India: An empirical analysis", *International journal of Agricultural and statistical sciences*, 12, supplement 1: 17-20.

349. Shireesha M, Bhavani Devi I, Vani N, Mohan Naidu G and Prasad S V, 2016,"Price atility of Turmeric in India", *International Journal of Agricultural Statistical Sciences*, 12 (1): 17-20.

350. Shireesha M, Bhavani Devi I, Vani N, Mohan Naidu G and Prasad S V, 2016, "A Study on marketing practices of turmeric in India", *Research Journal of Agricultural Sciences*, .7 (Special): 154-158.

351. Siddeswari G K, Sailaja V, Satya Gopal P V, Prasad S V, 2016, "Factors Influencing the Extent of Adoption of Recommended ICM Practices by the Participant and Non-Participant Farmers of Rice FFSs", *Research Journal of Agricultural Sciences* (*An International Journal*), 7: S55-S58.

352. Siddeswari G K, Sailaja V , Satya Gopal P V, Prasad S V, 2016, "Profile Characteristics of the Participant and Non-Participant Farmers of Rice Farmer Field Schools (FFSs) in Nellore District of Andhra Pradesh", *Advances in Life Sciences (An International Journal)*, 7867-7872.

353. Siddeswari G K, Sailaja V , Satya Gopal PV, Prasad SV, 2017, "Impact of Farmer Field Schools (FFSs) on Profitability of the Participant and Non Participant rice Farmers", *The Journal of Research ANGRAU*, 45 (1): 58-63.

354. Sindhu K, Gopi Kirshna T, Rambabu P, 2017**, "**A study on profile characteristic of agripreneurs in Visakhapatnam District of A.P.", *Indian Journal of Social Research* . 58 (2): 193-204.

355. Sindhu K, Gopi Krishna T, Rambabu P, Raghunatha Reddy G, 2016, "Relationship of profile characteristics of agripreneurs with their entrepreneurial behaviour in Visakhapatnam District of Andhra Pradesh", *The Andhra Agricultural Journal* 63 (3) : 722-725

356. Sindhu K, Gopi Krishna T, Rambabu P, Raghunatha Reddy G , 2016, "Constraints faced by agripreneurs in managing agro-based enterprises and suggestions to overcome", *The Andhra Agricultural Journal* 62 (3) : 978-981

357. Sirisha AB M, Lal Ahmed M, Rama Kumar P V and Srinivasa Rao V, 2017,"Genotype x environment interaction for seed cotton yield and quality traits in upland cotton (*Gossypium hirsutum*)",*Green Farming*, 8 (2): 338-341.

358. Siva Krishna N, Gayatri N K, Srinivas T and Umamaheswari P, 2016, "Stability of promising early duration rice genotypes", *Environment and Ecology*, 34 (4A) 1598-1601.

359. Siva Prasad P N, Kavitha P, Sreenivasa Chari M and Srinivasa Reddy M, 2016,"Comparison of extraction methods to assess potassium availability for rice growing soils of canal ayacut of Kurnool district, Andhra Pradesh", *An Asian Journal of Soil Science*, 2 (1): 42-48.

360. Snehasis Routray and Hari Prasad K V, 2016,"Tri-trophic interactions inving host plants, black legume aphid *Aphis craccivora* (Hemiptera; Aphididae) and the predator, *Chelomenus sexmaculatus* (Coccinellidae; coleopteran)", *European Journal of Entomology*, 113: 551-557.

361. Solomon Raju K, Satish Kumar Ch, Sarath Babu B, 2017, "The Demand and Supply of Pulses and its Implications for food security in India", *International Journal of Multidisplinary Advanced Research Trends*. 4 (1): 3.

362. Sowjanya A and Sree Rekha M, 2016**, "**Influence of integrated nitrogen management on rice yield quality parameters and economics", *Progressive Research-An International Journal*, 1 1 (4): 294-296.

363. Sowjanya A, Sree Rekha M**,** Murthy V R K and Prasuna rani P, 2016, "Drymatter and yield of rice as influenced by organics and inorganics of nitrogen", *The Andhra Agricultural Journal* , 63 (4): 46-49.

364. Spandana B and Prakash D S R S, 2017, "Characterisation of thioesterase gene in sesamumindium using bioinformatic tools", *Advanced in Crop Science and Technology*, 5 (1): 256.

365. Spandana B, 2017, Genetic divergence, Correlation, Path analysis and Variability studies in Maizegenotypes (Zea mays. L). Published in Green Farming Journal in January - February, 2017.

366. Spandana B, Prakash D S R S and Nagalakshmi S, 2017, "Bioinformatic characterization of desaturase partial gene in sesamum indium", *Advanced in Crop Science an Technology*, 5 (1): 259.

367. Sravani D, Mahalakshmi M S, Sandhya Rani C, and Prasanna Kumari V, 2016, "Evaluation of certain newer insecticides against spotted pod borer, Marucavitrata on greengram", *The Andhra Agricultural Journal* 63 (4): 879-883.

368. Sravanthi S and Ramana A V, 2016, "Yield, nutrient uptake and economics of zero till maize (*Zea mays L.*) as influenced by nutrient management practices in North Coastal Zone of A.P.", *International Journal of Science and Nature*, 7 (3): 553-556.

369. Sravanthi S and Ramana A V, 2016,"Effect of Nutrient Management Practises on Yield, Nutrient Uptake and Post Harvest Soil Nutrient Status of Zero Till Maize in North Coastal Zone of A.P.", *Progressive Research*, 11 (Special IV): 2506-2510.

370. Sravanthi S, Ramana A V and Ramana Murthy K V, 2016, "Growth, yield and economics of zero till maize as influenced by nutrient Management practices in north coastal zone of Andhra Pradesh", *Research on Crops*, 17 (3): 458-461.

371. Sravanthi S, Anusha K and Raman A V, 2016, "Agricultural waste management: issues and strategies", *Kisan Wor*ld, 43 (7): 27-29.

372. Sravathi S, Ramana A V, Ramana Murthy K V and Jagannadham J, 2016, "Nutrient management in zero till maize for north coastal zone of andhra pradesh", *The Andhra Agricultural Journal*, 63 (4): 741- 746.

373. Sreedhar Reddy K and Naidu M V S, 2016, "Characterization and classification of soils in semi-arid Region of Chennur rmandal of Kadapa district , Andhra Pradesh", *Journal of the Indian Society of Soil Science*, 64 (3): 207-2017.

374. Sreekanth B, Ravi Babu M, Jayalalitha K. and Ashoka Rani Y, 2016, "Nutrient Deficiency Diagnosis in Rice, Sugarcane, Millets and Cotton. In: Proceedings of `The Training Programme on Diagnosis and Management of Pests, Diseases and Nutritional Disorders of Major Crops`. 8-12 August, 2016 Ed: Krishnayya, P.V., Acharya N.G. Ranga Agricultural University, Agricultural College, Bapatla, Andhra Pradesh, India.

375. Sreenivasula Reddy B and J Subbiah, 2017, "Radiofrequency-Assisted Thermal Processing of Packaged Low-Moisture Food Powders for Enhancing Microbiological Safety, National Seminar on Trends in Farm Mechanization and Engineering Interventions for Sustainable Agriculture", Regional Agricultural Research Station (RARS), Tirupati.

376. Sreenivasula Reddy Band J Subbiah, 2017,"Enhancing microbiological safety of packaged soft wheat flourthrough radio frequency-Assisted Thermal Processing", 51st Convention of Indian Society of Agricultural Engineers (ISAE), New Delhi & CCSH Agricultural University, Hisar, Haryana.

377. Sreenivasulu K N, Venkataramana M, Subbarayudu M, 2016, "Qualitative regression models - some applications", *An International Multidiscipline research journal*, 2249-7137.

378. Sreenivasulu K N, Venkataramana M, Subbarayudu M, Rajani, 2016,"Regression Analysis with categorical variables", 11: 135-143.

379. Srilatha V, Reddy Y T N, Upreti K K, Venugopalan R and Jayaram H L, 2016, "Responses of pruning and paclobutrazol in mango (*Mangifera indica L.*): changes in tree vigour, flowering and phenols", *Journal of Applied Horticulture*, 18 (10).

380. Srinivasa Rao M, Subba Rao M, Lal Ahamed M and Ramesh Babu P, 2017,"Combining ability and heterosis for yield and yield attributes in rice (*Oryza sativa L.*)", *Green Farming*, 8 (3): 688-691.

381. Srinivasulu A, Ramana K T, Lakshmi L M, Sudhakar P and Nagaraju R, 2017, "Effect of Different Plant Growth Regulators on Growth and Establishment of Rangpur Lime (*Citruslimonia osbeck*) and Australian Sour orange(*Citrus aurantium*)Root Stock Seedlings",*Advances in Life Sciences*, 5 (7): 2791-2796

382. Sriramana V, Gopikrishna T, Sivanarayana G, Radha Y, 2016, "Development of knowledge test to increase the knowledge level of cashew growers in Srikakulam District of Andhra Pradesh", *The Andhra Agricultural Journal* 63 (2) : 440-447

383. Srividya Rani, Lakshmi T, Prasad S V and Mohan Naidu T, 2016,"Strategy for effective managerial role of farm Women in Chittoor District of Andhra Pradesh", *Research Journal of Agricultural Sciences*, 7 (Special): 59-62.

384. Srujana, Mahalakshmi B, Sai Ram Kumar M S, D V and Naidu T C M, 2016, "Influence of biochemical components of leaf on incidence of whitefly (*Bemisia tabaci Genn.*) in certain blackgram genotypes", *The Andhra Agricultural Journal* 63 (2): 364-367. 4.14

385. Studies on the evaluation of effect of Dust Pollution on Growth and yield black gram Hareesh Babu P, Narasimha Rao K L, Jayalalitha K and Lal Ahamed Mohammed 63 (4): 889 – 895

386. SubhashiniK, I Shakuntala Devi and S Hyma Jyothi, 2016, Micro Finance a tool of financialinclusion – A constraint analysis. Proceedings of National Conference on "Financing andSustaining Rural Agribusiness Enterprises – A bottom of the Pyramid Approach" held atSchool of Agribusiness Management, College of Agriculture, PJTSAU, Hyderabad

387. Sudeepthi K, Jyothula D P B, Suneetha Y and Srinivasa Rao V, 2016, "Genetic variability estimates for yield and its component characters in rice (*Oryza sativa L.*)", *The Andhra Agricultural Journal,* 64 (1): 94-96.

388. Sudha Rani M and Durga Prasad A V S, 2016, "Priming of sorghum seed –Easy way to increase sorghum yields of resource farmers", *Land bank journal*, 55 (1): 10-12.

389. Sudha Rani M, Durga Prasad A V S and Venkata R ,Prakash Reddy, 2016, "Effect of salt stress on morphological and physiological parameters of Rice (*Oryza sativa L*)", *Progressive Research journal*, 11 (3): 1671-1674.

390. Sudha Rani M, Durga Prasad A V S, Venkata R Prakash Reddy, Vishnu Vardhan Reddy A, 2016, "Exploitation of heterosis using diverse CMS lines in sunflower (*Helianthus annuus. L*)", *Progressive Research journal*, 11(3): 1605-1608.

391. Sudhir Kumar I, Srinivasa Rao P, Reddy Belum VS, V Ravindrababu and K H P Reddy, 2016,"Heterosis and inbreeding depression in tropical sweet sorghum (*Sorghum bicolor(L.) Moench*)", *Crop Research*, 51 (1):1-4.

392. Sujatha D V, Kavitha P, Naidu M V S and Uma Maheswari P, 2016, "Influence of green manure andpotassium on growth, yield and economics of rice (*Oryza sativa. L.*), *Jouranal Of Research ANGRAU*, 44 (3 &4): 43-49.

393. Sujatha D V, Kavitha P, Naidu M V S and Umamaheswari P, 2016, "Influence of green manure and potassium on growth yield and economics of rice (*Oryza sativa. L*)", *Journal of ANGRAU*, 44 (3&4):pp 43-49.2016.

394. Sunil Kumar M, Sarada Jayalakshmi Devi R and Bhaskara Reddy B V,"Invitro evaluation of fungicides and biocontrol agents against *Colletotrichum capsici*, incitant of blight of chickpea", *International Journal of Agricultural Science and Research*, 5 (6): 229-232.

395. Sunil Kumar M, Sarada Jayalakshmi Devi R, Bhaskara Reddy B V and Prasanthi L, 2017, "Morphological and Cultural characterization of of *Colletotrichum capsici*, incitant of blight of chickpea in Andhra Pradesh", *Legume Research*. 40 (3): 592-596.

396. Sunil Kumar M, Sarada Jayalakshmi Devi R, Bhaskara Reddy B V and Prasanthi L, 2015, "Diversity of *Colletotrichum* species associated with blight of chickpea and its relevance to disease severity", *Bioinfolet*, 12 (4B): 945-950.

397. Sunil Kumar M, Sarada Jayalakshmi Devi R, Hema Chandra Reddy P and Venkata Chalapathi V, 2016, "A review on colletotrichum blight of chickpea in Andhra Pradesh", *International Journal of Agricultural Science and Research*, 6 (2): 145-158.

398. Swamanna J, Kavitha P, Sreenivasa Chari M and Srinivasa Reddy M, 2016, "Potassium Release Characteristics of rice growing soils of Kurnool district", *The Journal of Research ANGRAU*, 43 (1&2): 55-63.

399. Swami Chaitanya T, Muniratnam P and Srinivasa Reddy M, 2016, "Assessment of production potential of white sorghum under high input management in Vertisols", *Andhra Pradesh J Agril. Sciences*, 2 (3): 211-217.

400. Swathi G, Rambabu P, Gopi Krishna T, Vishnu Sankara Rao D and Srinivasa Rao V, **"**Problems and suggestions to improve the livelihood of Tribal Farmers", *The Andhra Agricultural Journal* , . 64 (1): 234-240.

401. Swathi P, Nagavani A V, Bhargavi B, Ramana J V and Prabhakara Reddy G, 2016 "Effect of Nitrogen and time of harvesting on growth and yield parameters of fodder sorghum", *Current Biotica*. 10 (1): 59-63.

402. Swathi P, Nagavani A V, Bhargavi B, Sunith N and Prabhakara Reddy G, 2016,"Effect of Nitrogen and time of harvesting on Quality and Post harvest soil nutrient status in fodder sorghum", *Progressive research*, 11 (9): 6168-6170.

403. Swathi P, Nagavani A V and Bhargavi B, 2016, "Effect of levels of nitrogen and time of harvesting on growth and quality parameters of fodder sorghum", *Current Biotica*, 10 (1): 59-63.

404. Swathi P, Nagavani A V and Sunitha N, 2016,"Growth and quality of fodder sorghum as influenced by nitrogen fertilization and time of harvesting", *The Andhra Agricultural Journal* , 63 (2): 276-278.

405. Jogarao T, Prasad, P R K, Lalithakumari A, Prasuna Rani P and Pullarao Ch**,** 2016**, "**Effect of long term fertilization on nutrient content, uptake and yield of cotton", *The Andhra Agricultural Journal* , 63 (2): 343-347.

406. Tejaswini K LY, Ravi Kumar B N V S R, Lal Ahamed M, Krishnam Raju S, Srinivas M and Ramana Rao PV, 2017,"Genetic variability, heriatability, genetic advance and correlation studies F5 families in rice (*Oryza sativa L.*)", *International Journal of Agricultural Science and Research*, 7 (1): 75-82.

407. Tollamadugu N V, Prasad K V, Adam Shaik, Visweswara Rao P, Ravindra Reddy B, Giridhara Krishna T, 2016,"Size dependent effects of antifungal photogenic silver nanaoparticles on germination, growth and biochemeical parameters of rice (*Oryza sativa L*), maize (*Zea mays L*) and peanut(*Arachis hypogaea L*)", *IET Nanobiotechnology Journals*,

408. Tulasi G, Padma V, Reddy D V V, Rao P R, Sanjeeva Rao D, Ramesh T, and Radha Krishna K V, 2017, "Natural variation of top three leaf traits and their association with grain yield in rice hybrids", *Indian Journal of Plant Physiology*,

409. Uday Krishna S, Sunil Kumar M and Sarada Jayalakshmi Devi R, 2016, "Screening of chickpea germplasm for *Colletotrichum* blight resistance", *International Journal of Agricultural Science and Research*, 6 (2): 171-174.

410. Uday Krishna S, Sarada Jayalakshmi Devi R and Sunil Kumar M,2016, "Evaluation of fungicides and bio-control agents against *colletotrichum* blight of chickpea and development of suitable integrated disease management (IDM) strategy in Andhra Pradesh", *International journal of applied and natural science*, 5 (2): 83-88.

411. Uday Krishna S, Sunil Kumar M and Sarada Jayalakshmi Devi R, 2016, "Outbreak of *Colletotrichum* blight of chickpea and estimation of disease incidence in major chickpea growing areas of Andhra Pradesh", *International journal of applied and natural science*, 5 (2):

412. Umadevi G D, Sunitha N, Reddi Ramu Y, Naidu M V S, Prabhakara Reddy G and Reddy A P K, 2016,"Effect of various organic sources on growth and yield of groundnut", *Andhra Pradesh Journal of Agricultural Sciences*, 2 (2):104-107.

413. Umadevi G D, Sunitha N, Reddi Ramu Y, Naidu M V S and Prabhakara Reddy G and Pratap Kumar Reddy A, 2016,"Effect of various organic sources on growth and yield of groundnut", *Andhra Pradesh Journal of Agricultural Sciences*, 2 (2): 104-107.

414. Umadevi N, Sunita N, Reddy Ramu Y and Naidu M V S, 2016, "Response of groundnut (*Arachis hypogaea L.*) to organic sources of nutrients supply under rainfed conditions", *Progressive Research*, 11 (Special-III) 1878-18880.

415. Umarani E, Radhika K, Padma V and Subba Rao LV, 2016, "Evaluation of landrances of rice (*Oryza sativa L.*) for genetic diversity",*Green Farming*, 7 (3): 537-540.

416. Vanthala Arun Kumar, Vijaya Gopal A, Subhash Reddy R, Triveni S and Damodara Chari K, 2016, "Study On Distribution And Characterization Of Vesicular Arbuscular Mycorrhizal Fungi In Different Crops", *Progressive Research*, 11 (Special-V): 3662-3666.

417. Ashoka Rani Y, Ratna Kumari S, Jayalalitha K and Prasunarani P, 2016, "Variation in Pigment Composition under water stress (Rainfed) and Non-stress (Irrigated) conditions in *Bt* Cotton *(Gossypium Hirsutum L.)* Hybrids", 11 (Special –VI) 4165- 4169.

418. Vasavi M and Sree Rekha M, 2016, "Nutrient uptake and economics of Bt cotton", *Progressive Research*, 11(Special VII): 4480-4481.

419. Vemana K, Venkateswarlu N C, Rajesh A P and Naik K S S, 2016, "Field Screening Technique for Peanut Stem Necrosis Disease Using Parthenium hysterophorus infector Border and Impact of disease on yield", *Indian Journal of Plant Protection*, . 44 (2): 239-245.

420. Venkata Lakshmi N, Veeraraghavaiah R and Subbaiah G, 2017, "Response of maize to different levels of nitrogen under zero-till conditions after rice", *The Andhra Agricultural Journal* , 64 (1): 8-12.

421. Venkata Lakshmi N, Veeraraghavaiah R, Subbaiah G, Ashoka Rani Y and Ravindra Babu P, 2016,"Influence of nitrogen management practices with glyricidia leaf manure on yield and nutrient uptake of rice (*Oryza sativa L.*)", *The Andhra Agricultural Journal* , 63 (4): 763-766.

422. Venkata Lakshmi N, Veeraraghavaiah R, Subbaiah G, Ashoka Rani Y and Ravindra Babu P, 2016,"Influence of nitrogen management practices with glyricidialeaf manure on yield and nutrient uptake of rice (*Oryza sativa L.*)", *The Andhra Agricultural Journal* , 63 (4): 763-766

423. Venkata R, Prakash Reddy, 2017, **"**New concepts in Plant Breeding and Genetics", *Advances in Plants and Agricultural Research*, 7 (1): 00245.

424. Venkata R, Prakash Reddy, Sudha Rani M and Durga Prasad A V S, "Reaction of sunflower genotypes to Alternaria blight resistance", *Progressive Research journal*, 11 (3): 1573-1576.

425. Venkata Rao P, Neelaveni S, Pradeep Kumar P B and Punna Rao P, 2016, "Constraint analysis of drum seeder technology in paddy cultivation in north coastal zone of andhra pradesh", *Andhra Agricultural Journal*, 63 (2): 457-460.

426. Venkatalakshmi M, Venkateswarlu B**,** Prasad P V N and Prasuna Rani P, 2016, "Performance of baby corn as influenced by planting densities and levels of nitrogen", *The Andhra Agricultural Journal* , 63 (3): 531-534.

427. Venkatesh Y N, Durga Prasad N V V S, Sai Ram Kumar D V and Prasanna Kumari V, 2016, "Assessing the damage potential of *Spodoptera litura* on BG II cotton", *The Andhra Agricultural Journal* 63 (3): 631-639. 4.14

428. Veronica N, Padma V, Subramanyam D and Jayasree G, 2016, "Impact of graded phosphorous levels on various morpho agronomical and phosphorous related enzymes in rice (*Oryza sativa L.*) genotypes", *Progressive Research*, 11: 2429-2433.

429. Veronica N, Padma V, Subramanyam D, Jayasree G, Rao P R and Oleti S R, 2016, "Effect of graded phosphorous levels on yield and yield attributes of rice (*Oryza sativa L.*) genotypes in phosphorous use efficiency", *Progressive Research*, 11-2434-2436.

430. Vijaya Durga K, Venkata Ramana Rao P, Jyothula D P B and Srinivasa Rao V, **"**Correlation Studies Between yield and its Components in Advanced Breeding Lines in Rice (*Oryza Sativa.L*) Under Salinity", *The Andhra Agricultural Journal*, 63 (4):816-818, 2016

431. Vijaya Santhi, Ashoka rani Y, Lal Ahamed M and Jayalalitha K, 2016, "Yellow mosaic virus induced alterations in photosynthetic pigments and yield of blackgram (*Vigna mungo (L.) Hepper*) cultivars" , *Progressive Research*, 11 (special - VI): 4192-4195

432. Murthy VRK, Venkatarao P, Jyothibasu B and Kiran kumar S, 2016, "Weather health indices for ranges of rainfall in ITKS through murthy's concepts", *The Andhra Agricultural Journal* , 63 (4): 786-788.

433. Vykhaneswari K , Uma Devi K, Raghunadha Reddy G and Nafeez Umar Sk, "Constraint Analysis of Dairy Farmers in Co-operative and Non Co-Operataive Milk Supply Chains in Prakasam District of Andhra Pradesh", *The Andhra Agricultural Journal* , 207-212.

434. Vykhaneswari K, Uma Devi K, Raghunadha Reddy G and Nafeez Umar Sk, 2017, "Constraint Analysis of Dairy farmer in Co- Operative and Non– coperative Milk Supply Chains in Prakasam District of Andhra Pradesh", *The Andhra Agricultural Journal* . 64 (1): 1- 246. 207-212.

435. Kavya Y, Vijaya Gopal A, Subhash Reddy R and Sreedhar M, 2016," Enrichment of biogas manures with beneficial microorganisms", *International Journal of Currrent Microbiology and Applied Sciences*, 5 (7): 242-252.

436. KavyaY, Vijaya Gopal A, Subhash Reddy R and Sailaja Rani R ,2015, "Variations in bod and cod at various stages of biogas production using different agricultural wastes", *Journal of Plant Development Sciences*, 7 (6): 511-513.

437. Yamini M, Munaswamy V, Naga Madhuri K V and Reddi Ramu Y, 2015, "Long term effects of manure and fertilizers on soil phosphorus fractions under groundnut monocropping", *Andhra Pradesh Journal of Agricultural Sciences*, 1(4): 21-28.

438. Yamini S, Ravindrababu P, Prasad P R K and Martin luther M**,** 2016, "Macro nutrient status of tobacco growing soils of prakasam district, Andhra Pradesh", *The Andhra Agricultural Journal* , 63 (4): 116-119.

439. Yogeswari P, Sandhya Rani C, Ramachandra Rao G and Manoj Kumar V, 2016, "Survey on sorghum pests, their natural enemies and alternative hosts in Sorghum growing tracts under rice fallow situation of Guntur district", *The Andhra Agricultural Journal*, 63 (3): 643-648.

440. Yogeswari P, Sandhya Rani C, Ramachandra Rao G, Manoj Kumar V, 2017, "Screening of sorghum genotypes against Shootfly andStemborer", *The Andhra Agricultural Journal*, 64 (1): 146-153.

441. Yogeswari P, Sandhya Rani C, Ramachandra Rao G and Manoj Kumar V, 2016, "Survey on sorghum pests, their natural enemies and alternative hosts in sorghum growing tracts under rice fallow situations of Guntur district", *The Andhra Agricultural Journal*, 63(3): 643-648.

442. Yogeswari P, Sandhya Rani C, Ramachandra Rao G and Manoj Kumar V, 2017. "Screening of sorghum genotypes against shootfly and stem borer",*The Andhra Agricultural Journal*, 64 (1): 146-153.

2. Agricultural Engineering and Technology

1. Development of knapsack motorized robe weedier an Tiller Dr.C.Ramana-Innovation in Agriculture Mechanization –development of linkage among R&D Irish well – Industries publishers, place, complete book or book chapter

2. Gowtham Deekshithulu N V, Ravi Babu G, Ganesh Babu R and Sivarama Krishna M, 2016, "Performance evaluation of developed low cost microcontroller based automated drip irrigation system", *The Andhra Agricultural Journal* , 63 (3): 694-700.

3. Hari Babu B, Anil Kumar D and Srigiri D, 2016, "Determination of stiffness and damping coefficient of tractor front tires in non-rolling conditions", *International Journal of Agricultural Science and Research*, 6 (2): 43-52.

4. Kishan K, Hema Kumar H V, Ravi Babu G and Lavanya K, 2016, "Estimation of crop water requirement of TS channel command of krishna western delta using CROPWAT model", *The Andhra Agricultural Journal* , 63 (2): 396-402.

5. Kishore N, Madhavi T, Edukondalu L and Gayathri R L, 2017, "Development and chemical evaluation of guava candies", *International Journal of Agricultural Sciences.*

6. Krupavathi K, Ravibabu G, Ganeshbabu R and Madhusudhan Reddy K, 2017, "Comparison of measured discharges of designed trapezoidal modified broad crested weirs and estimated discharge by WINFLUME software", *The Andhra Agricultural Journal* , 64 (1): 197-203.

7. Madhava M, Anand D and Edukondalu L, 2017, "Shelf life extension of papaya fruit by shrink wrapping" *The Andhra Agricultural Journal*, 64 (1): 187-193.

8. Murali Naik K, Smith D D and Sardar Baig M "Development of Whey Enriched Protein Mix", *The Andhra Agril. Journal* 63 (4): 915-920

9. Murali Naik K, Sardar Baig M and Smith D D, "Development of Multi Purpose Mix", *The Andhra Agril. Journal* 63 (3): 676-679.

10. Naveen Kumar M, Edukondalu L, Krishnakanth B and Dileepchand M, 2016, "Role of physical dimensions on milling characteristics of 17 Indian paddy varieties", *International Journal of Agricultural Sciences*, 8 (33):1690-1692.

11. Naveen Kumar M, Edukondalu L, Ambedkar M and Srinivas Y, 2016, "A comparative study on drying kinetics of tomato pulp and tomato foam", *International Journal of Agricultural Sciences*, 8 (33): 1693-1696.

12. Rakesh G, Bhaskararao I, Ravibabu G and Polappa N, 2016, "Impact assessment of watershed works on socio-economical development in Mutukula watershed, Prakasam district", *The Andhra Agricultural Journal* , 63 (4): 927-935.

13. Ravibabu G, Apparao Ch, Sambaiah A and Edukondalu L, 2017, "Design and calibration of low cost electric circuit based soil moisture sensor", National seminar on trends in farm mechanization and engineering. *Interventions for sustainable agriculture* PP 24.

14. Sai Vinay B J V, Edukondalu L, Sivala Kumar and Veera Prasad G, 2017, "Development and evaluation of low cost grader for round fruits and vegetables. In Technical Compendium of 51 Annual Convention of ISAE and National Symposium on "Agricultural Engineering for Sustainable and Climate Smart Agriculture".

15. Samreen, Satyanarana Ch V, Edukondalu L, Vimala Beera V and Srinivasa Rao, 2017, "Membrane processing of pineapple juice", In Technical Compendium of 51 Annual Convention of ISAE and National Symposium on "Agricultural Engineering for Sustainable and Climate Smart Agriculture".

16. Samreen, Satyanarayana Ch V V, Edukondalu L and Sandhya M, 2016, "A comparative study of thermally treated and untreated sugarcane juice", *The Andhra Agricultural Journal* , 63 (2): 415-421.

17. Srigiri D, Veera Prasad G, Raj Kiran B and Edukondalu L, 2016, "Performance evaluation of manually operated push type multi crop planter", *Indian journal of science and technology*, 8 (29): 1624-1626

18. Srigiri D, Veera Prasad G, Raj Kiran B and Edukondalu L, 2016, "Development of single row manually operated multi crop planter", *International Journal of Agricultural Sciences*.

19. Surekha D, Edukondalu L, Smith D D and Raja Kumar K N, 2016, "Physical properties of two banana cultivars grown in Andhra Pradesh", *The Andhra Agricultural Journal* , 63 (1): 199-203.

20. Vijaya Deepthi P, Sivala Kumar, Srinivasa Rao P, Edukondalu L and Lakshmi J , 2016, "Storage Studies on Extruded Sorghum Products", *International Journal of Agricultural Science and Research*.

21. Vijaya Deepthi P, Sivala Kumar, Edukondalu L and Lakshmi J, 2016, "Optimization of Process parameters for Extruded Sorghum Products", *The Andhra Agricultural Journal* .

BY RESEARCH SCIENTISTS

Books and Chapters

1. Jyothirmai Madhavi K and Kishore Varma P, 2016, "Integrated disease management of greengram and blackgram", In: Diseases of pulse crops and their sustainable management, Eds: S.K. Biswas, Santosh Kumar and Gireesh Chand., Biotech books, New Delhi, pp.385-410
2. Kishore Varma P and Jyothirmai Madhavi K, 2016, "Pigeonpea wilt complex and its management with an integrated approach. In: Diseases of pulse crops and their sustainable management, Eds: S.K. Biswas, Santosh Kumar and Gireesh Chand., Biotech books, New Delhi, pp.303-318
3. Radhakrishnan T, Thirumalaisamy P P, Vemana K, Kumar A and Ratna kumar A L, 2016, "Major Virus Diseases of Groundnut in India and Their Management **In**: Plant Viruses: Eution and Management. R. Kumar Gaur, N. M. Petrov, Basavaprabhu L. Patil, M. I. Stoyanova (eds). Springer Science+Business Media Singapore. pp. 253-271.
4. Vemana K**,** 2016, "Impact of insect transmitted viral diseases in different crops and approaches for their management In: Proceedings of the training programme on Diagnosis and management of insect pests, diseases and nutrient disorders of major crops. P. V. Krishnayya (Eds). Acharya NG Ranga Agricultural University, Agricultural College, Bapatla. pp171.
5. Eswara Reddy N P and Hemalatha T M, 2016, "Molecular characterization and biological control of Sclerotium rolfsii causing stem rot of groundnut", Review article in Microbial Diversity- Exploration & Bioprospecting, *Scientific Publisher*s- Pp 455-467.

Research Papers

1. Abdul Rasheed V, Murali Krishna T, Devaki K and Bhaskar B, 2017, "Seasonal incidence and alternate hosts of Papaya mealy bug *Paracoccus marginatus* Williams and Granara de Willink, (Pseudococcidae:Hemiptera) in Chittoor and Kadapa districts of Andhra Pradesh in India", *International Journal Pure Application. Biological Science*, 5 (2): 253-261.
2. Adilakshmi D, Charumathi M and Appalaswamy A, 2016, "Development of early maturing clones with high yield and juice quality in sugarcane", *International Journal of ltidisciplinary Advanced Experimental Research*. III (2). pp 109—114.
3. Akhila Anil I, Sudhakar P, Pratima T and Umamahesh V, 2016, "Effect of photoperiod and temperature on growth and development of groundnut", *National Conference of Plant Physiology*, 8-10.
4. Akhila Anil I, Pratima T, Umamahesh V and Sudhakar P, 2016, "Understanding physiological basis of temperature and photoperiod responses under changing climate", *National Conference of Plant Physiology*, 8-10.

5. Amara Jyothi P, Jaganndham J, Hari Satyanarayana N and Madhu Kumar K, 2017, "Poster National Seminar on "*Agronomic Approaches for Climate Resilience in Agriculture*" Performance of new roselle (*Hibiscus subdariffa L.*) and their response to different fertilizer levels conducted on 2nd May, 2017 at RARS, Nandyal by ANGRAU.

6. Amaravathi Y, Vasanthi R P, Poojitha N K, Sankar B A, Eswar Reddy N P and Naidu T C M, 2016, "Biotic stress resistance/tolerance genes Identification and their validation by e-PCR in groundnut: An Insilico Approach: National Seminar 2016 Plant Genomics and Biotechnology: Challenges and Opportunities in 21st Century: 53-60

7. Amrutha Veena G and Eswara Reddy N P, 2016, "Efficacy of *Trichoderma* spp. against *Rhizoctonia bataticola*, the causal agent of dry root rot of chickpea", *Advances in Life Sciences*, 5 (18): 8031-8033.

8. Amrutha Veena G and Eswara Reddy N P, 2016, "*In vitro* Efficacy of chickpea Antagonistic Bacteria against *Rhizoctonia bataticola*", *Advances in Life Sciences*. 5(19) : 8303-8308.

9. Amrutha Veena G and Eswara Reddy N P, 2016, "Integrated disease management of dry root rot of chickpea", *Advances in Life Sciences*, 5(19): 8336-8343.

10. Amrutha Veena G and Eswara Reddy N P, 2016, "My coparasitism of *Trichoderma* on Rhizoctonia bataticola", *Advances in Life Sciences*, 5 (19) : 8250-8251.

11. Amrutha Veena G, Eswara Reddy N P, Bhasakar Reddy B V and Prasanthi L, 2016, "Molecular characterization of chickpea bacterial bioagents against dry root rot by RAPD and 16s rDNA techniques", *Ecology, Environment and conservation Journal*(September suppl.), pp. S423-S428.

12. Amrutha Veena G, Eswara Reddy N P, Bhasakara Reddy BV and Ranga Rani A, 2016, "Mode of action of chickpea antagonistic bacteria on *Rhizoctoniabataticola* under *in vitro*", *International Journal of Agricultural Science and Research*, (6) 6: 219-224.

13. Anitha N, Siva Reddy K V, Chenga Reddy V, Rama Kumar P V and Srinivasa Rao V, 2016, "Genetic variability, Heritability and Genetic advances for yield and yield contributing characters in inter-specific cotton hybrids (*G.hirsutum* L. x *G.barbadense* L.)", *The Andhra Agricultural Journal* , 63 (1) :63-66.

14. Anupama G, Lavanya Kumari P, 2016, "Industrial Based Occupational Diseases- A K AP Study On Workers of Rayalaseema Region", *Quest Journals Journal of Research in Business and Management* 4 (9): 21-29.

15. Anuradha N, Patro T S S K, Divya M, Sandhya Rani Y and Triveni U, 2017, "Morphological diversity analysis in finger millet (*Eleusine coracana (L.) Gaertn.*)", *Frontiers of Crop Improvement Journal*, 5 (1): 67-70

16. Anuradha T , 2016, "Genetic Divergence Studies for the Quantitative Traits of Paddy under Coastal Saline Eco System", *Journal of the Indian Society of Coastal Agricultural Research.* 34 (2): 1-1

17. Anusha B, KrishnaVeni B, Lal Ahmed M and Ashoka Rani Y, 2016, "Variability for yield, yield components and quality characters in M4 progenies of Rice (*Oryza sativa L.*)", *Andhra Agricultural Journal*, 63 (2): 301-305.

18. Anusha S, Prasada Rao G M V and Sairam Kumar D V, 2017, "Influence of different nitrogen levels on the management of Bt cotton sucking pests", *Journal of Entomology and Zoology Studies*, 5 (2): 16-21.

19. Archana K, Rambabu P, Sivanarayana G and Rao D V S, 2016, "Profile of the MGNREGS beneficiaries – A study in Srikakulam district of A.P", *The Andhra Agricultural Journal* , 63 (2) : 465 – 469.

20. Aruna.E and Karuna Sagar G, 2016, "Productivity of rainfed castor as influenced by plant geometry and nitrogen levels", *International Journal of Applied Sciences* 4(1):1-5

21. Arunselvi K, Ganesh Babu R, Bhaskara Rao I and Prasuna Rani P, 2016, "Effect of drip irrigation with saline water and water use efficiency of Okra (Abelmoschus Esculentus L. Moench)", *The Andhra Agricultural Journal* , 63 (2):430-434.

22. Asha Jyothi B and K Jhansi, 2016, Liquid biofertilizers- "A potential alternative to carrier based biofertilizers for sustainable soil health", Proceedings of International conference on "New approaches in Agricultural, Food and Environmental Sciences" held at Andhra Loyola College, Vijayawada on 22nd to 24th December 2016 pp No. 74

23. Asha Jyothi B, Sujatha T and Jhansi K, 2016, "Relative performance of promising pre release clones to saline irrigation water under natural conditions", 46th Annual Convention meeting of SISSTA at Chennai on 15th and 16th July 2016, pp.96-98.

24. Asha Jyothi B, Sujatha T and Jhansi K, 2016, "Response of promising pre-release clones of sugarcane in Krishna zone for different nutrient levels", Proceedings of International Conference and Exhibition on Sugarcane Value Chain –Vision 2025 Sugar at Vasantadada Sugar Institute, Haveli district, Pune, Maharastra held on November 13-16, 2016 pp: 80.

25. Ashok P, Dayal Prasad Babu J, Ratna Babu D and Srinivasa Rao V, 2016, "Studies on Genetic variability, heritability and genetic advance for Yield components and grain quality parameters of rice (*Oryza sativa* L.)", *The Andhra Agricultural Journal* , 63 (3): 575-579

26. Ashok P, Dayal Prasad Babu J and Ratna Babu D, 2016, "Character association and path analysis for yield components and grain yield parameters of rice (*Oryza sativa* L.)", *International Journal of Agricultural Science and Research*, 6 (6): 251-258

27. Ashok P, Dayal Prasad Babu J and Ratna Babu D, 2017, "Understanding diversity in rice (*Oryza sativa* L.) germplasm using principle component analysis, *Agricultural Research Journal*, 7 (4): 1002-1006

28. Ashok A, George James M, Sasikala K, Usha Rani T, 2016, "Site Specific nutrient management studies of cassava in Andhra Pradesh", *Proceedings of Indian Society of Soil Science*, 192 & 20(p).

29. Avinash B, Venu R, Prasad T N V K V, Alpha Raj M, Vasu K and Srilatha Ch, 2016, "Synthesis and characterization of neem leaf extract, 2, 3-Dehydrosalanol and Quercetin dihydrate mediated silver nano particles for therapeutic applications", *IET Nanobiotechnology,*

30. Avinash B, Venu R, Raj M A, Rao K S, Srilatha C and Prasad T N V K V, 2017, "*In vitro* evaluation of acaricidal activity of novel green silver nanoparticles against deltamethrin resistance *Rhipicephalus* (*Boophilus*) *microplus*", *Veterinary Parasitology*, 6: 237:130.

31. Azolla makes farm women self sustainable in feeding livestock December, 2016, 7-8K.Tejeswara Rao, Md.Latheef P, V.Sridevi, A.Upendra Rao, N.lakshminarayana, P.Sai Mahesh and Venugopala RaoSuccess storiesICAR, *IIFSR*, Modipuram, UP

32. Vijaya Lakshmi B, Suryanarayana Y, Rama Kumar P V, Ashoka Rani Y and Srinivas Rao V, 2016, "Studies On Gene Action And Combining Ability For Morpho- Physiological Traits In Rice (*Oryza Sativa* L.) Under Water Stress Condition, *The Andhra Agricultural Journal*, 63 (2) :322-327.

33. B Vijaya Lakshmi, Suryanarayana Y, RamaKumar P V, Ashoka Rani Y and Srinivas Rao V, 2016, "Correlation and path analysis for yield and its component traits in rice *Oryza Sativa* L.) Under Water Stress Condition", *The Andhra Agricultural Journal* 63 (1) : 86-90.

34. Bala Krishna B, Chenga Reddy V and Siva Reddy K V, 2016, "Distinctness, Uniformity and stability (DUS) characterization on fiber quality traits on cotton (*Gossypium* spp.)", *Germplasm, Environmental & Ecology*, 34 (1A): 262-266.

35. Bala Krishna B, Chenga Reddy V, Lal Ahamed M and Siva Reddy K V, 2016, "Genetic Divergence studies for yield and fiber quality traits in upland cotton (*Gossypium hirsutum* L.)", *International Journal of agriculture Sciences*, 8 (48) : 2045-2049.

36. Bayyapu Reddy K, Chenga Reddy V, Lal Ahmed M and Siva Reddy K V, 2017, "Study of combining ability analysis and gene action for seed cotton yield and fiber characters in upland cotton", *Journal of Research, ANGRAU*, 45 (1) : 22-31.

37. Bhadre Chandbashi K and Sunitha N, 2017, "Response of fodder maize to different crop geometry and nitrogen levels during *kharif* season", *Research Journal of Agricultural Sciences* 8(1) : 25- 29.

38. Bhanurekha K, Jayalakshmi V, Sreenivas T, Umamaheswari P and Sudha Rani M,"Genetic divergence studies for morpho physiological characters including seed yield in chickpea (*Cicer arietinum* L.)", *Journal of Research, ANGRAU*. 44 (1&2): 31-37

39. Bharathi S, Ratna Kumari S, Vamsi Krishna A N, Sree Lakshmi B and Chenga Reddy V, 2016, "Green manuring an option for nutrient management in organic cotton production", *Progressive Agriculture*, 11: 5015-5017

40. Bharathi G, Krishna Veni B, Lal Ahmed M and Jaya Lalitha K, 2016, "Studies on Genetic Divergence in High Yielding Rice (*Oryza sativa L.*) Genotype", *Journal of Rice Research*, 9(2): 6-10.

41. Bharathi S, Ratna Kumari S, Vamsi Krishna A N and Chenga Reddy V, 2016, "Effect of Nitrogen levels, split application of Nitrogen on yield and fibre quality in Bt Cotton in Vertisols", *Journal of Cotton Research and Development*, 30 (2) : 201-204.

42. Bhargavi K, Narayanaswamy G, Sahadeva Reddy B, Ravindra Chary G, Srinivasa Rao Ch, 2017, "Pearlmillet+Pigeon Pea (5:1) intercropping System: Risk resilient system for red soils of scarcity zone of Andhra Pradesh", National Seminar on "*Agronomic Approaches for Climate Resilience in Agriculture*" during 19-20 January, 2017.

43. Bhargavi K, Narayanaswamy G, Babu M V S, Reddy K M, Sahadeva Reddy B, 2017, "Staggered transplanting of tomato seedlings in rainfed alfisols at Girigetla micro watershed area in Kurnool district of Andhra Pradesh", National Seminar on "*Agronomic Approaches for Climate Resilience in Agriculture*" 2nd May, 2017.

44. Bhaskar B, Khayyum S, Prasad T N V K V, Anil Kumar, Sarada Jayalakshmi P A, 2016, "Evaluation of antifungal activity of the mycogenic silver nanoparticles against *Aspergillus niger* inciting collar rot disease in groundnut (*Arachis hypogaea* L)", *Indian Journal of Plant Pathology*, (4s): 605-608.

45. Bhaskar B, Khayum Ahammed S, Sarada Jayalakshmi Devi R, Manjula K, Rasheed V A and Prasad T N V K V, 2016 "Fungicidal action of mycogenic silver nanoparticles against *Aspergillus niger* inciting collar rot disease in groundnut (*Arachis hypogaea* L)", *Indian Phytopathology*, 69 (4s) : 605-608

46. Bhaskar B, Khayum Ahammed S, Rasheed V A and Sarada Jayalaksmhi Devi R,"Role of organic acids production in pathogenicity of *Aspergillus niger* inciting collar rot disease in groundnut", *Indian Phytopathology* 69 (4s) : 172-174.

47. Bhattiprolu S L and Chenga Reddy V, 2017, "Reaction of Bt cotton hybrids against major diseases", *Journal of Research, ANGRAU*, 45 (1): 7-10.

48. Bhattiprolu S L, Chenga Reddy V and Narayana E, 2016, "Development of rust disease in cotton as influenced by weather parameters", *Indian Phytopathology*, 69(3): 233-235.

49. Bhattiprolu S L and Monga D, 2017, "Integrated management of foliar diseases in cotton", *Journal of Cotton Research and Development*, 31 (1): 97-101.

50. Bhattiprolu S L, Bindu Madhavi G and Chenga Reddy V, 2016, "Efficacy of *Trichoderma viride* and *T. harzianum* against foliar diseases of cotton", *Journal of Cotton Research and Development*, 30 (2): 240-243.

51. Bhattiprolu S L, Durga Prasad N V V S, Chenga Reddy V and Bhattiprolu G R, 2017, "Field evaluation of Bt and non Bt cotton hybrids to foliar diseases", *Progressive Agriculture*, 17 (1): 5-9.

52. Boreddy S R and Subbiah J, 2016, "Temperature and moisture dependent dielectric properties of egg white powder", *Journal of Food Engineering*, 168: 60-67.

53. Boreddy S R, Thippareddi H, Froning G and Subbiah J, 2016, "Novel Radio frequency Assisted Thermal Processing Improves the Gelling Properties of Standard Egg White Powder", *Journal of Food Science*, 81(3):E665-E671

54. Chaitanya N, Gopala Swamy S V S and Madhumathi T, 2017, "Effect of modified atmosphere on Cigarette Beetle, *Lasioderma serricorne* (Fab.) in stored Turmeric", *Indian Journal of Entomology*, 79 (2): 202-207.

55. Chaitanya N, Gopala Swamy S V S, Madhumathi T, Manoj Kumar V and Lakshmipathy R, 2016, "A study on Incidence of Cigarette Beetle, *Lasiodermaserricorne* (Fab.) in Turmeric Rhizomes in Storage houses at Duggirala, Andhra Pradesh", *The Andhra Agricultural Journal* 63 (2): 374-378.

56. Chamundeswari N and Satyanarayana P V, 2016, "Estimation of genetic components for micronutrients in rice kernels", *Journal of Advances in Life Sciences*, 5 (20):9184-9186

57. Chamundeswari N, 2016, "Studies on nature of genetic divergence in rice (*Oryza sativa* L.)" *International journal of science environment and technology*, 5 (6):

58. Chamundeswari N, Satyanarayana P V, Krishnam Raju S, Bhuvaneswari V, Ravi Kumar B N V S R and Girija Rani M, 2016, "Identification of new sources of resistance for blast at maruteru, Andhra Pradesh", *Progressive Research*, 11 (7): 4934-4938.

59. Chamundeswari N, Satyanarayana P V, Raja Reddy K and Suryanarayana Y, 2016, "Estimates of Genetic components in diallel crosses for yield and yield contributing characters in rice (*Oryza sativa* L.)", *International journal of science environment and technology*, 5(6):

60. Chamundeswari N, Satyanarayana P V, Suryanarayana Y and Raja Reddy K, 2016, "Estimation of components of genetic variance for quality traits in rice by Hayman's approach", *Advances in Life Sciences*, 5 (20): 9148-9151.

61. Chandra Sekhar Y, Khayum Ahammed S, Prasad T N V K V and Sarada Jayalakshmi Devi R, "Evaluation of fungicidal activity of mycogenic silver nanoparticles against *sclerotium rolfsii* inciting stem rot disease in groundnut (*Arachis hypogaea* L)", *Indian Phytopathology* 69 (4s) : 609-613

62. Chandrasekhar Reddy M, and Vishnusankar Rao D, 2016, "Climate resilient technology adaptation and expected cost of uncertainty under Nagarjuna Sagar Project, Krishna River Basin", *The Journal of Research ANGRAU*, 44(3&4): 104-113.

63. Chandrasekhar Reddy M, Vishnusankar Rao D, Raghunadha Reddy G, Gurava Reddy K and Srinivasa Rao V, 2017, "Spatio-temporal variability of climate change and its impact on yield : A case from Nagarjuna Sagar Project", *The Journal of Research ANGRAU*, 45 (1): 46-57.

64. Chandrayudu E, Vemena K, Santhoshkumar Naik B and Prathyusha C, "Biophysical and Biochemical Constituents Influencing Thrips and Jassid Resistance in Groundnut Germplasm", Natural resource management: Ecological Perspectives, Indian Ecological Society, *International Conference 2016*, 2 (156): 780-782.

65. Chandrayudu E, Murali Krishna T, John Sudheer M, Sudhakar P and Vemana K, 2016, "Metabolic Mechanisms of Insecticide Resistance in *Spodoptera litura (Fab)* on Groundnut, *Pesticide Research Journal* 28 (2): 201-209.

66. Chandrayudu E, Vemana K, Santhosh kumar Naik B and Prathyusha C, 2016, "Biophysical and Biochemical Constituents Influencing Thrips and Jassid Resistance in Groundnut Germplasm", *Indian Journal of Ecology*, 43 (1): 500-505.

67. Chandrayudu E, Murali Krishna T, John Sudheer M, Sudhakar P and Vemana K, 2016, "Detection of Metabolic Mechanisms of Insecticide Resistance in *Spodoptera litura (Fab)* on Groundnut", *Pesticide Research Journal*, 28 (2): 209-209.

68. Chandrayudu E, Murali Krishna T, John Sudheer M, Sudhakar P and Vemana K, 2017, "Molecular characterization of insecticide resistant in larval population of *Spodoptera litura*", Fab. *Journal of Oil seeds Research*, 6 (4): 426-429.

69. Chandrayudu E, Murali Krishna T, John Sudheer M, Sudhakar P and Vemana K, 2017, "Variability in Resistance of Spodoptera litura (Fab.) to Different Groups of Insecticides in Groundnut", *Andhra Agricultural Journal*, 47 (4): 165-168.

70. Charumathi M and Naidu N V, 2016, "Influence of Nature of Gene Action in Sugarcane Germplasm Accessions for Yield and Quality Traits", *IOSR journal of Agriculture & veterinary Science(IOSR-JAVS)* 8 (1): 18-21.

71. Charumathi M, Triveni M and Ramakumar P V, 2017, "Use of Rapd Markers for Assessment Molecular Diversity in Sugarcane", *Internatuional Journal of Biotechnology and Allied Fields IJBAF*, 5 (4): 28-39

72. Damodara chari, Trimurtulu K, Subhash Reddy N, 2016, "Influence of Plant Growth promoting bacterial inoculants on soil nutrient status and health of the maize", *Research In Environment And Life Sciences*, 9 (4): 156-164.

73. Deepa M, Sudhakar P, Prasad T N V K V, Naga Madhuri K V, Umamahesh V, Yohan Y, Reddy K B, 2016, "Foliar nutrition of nano scale calcium oxide on groundnut : a case study *National Conference of Plant Physiology*" , Challenges in crop physiology research: from molecular to whole plant: 16.

74. Devaki K, Murali Krishna T, Hari Prasad K V, Sarada Jayalakshmi Devi R and Pavana Jyotsna K, "*Bacillus thuringiensis* strain Tpt-F504 16S ribosomal RNA gene, partial sequence. MF197874.1

75. Devaki K, Murali KrishnaT, Hari Prasad, K.V., Sarada Jayalakshmi Devi,R. and Pavana Jyotsna,K. *Bacillus thuringiensis* strain Tpt-F504 16S ribosomal RNA gene,partial sequence. MF197874.1

76. Devaki,K., Murali Krishna,T., Hari Prasad, K.V., Sarada Jayalakshmi Devi,R. Ramakrishna Rao A and Pavana Jyotsna,K. *Bacillus thuringiensis* strain F493 16S ribosomal RNA gene,partial sequence. MF487790.1

77. Devaki,K., Murali Krishna,T., Hari Prasad, K.V., Sarada Jayalakshmi Devi,R. Ramakrishna Rao A and Pavana Jyotsna,K. *Bacillus thuringiensis* strain N115 16S ribosomal RNA gene,partial sequence. MF487791.1

78. Dhandapani K V, Supraja N, Devipriya A, Prasad T N V K V and Babu Janarthanam R, 2016, "Evaluation of antibacterial activity and cytotoxic effects of green Ag NPs against Breast Cancer Cells (MCF 7), *Advances in Nano Research*, 4(2), 129-143.

79. Divya S V, Krishnayya P V, Madhumathi T, Manoj Kumar V and Prasuna Rani P, 2016, "Influence of water quality on the efficacy of certain insecticides on *Spodoptera litura* Fab. (Noctuidae: Lepidoptera)", *The Andhra Agricultural Journal*, 63 (4): 844-888.

80. Divya V, Chandrika V, Reddy G P, Naga Madhuri K V, Umamhesh V and Pratap Kumar Reddy, 2016, "Production potential and economic viability of food-forage based cropping systems under irrigation" , *Advances in Life Sciences* 5 (19): 8449-8453.

81. Divya V, Chandrika V, Reddy G P, Naga Madhuri K V V, Umamhesh and Pratap Kumar Reddy, 2016, "Energy use analysis of different food forge based cropping systems", *Progressive Research* 11 (III): 1501-1507

82. Dondapati Annekitty Deborah, R Lakshminarayana R Vemireddy[†*], Veeraghattapu Roja, Santhosh Patil, Ganga Prasad Choudhary, Sabahat Noor, Akkareddy Srividhya, Andi Kaliappan, Sandhya Rani, V Satyavathi, Ghanta Anuradha, Kommineni Radhika, Kalinati N Yamini, Gopalakrishna M Kadambari, Ranjith Kumar Nagireddy, Ebrahimali A Siddiq, Javaregowda Nagaraju (2017) Molecular dissection of QTL governing grain size traits employing association and linkage mapping in Basmati rice. *Molecular Breeding.*

83. Durga Rani CH V, Vanisri S , Jamaloddin Mohammed, Swathi Gattu, Ramprasad Eruvuri, Hadassah Gunti, Lakshminarayana, Vemireddy R, 2016, "The extent of genetic diversity among popular rice cultivars of Andhra pradesh and Telangana using microsatellite markers", *Electronic Journal of Plant Breeding*, 7 (4): 1089-1097

84. Ekezie F G, Suneetha W J, Maheswari K U, Kumari B A, Prasad T N V K V, 2017, "Green synthesis of copper nanoparticles using momordica charantia fruit extracts and evaluation of their anti-microbial efficacy", *International Journal of current Microbiology Applied Science*, 6 (4):99-109.

85. Ekezie F G, Suneetha W J, Maheswari K U, Prasad T N V K V, Kumari B A, 2016, "Momordica charantia extracts in selected media: screening of phytochemical content and *in vitro* evaluation of anti-diabetic properties", *The Indian Journal of Nutrition and Dietetics*, 53 (2):164-71.

86. Farm income improvement through farming systems approach (Success stories) 1-3 December, 2016 K.Tejeswara Rao, Md.Latheef P, V.Sridevi, A.Upendra Rao, N.lakshminarayana, P.Mounica and Venugopala RaoSuccess storiesICAR, IIFSR, Modipuram, UP

87. Farmer's perception on climate change and Integrated farming systems as adaptation measure towards changing climate (Series 1)January, 2017 (9-13)MD.Latheef P., K.T.Rao, Sri Devi.V, Rao, A.U, Lakshminarayana N and Rao, N AICRP-IFS, ARS, Sethampeta, Srikakulam, ANGRAU, A.P

88. Farmer's perception on climate change and Integrated farming systems as adaptation measure towards changing climate (Series 1)January, 2017(99-105)MD.Latheef P., K.T.Rao, Sri Devi.V, Venkata ramana, M and Cheralu.CWarangal, Telangana

89. Girija Rani M, Satyanarayana P V, Chamundeswari N, Ravikumar B N S V R, Ramana Rao P V, Srinivas T and Suneetha Y, 2016, "Genetics and molecular validation of new donors for different types of floods in rice", *Progressive Research*,11 (7) : 4893-4895.

90. Girija Rani M and PV Satyanaryana, "Role of Marker Assisted Selection in development of climate resilient rice varieties, 2017, In climate change and sustainable Agriculture, edited by Suresh kumar P, Manish kanwanth, Meena, P.D., Vinod Kumar, Rajesh A. Alone, *New India publishing Agency* , New Delhi pp75-84

91. Girija Rani M, Satyanaryana P V, Lalahmed M, Ashoka Rani Y, Srininvasa Rao V and Jhansi rani P, 2017, "Genetic diversity for lodging resistance in rice *Enivornment and ecology*, 35 (2B): 1188-1193.

92. Gopala Swamy S V S and Bhaskara Rao D, 2016, "Effect of Modified Atmospheres on *Caryedon serratus* (Olivier) in Stored Groundnut", *Indian Journal of Ecology*, 43 (2): 854-856.

93. Gopala Swamy S V S, John Wesley B, Vishnu Vardhan S and Sandeep Raja D, 2016, "Effectiveness of Phosphine Fumigation in Controlling insect pests in a arice (Oriza sativa) storage warehouse", PP: 425-428. In: Navrrao,S, Jayas, DS, Alagusundaram, K, (Eds). Proceedings of the 10th International Conference on Controlled Atmosphere and Fumigation in Stored Products (CAF 2016), CAF Permanent Committee Secretariat, Winnipeg, Canada.

94. Gopala Swamy S V S, Mahalakshmi M S and Souframanian J, 2016, "Evaluation of certain blackgram varieties for resistance to pulse bruchid, *Callasobruchus maculates* (F.)", The *Journal of Research, ANGRAU*, 44 (1 & 2): 8-13.

95. Gopala Swamy S V S, Sesha Mahalakshmi M and Souframanien J, 2016, "Evaluation of certain blackgram varieties for resistance to pulse bruchid, *Callosobruchus maculatus* (F.)", *The Journal of Research ANGRAU*, 44 (1&2): 8-13.

96. Goutami N, Prasuna Rani P, Ravindra Babu P and Lakshmi Pathy R, 2016, "Effect of nitrogen levels, Bio-fertilizers and FYM on content and uptake of nutrients by rice-fallow sorghum", *The Andhra Agricultural Journal*, 63 (1): 110-116.

97. Govardhan G, Reddy K H P, Reddy D M, Sudhakar P, Latha P and Reddy B V B, 2017, "Impact of moisture stress on yield and yield attributes in mungbean", *Ecology, Environment and conservation*, 269-274.

98. Govardhan G, Reddy K H P, Reddy D M, Sudhakar P, Reddy B V B and Latha P, 2017, "physiological responses of mungbean genotypes to irrigated and moisture stress conditions", *Ecology, Environment and conservation*, 259-264.

99. Gowtami Krishna T, Raghunadha Reddy G, Rao D V S and Srinivasa Rao V, 2016, "Impact of mechanization on employment of agricultural labour in rice operators in East Godavari District of A.P", *The Andhra Agricultural Journal* , 63 (1): 212-214.

100. Grace G A D and Sudha Rani D, 2017, "Insects as vectors of microbes", *Journal of Advanced Studies in Agril, Biological and Environmental Sciences*, 52-56.

101. Hari Satyanarayana N, Visalakshmi V, Bhanu Priya, Subhra Mukherjee, Roy S K, Rao A U and Sarkar K K, 2016, "Genetic divergence studies in Roselle (*Hibiscus sabdariffa* L.) for fibre yield over six environments", *The Ecoscan*, 9 (5): 291-296.

102. Hari Satyanarayana N**,** Subhra Mukherjee, Visalakshmi V, Bhanu Priya and Sarkar K K, 2017, "Principal Component Analysis for seed yield traits in Roselle (*Hibiscus sabdariffa L.*)", *Electronic Journal of Plant Breeding*, 8 (1): 46-50.

103. Hari Satyanarayana N**,** Manoj Kumar **V** and Visalakshmi V, 2017, "Genetic variability, character association and path analysis studis in roselle (*Hibiscus sabdariffa* L.) for fibre yield", *Bioinfolet*, 14 (1): 1-4.

104. Hari Satyanarayana N, Visalakshmi V , Jagannadham J, Madhu Kumar K, Amarajyothi P, Upendra Rao A and Venugopala Rao N, 2016, "Genetic diversity in roselle (*Hibiscus subdariffa L.*)for seed yield traits in North Coastal Zone of Andhra Pradesh", *Progressive Research-An International Journal*. (11) (Special-VII): 4939-4942.

105. Hari Satyanarayana **N,** Visalakshmi **V**, Ramana Murthy K V, Madhu Kumar K, Rao A U and Rao N V, 2017, "Genetic variability, heritability and genetic advance for seed yield and its components in Roselle (*Hibiscus sabdariffa* L.) North Coastal Zone of Andhra Pradesh", *Int. J. Curr. Microbiol. App. Sci*, 6 (5): 242-248.

106. Hemalatha T M , Eswara Reddy N P, Subba Rao M and Hemanth Kumar M, 2016, "Integrated management of sugar beet root rot caused by *Sclerotium rolfsii* with biocontrol agents and fungicides", *Advances in Life Sciences*, 5 (18): 7895-7899

107. Hemalatha T M, Eswara Reddy N P, Subba Rao and Hemanth Kumar, 2016, "Integrated management of Sugar Beet root rot Caused by Sclerotium rolfsii with biocontrol agents and fungicides", *Advances in Life Sciences* 5 (18): 7895-7899.

108. Hemalatha T M, Madhavilatha L, Subbarao M and Hemanth Kumar M, 2017, "Screening of finger millet varieties for resistance to blast disease caused by Pyricularia grisea" *Trends in Biosciences*, 10 (24).

109. Indusree A and Raghunadha Reddy G, 2016, "Costs and Returns analysis of red chilli cultivation in Guntur district of Andhra Pradesh: A comparative analysis of adopters Vs. non-adopters of forecasts", *Journal of Research, ANGRAU*, 44 (3&4): 149-152.

110. Isha Parveen S,Kiran Kumar Reddy C and Karuna Sagar G,2017, "Stability analysis for grain yield and its contributing traits in sesame (*Sesamum indicum*)", *Progressive Research*, 12 (1): 210-213.

111. Jaffar Basha S and Sitha Rama Sarma A, "Yield and economics of rice (*Oryza sativa L.*) relative to integrated nutrient management", *Advances in Life Sciences*. 5 (23): 10905- 10908.

112. Jaffar Basha S and Sitha Rama Sarma A, "Yield and water use efficiency of rice (*Oryza sativa L.*) relative to scheduling of irrigations", *Annals of Plant Sciences* 1559-1565.

113. Jaffar Basha S, Sitha Rama Sarma A and Munirathnam P, "Probability Analysis of Weekly Rainfall for Crop Planning at Nandyal of Andhra Pradesh," *Trends in Biosciences* 10 (2): 956.

114. Jaffar Basha S, Sitha Rama Sarma A and Khayum Ahammed S, "A review, Agronomic manipulations for pests and diseases management in chickpea", *International Journal of Pure Applied Bioscience*, 5 (2): 842-849.

115. Jaffar Basha S, Sitha Rama Sarma A and Rama Reddy Y, "Relatiuve performance of different weed management practices in rainfed American cotton under HDPS", *Advances in Life Sciences*, 5 (23): 9704-9707.

116. Jaffar Basha S, Sitha Rama Sarma A, Rama Reddy Y and Gopal Reddy B, "Evaluation of soil moisture conservation measures and fertilizer requirements for rainfed American cotton under HDPS", *Progressive Research* 11(Special IV): 2697-2699.

117. Jaffar Basha S, Munirathnam P and Gopal Reddy B, "Rainfall probability analysis for foxtail millet (*Setaria italica L.)* crop planning at Nandyal of Andhra Pradesh National symposium AGMET 2016 on Climate - driven Food ProductionSystems Agro-meteorological Interventions, 20-22 December 2016 TNAU, Coimbatore

118. Jahnavi M, Ramakrishna Rao A and Sarada G , 2016, "Molecular characterization of citrus butterfly *Papilio demoleus* L. by using PCR based randomly amplified polymorphic DNA", *Pest Management in Horticultural Ecosystems*. 22 (2): 123-128.

119. Jahnavi M, Ramakrishna Rao A and Sarada G, 2016, "Evaluation of certain new insecticide molecules against citrus butterfly, *Papilio demoleus* L. in acid lime", *Advances in Life Sciences*, 5 (20): 9293-9295.

120. Jamuna P, Sreelathavani Ch, Mukunda Rao Ch, Veerabhadra rao K and Venugopala rao N, 2016, "A study on Agro-advisory information seeking behavior among the farmers of Visakhapatnam district of North-Coastal Andhra Pradesh", *Progressive Research-An International Journal*, 12 (Special-Part I) 862-864

121. Jamuna P, Sreelathavani Ch, Mukunda Rao Ch, 2016, "A study on Agro Advisory information scaling behaviour among the farmers of Visakhapatnam dt. of North Coastal AP. *Progressive research*, 12 (Special I): 862-864.

122. Jamuna P, Sreelathavani Ch, Mukunda Rao Ch, Veerabhadra rao K and Venugopala rao N, 2016, "A study on Agro-advisory information seeking behavior among the farmers of Visakhapatnam district of North-Coastal Andhra Pradesh", *Progressive Research*, 12 (Special-Part I), Page no. 862-864.

123. Jayalakshmi V, Trivikrama Reddy A, Kamakshi N, Khayum Ahammad S, Munirathnam P, Gaur P M, Srinivasan S, Padmalatha Y and Gopal Reddy B, 2017, "Prospects of new chickpea varieties in Andhra Pradesh state of India Inter drought –V conference organised by ICRISAT at International Convention centre, Hyd. during Feb.21-25, (HICC)

124. Jayalakshmi V, Kiran Kumar Reddy C, Jyothirmayi G and Trivikrama Reddy A,"Studies on genetic diversity in chickpea utilizing morphological and total seed protein markers", *Legume Research*, 39 (2): 323-325

125. JayaPrakah R, Ashwinkumar B, Madhusudhan Reddy K and Srinivas Rao K, 2016, "Development and evaluation of 5 tyne cultivator as an attachment to BCS self propelled power weeder", *Progressive Research*, 11 Special (Part-IX), 6056-6058.

126. Jhansi K, 2016, "Evaluation of New Molecules for Management of Early Shoot Borer in Sugarcane", Paper presented in 46th Annual Convention meeting of SISSTA at Chennai on 15th and 16th July 2016 , 41-43pp.

127. Joga Rao P, Prasad P K, Lalitha Kumari A and Prasuna Rani P, 2016, "Long-term fertilization on correlation among carbon pools, soil nutrient status and kapas yield", *Progressive Research – An International Journal*, .11 (Special-IV): 2607-2610.

128. Joga Rao P, Prasad P R K, Lalitha Kumari A, Prasuna Rani P and Pulla Rao Ch, 2017, "Field and fiber qualities of cotton (*Gossypium hirsutum*) as influenced by long-term manures and fertilizers on cotton mono-cropping", *The Andhra Agricultural Journal* , 64 (1): 120-122.

129. Joga Rao P, Prasad P R K, Lalitha Kumari A, Prasuna Rani P and Pulla Rao Ch, 2016, "Effect of long term fertilization on nutrient content, uptake and yield of cotton", *The Andhra Agricultural Journal* , 63 (2): 343-347.

130. John K and Raghava Reddy P, 2016, "Studies on genetic parameters for yield and yield attributes in groundnut (*Arachis hypogaea* L.)", *International Journal of Advanced and Innovative Research*. . 5 (6): 231-233.

131. John K and Raghava Reddy P, 2017, "Studies on combining ability for yield and yield attributes in groundnut (*Arachis hypogaea* L), *International journal of current research in Biosciences and Plant Biology*, 4 (6): 87-91.

132. John K and Raghava Reddy P, 2016, "Studies on characters association and path coefficient analysis for yield and water use efficiency traits in groundnut (*Arachis hypogaea* L)", *International journal of current research in Biosciences and Plant Biology*, 3(10): 128-135.

133. John K and Raghava Reddy P, 2016, "Combining ability studies for yield and water use efficiency traits in groundnut (*Arachis hypogaea* L.) *Andhra Pradesh*", *Journal of Agricultural Sciences*, 2 (2): 108-115.

134. John K and Raghava Reddy P, 2016, "Identification of heterotic crosses for water use efficiency traits and yield in relation to moisture stress tolerance in groundnut", *International Journal of Advanced and Innovative Research*, 5 (6): 68-76.

135. K Sai Maheswari, Prathima T and Pratap Kumar Reddy A, 2017, "Direct seeding in Rice: A mitigation strategy under climate change conditions", *Agronomic Approaches for Climate Resilience in Agriculture*.

136. K Tejeswara Rao, Md Latheef , V Sridevi, A Upendra Rao, N lakshminarayana, P Mounica and Venugopala Rao, 2016, "Kitchen garden and vegetables in farming system: new source of income for a tribal farmer maintaining vegetable outlet in weekly sandy (Success stories) 4-6 December, 2016 Success storiesICAR, IIFSR, Modipuram, UP

137. Krishna Kanth K, Prasada Rao G M V and Sairam Kumar D V, 2016, "Relative toxicity of different novel insecticides against *Spodoptera litura* (Fab.) (Lepidoptera: Noctuidae)" *International Journal of Tropical Agriculture*, 34 (5): 1291-1296.

138. Krishna Kanth K, Prasada Rao G M V and Sairam Kumar D V, 2016, "Survival and development of first and second instar larvae of *Spodoptera litura* (Fab.) (Noctuidae: Lepidoptera)", *Progressive Research*, XI (Special vii):4375-4380.

139. Krishna Reddy G, Tirumala Reddy S, Maheswara Reddy P and Prathima T, 2017, "Effective utilization of rain water through farm pond technology for higher productivity in groundnut", *Agronomic Approaches for Climate Resilience in Agriculture*.

140. Krishna Reddy G, Tirumala Reddy S, Maheswara Reddy P and Prathima T, 2017, "Evaluation of different alternate crops as climate resilience technology to groundnut during Kharif", *Trends in Farm Mechanization and Engineering Interventions for sustainable Agriculture*, 76.

141. Krishna Veni B, Sandeep Raja D and Rama Rao C V, 2016, "Total Phenol Content and anti-oxidant activity in coloured rice genotypes", *IRRI Newsletter*, 14 (2&3): 5.

142. Krishnamma K, 2016, "Studies on population dynamics of microoganisms pertaining to applied biofertilizers and biopesticides in the rhizosphere of sugarcane paper presented in 46th Annual Convention meeting of SISSTA at Chennai on 15th and 16th July 2016, 148-153pp.

143. Krishnaveni S, Murali krishna T, Khayum Ahammad S and Manjula K, "Evaluation of wettable powder formulations of *Nomuraea rileyi* (farlow) samson against 3rd instar of *Spodoptera litura* under laboratory conditions at different storage intervals",*International Journal of Agricultural Science and Research*, 6 (6).

144. KrishnaVeni B, Rama Rao C V, Santhi Priya Ch and Poornima K, 2017, "Rice as a source of food-Nutritional facts and human health", A review article presented orally in the National Seminar on National Seminar on Zero Hunger Challenges-For Hunger Free India conducted at Govt. Women's College, Guntur from 5-6th January, 2017.

145. Krishnaveni S, Manjula K, Murali Krishna T and Khayum Ahammad S, "Preparation of grain formulations of *Nomuraea rileyi* (farlow) samson and testing virulence against 3rd instar of *Spodoptera litura*", *The bioscan* 11 (1): 185-187.

146. Krishnaveni S, Murali krishna T, Khayum Ahammad S and Abdul Rasheed V, "Effect of wettable powder formulations on germination of *Nomuraea rileyi* conidia at different storage intervals", *International Journal of Agricultural Science and Research*, 6 (6).

147. Krupavathi K, Ravi Babu G, Ganeshbabu R and Madhusudhan Reddy K, 2017, "Comparision of measured discharges of designated trapezoidal modified broad cresred weirs and estimated discharges by winflume software", *The Andhra Agricultural Journal* , 64 (1): 197-203.

148. Kumari M B G S, 2016, "Yield improvement through optimum plant density and gypsum application in groundnut", *International journal of current research* 8 (9): 38-39

149. Kumari M B G S, Bharathalakshmi M, Chitkala Devi T, Gouri V and Sita Ramalakshmi Ch, 2016, "Role of weather based agro advisories in climate resilient agriculture", *International Journal of Agricultural Sciences* 15 (4):E149-152.

150. Lakshmi Bhavani G, Pulla Rao Ch, Srinivas M and Prasad P R K, 2016, "Effect of N, P and K application on growth and yield of machine transplanted rice", *The Andhra Agricultural Journal* , 63 (3): 521-524.

151. Lakshmi Pathy T, Vijayabharathi A and Trivikrama Reddy A, 2017, "AMMI and GGE stability models in plant breeding *agrobios"* 15 (8): 112.

152. Lakshmi Pathy T, Trivikrama Reddy A and Vijayabharathi A, 2017 "Non-parametric stability measures in plant breeding" *agrobios,* 15 (9): 82-83.

153. Lakshmi Pathy T, Vijayabharathi A and Trivikrama Reddy A, 2016, "Prediction of hybrid performance by heterotic haplotype capture" *agrobios* 15 (8): 111-112.

154. Lakshmi Prasanna K, Madhu Vani P, Prasuna Rani P and Venkateswarlu B, 2017, "Fertility status of soils of Narasaraopet revenue division in Guntur district", *The Andhra Agricultural Journal* , 64 (1): 117-115.

155. Lakshmipathy R and Gopala Swamy S V S, 2016, "Comparative evaluation of entomopathogenic fungal isolates for the control of pulse beetle and cigarette beetle", *Journal of Soil Biology and Ecology*, 36 (1): 69-75.

156. Lalitha Kumari A, Kishore Babu G, Madhuvani P, Usha Rani T, 2016, "Dynamics of soil nutrients and yield levels of rainfed cotton as influenced by long term application of manures in vertisols over a period of 25 years", *Proceedings of Indian Society of Soil Science*, 262 (p).

157. Latha P, Naga Madhuri K V, Nirmal Kumar A R, Vasanthi R P, Sudhakar P and Sujatha K, 2016, "Screening of groundnut genotypes under iron deficiency stress conditions using biochemical indicators", *AP Science congress* , 112.

158. Lavanya Kumari P and Amaravathi Y, 2016, "Computation of Melting Temperatures (Tm) of oligonucleotides for high throughput PCR using MS-Excel", IOSR Journal of Biotechnology and Biochemistry. 2(6): 6-11.

159. Lavanya Kumari P, 2017, "Statistical tools for sustainable agriculture". recent advances in Groundnut Production Technology", B.S Publications Chapter-.40, pp.717-752.

160. Lokeswara Reddy A, Srinivas T, Prasanna Rajesh A and Uma Maheswari P, 2016, "stability analysis in drought tolerant groundnut", *Advances in Life Sciences*, 5 (20) : 9347 – 9350.

161. Lokeswara Reddy A, Srinivas T, Prasanna Rajesh A and Uma Maheswari P, 2016, "Genotypex Season interaction studies for yield, Physiological and quality trails in drought tolerant groundnut genotypes", *Progressive Research-II* (Special-V) : 3560 – 3563.

162. Lokeswara Reddy A, Srinivas T, Prasanna Rajesh A and Uma Maheswari P, 2016, "Stability analysis for yield and quality trails in drought tolerant groundnut genotypes", *Environment and Ecology*, 35: 1993 – 1997.

163. Madhavilatha L, Subba Rao M and Naga Madhuri K V, 2017, "Evaluation of improved sweet sorghum genotypes for yield and juice quality traits", *International journal of clinical and biological sciences*, 2 (1): 50-54.

164. Madhuri V and Karuna Sagar G, 2016, "Screening of fungicides and herbicides against *Sclerotium rolfsii*, stem rot of groundnut under in vitro conditions", *International research journal of Natural and Applied Sciences*,3 (6): 125-133

165. Madhusudhan Reddy K, Sahadeva Reddy B, Vijayakumar D and Ravindranath Reddy B, 2016, "Economic and efficient water lifting devices for from farm ponds in Scarce rainfall zone of Andhra Pradesh", *Progressive Research*, 11 Special (Part-IX): 6064-6065.

166. Madhusudhan Reddy K, Vijayakumar D, Sahadeva Reddy B, Ramana M V, 2017, "Design and development of Low H.P Tractor Drawn Inclined Plate Groundnut Planter", *Journal of Research ANGRAU*, 45 (1): 1-6,39-45.

167. Maha Lakshmi M S, Sreekanth M and Adinarayana M, 2016, "Field efficacy of certain neonicotinoids at different doses against major sucking pests in blackgram", *Progressive Research*, 11(Special-VII) : 4899-4901.

168. Mahalakshmi M S, Sreekanth M, Adinarayana M, Pushpa Reni Y, Koteswara Rao Y and Narayana E, 2016, "Incidence, Bionomics and Management of Spotted pod borer (*Maruca vitrata (Geyer*) in major pulse crops in India – A Review", *Agricultural Reviews*, 37 (1): 19-26.

169. Mahalakshmi M S, Sreekanth M, Adinarayana M and Koteswara Rao Y, 2016, "Evaluation of Flubendamide 20 % SG (Takumi 20 % SG) against Legume pod borer (*Maruca vitrata* (Fabricius) in blackgram under field conditions", *International research journal of Natural and Applied Sciences*, 3 (6): 134-139.

170. Malleswari Sadhineni, Nataraj K C, Sunitha N, Narayanaswamy G and Vijayasankara babu, 2016, "Yield and quality of oriental tobacco as influenced by preceding groundnut crop and integrated nutrient management", *Progressive Research*, 11 (special 9): 6165-6167.

171. Mallikharjuna Rao N, Sudha Rani D and Satyanarayana P V, 2016, "Insecticide induced resurgence of brown planthopper, *Nilaparvata lugens* (Stal) in rice, Insecticide induced resurgence of brown planthopper", *Nilaparvata lugens (*Stal*) in Rice*, Progressive Research, 11 (special-7) 4943-4947.

172. Mangala U N, Rao Y R, Kishore Varma P, and Muralidharan K, "Prevalence and characterization of Aspergillus spp. from rice grains in south India", *International Journal of Applied Biology and Pharmaceutical Technology*, 7 (4): 173-186

173. Manjunath J and Sharma A S R, 2017, "Biological characteristics and host stage preference of mealy bug parasitoid *Aenasius bambawalei* (Hymenoptera: Encyrtidae)*Advances in LifeSciences* (Accepted)

174. Manjunath J, Sarma A S R and Jaffar Basha S, "Record and host preference of a predatory bug, *Eocanthecona furcellata*(Hemiptera: pentatomidae) in scarce rainfall zone of Andhra Pradesh",Conference on National Priorities in Plant Health Management 4 - 5th February 2016, S V Agricultural College, Tirupati - 517 502, Andhra Pradesh.

175. Mansing Naik B, Satish Y and Ratna Babu D, 2016, "Genetic diversity analysis in American cotton (*Gossypium hirsutum* L.)", *Electronic Journal of Plant Breeding*, 63 (1): 83-87

176. Mansing Naik B, Satish Y and Ratna Babu D, 2017, "Correlation and path analysis for yield and yield component traits in American Cotton (*G. hirsutum* L.)", *The Andhra Agricultural Journal* , 64 (1): 97-100.

177. Mansingh Naik B, Satish Y and Ratna Babu D, 2016, "Genetic variability, Heritability and Genetic advance studies for Yield and Fibre Quality traits in American cotton (*Gossypium hirsutum* L.)", *Journal of Research ANGRAU*, 44 (1&2): 14-19.

178. Mansingh Naik B, Satish Y and Ratna Babu D, 2017, "Correlation and Path Coefficient analysis for Yield and Yield component traits in American Cotton (*Gossypium hirsutum* L.)", *The Andhra Agricultural Journal* , 64 (1): 97-100.

179. Mansingh Naik B, Satish Y and Ratna Babu D, 2016, "Genetic diversity analysis in American Cotton (*Gossypium hirsutum* L.)", *Electronic Journal of Plant Breeding*, (3&4): 1002-1006.

180. Medicinal plants and value addition to Native plant species: A component module for increased income and livelihood of small and marginal tribal farmers of High altitude and tribal areas of APJanuary, 2017 (430-434)Sivakesava Rao, T, Tejeswara Rao.K, Lakshminarayana, N, Upendra Rao, A & Venugopala Rao, NEmerging trends in value addition to plant products

181. Mohana Rao P, Prasad P R K, Ravindra Babu P, Narasimha Rao K L and Subbaiah G, 2016, "Influence of different sources of nutrients on physic-chemical and physical properties of soil in rice crop", *The Andhra Agricultural Journal* , 63 (2): 338-342.

182. Mohana Rao P, Prasad P R K, Ravindra Babu P, Narasimha Rao K L and Subbaiah G, 2016, " Influence of different sources of nutrients on available nutrient status of soil after harvest of rice crop", *The Andhra Agricultural Journal* , 63 (1): 121-127.

183. Mohana Rao Puli, Prasad P R K, Jayalakshmi M and Srihari Rao B, 2017, "Effect of organic and inorganic sources of nutrients on secondary and micro nutrient uptake by rice at various growth periods", *Research Journal of Agricultural Sciences* 8 (1): 20-24.

184. Mohana Rao Puli, Prasad P R K, Jayalakshmi M and Srihari Rao B, 2017, "Effect of organic and inorganic sources of nutrients on NPK uptake by rice crop at various growth periods", *Research Journal of Agricultural Sciences*, 8 (1): 64-69.

185 Mohana Rao Puli, Prasad P R K, Babu P R, Jayalakshmi M and Burla S R, "Effect of organic and inorganic sources of nutrients on rice crop", *ORYZA-An International Journal on Rice*, 53 (2): 151-159.

186. Mukunda Rao Ch, Bharathalakshmi M, Veerabhadra Rao K and Venugopala Rao N, 2016, "Effect of rooting media on seedling vigour of Sugarcane", *The Andhra Pradesh Journal Agricultre* Science, 2 (3): 195-197.

187. Mukunda Rao Ch, Bharathalakshmi M, Veerabhadra Rao K and Venugopala Rao N, 2016, "Sugarcane seedling rooting media and seedling vigour *life scientist*", *International research journal*, 3 (special issue): 33-35.

188. Munirathnam P and Ashok Kumar K, "Survey of weed flora in major crops of nandyal region in Kurnool district of Andhra Pradesh*Journal of Research, ANGRAU*

189. Munirathnam P, Ashok Kumar K, Jaffar Basha S and Prabhakar K, "Evaluation of profitable alternate crops to chickpea (*Cicer arietinum* L.) in vertisols of Andhra Pradesh", Abstracts of National Seminar on *Agronomic Approaches for Climate Resilience in Agriculture* held at RARS, Nandyal during 2nd May 2017 pp.6

190. Murali Krishna Ch, Madhusudhan Reddy K and Ram Rajeswar J, 2016, "Performance evaluation of drip irrigation system for cucumber crop-A field based study", *Progressive Research*, 11 (Special - IX): 6134-6138.

191. Murali Krishna T, Ramakrishna Rao A, Devaki K, Pavana Jotsna K and Srividhya P B, 2017, "*Amsacta albistriga* voucher Tpt0001 18S ribosomal RNA gene", partial sequence. MF079260.1

192. Muralidhar Y, Alpha Raj M, Prasad T N V K V, Chaitanya Kumar T V, Adilaxmamma K, Srilatha C, Srinivasa Rao G, Sreevani P and Aparna N, 2016, "Antibacterial, anti-inflammatory, and antioxidant effects of phytogenic silver nanoparticles synthesized using 11-<alpha>-keto-<beta>-boswellic acid in *Staphylococcus aureus* induced murine mastitis", *IET Nanobiotechnology*.

193. Muralikrishna T, Ramakrishna Rao A, Devaki K, Pavana Jyotsna K, Srividhya P B, Trimurthulu N and Rangeshwaran R, 2017, "*Pseudomonas stutzeri* strain Tpt-5 16S ribosomal RNA gene", partial sequence. MF079261.1.

194. N Balakrishna, Lakshmipathy R, Bagyaraj D J, Ashwin R, 2016, "Inuence of alley copping system on AM fungi, microbial biomass C and yield of nger millet, peanut and pigeon pea", *Agroforest System*.

195. Sarala N V, 2017, "Influence of planting methods, age of the seedlings and nutrient management on yield and quality of sugarcane raised from budchip seedlings in sandy loam soils of Andhra Pradesh", *International Journal of clinical and biological sciences* 2 (1): 44-49.

196. Naga Madhuri K V, Reddy P V R M , Lavanya Kumari P and Murali G, 2017, "Influence of 36 years of fertilizers and manure application on rainfed groundnut productivity", Trends in farm mechanization and engineering *Interventions for sustainable agriculture*,79.

197. Naga Lakshmi B, Latha P, Naga Madhuri K V and Uma Mahesh V, 2016, "Alteration in anti oxidant enzymes under iron deficiency stress conditions in groundnut", *National Conference of Plant Physiology* , Challenges in crop physiology research: from molecular to whole plant, 16.

198. Naga Madhuri K V, Latha P, Vasanthi R P, John K, Reddy P V R M, Lavanya Kumari P, Murali G, Giridhara Krishna T, Naidu T C M and Naidu N V, 2017, "Evaluation of groundnut genotypes for phosphorus efficiency through leaf acid phosphatase activity", *InterDrought V proceedings*.

199. Naga Madhuri K V, Latha P, Murali T, Variath, Reddy PVRM, Murali G , Giridhara Krishna T, Naidu T C M and Janila Pasupuleti, 2017, "Genetic variability among peanut genotypes for leaf P-content and leaf acid phosphatase activity", Nineth International Conference of the Peanut Research Community' - *Advances in Arachis through Genomics & Biotechnology*.

200. Naga Madhuri K V, Reddy P V R M and Giridhara Krishna T, 2016, "Soil fertility mapping in Gudupalli mandal of Chittoor district by geographic information system", *Advances in Life Sciences*, 5 (23): 10948-10954.

201. Naga Madhuri K V, Reddy P V R M, Prasad T N V K V, Murali G and Giridhara Krishna T, 2017, "Influence of long-term application of fertilizers and manure on soil profile nutrient status" , *Proceedings of 104th Indian Science Congress, 266.*

202. Naga Madhuri K V, Reddy P V R M, Prasad T N V K V, Murali G and Giridhara Krishna T, 2016, "Influence of longterm application of fertilisers and manure on soil nutrient status", *National seminar on Developments in soil science - 2016*, Gwalior by ISSS: 124.

203. Nagamani P, Someshwar Bhagat, Biswas M K and Viswanath K, 2016, "Effect of atile and Non atile Compounds of *Trichoderma* spp, against soil borne diseases of chickpea", *International Journal Current Microbiology Application Science, 6* (7): 1486-1491.

204. Nagamani P and Johnson M, 2017, "Impact of seasonal and unseasonal rains due climate change on agriculture of YSR District of Andhra Pradesh. National Seminar on "Trends in Farm Mechanisation and Engineering interventions for sustainable Agriculture" from 14-15th December,2016

205. Nagamani P, Veeraiah A ,Sunil Kumar K and Jhonson M, 2016, "Role of DAATT centre on Dissemination of Technologies and Improved varieties in YSR Kadapa district of Andhra Pradesh", National Conferance on Innovative and Current Advances in Agriculture and Allied Sciences (ICAAAS-2016) December 10-11, 2016.

206. Nagarjuna Reddy G, Thahir Basha S, Eswara Reddy N P, Bhaskara Reddy B V and Nagamani P, 2016, "Integrated management of dry root rot of chickpea (*Cicer arietinum* L.) caused by *Rhizoctonia bataticola* (Taub) Butler", *Progressive Research*. 11 (4): 630-633.

207. Nagendra Babu N, Sivanarayana G, Gopikrishna T and Umadevi K, 2016, "Association of profile of the farmers of adopted village with the direct and indirect changes in Guntur district", *The Andhra Agricultural Journal* , 63 (2): 461 – 464.

208. Nancy Jasmine K, Prasuna Rani P, Prasad P R K and Lakshmi Pathy R, 2016, "Characterization of saline soils of Uppugunduru Region, Prakasam district, Andhra Pradesh", *The Andhra Agricultural Journal* , 63 (4): 838-843.

209. Nancy Jasmine, Prasuna Rani P and Lakshmipathy R, 2017, "Microbial and enzymatic activities of saline soils", *Natural Farming*, 8: 643-647.

210. Narayana E, Subbarao G and Venkateswarlu E, 2016, "Influence of plant population and varieties on growth and yield of cluster bean (*Cymopsis tetragonaloba*)", *The Andhra Agricultural Journal*, 63 (4): 755-756.

211. Narayana Swamy G, Nagavani A V, Bhargavi K, Sahadeva Reddy B, Vijayasankara Babu M and Uma Mahesh V, 2016, "Short term comparison of yield and organic carbon changes under organic production of groundnut in rainfed alfisols of Andhra Pradesh", *Progressive Research*, 11 Special (IX): 6171-6173.

212. Nataraj K C, Vijaysankar Babu M, Narayanaswamy G, Bhargavi K, Sahadeva reddy B, 2016, "Nutrient Management Straggles in Groundnut-based Crop Production Systems in Dry-land Regions of Southern Andhra Pradesh", *Indian Journal of Fertilizers*, 12 (10) 58-75.

213. Nataraj K C, Vijay Sankar Babu M, Narayana Swamy G, Bhargavi K, Sahadeva Reddy B and Srinivasa Rao Ch, 2016, "Based Crop Nutrient Management Strategies in Groundnut production Systems in Dry land Regions of Southern Andhra Pradesh", *Indian Journal of Fertilisers*, 12 (10): 75-58.

214. Nataraj K C, Vijay Sankar Babu M, Malleswari Sadhineni S N, Narayana Swamy G and Ravindranatha Reddy B, 2016, "Georeferenced soil fertility status of secondary nutrients in rainfed soils of anantapur district, Andhra Pradesh", *Progressive Research*, 11 Special (IX) : 6174 – 6178.

215. Navya Jyothi K, Sumathi V, Sunitha N and Ravindra Reddy B, 2016, "Effect of nitrogen fertilisation on yield and nutrient uptake of foxtail millet (*Setaria itallica* L.) varities", *Progressive Research*, 11 (special 3): 1662-1665.

216. Neelima S, Ashok Kumar K, Venkataramanamma K and Padmalatha Y, 2016, "Genetic variability and genetic diversity in sunflower", *Electronic Journal of Plant Breeding*, 7 (3): 703-707.

217. Nireesha V, Srinivasa Rao V, Rao D V S and Raghunadha Reddy G, 2016, "A study on forecasting of area, production and productivity of pearl millet in Andhra Pradesh", *Journal of Research, ANGRAU*, 44 (3&4): 119-126.

218. Nirmal Kumar A R, Vijayalakshmi C and Vijayalakshmi D, 2017, "Alteration in enzyme activities to Assess the tolerance / susceptibility of Rice (*Oryza Sativa L.*) to Heat and Drought Stress", *International Journal of Bio-resource and Stress Management* 8 (2): 285-290.

219. P Amara Jyothi, Jaganndham J, Hari Satyanarayana N, Madhu Kumar K and Upendra Rao A, 2016, "Impact of agronomic management practices on seed yield of Sunnhemp (*Crotolaria juncea L.*)", *Agricltural International*, 3 (2): 7-11

220. Padma M, Reddy B S and Madhava M, 2016, "Evaluation of the quality parameters of the turmeric rhizomes dried on different floors and conditions", *International Journal of Agricultural Sciences*, 12 (2), 302-308.

221. Padma M, Sreenivasula Reddy B and Madhava M, 2016, "Some studies on curing and drying characteristics of turmeric rhizomes", *International Journal of Processing and Post-Harvest Technology*, 7 (1), 151-156.

222. Padma N, Chandra Mohan Reddy C V, Gerald Hankins, Andreas Ebert, Doil Choi, John Stommel and Umesh Reddy K, 2016, "Genome-Wide Divergence and Linkage Disequilibrium Analyses for *Capsicum baccatum* Revealed by Genome-Anchored Single Nucleotide Polymorphisms", *Frontiers in plant sciences*, 7: 1646.

223. Padmavathi P, Murthy I Y L N and Suresh M, "Productivity, economics and soil fertility of soybean-safflower cropping system in response to nutrient management practices", *Legume Research*, 39 (4): 572-577.

224. Paramasiva I, War A R, Krishnayya P V and Sharma H C, 2016, "Aqueous washings of host plant surface influence the growth inhibitory effects of delta endotoxins of *Bacillus thuringiensis* against *Helicoverpa armigera*", *Entomologia Experimentaliset Applicata*, 161 (2): 01-13.

225. Patil S, Srividhya A, Roja Veeraghattapu, Deborah D A K, Gopalakrishna Murty Kadambari, Ranjitkumar Nagireddy, Siddiq E A, Lakshminarayana, Vemireddy R, 2017, "Molecular dissection of a genomic region governing root traits associated with drought tolerance employing a combinatorial approach of QTL mapping and RNA-seq in rice", *Plant Molecular Biology Reporter,*

226. Patro T S S K, Divya M, Sandhya Rani Y, Triveni U and Anuradha N 2017 Resistance of Kodo millet (*Paspalum scrobiculatum*) varieties against *Rhizoctonia solani* the incitant of banded sheath blight disease. *Frontiers of Crop Improvement Journal*, 5 (1): 78-79

227. Patro T S S K, Divya M, Sandhya Rani Y, Triveni U and Anuradha N 2017 Identification of resistant sources against *Rhizoctonia solani* Kuhn. the incitant of sheath blight of *Echinocloa frumentacea*. *Progressive Research*, 12 (1): 109-110

228. Patro T S S K, Divya M, Sandhya Rani Y, Triveni U and Ashok S 2016 Identification of resistant sources of finger millet against *Pyricularia grisea* Sacc. *Journal of Agricultural Technology*, 12(7.1): 1519-1523

229. Pavan Shankar H P, Krishna Veni B, Dayal Prasad Babu J and Srinivasa Rao V, 2016, "Assessment of genetic variability and association studies in dry direct sown rice (*Oryza sativa L.*)", *Journal of Rice Research*, 9 (2): 11-16.

230. Performance of drum seeder direct sown method of paddy cultivation in HAT areas of Srikakulam district (Research article)15th and 16th February, 2017,N.Lakshminarayana, S.Yamini, Dr.K.Tejeswara Rao and G.JoginaiduNational seminar on Green wealth for global health (Page no.82)

231. Poornima N, Lal Ahamed M, Ratna Babu D and Nafeez Umar Sk, 2017, "Variability studies on yield and yield contributing characters in maize (*Zea mays L.*)", *The Andhra Agricultural Journal* , 64 (1): 84-86

232. Prabhakar K, Pullibai P, Manjunath J, Padmalatha Y, Muniratnam P and Gopalreddy B, "Response of nandyala pogaku-1(NBD-119) bidi tobacco (*Nicotiana tobaccum L.*) to nitrogen levels and topping under rainfed conditions in vertisols of Andhra Pradesh", *The Andhra Agricultural Journal*

233. Prabhakar K, Pullibai P, Muniratnam P, Manjunath J, Raghavendra T, Padmalatha Y and Gopal Reddy B, "Supplementation of nitrogen and potassium nutrients through foliar nutrition to bidi tobacco (*Nicotiana tobaccum* L.)," *The Journal of Research of ANGRAU*, 44 (3&4): 27-32.

234. Prabhakar K, Muniratnam P, Balajinayak S, Venkataramanamma K, Raghavendra T, Pullibai P and Gopal Reddy B, "Soil test based nutrient management to improve production of sunflower (*helianthus annuus* l.) in rabi season", *The Journal of Research of ANGRAU*, 45 (1):16-21

235. Prabhakar K, Munirathnam P, Balaji Nayak S, Venkataramanamma K, Raghavendra T, Pulli Bai P and Gopal Reddy B, 2017, "Soil test based nutrient management for rabi sunflower (*Helianthus annuus* L.)", *Journal of Research, ANGRAU* 45 (1): 16-21.

236. Pradeep Kumar S, Sudharani D, Venkatesh M N and Ratna Prasad P, 2017, "Bioefficacy and residual trials of Diuron 80 WP formulation against weeds in maize", *Trends in Biosciences*, 10 (18): 3179-3181.

237. Pradeep S, Satish Y, Ratna Babu D and Srinivasa Rao V, 2016, "Genetic variability, heritability and genetic advance studies in cotton (*Gossypium hirsutum* L.)", *The Andhra Agricultural Journal* , 63 (4): 813-815.

238. Prasad T N V K V, Adam S, Visweswara Rao P and Giridharakrishna T, 2017, "Size dependent effects of antimicrobial phytogenic silver nanoparticles on germination, growth and biochemical parameters of rice (*Oryza sativa L*), maize (*Zea mays L*) and Peanut (*Arachis hypogaea* L)", *IET Nanobiotechnology*, 2016, 11 (3): 277.

239. Prasada Rao V, Venkateswarlu B, Rao A S, Balkrishna Yadav, Rao K L N and Prasuna Rani P, 2017, "Response of aerobic rice to sub surface drip fertigation", *The Andhra Agricultural Journal* . 64 (1): 3-7.

240. Prasada Rao V, Venkateswarlu B, Rao A S, Balkrishna Yadav, Rao K L N and Prasuna Rani P, 2016, "Response of zero tillage maize to sub surface drip fertigation", *The Andhra Agricultural Journal* , 63 (4): 758-762.

241. Prasanna kumar S V V and Ratna Babu D, 2016, "Combining ability and heterosis in Maize (*Zea mays* L.) for yield and yield components", *International journal of Agriculture, Environment and Biotechnology*, 9 (5): 763-772

242. Prathima T, Nagamadhuri K V, Tirumala Reddy S and Ramana M V, 2017, "Effect of different tillage methods on weed density in rainfed groundnut" *Agronomic Approaches for Climate Resilience in Agriculture*, 97.

243. Prathyusha C, 2017, "Studies on tank mix application of early post emergence herbicides for efficient weed control in groundnut", *Trends in Biosciences*, 10 (22): 4552-4556.

244. Pratyusha P, Krishna Prasadji J, Krishnam Raju S, Prasanna Kumari V and Sairam Kumar D V, 2016, "Reaction of rice genotypes to false smut with reference to the host factors favouring the disease", *The Andhra Agricultural Journal* , 63 (4):857-866.

245. Praveen Babu R and Sivanarayana G, 2016, "Constraints faced by the rice farmers in adoption of recommended technologies in E.G (Dt.) of A.P", *Journal of Research ANGRAU*, 44 (1&2) : 83-87.

246. Praveen Kumar N S, Paul K S R and Chandrasekhar Reddy M, 2017, "Cost and returns of different rice production technologies under NSP right canal of Guntur district of Andhra Pradesh", *The Andhra Agricultural Journal* , 64 (1): 204-207.

247. Priyanka M, Prasada Rao G M V, Sandhya Rani Ch, Prasanna Kumar V and Grace A D G, 2016, "Incidenec and management of leaf hopper *Amrasca biguttulabiguttula* (Ishida) to varied nitrogen levels under HDPS of cotton", *Progressive Research*, 11 (Special viii): 4467-4469.

248. Priyanka G and Ramana Murthy K V, 2016, "Effect of integrated weed management practices on growth, yield and economics of rice", *Progressive Research* 11(Spl.4): 2444-2448.

249. Priyanka G and Ramana Murthy K V, 2016, "Rice- weed ecosystem under mechanized system of rice intensification (MSRI) in North coastal A.P", *The Andhra Agriculture Journal*. . 64 (3&4): 13-17.

250. Priyanka G and Ramana Murthy K V, 2017, "Performance of rice under mechanized system of rice intensification with different weed management practices", *Trends in Biosciences* 10 (2): 700-704

251. Pushpa Reni Y, Sateesh Babu J and Ramana M V, 2016, "Genetic Diversity for yield and its components in Blackgram" (*Vigna mungo* (L.) Hepper]", *International research journal of Natural and Applied Sciences*, 3 (7): 186-193.

252. Lakshmipathy R and Gopalaswamy S V S, 2016, "Comparative evaluation of entomopathogenic fungal isolates for the control of pulse beetle and cigarette beetle", *Journal of Soil Biology and Ecology*, 36: 69-75.

253. Radha Krishna Y, Gopala swamy S V S and Ramana M V, 2016, "Response of Maize to different plant densities and nitrogen levels under zero tillage", *The Andhra Agricultural Journal*, 63 (1) :155-157.

254. Radha Kumari C, Sahadeva Reddy B, Niveditha M, Sudheer K V S and Pavan Kumar Reddy Y, 2016, "Suitability of cluster bean varieties for rainfed alfisols of scarce rainfall zone", *Journal of Research ANGRAU*, 44 (1 & 2): 20-25.

255. Radha Kumari C, Shanthi P, Niveditha M, Sudheer K V S and Sahadeva Reddy B, 2016, "Growth and yield of bajra hybrid as influenced by spacing and nitrogen levels in rainfed alfisols", *The Journal of Research ANGRAU*, 43 (3 &4): 34 – 41.

256. Radha Kumari C, Shanthi P, Niveditha M, Sudheer K V S and Sahadeva Reddy B, 2017, "Identification of suitable foxtail millet variety for rainfed alfisols of scarce rainfall zone", *The Journal of Research ANGRAU*, 45 (1): 1-6.

257. Radha Kumari C, Shanthi P, Niveditha M, Sudheer K V S, Pavan Kumar Reddy Y and Sahadeva Reddy B, 2016, "Response of bajra hybrid to spacing's and nitrogen levels in rainfed alfisols", *Andhra Pradesh Journal of Agricultural Sciences*, 2 (2): 96-103.

258. Raghavendra T, Jayalakshmi V and Venkatesh Babu D, 2017, "Temperature Induction Response (TIR) - A Novel physiological approach for thermotolerant genotypes in chickpea (*Cicer arietinum* L.)", *Indian Journal of Agricultural Research*, 51 (3): 252-256.

259. Raghavendra T, Jayalakshmi V and Venkatesh Babu D, "Temperature Induction Response (TIR)- A novel physiological approach for thermotolerant genotypes in chickpea (*Cicer aritinum* L.)", *Indian journal Agricultural Res*earch, 51 (3) 2017: 252-256.

260. Raja kumar N, Suresh M, Chitkala Devi T, Gouri Kumari M G B S and Kishore Varma P, "Weather based forecasting model for the top rot disease in sugarcane caused by *Fusarium moniliforme* Sheldon. *Sugar Journal*. 193-199.

261. Raja kumar, Kishore Varma N, Suresh P, Mand Veerabhadra Rao K, "*In vitro* evaluation of *Trichoderma* species against *Colletotrichum falcatum* Went pathotypes, the causal agent of sugarcane red rot", *Sugar Journal*. 193-199.

262. Rajamani S, 2016, "Character asociación and path analysis of seed cooton yield and its component characters in cotton", *Journal of Cotton Research and Development Association* 30 (1): 16-21.

263. Rajamani S, Sreekanth M, Saidanaik V and Narayana E, 2016, "Selection índices for yield and attributing charaters improvement in pigeopea", *Ineternational Journal of Life Science Scientific Research*. 2 (2): 127-129.

264. Rama Devi B, Lal Ahamed M, Ratna Babu D and Madhumathi T, 2017, "Correlation and path analysis for morphological triats in maize (*Zea mays* L.)", *The Andhra Agricultural Journal* , 64 (1): 87-90

265. Rama Lakshmi Ch S, Sreelatha T, Veerabhadrarao K and Venugopalarao N, 2016, "Effect of sugarcane monocropping on soil physical and chemical properties in texturally varied soils", *Agricultural Science Digest*. 36 (2) : 155-159

266. Rama Rao I V Y and Sriram K "Assessing the performance of Jaggery market in Andhra Pradesh state, India" *International Journal of Environment, Agriculture and Biotechnology*, 630

267. Rama Rao I V Y and Sriram K "Estimating the Efficiency in Value Chain of Jaggery In Andhra Pradesh The *Journal of Research, ANGRAU*, Pp:127-134

268. Ramana Reddy D V, Ram Prakash T, Srinivas A, Naga Sravani P, VishaKumari V and MaruthiSankar G R, 2017, "Modelling of Soil-Plant-Fertilizer relations for optimizing fertilizer doses for different levels of finger millet yield under semiaridAlfisols", *Communications in Soil Science and Plant Analysis*. 48 (7) : 778-791.

269. Ramesh Babu P, Surya Narayana Y, Sreelakshmi Ch, Sreevalli Devi M, Krishna Naik R, Rajan C P D, Raja Sekhar P and Vineetha U, 2016, "NLR 40054: A high yielding blast tolerant, aromatic, short grain rice culture", *Journal of Rice Research*, 9(2): 67-70.

270. Ranga Rani A, Khayum Ahammed S, Patibanda A K and Sarada Jayalaksmhi Devi R, "Characterization and rhizosphere competence of *Trichoderma* Spp. in different cropping systems of Chitoor district (A.P.)", *Indian Phytopathology* 69 (4s) : 506-509

271. Ranjith K, Nagireddy, Jayavardhan T S, Vemireddy L R, Siddiq E A, 2017, "Genetic diversity asessment using molecular markers and drought tolerance traits in rice accessions", *International Journal of Current Research*, 9 (2): 46033-46043.

272. Ratnam M and Rajamani S, 2016, "Effect of weather parameters on the performance of Bt cotton grown under different windows", *The Andhra Agricultural Journal* , 63 (1): 24-26.

273. Ratnam M, B Venkateswarlu, E Narayana, T C M Naidu and A Lalitha kumari, 2017, "Dry matter partitioning and grain yield potential ofmaize-chickpea sequence as influenced by sowing time and nitrogen levels", The *Journal of Research, ANGRAU*. 44 (3&4): 67-71.

274. Ratnam M and A S Rao, 2016, "Integrated weed management in redgram", *Journal of Research ANGRAU*, ume 42 (3&4) : 48-52.

275. Ratnam M, S Rajamani and E Narayana, 2016, "Response of pigeonpea genotypes of different maturity duration to radiation use efficiency under rain-fed conditions of Andhra Pradesh", *International Journal of Advanced Research*, 4 (4) : 614-616.

276. Ravi Teja M, P Srilakshmi, K Vijay Krishna Kumar, H Sudini, P Kishore Varma and S R Koteswara Rao, 2016, "Review on the aflatoxin contamination in groundnut at traders level and its management using PGPR", *Progressive Research*, 11 (Special IV): 2746-2756.

277. Ravikanth B, Satyanarayana P V, Chamundeswari N and Girija Rani M, 2016, "Genetic analysis of characters related to lodging resistance and yield in rice (*Oryza sativa L.*) under direct seeded condition", *Advances in Life Sciences*, 5 (19): 8854-8856.

278. Reddy B V, Reddy C V C M, Chandrasekhar A and Gopal Reddy B, "Genetic characterization of elite kodomillet lines using cluster and principal component analyses "*Progressive research*", 11 (Special-VII): 4625-4630.

279. Reddy B V, Reddy C V C M, Chandrasekhar A and Gopal Reddy B, "Genetic characterization of elite finger millet lines using cluster and principal component analyses "*Progressive research*", 11(Special-VII): 4631-4636.

280. Reddy B V, Reddy C V C M, Reddy P V R M and Gopal Reddy B, "Genetic characterization of promising prosomillet lines using cluster and principal component analyses", *Journal research, ANGRAU*, 44 (3&4): 50-58.

281. Reddy C V C M and Reddy P V R M, "New Paradigms in Improvement of Drought Tolerance in Crop Plants – Book chapterRecent Advances in Groundnut Production Technology, B. S. Publications, Hyderabad Pp: 841-848.

282. Reddy P V R M and Naga Madhuri K V, 2017, "Soil resource inventory of Madabaka village of Chittoor sitrict, AP", *Trends in farm mechanization and engineering Interventions for sustainable agriculture* : 69

283. Reddy P V R M, K V Naga Madhuri, T N V K V Prasad and T Giridhara Krishna, 2017, "Soil nutrient mapping with GPS and GIS in Santhipuram mandal of AP 104th Indian Science Congress: 227

284. Reddy U K, C V C M Reddy and Andrew H Paterson et al.Genome-wide divergence, haplotype distribution and population demographic histories for *Gossypium hirsutum* and *Gossypium barbadense* as revealed by genome-anchored SNPs. *Nature scientific reports*, 7: 41285

285. Reddy Yamini B and Jayalakshmi V, "Correlation and path analysis for yield and drought tolerance attributes inchickpea (C*icer arietinum* L.)", *Advances in Life Sciences* 5 (19), 8233-8237.

286. Reddy Yamini B and Jayalakshmi V, "Genetic studies on chlorophyll content in chickpea (*Cicer arietinum* L.)" , *Journal of Food legumes*, 29 (2): 102-105

287. Reddy Yamini B and V Jayalakshmi, "Heterosis for chlorophyll content in chickpea (*Cicer arietinum L.)",Progressive Research*, 11 (Special-IV) : 2672-2676

288. Rekha G, Gopala Swamy S V S and Sandhyarani C, 2017, "Relative susceptibility of groundnut genotypes to the storage insect, *Caryedon serratus"*, *Environment & Ecology*, 36 (3): 2555-59.

289. Rekha G, Gopala Swamy S V S and Sandeep Raja D, 2017, "Morphological and biochemical basis of tolerance to bruchid, *Caryedon serratus* (Olivier) in groundnut pods", *Journal of Entomology and Zoological Studies*, 5 (3): 373-376.

290. Revathi K, Sree Rekha M, Venkata Lakshmi N and Prasuna Rani P, 2016, "Influence of planting densities and nitrogen levels on yield of rabi Maize", *The Andhra Agricultural Journal* , 63 (4): 751-754.

291. Revathi K, Sreekanth M and Krishnayya P V, 2016, "Influence of Pod and Seed Characters of Pigeonpea genotypes on podfly incidence. *Indian Journal of Plant Protection*", 44 (2): 246-249.

292. Roja V, Patil S, Deborah D A, Srividhya A, Ranjithkumar N, Kadambari G, Ramana Rao P V, Siddiq E A, Vemireddy L R, 2016, "Finding genomic regions and candidate genes governing water use efficiency in rice", *Biologia Plantarum*, 60 (4): 757-7663

293. S. Neelima, "Hybrid seed production in sunflower" contributed-Book Chapter Pantala vittanotpatti- Vittana druvikarana sikshana karyakramam manual, pp 34-36.

294. Sai Maheswari K, Prathima T and Pratapkumar Reddy A, 2017, "Integrated farming systems for enhancing farm productivity under changing climate in rainfed areas", *Trends in Farm Mechanization and Engineering Interventions for sustainable Agriculture*, 87

295. Sai Sravan U, Ramana Murthy K V, Ramana A V and Sunanda N, 2016, "Studies on improvement of system productivity through introduction of pre *kharif* crops in rice (*oryza sativa* L.) based cropping system", *The Andhra Agriculture Journal* 63 (2): 251-255.

296. Salej Sood, Patro T S S K, Sunil Karad and Abhinav Sao 2016 Evaluation of finger millet genotypes for stability using parametric and non-parametric methods in India. *Electronic Journal of Plant Breeding*, 7 (4): 857-863

297. Sameera Sk and T Srinivas, 2016, "Variability correlation and path analysis for grain yield and quality in rice (Oryza sativa L)", *Environment and Ecology* 34 (2A) : 755 – 761.

298. Sameera SK, Srinivas T, Prasanna Rajesh A, Jayalakshmi V and Nirmala P J, "Variability and path coefficient for yield and yield components in rice," *Bangladesh, Journal of Agriculture Research*, 41 (2): 259-271.

299. Sameera Sk, Srinivas T, Rajesh A P, Jaya Lakshmi V and Nirmala P J, 2016, "Variability and path co-efficient for yield and yield components in rice", *;L*, 41 (2) : 259 – 271.

300. Sandhya Kishore N, Srinivas T, Pallavi M and Nagabhushanam, 2016, "Genetic divergence studies in rice", *Progressive Research*, II (special-V) : 3095-3097.

301. Sandhya Rani Y, Triveni U and Patro T S S K 2017 Integrated nutrient management for enhancing the soil health, yield and quality of little millet (*Panicum sumatrense*). *International Journal of Bio-resource and Stress Management*, 8 (1): 26-32.

302. Sandhya Rani Y, Triveni U and Patro T S S K and Divya M, 2017, "Effect of organic sources of nutrients on soil health, yield and quality of little millet (*Panicum sumatrense*)", *Research Journal of Agricultural Sciences*, 8 (2): 379-381.

303. Sandhya Rani Y, Triveni U, Patro T S S K and Divya M, 2017, "Yield and quality improvement in finger millet through nutrient management in red sandy loam soils", *Progressive Research*, 12 (2): 154-160.

304. Santhi Priya Ch and Ratna Babu D, 2017, "Simultaneous selection for yield and quality components using classical selection in rice (Oryza sativa L.)", *Research journal of chemical and environmental science*, 5 (2): 32-37.

305. Santhi Priya Ch, Suneetha Y, Ratna Babu D and Srinivasa Rao V, 2017, "Variability, Heritability and Genetic Advance in rice (*Oryza sativa* L.)", *The Andhra Agricultural Journal* , 64 (1): 91-93

306. Santhi Priya Ch, Suneetha Y, Ratna Babu D and Srinivasa Rao V, 2017, "Inter-relationship and path analysis for yield and quality characters in rice (*Oryza sativa* L.)", *International Journal of Science, Environment & Technology*, 6 (1): 381-390

307. Santhi Priya Ch, Suneetha Y, Ratna Babu D and Srinivasa Rao V, 2017, "Assessment of genetic divergence in rice for grain yield and quality traits", *Environment and Ecology*, 35 (3B): 2007-2011.

308. Santhi Priya Ch, Suneetha Y, Ratna Babu D and Srinivasa Rao V, 2017, "Variability, heritability and genetic advance in rice (*Oryza sativa L.), The Andhra Agricultural Journal*, 64 (1): 91-93.

309. Sarada O and Suneel Kumar G V, 2016, "Participation of rural women in agricultural activities and extension programmes in Prakasam district of Andhra Pradesh", *The Andhra Agricultural Journal* , 63 (1): 235-239.

310. Sarada O and Suneel Kumar G V, 2016, "An analysis of vocational training needs of rural women", *Journal of Farm Science*, 29 (4): 152-153.

311. Sarada O and Suneel Kumar G V, 2016, "Impact of paddy drum seeder FLDs on farmers knowledge and adoption levels", *The Andhra Agricultural Journal* , 63 (2): 452-456

312. Sarada O and Suneel Kumar G V, 2016, "Information needs and information sources of farmers of Prakasam district of A.P", *Andhra Pradesh Journal of Agricultural Sciences*, 2 (1): 74-81.

313. Sarada O, Suneel Kumar G V and Anand Singh K, 2016, "Training need assessment n adopted villages of Krishi Vigyan Kendra, Undi, West Godavari District", *The journal of Research PJTSAU*. 44 (1&2): 73-77.

314. Sarala N V, Nagamadhuri K V, Hemanth Kumar M, Subba Rao M, 2016, "Nitrogen management through organic manures in sugarcane plant –ratoon cropping sequence in southern agro climatic zone of A.P", The *Andhra Agricultural Journal* 63 (1) 27-30.

315. Sarala N V, Hemanth Kumar M, Naga Madhuri K V and Subba Rao M, 2016, "Nitrogen management through organic manures in sugarcane cropping sequence in southern agroclimatic zone of A.P", *The Andhra Agricultural Journal* , 63 (1): 27-30.

316. Sarala N V, Hemanth Kumar M, Subba Rao M, 2016, "Sequence cropping to sugarcane crop under irrigated dry situation in sandy loam soils of Rayalaseema zone of Andhra Pradesh", *Annual convention of SISSTA* Pp: 110.

317. Sarath Kumar Reddy Y, Raja Rajeswari V, Sudhakar P, Naga Madhuri K V, Ravindra Babu V and Naidu N V, 2016, "Fortification of grain Zn content in rice genotypes through Zinc application", *National Conference of Plant Physiology, Challenges in crop physiology research: from molecular to whole plant*: 84

318. Saritha Routu and Srilatha Ch, 2016, "Gender Mainstreaming in Agriculture: Challenges and strategies", *Life Sciences International research journal*, 3: 42-43

319. Saritha Routu, 2017, "On farm evaluation of low input rice production system on grain and water productivity", *Progressive Research*, .5930-5932

320. Sateeshbabu J, Pushpa Reni Y and Ramana M V, 2016, "Character correlation and path coefficient in blackgram" (*Vigna mungo* (L.) Hepper", *International research journal of Natural and Applied Sciences*, 3(7): 178-185.

321. Satish Y and Suneel Kumar G V, 2016, "Genotype X Environment analysis for pod yield and its component traits in groundnut (Arachis hypogea L.)", *Progressive Research*, 11 (7): 4968-4970.

322. Satya Priya Lalitha V , Krishnamma K and Jhansi K, 2016 " Co V 09-356 (2003 V 46) – A popular early maturing sugarcane variety suitable for East – Coast zone of India' to National Symposium on " Challenges, Opportunities and Innovative Approaches in Sugarcane Agriculture, Bio-energy and Climate Change" held from 21st -23rd December 2016 at UPCSR, Shahjahanpur, UP.

323. Satya priya Lalitha V, Krishnamma K and Jhanis K, 2016 2009 V 127 (Co V 15-356) – A sucrose rich high yielding early maturing sugarcane variety published in 46th Annual Convention of SISSTA, 15th -16th July 2016 at Chennai, Tamilnadu pp: 54-56.

324. Satya priya Lalitha V, Krishnamma K and Jhanis K, 2016 2010 V 146 - A high yielding mid-late maturing sugarcane variety published in 46th Annual Conventiion of SISTA. 15th 16th July, 2016 at Chennai, Tamilandu pp:57:59

325. Satyanarayana N H, Visalakshmi V, Priya B, Mukherjee S, Roy S K, Rao A U and Sarkar K K, 2016, "Multivariate Analysis of Quantitative Characters for Fiber Yield in Roselle (*Hibiscus sabdariffa L.)* Over Six Environments", *Vegetos* 29 (4): 50-52.

326. Satyanarayana P V, Chamundeswari N, Girija Rani M , Ravikumar B N S V R, Srinivas T and Suneetha Y, 2017, "Recent High Yielding Varieties from APRRI, Maruteru for Intensive Cultivation in Irrigated Wetlands", *ICAR_IIRR News letter*, 5 (1): 12-15

327. Sindhu K, Gopi Krishana T, Rambabu P and Raghunadha Reddy G, 2016, "Constraints faced by Agriprenures in mango agrobased enterprises and suggestions to overcome", *The Andhra Agricultural Journal* , 63 (4): 978-981.

328. Sindhu K, Gopi Krishana T, Rambabu P and Raghunadha Reddy G, 2016, "Relationship of profile characteristics of Agriprenures with their entrepreneurial behavior in Visakhapatnam District of Andhra Pradesh", *The Andhra Agricultural Journal* , 63 (3): 722-725.

329. Sireesha A, Sreenivas Ch, Usharani T and Satyanarayana P V, 2017, "Impact of organic farming practices on soil nutrient status, rice yileds and pest incidence in rice- rice cropping system of Godavari delta", National seminar on strategies towards actualizing the concept of sustainable agriculture.

330. Sirisha K J V, Raghunadha Reddy G, Rao D V S and V Srinivasa Rao, 2016, "Impact and determinants of credit under KCC scheme in guntur district of A.P", *The Andhra Agricultural Journal* , 63(1): 208-211.

331. Sirisha A B M, Lal Ahamad M, Rama Kumar P V, Ratna Kumari S and Srinivasa RaoV, 2016, "Genetic Variability for seed cotton yield and yield components in cotton (*Gossypium hirsutum* L.) *The Andhra Agricultural Journal* , 63 (2): 335-337.

332. Sitarambabu V, Rao D V S and Raghunadha Reddy G, 2016, "An impact assessment on consumption expenditure of MGNREGA in Andhra Pradesh", *Progressive Research*, 2527-2531.

333. Sitarambabu V, Rao D V S, Raghunadha Reddy G, Vijayabhinandana B and Srinivasa Rao V, 2016, "Socio-economic impact analysis of mahatma gandhi national Rural Employment Guarantee Scheme in Andhra Pradesh: A tool for enhancing the Livelihood security in Rural areas", *Advances in Life Sciences*, 5 (19): 8323-2335.

334. Sitha Rama Sarma A, Jaffar Basha S, Rama Reddy Y and Gopal Reddy B, "Efficacy of new insecticides against leaf hopper, *Amrasca* spp. in Bt cotton", *Advances in Life Sciences*, 5 (21), 9671-9674

335. Sitha Rama Sarma A, Jaffar Basha S, Rama Reddy Y and Gopal Reddy B, "Efficacy of insecticides and biocontrol agents in Bt cotton against leafhopper", *Amrasca spp Progressive Research*, 11: 5732-5735.

336. Siva M, Ramesh Babu P, Rayal Prasad Babu J, Srinivasa Rao V, Jaya Lalitha K, 2017, "Study of variability, heritability and genetic advance for morphological and physiological traits in rice (*Oryza sativa L.*)", *The Andhra Agricultural Journal* , 64 (2): 342-346.

337. Siva Ramakrishna N, Gayathri N K, Srinivas T and Uma Maheshwari P, 2016, "Studies on stability of promising early duration rice genotypes", *Environment and Ecology*, 34 (4) 1738-1741.

338. Sivadevika O, Ratna Prasad P, Prasuna Rani P and Lakshmi Pathy R, 2016, "Influence of Biochar on yield and yield attributes of sweet corn", *The Andhra Agricultural Journal* , 63 (4): 849-851.

339. Sowjanya A, Sree Rekha M, Murthy V R K and Prasuna Rani P, 2017, "Dry matter and yield of rice as influenced by organics and inorganics of nitrogen", *The Andhra Agricultural Journal* , 64 (1): 46-49.

340. Sowjanya P, Prasuna Rani P and Madhu Vani P, 2016, "Available nutrient status and fertility capability grouping of soils of bobbili mandal, vizianagaram district, Andhra Pradesh", *Indian Society of Coastal agricultural Research*, 34 (1): 25-32

341. Sowjanya P, Prasuna Rani P, Madhu Vani P and Srinivasa Rao V, 2016, "Spatial variability of soils of bobbili mandal, vizianagaram district, Andhra Pradesh", *The Andhra Agricultural Journal* , 63 (1): 137-142.

342. Sravana Varalakshmi K, .Raghunadha Reddy G, Rao D V S and Srinivasa Rao V, 2016, "Impact of weather based crop insurance scheme on insured and uninsured chilli cultivators in guntur district of A.P", *The Andhra Agricultural Journal* , 63 (1): 215-218.

343. Sree Vani P, Alpha Raj M, Adilaxmamma K, Muralidhar Y, Eswara Prasad P and Prasad T N V K V, 2016, "Evaluation of the wound healing efficacy of chemical and phytogenic silver nanoparticles IET Nanobiotechnology, 2016.

344. Sreekanth M , Mahalakshmi M S and Ramana M V, 2016, "Integrated pest management of pod borers in pigeonpea (*Cajanus cajan*)", *Progressive Research*, ume 11(Special-VII) : 4477 - 4479.

345. Sreekanth M and Ratnam M, 2016, "Population build-up and seasonal abundance of *Helicoverpa armigera* on Pigeonpea", *Journal of Insect Science*, 29 (1): 192-195.

346. Sreekanth M, Ratnam M and Koteswara Rao Y, 2016, "Monitoring of gram pod borer, *Helicoverpa armigera* through pheromone traps on pigeonpea (*Cajanus cajan* (L) Millsp. And impact of weather parameters on trap catch", *The Journal of Research ANGRAU*, 44 (1&2): 63-66.

347. Sri Lakshmi P, Chamundeswari N, Satyanarayana P V, Santhosh Kumar M, Shalini T, Girija Rani M and Ravi Kumar B N V S R, 2016, "Genetic parameters of variation for anaerobic germi nation and seedling vigour traits in rice (*Oryza sativa L.*)", *Progressive Research*, 11 (7):5069-5072.

348. Srilakshmi P, Ratna Babu D, Rama Kumar P V and Anil Kumar P, 2017, "Eving suitable selection index by assigning equal economic weights in finger millet [*Eleusine coracana* (L.), *The Journal of Research ANGRAU*, 45 (1): 11-15.

349. Srilakshmi P and Ratna Babu D, 2016, "Restricted selection in finger millet [*Eleusine coracana* (L.) Gaertn] for nutritional and yield components", *International Journal of Agricultural Science and Research*, 6 (6): 381-386

350. Srilakshmi P and Ratna Babu D, 2017, "Formulation of selection index by assigning inverse of means as economic weights in finger millet (*Eleusine coracana* (L.) Gaertn)", *International journal of Pure and Applied Bioscience*, 5 (2): 262-266.

351. Srilatha vani Ch and Pradeep Kumar, 2016, "A Study on Awareness Levels and Adaptation Strategies for Climate Variability among Farmers", *the International journal of Environment and Biotechnology* 1 (2): 190-194

352. Srilatha vani Ch,2016, "Empowerment of women through milk micro enterprises in A.P", Social Science *International research journal,* 2 (special issue1): 117-120

353. Srilatha vani Ch, Jamuna , P Veerabhadra Rao and K Venugopala Rao, 2016, "Adoption of Integrated pest management practices by sugarcane growers of NC Zone of AP Progressive Research", *An International Journal*.11 (Special-VIII): 4436-4439

354. Srilatha Vani Ch, Ammaji P and Balazzi Naik R, "Constraints and strategies in Biotech. Book , New Delhi 1-12 Increasing pulses production for evergreen reution.

355. Srinath Reddy A B, Savitha H N, Nataraj K C and Hawaldar Y N, 2016, "Evaluation of suitable statistical models to analyze the trend in area, production and productivity of arecanut (*Areca catechu*) grown in Karnataka, India", *Progressive Research*, 11 Special (Part-IX): 6129 - 6131.

356. Srinivas T , Sivashankar N, Subba Rao L V, Gayatri N K, Uma Maheswari P, Suneetha Y, Lokeswara Reddy A and Hruday Raj K, 2016, "Genetic variability and association analysis for quantitative trails of promising early rice genotypes", *Advance in life Sciences*, 5 (20): 8341-9346.

357. Srinivas M, Kumari M B G S, Anusha B, Sreenivas Ch and Satyanarayana P V, 2016, "Response of machine transplanted rice to different levels of nutrients under coastal irrigated ecosystem", *Journal of Rice Research*, 9 (2): 55-58.

358. Srinivas Manukonda, Tejaswini K L Y, Sudheer Kumar I and Ramana Rao P V, 2016, "Sustainable agriculture - A way to sustain life", *International Journal of Multidisciplinary advanced experimental Research*, 3 (2): 90-101.

359. Srinivas T, Siva Rama krishna N, Subba Reddy L V, Gayathri N K, Uma Maheshwari P, Surendra Y, Lokesh Reddy A and Hruday Raj K, 2016, "Genetic variability and Association analysis for quantitative traits of promising earlyrice genotypes", *Advances in LifeSciences* 5 (20): 9341- 9346- 2016.

360. Srinivasa Rao M, Subba Rao M, Lal Ahamad M and Ramesh Babu P, 2017, "Combining ability and heterosis for yield and yield attributes in rice *Oryza sativa*", 8 (3): 688-691.

361. Srinivasa Rao M, Mallikharjuna Rao N and Gopi Krishna T, 2017, "Impact of climate resilient technologies in economic development of the farmers in Khammam district of Andhra Pradesh, Paper presented in National conference on Adaptation interventions for climate resilient agriculture in coastal Agro – ecosystems 9-10 March, 2017 at RARS, LAM. Pp. 97-102.

362. Srinivasarao Ch, Sudha Rani Y, Girija Veni V, Sharma K L , Maruthi Sankar G R, Prasad J V N S, Prasad Y G and Sahrawat K L, 2016, "Assessing village-level carbon balance due to greenhouse gas mitigation interventions using EX-ACT model", *International Journal of Environmental Science and Technology*, 13: 97–112.

363. SrinivasaRao P, G Rosaiah and B Asha Jyothi, 2016, "Heavy metal soil pollution around the globe", Proceedings of International conference on "New approaches in Agricultural, Food and Environmental Sciences" held at Andhra Loyola College, Vijayawada on 22nd to 24th December 2016 pp No. 323.

364. Sriramana V, Gopikrishna T, Sivanarayana G and Radha Y, 2016, "Development of knowledge test to measure the knowledge level of cashew growers in Srikakulam district of A.P", *The Andhra Agricultural Journal* , 63 (2) : 440-447.

365. Srujana B, Mahalakshmi M S, Sai Ram Kumar D V and Naidu T C M, 2016, "Influence of Biochemical components of leaf on incidence of whitefly, (*Bemisia tabaci* Genn.) in cetain blackgram genotypes", *The Andhra Agricultural Journal* , 63 (23): 364-367.

366. Subbarami Reddy A, Venkata Rao P, Sateesh Babu J and Ramana M V, 2016, "Impact of seaweed liquid fertilizers on productivity of blackgram", *International journal of current research in biosciences and plant biology*, 3 (8):88-92.

367. Subbaramireddy A, Venkata Rao P, Sateesh Babu J and Koteswara Rao Y, 2016, "Response of integrated weed management practices on growth and yield of pigeonpea", *International journal of current microbiology and applied sciences,* 5 (3): 610-616.

368. Sujala Ch, Prasuna Rani P, Prasad P R K and Rao A S, 2016, "Performance of sweet corn as influenced by organics in a clay loam soil", *The Andhra Agricultural Journal* , 63 (1): 132-136.

369. Sujatha T and Jhansi K 2016 "Effect of Moisture stress on juice quality and yield in pre released sugarcane clones" SISST proceedings- A sugar Journal, 46th Annual convention held at Chennai, Pp.1-3.

370. Sujatha T, Asha Jyothi B and Jhansi K 2016 Performance of pre-release sugarcane mid-late clones under waterlogging stress conditions. Proceedings of International Conference and Exhibition on Sugarcane Value Chain –Vision 2025 Sugar at Vasantadada Sugar Institute, Haveli district, Pune, Maharastra held on November 13-16, 2016 pp: 77.

371. Sujatha T, Jhansi K and Asha Jyothi B 2016 Relative performance of sugarcane under moisture stress conditions. *The Andhra Agril. Journal* (63) 1: 243-245

372. Sujitha A, Bhaskara Reddy B V, Siva prasad Y, Usha R, 2016, "Serological, Molecular Characterization and Diagnostic Methods of Groundnut Bud Necrosis Virus Infecting Onion (Allium cepa L.) in South India", *Asian Journal of Plant Pathology,*

373. Sujitha A, Bhaskara Reddy B V, Sivaprasad Y, Usha R, Giridhara Krishna T, 2016, "Serological and molecular identification of *Tobacco streak virus* infecting Onion in Southern India", *International Journal of Virology*:

374. Suneel Kumar G V, Bhaskar L V, Satish Y and Rehaman S J, 2016, "Evaluation of liquid formulations of Bt against gram pod borer, *Helicoverpa armigera* (Hubner) and spotted pod borer, *Maruca vitrata* (Geyer) in pigeonpea", *Journal of Applied Biology and Biotechnology*, 4 (01): 39-42.

375. Suneel Kumar G V, Vijaya Bhaskar L, Satish Y and Subba Rao G, 2016, "Effect of Intercrops on the Relative Incidence of Insect Pests of Castor, *Ricinus communis* L", *The Andhra Agricultural Journal* , 63 (2): 368-373.

376. Suneel Kumar G V and Ram Prasad B, 2016, "Impact of Bt cotton expressing Cry1Ac and Cry2Ab on cotton leaf worm, *Spodoptera litura* (F.), *Indian Journal of Entomology*, 78(3): 239-245.

377. Suneel Kumar G V and Ram Prasad B, 2016, "Susceptibility changes in *Helicoverpa armigera* (Hubner) (Lepidoptera : Noctuidae) to *Bacillus thuringiensis* Cry1Ac Toxin", *Indian Journal of Entomology*, 78 (1): 01-09.

378. Suneel Kumar G V and Sarada O, 2016, "Evaluation of Bio Intensive Integrated Pest Management module against insect pest complex of rice", *Andhra Pradesh Journal of Agricultural Sciences,* 2 (1): 42-47.

379. Suneel Kumar G V and Sarada O, 2017, "Management of stem borer, *Chilo partellus* (Swinhoe) in maize through inundative release of *Trichogramma chilonis* Ishii", *The Andhra Agricultural Journal* , 64(1): 154-157.

380. Suneel Kumar G V, Vijaya Bhaskar L, Satish Y and Subba Rao G, 2016, "Effect of intercrops on the relative incidence of insect pests of castor, *Ricinus communis* L", *The Andhra Agricultural Journal* , 63 (2):368-373.

381. Suneel Kumar G V, Gopala Swamy S V S and Gurivi Reddy M, 2016, "Thrips transmitted to spoviruses – Global status and management strategies", *Current Biotica*, 9 (4): 396-423.

382. Suneel Kumar G V, Satish Y and Sarada O, 2016, "Evaluation of new insecticides and fungicides for compatibility and management of defoliators and late leaf spot in groundnut", *International Journal of Plant, Animal and Environmental Sciences*, 6 (1): 58-63.

383. Supraja N, Prasad T N V K V, Soundariya M and Babujanarthanam R, 2016, "Synthesis, characterization and dose dependent antimicrobial and anticancerous activity of phycogenic silver nanoparticles against human hepatic carcinoma (HepG2) cell line", *AIMS Bioengineering*. 3 (4), 425-440.

384. Supraja N, Avinash B, Prasad T N V K V, 2017, "Green synthesis and characterization of silver nanoparticles from gymnema sylvestre leaf extract study of antimicrobial activities",*International Journal Current Microbiology* Applied Science, 6 (3):530-40.

385. Supraja N, Maruthamuthu S, Prasad T N V K V, 2016, "Temperature-dependent extracellular synthesis and characterization of nanoscale calcium pyrophosphate crystals using marine thermophilic bacteria" , *Synthesis and Reactivity in Inorganic, Metal-Organic, and Nano-Metal Chemistry*, 46 (2): 189-201.

386. Supraja N, Prasad T N V K V and David E, 2016, "Synthesis, characterization and antimicrobial activity of the micro/nano structured biogenic silver doped calcium phosphate", *Applied Nanoscience*, 6 (1): 31-41.

387. Supraja N, Prasad T N V K V and Adam S, 2016, "Phytogenic silver nanoparticles (*Alstonia scholaris*) incorporated with epoxy coating on PVC materials and their biofilm degradation studies", *Advances in Nano Research*, 4 (4): 281-294.

388. Supraja N, Prasad T N V K V, David E and Krishna T G, 2016, "Antimicrobial kinetics of Alstonia scholaris", *Applied Nanoscience*, 6 (5): 779-87.

389. Supraja N, Prasad T N V K V, Krishna T G and David E, 2016, "Synthesis, characterization, and evaluation of the antimicrobial efficacy of Boswellia ovalifoliolata stem bark-extract-mediated zinc oxide nanoparticles", *Applied Nanoscience*, 6 (4): 581-90.

390. Suresh M, Uma Devi G, Adilakshmi D, Raja kumar N, Vijayalakshmi K, Bharatalakshmi M and Bhaskara Reddy B V, "Impact of sett disinfectants on yellow leaf disease (YLD) incidence and yield and growth parameters in sugarcane", *International Journal of Bio-resource and Stress Management*. 7 (4): 862-869.

391. Suresh M, Raja kumar N, Adilakshmi D, Kishore Varma P, Bharatalakshmi P and Veerabhadra Rao K, "Detection of sugarcane yellow leaf virus (SCYLV) in field varieties and in vitro regenerated plantlets of sugarcane through DAS-ELISA", *Sugar Journal*. 44-49.

392. Suresh M, Prasad R D, Padmavathi P and Vishnuvardhan Reddy A, "Biological and Chemical management of diseases of safflower (*Carthamus tinctorious* L.)", *Journal of Oil seeds Research*. 33 (2): 153-155.

393. Swami Chaitanya T, Munirathnam P and Srinivasa Reddy M, 2016, "Effect of irrigation and nitrogen levels on growth, yield and economics of white sorghum", *Progressive Research*, 2795-2799.

394. Swarnalatha K, Trimurtulu N, Ammani K and Ashok S, 2017, "AM Fungal Spore diversity in different agroclimatic zones of Andhra Pradesh", *International Journal Current Microbiology Applied Science*, 6 (3): 1496-1505.

395. Swarnalatha K, Trimurtulu N, Ammani K, Lakshmipathy R and Ashok S, 2017, "Characterization of AM fungal isolates of different agro-climatic zones of andhra pradesh and their efficacy on maize (*Zea mays L) Plant Growth", International Journal Current Microbiology App. Science*, 6 (4): 1778-1786.

396. Swetha Sree, Rajarajeswari V, Latha P, Prathima T, Umamahesh V and Sudhakar P, 2017, "Ideotyping Rice plant to face the challenge of global climate change", *Trends in Farm Mechanization and Engineering Interventions for sustainable Agriculture*, pp.86.

397. SwethaSree M, Rajarajeswari V, Latha P, Pratima T and Sudhakar P, 2016, "Physiological response of maize to photoperiod and temperatures", *National Conference of Plant Physiology*, 8-10.

398. Usha Rani T, Balaguravaiah D, and Bharathalaxmi M, 2017, "Influence of mycorrhizae and levels of phosphorus on total phosphorus and phosphorus fractions of sandy loam soils in sugarcane of coastal area of Andhra Pradesh", Proceedings of 47th Annual convention of SISSTA from 30.06.2017 to 1.07.2017 at Tirupathi, pp. 52-58.

399. Usha Rani T, Bharathalaxmi M, 2016, "Nutrient management in zero tillage maize in North Coastal Zone", *Proceedings of Indian Society of Soil Science*, 191 & 20 (p).

400. Tejaswini K L Y and Srinivas M , 2017, "Hybrid rice cultivation in India", *International Journal of Research in Applied, Natural and Social Sciences*, 5 (1): 15-20

401. Tejaswini K L Y, Ravi Kumar B N V S R, Lal Ahamed M, Krishnam Raju S, Srinivas M and Ramana Rao P V, 2016, "Study of genetic parameters in F5 families of rice (*Oryza sativa* L.)", *International Journal of Environment, Agriculture and Biotechnology* 1 (4): 735-738

402. Tejaswini K L Y, Ravi Kumar B N V S R, Lal Ahmed M, Krishnam Raju S, Srinivas Maunkonda and Ramana Rao P V, 2017, "Genetic variability, heriatability, genetic advance and correlation studies F5 Families in Rice (*Oryza sativa* L.)", *International Journal of Agricultural Science and Research*, 7 (1), 75-82

403. Tejaswini K L Y, Srinivas M and Ramana Rao P V, 2016, "Intercropping – Objectives, principles, advantages and disadvantages", *International Journal of Multidisciplinary advanced experimental Research*, 3 (2): 75-84.

404. Tejaswini K L Y, Srinivas M, Ravi Kumar B N V S R, Lal Ahamed M, Krishnam Raju S and Ramana Rao P V, 2016, "Correlation and path analysis studies of yield and its component traits in F5 families of rice" *Journal of Agricultural and veterinary Science* 9 (11): 80-85.

405. Tejaswini K L Y, Srinivas M, Sudhir Kumar I and Ramana Rao P V, 2016, "Farming systems approach–way to sustainability and profitability in Agriculture", *International Journal of Multidisciplinary Advanced Experimental Research*, 3 (1): 72-79.

406. Tejaswini K L Y, Srinivas M, Ramana Rao P V, Ravi Kumar B N V S R, Lal Ahamed M and Krishnam Raju S, 2016, "Cluster studies in rice (*Oryza sativa* L.) using wards minimum variance method", *Journal of Agricultural and Research*, 4 (9): 129-139.

407. Tejaswini K L Y, Krishnam Raju S, Ravi Kumar B N V S R, Lal Ahamed Mohammad, Ram kumar P V, Satyanarayana P V and Srinivas M, 2016, "Screening of Rice F5 Families for Sheath Blight and Bacterial Leaf Blight, *Journal of Rice Research* 9 (1): 4-10.

408. Thahir Basha S, Nagalakshmi Devamma M and Eswara Reddy N P, 2016, "Investigation into the significance of temperature with respect to pathogen growth, *Colletotrichum gloeosporioides* – a devastating fungal pathogen causing mango anthracnose", *Andhra Pradesh Journal of Agricultural Sciences*, 2 (3): 173-176.

409. Thahir Basha S, Nagalakshmi Devamma M and Eswara Reddy N P, 2016, "Exploring the novel leaf endophytes for commercialization as bioresource tool to control mango anthracnose", *Andhra Pradesh Journal of Agricultural Sciences*, 2 (3): 168-172.

410. Thiruchenduan S, Maheswari KU, Suneetha J, Prasad T N V K V and Rajeswari B, 2016, "Screening for Plant Secondary Metabolites in Selected Indigenous Herbal Plants", *Imperial Journal of Interdisciplinary Research*, 2 (4):

411. Thiruchenduran S, Maheswari K U, Prasad T N V K V, Rajeswari B and Suneetha W J, "UV-Vis scanning coupled with PCA as an alternative method for phytochemical screening of natural products-Costus Igneus leaf metabolites", *Journal of Pharmacognosy and Phytochemistry"*, 6 (1): 411.

412. Tirumala Reddy S, Krishna Reddy G, Maheswara Reddy P and Prathima T, 2017, "Response of fodder jowar varieties to different levels of nutrient application", *Agronomic Approaches for Climate Resilience in Agriculture*, pp.2.

413. Tirumala Reddy S, Krishna Reddy G, Maheswara Reddy P, Prathima P and Reddy P V R M, 2017, "Evaluation of multicut fodder sorghum varieties under varied nitrogen levels", *Agronomic Approaches for Climate Resilience in Agriculture*, pp.90.

414. Triveni M, Charumathi M and Ramakumar P V, 2016, "Nature of gene action for Cane, CCs Yields and their Yield Components in Sugarcane (*Saccharum officinarumL.)"*, *The Andhra Agricultural Journal*, 63 (4): 796-799

415. Triveni U, Sandhya Rani Y, Patro T S S K, Anuradha N, Divya M and Anuj Bansal 2017, "Response of improved long duration finger millet (*Eleusine coracana L.*) genotypes to different levels of NPK fertilizers under rainfed conditions", *Progressive Research*, 12 (1): 22-26

416. Trivikrama Reddy A, Jayarame Gowda and Saifulla M, 2016,"Identification of Sources Resistant to dry root rot caused by *Macrophomina phaseolina* (Tassi) in chickpea (*Cicer aritinum* L.)", *Mysore Journal of Agricultural Science*, 50 (2): 369-371.

417. Trivikrama Reddy A, Jayarame Gowda, Ravikumar R L, Mohan Rao A, Ramesh S and Mohammed Saifulla, "Resistance Source Identification for dry root rot caused by *Macrophomina phaseolina* (Tassi) in chickpea (*Cicer aritinum* L.)", *Advances in Life Sciences*, 5 (21): 9767-9770.

418. Trivikrama Reddy A, Lakshmi Pathy T and Vijayabharathi A, 2016, "Digital PCR and its applications", *AGROBIOS* 15 (3): 102-103.

419. Umadevi G D, Sunitha N, Reddi Ramu Y and Naidu M V S, 2016, "Response of groundnut (*Arachis hypogaea*) to organic sources of nutrient supply under rainfed condition", *Progressive Research*, 5 (6): 2156-2160.

420. Umadevi G D, Sunitha N, Reddi Ramu Y, Naidu M V S, Prabhakara Reddy G and Pratap Kumar Reddy A, 2016, "Effect of various organic sources on growth and yield of groundnut", *Andhra Pradesh Journal of Agricultural Sciences*, 2 (2): 104-107.

421. Umamaheswari G, Venkateswarlu E, Srinivasulu K and Ravindrababu P, 2016, "Influence of weed control treatments on growth and productivity of sweet corn (*Zea mays L.Saccharata*), *The Andhra Agricultural Journal* , 63 (3): 516-520.

422. Upendra Rao A, Murthy K M D, Adi Lakshmi D, Sridhar T V, Vijay D, 2016, "Water management options for rabi rice on delta soils", *Journal of eco-friendly agriculture* 11 (2):186-190.

423. Usha Rani T, Sirisha A, 2016, "Soil fertility management in rice maize cropping system in sandy loam soils of north coastal zone of andhra pradesh", *Proceedings of Indian Society of Soil Science*, 15 & 2 (p).

424. Usha Rani T, Balaguravaiah D, Bharatha Lakshmi M, Rao K V, 2016, "Nutrient Uptake of Sugarcane Plant and Ratoon Crops at Different Stages Influenced by Cane Trash and Mycorrhizae in Presence of Phosphorus Levels", *Journal of bioresource and stress management*, 71-85.

425. Usha Rani T, Balaguravaiah D and Bharatha laxmi M, 2016, "Influence of mycorrhizae and levels of phosphorus on phosphorus fractions of sandy loam soils in sugarcane", *Progressive Research*, 2 (part VII): 4536-4549.

426. Usha RaniT, Balaguravaiah D, Bharatha Lakshmi M, 2015, "Influence of phosphorus and mycorrhizae on root colonization and spore count at different stages of sugarcane", *Land bank journal*, 54 (III) 27-32.

427. Vajantha Band Umadevi M, 2016, "Effect of organic and inorganic sources of nutrients on N concentration and uptake by Ashwagandha (*Withania somnifera L.*)", *The Andhra Agricultural Journal* 63 (3): 592-598.

428. Vasanthi R, Latha P, Prathima T, Krishna Reddy G, Tirumala Reddy S, Venkataramana E, Nagamadhuri K V, Maheswar Reddy P, Padmini K and Giridhara Krishna T, 2017, "TCGS-1157, short statured short duration Virginia bunch groundnut culture with high yield potential", *Agronomic Approaches for Climate Resilience in Agriculture*, pp.93.

429. Vemana K, Venkateswarlu N C, Rajesh A P and Naik K S S , 2016, "Field screening technique for peanut stem necrosis disease using Parthenium infector border and impact of disease on yield", *Indian Journal of Plant Protection*, 44(2): 239-245

430. Venkata Lakshmi M, Venkateswarlu B, Prasad P V N and Prasuna Rani P, 2016, "Performance of baby corn as influenced by plant densities and levels of nitrogen", *The Andhra Agricultural Journal* , 63 (3): 531-534.

431. Venkata Rao P, Subbarami reddy A, Sateesh Babu J and Ramana M V, 2016, "Impact of seaweed liquid fertilizers on productivity of blackgram", *International journal of current research* in *biosciences and plant biology*, 3 (8): 88-92.

432. Venkata Rao P, Subbarami reddy A, Sateesh Babu J and Ramana M V, 2016, "Response of nitrogen and irrigation on productivity of rabi blackgram", *International Journal of applied biology and pharmaceutical technology*, 7 (4): 10-13

433. Venkata Rao P, Subbarami reddy A, Sateesh Babu J and Ramana M V, 2016, "Response of rabi pigeonpea to sowing time and irrigations", *Journal of Research ANGRAU*, 44 (1&2): 38-43.

434. Venkata Rao P, Subbaramireddy A, Sateesh Babu J and Ramana M V, 2016, "Effect of sowing time and supplemental irrigation on yield and economics of rabi pigeonpea", *International journal of research in agricultural sciences*, 3 (6): 316-319.

435. Venkata Rao P, Subbaramireddy A, Sateesh Babu J and Ramana M V, 2016, "Integrated weed management practices for improved productivity and economics in mungbean (*vigna radiata (L.*)", *Journal of Research ANGRAU*, 45 (1):32-38.

436. Venkata Rao P, Subbaiah G and Veeraraghavaiah R, 2016, "Productivity and nutrient uptake of rice fallow maize as influenced by plant density and fertilizer N under No-till conditions", *International journal of current microbiology and applied sciences* 5 (6):826-836.

437. Venkataramanamma K, Neelima S, Ashok kumar K and Vishnuvardhan Reddy K, 2016,"Management of important diseases of sunflower under field conditions", *Andhra Pradesh Journal of Agricultral Science*, 2 (3): 232-237.

438. Venkataramanamma K, Neelima S and Prabhakar K, "Performance of chemical and plant extract on powdery mildew disease of sunflower", *Progressive Research*, 11: 6148-6149.

439. Venkataramanamma K, Neelima S and Prabhakar K, 2017, "Performance of chemical and plant extract on powdery mildew disease of sunflower", *Progressive Research*, *Andhra Pradesh Journal Agrilcultaral Science*, 2 (3): 232-237.

440. Venkataramanamma K, Neelima S, Yogeeswarudu B, Ashok kumar K and Sukumar S, 2016, "Management of sunflower powdery mildew disease by using bioagents and fungicides", *Indian Journal of Plant Protection*, .44 (4).

441. Venkatesh Babu D, and Raghavendra T, 2017, "Screening of thermotolerant sorghum genotypes at seedling stage using TIR technique", *The Bio-Scan* 12 (1): 381-384.

442. Venkatesh I, Bhattiprolu S L, Krishna Prasadji J and Ramachandra Rao G, 2016, "Biochemical analysis of cotton genotypes infected with alternaria leaf spot", *Journal of Cotton Research and Development*, 30 (2): 265-270.

443. Venkatesh K, Srinivasa T, Prasanna Rajesh A and Uma Maheswari P, 2017, "Genetic variability and association analysis for quantitative and physiological trails of drought tolerant ground nut genotypes", *Environment & Ecology*, 35 (4A) : 2981 – 2989.

444. Vennela B, Aum Sharma, Veeraprasad G, Raghubabu M and Vijaykumar M, 2016, "Effect of different implements for improving the productivity and quality of sugarcane rations (*Sacharum Officinarum L.*)", *The Andhra Agricultural Journal* , 63 (2): 403-407.

445. Vijay Sankar Babu M, Nataraj K C, Malleswari sadhineni S N, Narayanaswamy G and Ravindranatha Reddy B, 2016, "Effect of crop residue mulching and insitu rain water harvesting through micro catchments on yield of rainfed groundnut", *Progressive Research*, 11 Special (Part-9): 6185 - 6188.

446. Vijaya Lakshmi B, Suryanarayana Y Y, Rama Kumar P V, Ashoka Rani Y and Srinivas Rao V, 2016 "Genetic parameters of morpho-physiological traits under water stress condition in rice (*Oryza sativa L.*)", *Journal of Rice Research*, 9 (2) :24-27.

447. Vijayabharathi A, Trivikrama Reddy A and Lakshmi Pathy T ,2016, "Epicuticular wax: Superhydrophobicity plant surface in plant abiotic stress", *AGROBIOS* 15(2): 121-122.

448. Vijayabharathi A, Trivikrama Reddy A and Lakshmi Pathy T, 2017, "MAGIC populations for crop improvement" *AGROBIOS*, 15 (9): 82-83

449. Vijayasankara Babu M, Nataraj K C, Vijayasai Reddy M and Ravindranataha Reddy B, 2016, "Relevance of soil studies to human health - A review. Souvenir & Conference Book of National Conference on Innovative and Current Advances in Agriculture & Allied Sciences, 10-11 December 2016, PJTSAU, Hyderabad: 85-89.

450. Vijayasankara Babu M, Nataraj K C, Malleswari Sadhineni S N, Narayana Swamy G and Ravindranatha Reddy B, 2016, "Effect of crop residue mulching and insitu rain water harvesting through micro catchments on yield of rainfed groundnut", *Progressive Research*. 11 Special (IX): 6185 – 6188.

451. Vineetha U, Harathi P N, Ramesh Babu P, Paramsiva I, Sreelakshmi Ch and Krishna Naik R, 2016, "Response of pre release short duration rice cultures to nitrogen levels during summer season", *International Journal of Tropical Agriculture*, 34 (5): 1267-1269.

452. Vineetha U, Harathi P N, Paramsiva I, Sreelakshmi Ch , Krishna Naik R and Ramesh Babu P, 2016, "Performance of Machine Transplanted Rice to Nitrogen Management", *International Journal of Tropical Agriculture*, 34 (5): 1263-1266.

453. Vineetha U, Ramesh babu P, Raja Sekhar P, Harathi P N, Paramasiva I, Sreelakshmi Ch and Krishna Naik R, 2016, "Response of pre release long duration rice culture to nitrogen levels during khrif season", *Progressive Research*, 11 (5): 3476-3478.

454. Visalakshi M, 2016, "Field recovery of egg parasitoid, *Trichogramma chilonis* Ishii in sugarcane ecosystem", *Progressive Research*.11 (Special VII): 4902-4905.

455. Visalakshi M and Sireesha A, 2016, "Adoption status of direct seeding rice using drumseeder", *Journal of Rice Research*, 9(1):30-34.

456. Visalakshi M, Bhavani B and Govinda Rao S, 2016, "Ecofriendly and biointensive approach for the management of sugarcane shoot borers under organic farming", *Journal of Ecofriendly Agriculture* 11 (1):41-43

457. Visalakshi M, Bhavani B and Govinda Rao S, 2016, "Field evaluation of *Trichogramma chilonis* (Ishii) for the management of shoot borers in sugarcane", *International Journal of Bioresource and stress management*, 7 (4): 914-917.

458. Visalakshi M, Bhavani B, 2016, "Effect of chemical insecticides on termites in sugarcane under various methods of application", *Life Sciences International research journal*, 2:1

459. Visalakshmi V, Hari Satyanarayana N, Madhu Kumar K, Upendra Rao A, 2016, "Management of rice stem borer, *Scirpophaga incetulas* by new insecticide molecules", *AgricINTERNATIONAL* 3 (2) :69-74.

460. Visalakshmi V, Hari Satyanarayana N, Madhu Kumar K, Upendra Rao A, 2016, "Incidence of paddy yellow stem borer *Scirpophaga incertulas* (Walker) in relation with weather parameters", *The Ecoscan. An International Quarterly Journal of Environmental Sciences*, 9 921-925.

461. Visalakshmi V, Hari Satyanarayana N, Madhu Kumar K and Rao A U, 2016, "Effect of new insecticides on major pests and natural enemies in rice", *Agric International*, 3 (2): 19-24.

462. Visalakshmi V, Hari Satyanarayana N, Madhu Kumar K and Rao A U, 2016, "Efficacy of new insecticide molecules against major pests of rice", International *Journal of Farm Science*s, 6 (2): 169-175.

463. Visalakshmi V, Hari Satyanarayana N, Madhu Kumar K, Upendra Rao A, 2016, "Incidence of gallmidge *Orseolia oryzae* (Wood-Manson) in relation with weather parameters", *Progressive Research*, (11) (Special-VII): 4795-4797.

464. Yamuna C, Kishore Varma P and Prasad R D, 2016 "*In vitro* evaluation of fungicides against Botryotinia ricini, the incitant of gray mold of castor", *Progressive Research*, 11(Special V): 2875-2878.

465. Zuby Ansari, Ramarao G, 2016, "Study of evaluation of guar genotypes under natural conditions", *The Andhra Pradesh Journal of Agricultural Sciences* :2 (1) 34-37.

By Extension Scientists

Research Papers

1 Divya P, Kanaka Durga L, Sunil N, Rajasri M, Keshavulu K and Udayababu P, 2016, "Modified atmosphere storage for the management of pulse beetle, *Callosobruchus Chinensis* in Horsegram", *Journal of Lagume Research*, 39 (3) 2016 : 474-478.

2 Nagamani P, Veeraiah A, Sunil Kumar K and Johnson M, 2016, "Role of DAATT Centre on dissemination of technologies and improved varieties in Y.S.R Kadapa district of Andhra Pradesh", National conference on Innovative and current advances in Agriculture and allied sciences (ICAAS – 2016) December 10.11.2016, PJTSAU, Hyderabad. Jointly organized by SSDAT, Meerut (UP) & Astha foundation, Meerut (UP) India.

3 P.S.Rao, Parimala K, Rajasri M and Sudharani M, 2016, "Effect of seed coating with polymers and chemicals on seed quality during storage in hybrid cotton", *Journal of Research. ANGRAU*, 43 (1&2) : 44.

4 Prasanna lakshmi R, Srinivasulu A, Bhargava Rami Reddy, Bala hussain reddy P and P Ganesh kumar, 2016, "Effect of Integrated pest management strategy of mango fruit fly in Chittoor district of Andhra Pradesh", *Advances in Life Sciences*.

5 Rajasri Mandali, Ramesh B, Hymavathi M, Srinivasa Rao Ch and Sashibhushan V, 2016, "Dissipation of monocrotophos residues in castor, *Ricinus Communis* and harvest time residues in its bi products and soil using Lc-MS-MS", *Asian Journal of Chemistry*, 29(3) : 665-668

6 Rajasri Mandali, Vijayalakshmi K and Sujatha M, 2016, "Survey and Biotype identification of whitefly, *Bemisia tabaci* transmitting tomoto leaf curl virus in Andhra Pradesh", *Indian Journal of Agricultural Technology*, 12 (7.1) : 1689-1696.

7 Rama Subbaiah K and Sampath Kumar D, 2017, "Performance of zero tillage maize in the farmers fields of Ananthapuramu district" National Seminar on Agronomic approaches for climate resilience, Page No 11.

8 Sampath Kumar D and Rama Subbaiah K, 2017, "Performance of double cropping system (Setaria- bengalgram) for enhancing cropping intensity and net income in rainfed black soils of Ananthapuramu district", National seminar on Agronomic approaches for climate resilience, Page No 11.

XI. AWARDS AND HONOURS

Dr. G. Ramachandra Rao, Professor, Department of Environmental Science, Advanced P.G. Centre, Lam received Dr. I.V. Subba Rao, Rythu Nestham award for his excellence in extension activities as DAATTC Co-ordinator.

Dr. K. Radhika, Associate Professor, Department of Seed Science & Technology received Sri Mandava Venkataramaiah Best Teacher award.

Dr. Lal Ahamed M, Assistant Professor Department of Molecular Biology & Biotechnology was conferred with University Best Teacher award.

Dr. P. V. Krishnayya, Professor and University Head, Entomology received Ugadi Puraskar for the year 2017.

B. Naga Lakshmi, Lady Physical Director, Agricultural college, Bapatla, secured 1st rank in Master of Physical Education (M.P.Ed) and received University Gold Medal from the Hon'ble Governor of Andhra Pradesh.

Dr. V. R. K. Murthy, Professor and Head, Department of Agronomy, Agricultural college, Bapatla, received Andhra Pradesh State Best Teacher award on 05.09.2016.

Dr. B. Venkateswarlu, Professor, Department of Agronomy, Agricultural college, Bapatla, received Best Teacher award as Ugadi Puraskaram in April 2017 from State Government of Andhra Pradesh.

Dr. M. Shanthi Priya, Associate Professor, Department of Genetics and Plant Breeding, S.V. Agricultural College, Tirupathi was adjusted with University Best Teacher award for the year 2014 during 48th convocation held at Agricultural College, Bapatla.

Dr. S.R.Koteswara Rao, Professor and Head, Department of Entomology, S.V. Agricultural College, Tirupathi received State level Best Teacher award for the year 2016.

Dr. P. Sudhakar, Professor and Head, Department of Crop Physiology, S.V. Agricultural College, Tirupathi received Ugadi Puraskarm Award -2017, from the Government of Andhra Pradesh. He also received Reviewer Excellence award for the year 2016.

Dr. M. V. S. Naidu, Professor, Department of Soil Science, S.V. Agricultural College, Tirupathi received Best Poster award at ISSS convention, Gwalior.

Dr. S.R.Koteswara Rao, Professor and head, Department of Entomology, S.V. Agricultural College, Tirupathi was nmminated as a Member, Board of Management, ANGRAU during 2016 for a tenure of three years

Dr. K.N. Ravi Kumar Professor and Head, Department of Agricultural Economics, Agricultural College, Mahanandi, received State Best Teacher Award-2016from the Government of Andhra Pradesh.

Dr. A.V.S. Durga Prasad, Assistant Professor, Department of Genetics and Plant Breeding, Agricultural College, Mahanandi received Dr. P. Veerabadhiran Gold Medal for best Ph.D thesis in blackgram from Indian Society of Plant Breeders, TNAU, Coimbatore on 9th, September, 2016.

Dr. A.V.S. Durga Prasad, Assistant Professor, Department of Genetics and Plant Breeding, Agricultural College, Mahanandi received ISPB Student Cash Award 2105-16 for

securing third Rank during his Ph.D in Genetics and Plant Breeding from Indian Society of Plant Breeders, Centre for Plant Breeding and Genetics, TNAU, Coimbatore on 9th, September, 2016.

Dr. A.V.S. Durga Prasad, Assistant Professor, Department of Genetics and Plant Breeding, Agricultural College, Mahanandi received "Excellence in Teaching award in Genetics & Plant Breeding" from Astha Foundation during the National Conference on Innovative and Current Advances in Agriculture and Allied Sciences (ICAAAS-2016) organized at PJTSAU, Rajendranagar, Hyderabad on 10th and 11th December, 2016.

Dr. S. Dhurua, Associate Professor and Head, Department of Entomology, Agricultural College, Naira received appreciation certificate from District Administration during Republic day Celebrations, 2017 at Srikakulam.

Dr. N. Sunanda, Assistant Professor, Department of Agricultural Economics, Agricultural College, Naira received Best Teacher award and Commendation Certificate from Dr. R. Ankaiah, Associate Dean, Agricultural College, Naira on the occasion of Independence Day Celebrations, 2016.

Dr. S. Neelaveni, Assistant Professor and Head, Department of Agricultural Extension, Agricultural College, Naira received best participant award in Winter school on "New Age Extension Strategy for Communication Proficiency and Managerial Skill for Extension Professionals" at BCKV, Kalyani.

Dr. S. Govinda Rao, department of Statistics & Mathematics, Agricultural College, Naira received Certificate of Appreciation, during the 68th Republic Day Celebrations held at Agricultural College, Naira on 26.01.2017.

Dr. L. Edukondalu, Assistant Professor, College of Agriculture Engineering, Bapatla, received "Meritorious Teacher Award".

Er. A. Ashok Kumar, Assistant Professor, Department of Farm Machinery and Power, College of Agriculture Engineering, Madakasira, received IEI Young Engineers Award 2016-17 in Agricultural Engineering discipline.

Dr. Ch. V. V. Satyanarayana, Assistant Professor, College of Food Science and Technology, Bapatla received A.P State Best Teacher award from the honorable Chief Minister of A.P on 7.9.2016 at Vijayawada.

Er. A. Sambaiah, Scientist (SWE-1), Saline water scheme, Bapatla was awarded with "Meritorious Scientist Award" by Government of Andhra Pradesh on the eve of Republic Day, 2017.

Dr. S.V.S. Gopala Swamy, Scientist, Entomology, Post-Harvest Technology Centre, Bapatla received "MERITORIOUS SCIENTIST AWARDS" in the Agriculture from the Honorable Chief Minister of Andhra Pradesh, Sri. N. Chandrababu Naidu on the occasion of 48th Annual Convocation of Acharya N. G. Ranga agricultural University on 26th September, 2016 at Bapatla.

Er. S. Vishnuvarddhan, Scientist, Agricultural Engineering and Food Processing, Post-Harvest Technology Centre, Bapatla received "MERITORIOUS SCIENTIST AWARDS" in Agricultural Engineering from the Honorable Chief Minister of Andhra Pradesh, Sri. N. Chandrababu Naidu on the occasion of 48th Annual Convocation of Acharya N. G. Ranga agricultural University on 26th September, 2016 at Bapatla.

Dr. T. Sujatha, Senior Scientist, Crop Physiology, SRS, Vuyyuru received 'Best Paper award' and 'Gold Medal' for the research paper presented during 45th Annual Convention of SISSTA held on 15th and 16th July, 2016 at Chennai.

Dr. T. S. S. K. Patro, Senior Scientist and Head, ARS, Vijayanagaram received Outstanding Scientist award-2016 at 3rd International Conference on Agriculture, Horticulture & Plant Sciences, New Delhi, India organized during 25th and 26th June, 2016.

Dr. T. S. S. K. Patro, Senior Scientist and Head, ARS, Vijayanagaram received Special Recognition Award-2016 during 5th International Conference on Integration of Science and Technology for Sustainable Development 2016 held during 26th and 27th, November, 2016 at Inle Cherry Queen Hotel, Southern Shan State, Myanmar.

Smt. N.Anuradha, Scientist, Plant Breeding, ARS, Vijayanagaram received BRICPL Young Scientist Award-2016 at International Conference on Emerging Trends in Chemical, Physical and Biological Sciences (ICET-2016) held during 9th to 11th December, 2016 at Kathmandu, Nepal.

Smt. Y Sandhya Rani, Scientist, ARS, Vijayanagaram received Young Scientist Award-2016, from Astha Foundation at National Conference on Innovative and Current Advances in Agriculture and Allied Sciences (ICAAAS-2016) during 10th and 11th, December, 2016, at Hyderabad.

Smt. U. Triveni, Scientist, ARS, Vijayanagaram received Young Scientist Award-2016 at 4th International Conference on Recent Advances in Agriculture and Horticulture Sciences, held during 30th and 31st December 2016 at The Fern Residency Jodhpur, Rajasthan.

Dr.K.Tejeswara Rao, Agronomist (AICRP, IFS, ECF Scheme) ARS, Seethampeta, received Best Scientist award from the District Magistrate on the eve of republic day celebrations in Srikakulam.

Sri N.Lakshminarayana, Scientist, Extension, ARS, Seethampeta received Best Scientist award from PO, ITDA, Seethampeta on the eve of republic day celebrations.

Dr. K.Bhargavi , ARS, Reddipalli received Vasantha Rao Naik award for the year 2016-2017 for implementation of Dryland Agriculture in farmers' fields.

Smt. Ch. Sreelakshmi, Scientist, Plant Breeding, ARS, Nellore, received Young Scientist award during 48th Annual convocation at Agricultural College, Bapatla on 26.09.16.

Dr. U. Vineetha, Scientist, Agronomy, ARS, Nellore, received consolation prize for the best poster presentation in National Seminar on Agronomic approaches of climate resilient Agriculture on 02.05.17.

Dr. P. Ramesh Babu, Principal Scientist, Plant Breeding, ARS, Nellore, received reviewer excellence award as reviewer of Indian Journal of Agricultural Research and Legume Research on 17.06.2016.

Dr. M. Vijaya Sankar Babu, ARS, Anantapur received Distinguished Scientist award during National Seminar on Innovative and Current Advances in Agriculture and allied sciences (ICAAAS-2016) held at PJTSAU, Hyderabad during 10th and 11th December, 2016.

Dr. G. Narayanaswamy, ARS, Anantapur received Best Scientist award for the year 2016

at National Seminar on Innovative and Current Advances in Agriculture and allied sciences (ICAAAS-2016) held at PJTSAU, Hyderabad during 10th and 11th December, 2016.

A. Malliswara Reddy, ARS, Anantapur received Young Scientist awared at National Seminar on Innovative and Current Advances in Agriculture and allied sciences (ICAAAS-2016) held at PJTSAU, Hyderabad during 10th and 11th December, 2016.

K.C. Nataraj, ARS, Anantapur, receiving Young Scientist award at National Seminar on Innovative and Current Advances in Agriculture and allied sciences (ICAAAS-2016) held at PJTSAU, Hyderabad during 10th and 11th December, 2016

Dr.P.Jamuna, Principal Scientist and Extension Specialist, RARS, Anakapalli received Rashtriya Gaurav award from India International Friendship Society (IIFS), New Delhi on 13.8.2016 for outstanding services, achievements & contributions from Shri Bheeshma Narayan Singh, Hon'ble Ex. Governor of Uttarakhand.

Dr.P.Jamuna, Principal Scientist and Extension Specialist, RARS, Anakapalli received Appreciation Certificate with Memento for acting as Co-Chairman in the Centennial Fiesta National symposium (21-23, December 2016) held by UPCSR (Uttar Pradesh Council of Sugarcane Research) at Shahjahanpur during Technical session on Transfer of Technology (TOT) conducted on 22.12.2016.

Dr.P.Jamuna, Principal Scientist and Extension Specialist, RARS, Anakapalli received Vocational Excellence Award, given by Rotary club, Anakapalle for the year 2016-17 in the field of Agricultural Research during Rotary club Annual meet on 26.1.2017 in the Rotary club hall at Anakapalle.

Dr.P.Jamuna, Principal Scientist and Extension Specialist, RARS, Anakapalli received Ugadi Puraskaralu for the year 2017 from Hon'ble Chief Minister, Shri Nara Chandra Babu Naidu garu at Thummalapalli Kala Kshetram, Vijayawada on 29.3.2017.

Dr. Ch.Mukunda Rao, Principal Scientist, Crop Physiology, RARS, Anakapalli received an award of Best Employee / State best citizen of A.P.2016 by A.P. State cultural Awareness society, Andhra Pradesh from Dr.Yaduraj, Retired Chief Justice, Hyderabad on 13.03.2017.

Dr. Ch.Mukunda Rao, Principal Scientist, Crop Physiology, RARS, Anakapalli received an award of Meritorious Scientist 2017 from International journal of tropical agriculture (IJTA), Rishikesh, Uttarakhand on 24.06.2017.

Dr. B. Bhavani, Senior Scientist, Entomology received KCP Award of Prize (Gold medal) to an Agril. Scientist working in ANGRAU for notable and original research contribution on any aspects on Sugarcane production under endowment fund made by Sugarcane Growers Association of M/s. KCP Limited, Vuyyur for the year 2014 during 48th Annual Convocation of ANGRAU held on 26-9-16 at Agricultural College, Bapatla.

Dr. B. Bhavani, Senior Scientist, Entomology received Dr A.P.J Abdul Kalam Excellency award from IIFS, New Delhi during National Seminar on Economic Growth and National Integration on 14th January, 2017.

Dr. Ch. S. Rama Lakshmi, Scientist, Soil Science received VR Durgamba Charitable trust endowment award for organic farming research

in Sugarcane during 48th annual convocation of ANGRAU on 26.09.2016 held at Agricultural College, Bapatla.

Dr.N.P.Eswara Reddy, Principal Scientist, RARS, Tirupathi received "Scientist of the Year Award 2017" in the 5th International Conference on Agriculture, Horticulture and Plant Science held at Rishikesh, Uttarakhand during 24th-25th, June 2017 organized by International Journal of Tropical Agricultural Serials Publications Pvt. Ltd., New Delhi.

Dr R. P. Vasanthi, Principal Scientist, Plant Breeding, RARS, Tirupathi received Reviewer Excellence award of ARCC, Karnal.

Dr. L. Prasanthi, Principal Scientist, Plant Breeding, RARS, Tirupathi received distinguishing scientist award for 2016 from Society for Scientific development in Agriculture and Technologies.

.Dr. M. V. Ramana, Principal Scientist, Agricultural Engineering, RARS, Tirupathi recevied Dr. A. V. Krishnaih Memorial gold medal award for the year 2014-15 during 48th annual convocation held at Agricultural college Bapatla on 26.9.2016.

Dr. M. V. Ramana, Principal Scientist, Agricultural Engineering, RARS, Tirupathi recevied best ISAE State chapter for organizing National seminar on farm mechanization at RARS Tirupati during Feb 2017 at HAU, Hissar.

Dr P. Pratima, Senior Scientist, Agro-meteorology, RARS, Tirupathi received National Level Best Agromet Field Unit award among 130 AMFUS on 142nd Foundation Day celebrations on 15th January, 2017 at Mausam Bhavan, Lodhi Road, New Delhi.

Dr. K. V. Naga Madhuri, Senior Scientist, Soil Science, RARS, Tirupathi received Commendation certificate from District Collector and Magistrate, Chittoor during 68th Republic Day celebrations, 2017 at Chittoor.

Dr. K. V. Naga Madhuri, Senior Scientist, Soil Science, RARS, Tirupathi received Best Poster award during Inter Drought V International conference-2017 during 21st to 25th February, 2017 at Novotel, Hyderabad.

K. Devaki, Scientist, Entomology, RARS, Tirupathi received Meritorious award from District Collector and Magistrate, Chittoor district on the occasion of Independence Day celebrations on 15.08.2016.

P. Maheswara Reddy, Scientist, Agronomy, RARS, Tirupathi received Meritorious award from District Collector and Magistrate, Chittoor district on the occasion of Independence Day celebrations on 15.08.2016.

Dr. Kadiri Mohan, Scientist, Agricultural Extension, RARS, Tirupathi received Meritorious award from District Collector and Magistrate, Chittoor district on the occasion of Republic Day celebrations on 26-1-2017.

Dr. Y. Satish, Scientist, Plant Breeding, RARS, Lam, Guntur received University level Meritorious Research Scientist Award during 48th Annual Convocation of ANGRAU on 26.9.2016 at Agricultural College Bapatla.

Dr. V. Bhuvaneswari, Scientist, Plant Pathology, Marutetu received Sri Veerapaneni Narasimham Memorial Gold Medal" for the year 2014-15 for best Research in Plant Pathology during 48th Annual Convocation of ANGRAU on 26.9.2016 at Agricultural College Bapatla.

Dr. P. Venkata Ramana Rao, Scientist, Plant Breeding, Maruteru received UGC sponsored

Raman Fellowship for Post Doctoral Research for Indian Scholars in USA for a period of nine months from August 2016 to April 2017.

Dr S. J Reddy, Principal Scientist, Agricultural Engineering, Nandayal received Mahindra Samriddhi India Agri Award-2016.

Dr. Y. Rama Reddy, Principal Scientist Plant Breeding, Nandayal received Best Scientist Award by Seedsmen Association, Hyderabad.

Dr Y. Rama Reddy, Principal Scientist Plant Breeding, Nandayal received Padmasri I.V.Subba Rao Memorial Award by Rythunestham Magazine, Hyderabad.

Dr. P. Munirathnam, Principal Scientist, Agronomy, Nandayal received Ugadi Puraskaram-2017 by Government of Andhra Pradesh.

Dr. S. Rajasekhar Naidu, Co-ordinator, DAATTC, Chittoor is awarded with Ugadhi Puraskaram -2017 on 23.03.2017 from Hon'ble Chief Minister Sri. N. Chandrababu Naidu.

DAATTC, Anantapur received the best DAATTC, for mass communication of press and electronic media in the year 2015-16 occasion of REAC meeting on 4-5th of December, 2017.

KVK, Utukuru received Best KVK Award for the year 2015-16 of ANGRAU on 4-12-2016.

KVK, Utukuru received Best Entreprenureship Development award for the year 2015-2016 of ANGRAU,

Dr.A.Veeraiah, Programme Coordinator, KVK, Utukuru received Appreciation Certificate from District Collector for 2016.

KVK, Amadalavalasa received ICAR Zonal best KVK award for 2016 from ICAR, New Delhi.

KVK, Amadalavalasa received Independence day award in the name of Best performing institute for the year 2016 from the District Administration.

KVK, Darsi Received Best presentation award for Cluster frontline demonstrations of Oil seeds under NFSM at Indira Gandhi Krishi Vidyaapeeth, Chhattisgarh, Raipur during National workshop and review meeting of CFLD's of oil seed crops.

KVK, Darsi received Best presentation award for Cluster frontline demonstrations of Oil seeds and pulses under NMOOP at ATARI, Zone-V, Hyderabad during National workshop on NFSM and NMOOP.

Dr. V. Sailaja, Associate Professor, KVK, Gantashala received ANGRAU Meritorious Teacher Award in the faculty of Agriculture for 2014 during 48th ANGRAU annual convocation at Agricultural college, Bapatla.

Dr.M.Rajasri, Programme Coordinator, KVK, Garikapadu received "Outstanding Scientist Award 2016" in IJTA 3rd International Conference on Agriculture, Horticulture and Plant Sciences, New Delhi, India.

Dr. V. Jyothi, SMS, KVK, Garikapadu, received second price for best participant award from Dr. A. K. Singh, DDG (Agril. Extn.), ICAR, New Delhi in 21 days ICAR sponsored CAFT training programme on "Information Communication Technology Mediated Agricultural Extension" at ICAR-IARI, New Delhi during 2nd - 22th August, 2016.

Dr.M.Rajasri, Programme Coordinator, KVK, Garikapadu received "Distinguished Scientist Award" in ICET-2016, Kathmandu,

Nepal organized by Biologix Research and Innovation Centre, India in collaboration with Biotechnology Society of Nepal.

Dr. V. Jyothi, SMS, KVK, Garikapadu received Best Paper Presentation Award for the research paper entitled "Pocket Cards - An Innovative Low Cost Extension Methodology in Disseminating Critical Crop Interventions to Farming Community" during 8th National Extension Education Congress organized by Society of Extension Education, Agra at NAARM, Hyderabad. She also received Best Extension Professional Award during the congress.

Dr.P.Bala Hussain Reddy, Prog. Coordinator, KVK, Kalikiri received Dr.Abdul Kalam Life time achievement National Award from International Institute for Social and Economic Reforms, Bengaluru.

Dr.P.Bala Hussain Reddy, Prog. Coordinator, KVK, Kalikiri received Commendation certificate on Republic day from District Administration, Chittoor.

KVK Kalyandurg received best KVK Award in Publicity category for the year 2015-16 by ANGRAU.

ANNEXURE I

MEMBERS OF RESEARCH AND EXTENSION ADVISORY COUNCIL (REAC)

Chairperson

Sri B.Rajsekhar, I.A.S.
Vice-Chancellor

Convener and Secretary

Dr. N. V. Naidu
Director of Research, ANGRAU

Members

Members of the Board of Management

Sri K.S. Jawahar, MLA,
Kovvur

Sri B.C. Janardhan Reddy MLA,
Banaganapalli

Sri Mekala Lakshmi Narayana,
Progressive Agriculturist, Guntur

Sri T V Muralinatha Reddy,
Progressive Agriculturist, Tirupati

Sri Alluri Vijaya,
Progressive Agriculturist, Visakhapatnam

Sri Chapara Ganapathi Rao,
Progressive Agriculturist, Srikakulam

Sri P. Rajsekhar, ZPTC
Mummudivaram, East Godavari dist.

Dr. G.V. Nageswara Rao,
Professor (Plant Pathology), ANGRAU
Rajamahendravaram

Commissioner & Director of Agriculture,
Govt. of A.P

Managing Director,
A.P.S.S.D.C

Director,
APSSCA, Govt. of A.P.

Director,
Women and Child Welfare, Govt. of A.P

University Officers

Dr K Raja Reddy
Director of Extension

Dr. T. Ramesh Babu
Dean of Agriculture, ANGRAU

Dr. D. Bhaskar Rao
Dean of Agril. Engg. & Technology, ANGRAU

Dr. T. Neeraja
Dean of Home Science

Eminent Scientists

Dr. B. Lakshmi Reddy,
Ex. Director of Extension, ANGRAU

Dr.A.Satyanarayana,
Ex-Director of Extension, ANGRAU

Dr. N. Srirama Reddy,
Ex-Dean of Agriculture, ANGRAU

Associate Directors of Research

Dr N. Venugopala Rao
North Coastal Zone

Dr V. Satyanarayana
Godavari Zone

Dr P Ratna Prasad
Krishna Zone

Dr T C M Naidu
Southern Zone

Dr B. Gopal Reddy
Scarce Rainfall Zone

Dr G Jogi Naidu
High Altitude and Tribal Area Zone

Associate Deans of Colleges

Dr. P.R.K. Prasad
Agricultural College
Bapatla – 522 101
Guntur District.

Dr. V. Raja Rajeswari
S.V. Agricultural College
Tirupati – 517 502
Chittoor District.

Dr. R. Anakaiah
Agricultural College
Naira – 532 185
Srikakulam District.

Dr. D. Balaguravaiah
Associate Dean,
Agricultural College (M.C Farm)
Mahanandi – 518 502
Kurnool District.

Dr. P. Jayarami Reddy
Associate Dean, Agricultural College
(SKVT Degree College Campus)
Near Y Junction,
Rajahmundry – 533 105
East Godavari District.

Dr. A. Mani
Associate Dean
College of Agricultural Engineering
Karlapalem Road
Bapatla - 522101
Guntur District.

Dr. C. Ramana
Associate Dean
College of Agricultural Engineering
Madakasira – 515301
Anantapuramu District

Dr. D Vishnu Sankar Rao
Associate Dean
College of Food Science & Technology
Bapatla - 522101
Guntur District.

Dr. S. Kaleemullah
Associate Dean
College of Food Science & Technology
Pulivendula – 516 390
Kadapa District.

Dr. L. Uma Devi
Associate Dean
College of Home Science
Door No- 238
Chinmaya Balanivas (Balanivas)
S.V.N. Colony, Guntur – 522 006.

Progressive Farmers

Sri Gangadhar,
Annavaram Village,
Chodavaram Mandal,
Visakhapatnam District

Sri Mucherla Kalyan Kumar
Near Venugopalaswami temple,
Pawara Village, Samalkot Mandal,
East Godavari District

Sri K. Rama Krishna,
Obanna Village,
Naguppalpadu Mandal,
Prakasam District

Sri C. Venkata Subba Reddy
Goturu Village & Post,
Valluru Mandal,
YSR Kadapa District

Sri P. Mahesh,
Udiripikonda,
Kuderu Mandal,
Anantapuramu district.

Sri N. Nooka Raju,
Gujji padu Village,
Kurupam Mandal,
Vizianagaram District

Agro Business Consortium

Sri A. Bhavani Prasad,
D. No.31-7-7/C,
Ghna Apartments, A3,
Maruthinagar,
Vijayawada,
Krishna District

Sri P. Bhudevi,
Hira mandalam Village & Post,
Srikakulam District

Woman Farmer

Smt.M. Bhanumathi,
W/o. M. Venkata Narasimha Rao,
D. No.1-126, Opp: Ramalayam Street,
Maddirala Post,
Chilakaluripet Mandal,
Guntur District

Special Invitees

Sri I. Narasimha Raju,
Farmer, Yendagandi Village,
Bheemavaram Mandal,
West Godavari District

Sri K. Sri Hari Rao
Farmer, Lingarao Palem Post,
Yedlapadu Mandal,
Guntur District

Sri A. Malleswari,
Farmer, Nutakki,
Mangalagiri Mandal,
Guntur District

Sri Ch. Sriramamurthy,
Farmer, Ch Uppalapadu Post,
Ammanabrolu,
Naguppulapadu Mandal,
Prakasam District

Sri K. Malakondaiah,
Farmer, Singapeta Village,
Alluru Mandal,
SPSR Nellore District

Smt.K. Ratnamala,
Farmer, Munagalapalem Village & Post,
Yerpedu Mandal,
Chittoor district

Sri N. Nageswara Raju,
Farmer, Swamrayakandriga,
NR Kandriga Post,
Karaveti nagar Mandal,
Chittoor district

Sri D. Rama Subba Reddy,
Farmer, Appalapuram Village,
Banaganapalle Mandal,
Kurnool District

Smt.G. Sakuntala
W/o. G. Venkata Sep,
Farmer, Pandipadu Village,
Kalluru Mandal,
Kurnool district

Sri K. Rama Chandra Reddy,
Farmer, Akuledu Village,
Singanamala Mandal,
Anantapuramu district

Smt K. Kalavathi,
Farmer, Lakkaguda Village,
GL Puram Mandal,
Vizianagaram district

Sri Batchu Sreenivasa Rao,
Chairman,
BR Group of Educational Institutions,
301, Anish Residency,
3rd line Symala Nagar,
Guntur-522 006.

Representative from KVKs (operated by NGOs)

Programme Coordinator,
KVK, Yagantipalle,
Kurnool District.

Programme Coordinator,
KVK, BCT, Yellamanchilli,
Visakhapatnam

Programme Coordinator,
KVK, RASS, Tirupati.

Principal Scientists of crops / disciplines

Principal Scientist (Rice),
RARS, Maruteru.
Principal Scientist (Millets) & Head,
ARS, Perumallapalle, Chittoor district.

Principal Scientist (Pulses),
RARS, Lam, Guntur.
Principal Scientist (Groundnut),
ARS, Kadiri, Anantapuramu district.

Principal Scientist (Sugarcane),
RARS, Anakapalle,
Visakhapatnam district.

Principal Scientist (Cotton),
RARS, Lam, Guntur.

Principal Scientist (Farm Mechanization),
RARS, Tirupati, Chittoor district.

Principal Scientist (Microbiology) & Head,
ARS, Amaravati, Guntur district.

Principal Scientist (Dryland Agriculture) & Head,
ARS, Anantapuramu.

Principal Scientist (Agronomy),
Integrated Weed Management Scheme,
RARS, Lam.

Principal Scientist (Seeds),
STR & PC, Thangadancha,
via Jupadu Bunglow,
Kurnool district.

University Heads of Departments

Nodal Officer,
Admn. Office, ANGRAU, Guntur
and University Head, Department of Agronomy

Principal Scientist (Plant Breeding),
RARS, Lam, Guntur and University Head,
Department of Genetics & Plant Breeding.

Principal Scientist (Biotechnology) &
University Head, Department of Biotechnology,
RARS, Tirupati.

Associate Dean, Agricultural College, Naira
and University Head, Department of Entomology.
Principal Scientist (Plant Pathology),
ARS, Nellore & University Head,
Department of Plant Pathology

Associate Dean, Agricultural College, Mahanandi
and University Head,
Department of Soil Science & Agricultural Chemistry.

Principal Scientist (Microbiology)
& University Head,
Department of Microbiology,
ARS, Amaravati.

Professor and University Head,
Department of Crop Physiology,
Agricultural College, Rajamahendravaram

Associate Dean,
College of Food Science and Technology, Bapatla
and University Head,
Department of Agril. Economics.

Associate Dean,
Agricultural College,
Rajamahendravaram & University Head,
Department of Extension Education.

Professor & University Head,
Department of Statistics and Mathematics,
Agricultural College, Bapatla.

Professor (Academic),
O/o Dean of Agricultural Engineering and Technology,
Admn. Office, ANGRAU, Guntur
and University Head,
Department of Soil & Water Engineering.

Principal Scientist (Agril. Engg.),
AICRP on PHET,
RARS, Anakapalle and University Head,
Department of Agril. Process & Food Engineering

Associate Dean,
College of Agricultural Engineering,
Madakasira and
University Head,
Department of Farm Machinery & Power.

Professor & University Head,
Department of Food Engineering,
College of Food Science and Technology, Bapatla.

Professor & University Head,
Department of Food Science & Technology,
College of Agricultural Engineering, Bapatla.

Professor and University Head,
Department of Foods & Nutrition,
College of Home Science, Guntur.

Associate Dean,
College of Home Science, Guntur
and University Head,
Department of Human Development & Family Studies,
Extension & Communication Management.

Professor and University Head,
Department of Apparel & Textiles,
College of Home Science, Guntur.

ANNEXURE II

CADRE-WISE FACULTY STRENGTH DURING 2016-17

S. No.	Name of the College / Research Station / Extension Unit	Professor / Principal Scientist		Associate Professor / Senior Scientist		Assistant Professor/ Scientist	
		S	I.P.	S	I.P.	S	I.P.
1	2	3	4	5	6	7	8
TEACHING							
1	Agricultural College, Bapatla	8	2	9	5	69	40
2	S.V. Agricultural College, Tirupati	5	2	10	5	53	37
3	Agricultural College, Naira	1	1	11	4	18	9
4	Agricultural College, Mahanandi	1	1	7	4	16	10
5	Agricultural College, Rajamahendravaram	2	0	11	4	20	11
6	Advanced P.G. Centre, Guntur	0	3	0	5	0	9
7	Institute of Agri. Business Management, Tirupati	0	0	0	1	0	2
8	College of Agricultural Engineering, Bapatla	1	1	6	4	15	12
9	College of Agricultural Engineering, Madakasira	6	1	8	0	17	10
10	College of Food Science & Technology, Bapatla	1	0	5	2	9	5
11	College of Food Science & Technology, Pulivendula	5	1	13	0	18	6
12	College of Home Science, Guntur	0	1	0	0	10	7
13	Agriculture Polytechnic, Anakapalle	0	0	0	0	0	1
14	Agriculture Polytechnic, Maruteru	0	0	1	0	0	0
15	Agriculture Polytechnic, Podalakur	0	0	1	1	0	0
16	Agriculture Polytechnic, Reddipalli	0	0	1	1	2	0
17	Agriculture Polytechnic, Utukur	0	0	1	0	2	2
18	Agriculture Polytechnic, Garikapadu	0	0	4	0	3	0
19	Agriculture Polytechnic, Madakasira	0	0	0	0	5	0
20	Agriculture Polytechnic, Chintapalle	0	0	0	0	0	0
21	Agriculture Polytechnic, Nandyal	0	0	0	0	0	0
22	Agriculture Polytechnic, Tirupati	0	0	0	0	0	0
23	Agriculture Polytechnic, Kalikiri	0	0	1	0	4	2
24	Agriculture Polytechnic, Somasila	0	0	0	0	0	0
25	Agricultural Polytechnic, Rampachodavaram	0	0	0	0	0	0

S. No.	Name of the College / Research Station / Extension Unit	Professor / Principal Scientist		Associate Professor / Senior Scientist		Assistant Professor/ Scientist	
		S	I.P.	S	I.P.	S	I.P.
1	2	3	4	5	6	7	8
26	Agricultural Polytechnic, J.M.Puram	0	0	0	0	0	0
27	Agricultural Polytechnic, Gantasala	0	0	0	0	0	0
28	Agricultural Polytechnic, Ramagiri	0	1	0	0	0	0
29	Agril. Polytechnic (Seed Technology), J.M.Puram	0	0	0	0	0	0
30	Agril. Polytechnic (Organic Farming) Chintapalle	0	0	0	0	0	0
31	Polytechnic of Agricultural Engineering, Kalikiri	0	0	0	0	0	0
32	Polytechnic of Agricultural Engineering, Anakapalle	0	0	0	0	0	0
	Sub Total (Teaching)	**31**	**11**	**90**	**34**	**259**	**153**
RESEARCH							
I. KRISHNA ZONE							
Guntur District							
1	Regional Agricultural Research Station, Lam	3	2	9	8	31	25
2	Rice Research Unit, Bapatla	0	0	1	1	4	1
3	Post Harvest Technology, Bapatla	0	0	1	1	4	3
4	Saline Water Research Scheme, Bapatla	1	1	1	0	4	3
5	AICRP on Sorghum	1	0	1	1	0	0
6	AICRP on FIM	0	0	1	0	0	1
7	Agricultural Research Station, Amaravati	1	1	0	0	2	2
8	Agricultural Research Station, J.M.Puram	0	0	0	0	3	2
Krishna District							
9	Agricultural Research Station, Vuyyuru	0	2	1	1	5	2
10	Agricultural Research Station, Machilipatnam	0	0	0	0	3	1
11	Agricultural Research Station, Garikapadu	1	0	1	1	2	0
12	Agricultural Research Station, Ghantasala	0	1	1	1	3	0
13	**Prakasam District**						
14	Agricultural Research Station, Darsi	0	0	1	0	4	2

S. No.	Name of the College / Research Station / Extension Unit	Professor / Principal Scientist		Associate Professor / Senior Scientist		Assistant Professor/ Scientist	
		S	I.P.	S	I.P.	S	I.P.
1	2	3	4	5	6	7	8
II. GODAVARI ZONE							
West Godavari District							
15	Regional Agril. Research Station, Maruteru	2	4	17	12	39	20
16	Agricultural Research Station, Vijayarai	0	0	1	1	0	0
East Godavari							
17	Agricultural Research Station, Peddapuram	0	0	0	1	3	2
III.	**NORTH COASTAL ZONE**						
Visakhapatnam District							
18	Regional Agril. Research Station, Anakapalle	2	1	9	8	19	11
19	Agricultural Research Station, Yelamanchili	0	0	0	0	4	2
Srikakulam District							
20	Agricultural Research Station, Amadalavalasa	0	0	1	1	4	3
21	Agricultural Research Station, Ragolu	0	3	2	0	3	0
Vizianagaram District							
22	Agricultural Research Station, Vizianagaram	0	0	1	1	5	2
IV.	**SOUTHERN ZONE**						
Chittoor District							
23	Regional Agricultural Research Station, Tirupati	1	1	11	11	11	10
24	Agricultural Research Station, Perumallapalle	1	1	0	0	5	5
SPS Nellore District							
25	Agricultural Research Station, Nellore	0	1	3	3	4	5
26	Agricultural Research Station, Podalakur	0	0	1	1	5	2
27	Agricultural Research Station, Kavali	1	0	0	0	0	0
YSR (Kadapa) District							
28	Agricultural Research Station, Utukur	0	0	1	1	5	4
V.	**SCARCE RAINFALL ZONE**						
Kurnool District							
29	Regional Agricultural Research Station, Nandyal	1	4	10	1	21	14
30	STRPC, Tangadancha	0	1	0	0	0	3

S. No.	Name of the College / Research Station / Extension Unit	Professor / Principal Scientist		Associate Professor / Senior Scientist		Assistant Professor/ Scientist	
		S	I.P.	S	I.P.	S	I.P.
1	2	3	4	5	6	7	8
Anantapuram District							
31	Agricultural Research Station, Anantapuramu	1	1	6	2	7	8
32	Agricultural Research Station, Reddipalli	0	0	1	1	0	0
33	Agricultural Research Station, Kadiri	1	1	6	4	2	1
VI. HIGH ALTITUDE AND TRIBAL AREA ZONE							
Visakapatnam District							
34	Regional Agril. Research Station, Chintapalle,	1	1	1	0	6	2
Srikakulam District							
35	Agricultural Research Station, Seethampet	0	0	1	0	4	2
	Sub Total (Research)	**18**	**23**	**79**	**61**	**212**	**138**
Krishi Vigyan Kendras (KVKs)							
1	KVK, Reddipalli, Anantapuram Dist.	0	1	1	1	6	4
2	KVK, Rastakuntabai, Vizianagaram Dist.	1	1	0	0	6	3
3	KVK, Amadalavalasa, Srikakulam Dist.	0	0	1	1	6	3
4	KVK, Utukur, YSR (Kadapa) Dist.	0	0	1	0	6	2
5	KVK, Undi, West Godavari Dist.	0	0	0	0	6	3
6	KVK, Darsi, Prakasam Dist.	0	0	1	0	6	2
7	KVK, Nellore, SPS Nellore Dist.	1	1	0	0	6	2
8	Dr. K. L.Rao KVK, Garikapadu, Krishna Dist.	0	0	1	0	6	4
9	KVK, Kalyandurg, Ananthapuram Dist.	0	1	1	0	6	1
10	KVK, Banavasi, Yammiganur, Kurnool Dist.	1	1	0	0	6	1
11	KVK, Kalikiri, Chittoor Dist.	0	0	1	0	6	3
12	KVK, Ghantasala, Krishna Dist.	0	1	1	0	6	3
13	KVK, Kondempudi, Vishakapatnam Dist.	0	0	0	0	6	1
District Agricultural Advisory & Transfer of Technology Centres (DAATTCs)							
14	DAATTC, Guntur District.	0	0	0	0	4	3
15	DAATTC, Machilipatnam, Krishna District.	0	0	0	0	3	3

S. No.	Name of the College / Research Station / Extension Unit	Professor / Principal Scientist		Associate Professor / Senior Scientist		Assistant Professor/ Scientist	
		S	I.P.	S	I.P.	S	I.P.
1	2	3	4	5	6	7	8
16	DAATTC, Eluru, West Godavari District.	0	0	0	0	3	1
17	DAATTC, Kakinada, East Godavari District	0	0	1	1	2	1
18	DAATTC, Ongole, Prakasam District	0	0	0	0	4	3
19	DAATTC, Anakapalle, Visakhapatnam District.	0	1	0	0	3	1
20	DAATTC, Vizianagaram District.	0	0	0	0	3	2
21	DAATTC, Srikakulam District	1	1	0	0	1	1
22	DAATTC, SPS Nellore District.	0	1	0	0	3	2
23	DAATTC, YSR (Kadapa) District.	0	0	2	1	0	0
24	DAATTC, Kurnool District.	0	0	0	0	3	2
25	DAATTC, Anantapuram District.	0	1	0	0	3	2
26	DAATTC, Chittoor District	0	1	0	1	3	1
Other Extension Centres							
27	Farmers Call Centre	0	0	0	1	0	0
	Sub Total (Extension):	**4**	**12**	**10**	**10**	**113**	**53**
	Administrative Office						
	Grand Total						

ANNEXURE III

STUDENTS' ENROLMENT BY COURSES, FIRST YEAR TO FINAL YEAR IN UNDERGRADUATE, POSTGRADUATE, DOCTORAL AND DIPLOMA PROGRAMMES DURING 2016-17

Course	Year	Total Student Enrolment			Enrolment Distribution													
					SC Students		ST Students		BC Students		OC Students		Muslim Minority		Physically Challenged Students		Foreign Students	
		Boys	Girls	Total	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
B.Sc. (Ag)	I	330	437	767	48	71	23	21	151	175	95	153	8	12	6	10	0	0
	II	265	312	577	37	48	24	10	103	130	91	114	7	5	5	8	0	0
	III	224	323	547	32	59	13	13	106	128	67	114	5	8	3	3	0	0
	IV	239	311	550	40	48	13	12	102	133	78	105	6	9	5	6	0	0
Sub Total (UG)		1058	1383	2441	157	226	73	56	462	566	331	486	26	34	19	27	0	0
M.Sc. (Ag)	I	53	82	135	9	9	8	0	20	33	14	36	2	2	0	0	1	1
	II	53	75	128	8	12	9	0	22	20	12	38	2	5	0	0	0	0
	Total	106	157	263	17	21	17	0	42	53	26	74	4	7	0	0	1	1
M.Sc. (ABM)	I	8	4	12	2	1	0	0	1	0	4	3	2	0	0	0	0	0
	II	1	2	3	0	0	0	0	0	2	1	0	0	0	0	0	0	0
	Total	9	6	15	2	1	0	0	1	2	5	3	2	0	0	0	0	0
Sub Total (PG)	115	163	278	19	22	17	0	43	55	31	77	6	7	0	0	1	1	
Ph.D. (Ag.)	I	22	27	49	3	6	3	1	10	9	5	10	1	1	0	0	0	0
	II	20	27	47	6	5	4	0	5	15	5	7	0	0	0	0	0	0
	III	13	16	29	4	3	2	0	5	8	2	5	0	0	0	0	0	0
Sub Total (Ph.D.)	55	70	125	13	14	9	1	20	32	12	22	1	1	0	0	0	0	

Course	Year	Total Student Enrolment			Enrolment Distribution													
					SC Students		ST Students		BC Students		OC Students		Muslim Minority		Physically Challenged Students		Foreign Students	
		Boys	Girls	Total	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Diploma	I	192	278	470	46	65	20	24	111	163	25	36	6	9	1	2	0	0
(Agriculture)	II	162	223	385	42	38	11	17	104	150	19	45	7	2	1	0	0	0
	Total	354	501	855	88	103	31	41	215	313	44	81	13	11	2	2	0	0
Diploma (Seed	I	9	12	21	1	3	0	1	5	5	3	3	0	0	0	0	0	0
Technology)	II	10	10	20	0	2	0	0	9	4	1	4	0	0	0	0	0	0
	Total	19	22	41	1	5	0	1	14	9	4	7	0	0	0	0	0	0
Diploma	I	7	16	23	2	3	2	0	2	10	1	3	0	0	0	0	0	0
Organic Farming)	II	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	7	16	23	2	3	2	0	2	10	1	3	0	0	0	0	0	0
Sub Total (Dip.)	380	539	919	91	111	33	42	231	332	49	91	13	11	2	2	0	0	
Sub Total (Agril.)	1608	2155	3763	280	373	132	99	756	985	423	676	46	53	21	29	1	1	
Faculty of Agricultural Engineering and Technology																		
UG Programmes																		
B.Tech.	I	61	46	107	5	5	2	3	30	27	16	9	0	2	0	0	8	0
(Ag.Engg.)	II	59	41	100	7	8	5	1	31	20	13	11	1	1	0	0	2	0
	III	62	47	109	6	8	3	2	30	26	18	23	1	1	0	1	1	0
	IV	51	60	111	4	12	3	2	21	22	18	20	1	1	0	0	6	0
	Total	233	194	427	22	33	13	8	112	95	65	63	3	5	0	1	17	0

Course	Year	Total Student Enrolment			Enrolment Distribution													
					SC Students		ST Students		BC Students		OC Students		Muslim Minority		Physically Challenged Students		Foreign Students	
		Boys	Girls	Total	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
B.Tech	I	35	43	78	6	7	5	1	15	17	8	18	1	0	0	0	0	0
(Food Tech.)	II	38	37	75	6	6	3	1	17	13	11	17	0	0	0	0	0	0
	III	29	52	81	6	8	3	1	10	25	10	18	0	0	0	0	0	0
	IV	27	42	69	2	8	2	3	13	17	10	14	0	0	0	1	0	0
	Total	**129**	**174**	**303**	**20**	**29**	**13**	**6**	**55**	**72**	**39**	**67**	**1**	**0**	**0**	**1**	**0**	**0**
Sub Total (UG)		**362**	**368**	**730**	**42**	**62**	**26**	**14**	**167**	**167**	**104**	**130**	**4**	**5**	**0**	**2**	**17**	**0**
PG Programmes																		
M.Tech.	I	5	12	17	1	1	1	1	4	4	0	3	0	1	0	0	0	1
(Ag.Engg.)	II	12	6	18	2	1	1	0	2	1	4	3	2	0	0	0	1	1
Sub Total (PG)		**17**	**18**	**35**	**3**	**2**	**2**	**1**	**6**	**5**	**4**	**6**	**2**	**1**	**0**	**0**	**1**	**2**
Doctoral Programmes																		
Ph. D.	I	10	0	10	3	0	1	0	2	0	3	0	0	0	0	0	1	0
(Ag.Engg.)	II	3	7	10	0	1	1	0	1	3	1	2	0	1	0	0	0	0
	III	5	0	5	2	0	1	0	2	0	0	0	0	0	0	0	0	0
Sub Total (Ph.D.)		**18**	**7**	**25**	**5**	**1**	**3**	**0**	**5**	**3**	**4**	**2**	**0**	**1**	**0**	**0**	**1**	**0**

Course	Year	Total Student Enrolment			Enrolment Distribution													
					SC Students		ST Students		BC Students		OC Students		Muslim Minority		Physically Challenged Students		Foreign Students	
		Boys	Girls	Total	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Diploma Programmes																		
Diploma	I	28	30	58	7	5	2	2	17	13	3	9	0	0	0	0	0	0
(Ag. Engg.)	II	21	36	57	3	7	1	2	9	18	8	8	0	1	0	0	0	0
	III	22	26	48	7	4	3	0	7	19	5	2	0	1	0	0	0	0
Sub Total	**71**	**92**	**163**	**17**	**16**	**6**	**4**	**33**	**50**	**16**	**19**	**0**	**2**	**0**	**0**	**0**	**0**	
(Diploma)																		
Sub Total		**468**	**485**	**953**	**67**	**81**	**37**	**19**	**211**	**225**	**128**	**157**	**6**	**9**	**0**	**2**	**19**	**2**
(Ag.Engg)																		
Faculty of Home science																		
UG Programmes																		
B.Sc. (HS)	I	0	97	97	0	21	0	11	0	41	0	16	0	8	0	0	0	0
	II	0	36	36	0	9	0	2	0	10	0	13	0	2	0	0	0	0
	III	0	27	27	0	7	0	6	0	12	0	1	0	1	0	0	0	0
	IV	0	25	25	0	8	0	1	0	10	0	6	0	0	0	0	0	0
Sub Total (UG)		**0**	**185**	**185**	**0**	**45**	**0**	**20**	**0**	**73**	**0**	**36**	**0**	**11**	**0**	**0**	**0**	**0**

Course	Year	Total Student Enrolment			Enrolment Distribution													
					SC Students		ST Students		BC Students		OC Students		Muslim Minority		Physically Challenged Students		Foreign Students	
		Boys	Girls	Total	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
PG Programmes	I	0	14	14	0	4	0	1	0	4	0	5	0	0	0	0	0	0
M.Sc. (HS)	II	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub Total (PG)	**0**	**14**	**14**	**0**	**4**	**0**	**1**	**0**	**4**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	
Ph.D. Programmes	I	0	3	3	0	2	0	0	0	1	0	0	0	0	0	0	0	0
Ph.D. (HS)	II	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	III	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub Total (Ph.D)		**0**	**3**	**3**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Sub Total (HS)		**0**	**202**	**202**	**0**	**51**	**0**	**21**	**0**	**78**	**0**	**41**	**0**	**11**	**0**	**0**	**0**	**0**
GRAND TOTAL		**2076**	**2842**	**4918**	**347**	**505**	**169**	**139**	**967**	**1288**	**551**	**874**	**52**	**73**	**21**	**31**	**20**	**3**

ANNEXURE IV

COLLEGE-WISE STUDENTS' STRENGTH - FIRST YEAR TO FINAL YEAR DURING 2016-17

S. No.	Name of the College	Year	Boys	Girls	Total	SC	ST	BC	OC	Muslim Minority	Physically Challenged Students		Foreign Students	
											Boys	Girls	Boys	Girls
Faculty of Agriculture														
1.	Agricultural College, Baptla	**B.Sc. (Ag.)**												
		I	89	146	235	40	13	92	78	12	1	5	0	0
		II	83	135	218	36	13	92	70	7	2	3	0	0
		III	84	123	207	39	9	84	65	10	2	2	0	0
		IV	88	105	193	32	9	72	73	7	4	3	0	0
		M.Sc. (Ag.)												
		I	33	34	67	12	4	31	18	2	0	0	0	0
		II	28	28	56	8	5	21	20	2	0	0	0	0
		Ph.D. (Ag.)												
		I	10	12	22	5	1	10	5	1	0	0	0	0
		II	8	9	17	5	0	10	2	0	0	0	0	0
		III	6	7	13	5	1	6	1	0	0	0	0	0
2.	S V Agricultural College, Tirupati	**B.Sc. (Ag.)**												
		I	81	92	173	24	12	37	88	5	4	3	0	0
		II	57	74	131	19	6	34	64	4	2	2	0	0
		III	57	74	131	18	7	35	69	2	0	0	0	0
		IV	58	81	139	21	7	34	69	7	0	1	0	0

S. No.	Name of the College	Year	Boys	Girls	Total	SC	ST	BC	OC	Muslim Minority	Physically Challenged Students		Foreign Students	
											Boys	Girls	Boys	Girls
		M.Sc. (Ag)												
		I	11	31	42	1	1	13	23	1	0	0	1	1
		II	19	34	53	9	3	15	21	5	0	0	0	0
		Ph.D. (Ag)												
		I	11	11	22	2	2	8	9	1	0	0	0	0
		II	12	17	29	6	4	10	9	0	0	0	0	0
		III	7	9	16	2	1	7	6	0	0	0	0	0
3	Agricultural College, Naira	**B.Sc. (Ag)**												
		I	77	90	167	19	6	119	18	3	1	1	0	0
		II	60	38	98	7	8	60	19	1	1	2	0	0
		III	31	50	81	11	5	60	3	1	0	1	0	0
		IV	39	63	102	13	5	70	11	1	0	2	0	0
		M.Sc. (Ag)												
		I	0	4	4	2	0	2	0	0	0	0	0	0
		II	1	1	2	0	1	1	0	0	0	0	0	0
4	Agricultural College, Mahanandi	**B.Sc. (Ag)**												
		I	53	59	112	18	7	42	44	0	0	1	0	0
		II	49	34	83	14	4	35	29	0	0	1	0	0
		III	31	43	74	10	2	38	23	0	1	0	0	0
		IV	35	37	72	12	3	42	14	0	1	0	0	0

S. No.	Name of the College	Year	Boys	Girls	Total	SC	ST	BC	OC	Muslim Minority	Physically Challenged Students		Foreign Students	
											Boys	Girls	Boys	Girls
		M.Sc. (Ag)												
		I	2	2	4	0	2	2	0	0	0	0	0	0
		II	1	2	3	1	0	1	1	0	0	0	0	0
5	Agricultural College, Rajahmundry	**B.Sc. (Ag)**												
		I	30	50	80	18	6	36	20	0	0	0	0	0
		II	16	31	47	9	3	12	23	0	0	0	0	0
		III	21	33	54	13	3	17	21	0	0	0	0	0
		IV	19	25	44	10	1	17	16	0	0	0	0	0
6	Advanced P.G. Centre, Guntur	**M.Sc. (Ag)**												
		I	7	11	18	3	1	5	9	1	0	0	0	0
		II	4	10	14	2	0	4	8	0	0	0	0	0
		Ph.D. (Ag)												
		I	1	4	5	2	1	1	1	0	0	0	0	0
		II	0	1	1	0	0	0	1	0	0	0	0	0
		III	0	0	0	0	0	0	0	0	0	0	0	0
7	Institute of Agril. Business Management, Tirupati	**M.Sc. (Ag)**												
		I	8	4	12	3	0	1	7	2	0	0	0	0
		II	1	2	3	0	0	2	1	0	0	0	0	0

S. No.	Name of the College	Year	Boys	Girls	Total	SC	ST	BC	OC	Muslim Minority	Physically Challenged Students		Foreign Students	
											Boys	Girls	Boys	Girls
Faculty of Agricultural Engineering & Technology														
		B.Tech. (Ag. Engg.)												
8	College of Agricultural Engineering, Bapatla B.Tech. (Ag. Engg.)	I	40	34	74	7	3	36	18	2	0	0	8	0
		II	39	32	71	10	4	36	17	2	0	0	2	0
		III	41	32	73	10	2	40	29	2	0	0	1	0
		IV	35	43	78	13	3	28	26	2	0	0	6	0
		M.Tech. (Ag. Engg.)												
		I	5	12	17	2	2	8	3	1	0	0	0	1
		II	12	6	18	3	1	3	7	2	0	0	1	1
		Ph.D. (Ag. Engg.)												
		I	10	0	10	3	1	2	3	0	0	0	1	0
		II	3	7	10	1	1	4	3	1	0	0	0	0
		III	5	0	5	2	1	2	0	0	0	0	0	0
		B.Tech. (Ag. Engg.)												
9	College of Agricultural Engineering, Madakasira	I	21	12	33	3	2	21	7	0	0	0	0	0
		II	20	9	29	5	2	15	7	0	0	0	0	0
		III	21	15	36	4	3	16	12	0	0	1	0	0
		IV	16	17	33	3	2	15	12	0	0	0	0	0
		B.Tech. (Food Tech.)												
10	College of Food Science and Technology, Bapatla	I	20	25	45	9	4	16	16	0	0	0	0	0
		II	28	28	56	9	4	23	20	0	0	0	0	0
		III	19	31	50	7	2	26	15	0	0	0	0	0
		IV	16	28	44	4	3	22	15	0	0	0	0	0

S. No.	Name of the College	Year	Boys	Girls	Total	SC	ST	BC	OC	Muslim Minority	Physically Challenged Students		Foreign Students	
											Boys	Girls	Boys	Girls
B.Tech. (Food Tech.)														
11	College of Food Science and Technology, Pulivendula	I	15	18	33	4	2	16	10	1	0	0	0	0
		II	10	9	19	3	0	7	8	0	0	0	0	0
		III	10	21	31	7	2	9	13	0	0	0	0	0
		IV	11	14	25	6	2	8	9	0	0	1	0	0
Faculty of Home Science														
		B.Sc. (H.Sc.)												
12	College of Home Science, Bapatla	I	0	97	97	21	11	41	16	8	0	0	0	0
		II	0	36	36	9	2	10	13	2	0	0	0	0
		III	0	27	27	7	6	12	1	1	0	0	0	0
		IV	0	25	25	8	1	10	6	0	0	0	0	0
		M.Sc. (H.Sc.)												
13	Advanced P.G. Centre, Guntur	I	0	14	14	4	1	4	5	0	0	0	0	0
		II	0	0	0	0	0	0	0	0	0	0	0	0
		Ph.D. (H.Sc.)												
		I	0	3	3	2	0	1	0	0	0	0	0	0
		II	0	0	0	0	0	0	0	0	0	0	0	0
		III	0	0	0	0	0	0	0	0	0	0	0	0

S. No.	Name of the College	Year	Boys	Girls	Total	SC	ST	BC	OC	Muslim Minority	Physically Challenged Students		Foreign Students	
											Boys	Girls	Boys	Girls
Diploma Programmes														
14	Agricultural	Diploma (Agriculture)												
	Polytechnic,	I	22	41	63	16	4	36	7	0	0	0	0	0
	Maruteru	II	29	49	78	17	6	46	9	0	0	0	0	0
15	Agricultural	Diploma (Agriculture)												
	Polytechnic,	I	17	40	57	9	3	42	3	0	1	1	0	0
	Anakapalli	II	30	36	66	12	4	46	4	0	0	0	0	0
16	Agricultural	Diploma (Agriculture)												
	Polytechnic,	I	12	14	26	4	1	14	3	4	0	0	0	0
	Podalakur	II	7	10	17	0	1	11	3	2	0	0	0	0
17	Agricultural	Diploma (Agriculture)												
	Polytechnic,	I	2	3	5	3	9	18	5	5	0	0	0	0
	Reddipalli	II	3	2	5	2	5	33	4	4	0	0	0	0
18	Agricultural	Diploma (Agriculture)												
	Polytechnic,	I	10	16	26	6	3	9	8	0	0	0	0	0
	Utukuru	II	9	11	20	4	2	8	6	0	0	0	0	0
19	Agricultural	Diploma (Agriculture)												
	Polytechnic,	I	7	17	24	3	4	9	7	1	0	0	0	0
	Kalikiri	II	6	18	24	4	2	10	6	2	0	0	0	0

S. No.	Name of the College	Year	Boys	Girls	Total	SC	ST	BC	OC	Muslim Minority	Physically Challenged Students		Foreign Students	
											Boys	Girls	Boys	Girls
Diploma Programmes														
20	Agricultural	Diploma (Agriculture)												
	Polytechnic,	I	21	3	24	6	1	14	3	0	0	0	0	0
	Ramachandrapuram	II	0	0	0	0	0	0	0	0	0	0	0	0
21	Agricultural	Diploma (Agriculture)												
	Polytechnic,	I	13	10	23	8	2	9	4	0	0	1	0	0
	JM Puram	II	8	17	25	10	2	10	3	0	0	0	0	0
22	Agricultural	Diploma (Agriculture)												
	Polytechnic,	I	7	16	23	6	1	11	5	0	0	0	0	0
	Madakasira	II	10	13	23	6	1	10	6	0	0	0	0	0
23	Agricultural	Diploma (Agriculture)												
	Polytechnic,	I	0	0	0	0	0	0	0	0	0	0	0	0
	Chintapalli	II	6	16	22	2	2	13	5	0	0	0	0	0
24	Agricultural	Diploma (Agriculture)												
	Polytechnic,	I	7	19	26	5	1	16	4	0	0	0	0	0
	Nandyal	II	17	9	26	4	0	18	3	0	1	0	0	0
25	Agricultural	Diploma (Agriculture)												
	Polytechnic,	I	15	14	29	9	3	15	0	2	0	0	0	0
	Somasila	II	14	10	24	6	1	10	7	0	0	0	0	0

S. No.	Name of the College	Year	Boys	Girls	Total	SC	ST	BC	OC	Muslim Minority	Physically Challenged Students		Foreign Students	
											Boys	Girls	Boys	Girls
Diploma Programmes														
26	Agricultural	Diploma (Agriculture)												
	Polytechnic,	I	10	28	38	9	3	26	0	0	0	0	0	0
	Garikapadu	II	10	22	32	8	2	30	0	0	0	0	0	0
27	Agricultural	Diploma (Agriculture)												
	Polytechnic,	I	7	17	24	7	3	9	3	2	0	0	0	0
	Tirupati	II	13	10	23	5	0	9	8	1	0	0	0	0
28	Agricultural	Diploma (Agriculture)												
	Polytechnic,	I	19	21	40	12	3	21	3	1	0	0	0	0
	Gantasala	II	0	0	0	0	0	0	0	0	0	0	0	0
29	Agricultural	Diploma (Agriculture)												
	Polytechnic,	I	23	19	42	8	3	25	6	0	0	0	0	0
	Ramagiri	II	0	0	0	0	0	0	0	0	0	0	0	0
30	Seed Technology	Diploma (Seed Technology)												
	Polytechnic,	I	9	12	21	4	1	10	6	0	0	0	0	0
	JM Puram	II	10	10	20	2	0	13	5	0	0	0	0	0
	Agril. Polytechnic,	Diploma (Organic Farming)												
	Organic Farming	I	7	16	23	5	2	12	4	0	0	0	0	0
	Chintapalli	II	0	0	0	0	0	0	0	0	0	0	0	0

S. No.	Name of the College	Year	Boys	Girls	Total	SC	ST	BC	OC	Muslim Minority	Physically Challenged Students		Foreign Students	
											Boys	Girls	Boys	Girls
Diploma Programmes														
31	Polytechnic of	Diploma (Agricultural Engineering)												
	Agriculture	I	17	13	30	6	2	15	7	0	0	0	0	0
	Engineering,	II	10	18	28	5	2	10	10	1	0	0	0	0
	Kalikiri	III	11	10	21	5	2	8	5	1	0	0	0	0
32	Polytechnic of	Diploma (Agricultural Engineering)												
	Agriculture	I	11	17	28	6	2	15	5	0	0	0	0	0
	Engineering,	II	11	18	29	5	1	17	6	0	0	0	0	0
	Anakapali	III	11	16	27	6	1	18	2	0	0	0	0	0

ANNEXURE V

AGRO-CLIMATIC ZONE-WISE LIST OF RESEARCH STATIONS AND THEIR FUNCTIONS

S. No.	Zone/Research Station	FUNCTIONS	
		Main	Verification
I. KRISHNA ZONE			
	Guntur District		
1.	Regional Agricultural Research Station, Lam - 522 034 Phone: 0863-2524017	Cotton, Pulses, Millets, Regl. Res. Units - Chemistry, Entomology, Plant Pathology, Integrated Weed Management, Agril. Economics, Extension Education, Geospatial Technology center and farmer's call center.	Mustard, Castor, Gingelly, Mushroom Spawn Production, Farming Systems Research, Forage Sorghum, Watershed Management.
2.	Rice Research Unit, Agricultural College Campus, Bapatla-522101 Phone: 08643-225901	Rice	Rice based Cropping Systems
3.	Post Harvest Technology Centre, Agricultural College Campus, Bapatla-522101 Phone: 08643-225180	Post Harvest Equipment, Grain Storage Structures, Evaluation	
4.	Saline Water Scheme, Agricultural College Campus, Bapatla-522101 Phone: 08643-225098	Research on Use of Saline Water in Agriculture and seaweed	
5.	AICRP on Small Millets - Sorghum, Agricultural College Campus, Bapatla -522101	Sorghum	
6.	AICRP on Farm Implements & Machinery, College of Agricultural Engineering Campus, Bapatla - 522 101	Farm Machinery	
7.	Agricultural Research Station, Amaravati - 522 020, Phone: 08645-213345	Rhizobium Culture and other Biofertilizers Production	

S. No.	Zone/Research Station	FUNCTIONS	
		Main	Verification
8.	Agricultural Research Station, Jangamaheswarapuram-522 415, Phone: 08649-213108	Seed Production in Rice and pulses	Rice germplasm
Guntur District			
9.	Agricultural Research Station, Vuyyur - 522 165 Phone: 08676-233236	Sugarcane	Sugarcane based Cropping Systems (rice and pulses)
10.	Agricultural Research Station, Machilipatnam-521 002 Phone: 08672-223266	Rice for Saline Soils	Saline resistant germplasm
11.	Agricultural Research Station, Garikapadu - 521 175 Phone: 08654-288245	Crops and Cropping Systems, Water Management for NSP Left Canal	Rice, Pulses, Oilseeds and Soybean
12.	Agricultural Research Station, Ghantasala - 521 133 Phone: 08671-203160	Rice Fallow Pulses *(rabi and summer)*	Rice in *kharif* and pulses during *Rabi*
Prakasam District			
13.	Agricultural Research Station, Darsi - 523 247 Phone: 08407-253248	Crops and Cropping Systems for NSP Right Canal, Oilseeds, Millets, Agro-forestry, Soil and Water Management	Pulses
14.	A.P.Rice Research Institute & RARS Maruteru - 534 122 Phone: 08819-246283	Rice, Rice-based Farming Systems, Soil & Water Management for Delta Soils, Post-harvest Technology (Rice), Rice-cum-fish Farming, Summer Pulses	Rice germplasm
15.	Agricultural Research Station, Pulla Phone:08829-282498	Deep water Rice	
16.	Agricultural Research Station, Vijayarai - 534475 Ph.No.08812-225689	Honey Bee Research	Maize

S. No.	Zone/Research Station	FUNCTIONS	
		Main	Verification
East Godavari District			
17.	Agricultural Research Station, Peddapuram - 533 437 Phone: 08852-241853	*Ragi* and *Maize*	Greengram, Blackgram, Sesamum, Groundnut & Maize
III. NORTH COASTAL ZONE			
Visakhapatnam District			
18.	Regional Agricultural Research Station, Anakapalle - 531 001 Phone: 08924-223370	Sugarcane and Sugarcane Based Cropping Systems	Oilseeds and Millets, Watershed Management
19.	Agricultural Research Station, Yelamanchili - 531 005 Phone:08931-232441	Sesamum	Groundnut, Sunflower
Srikakulam District			
20.	Agricultural Research Station, Amadalavalasa - 532185 Phone: 08942-286270	Mesta and Mesta based Cropping Systems	Oilseeds and Pulses
21.	Agricultural Research Station, Ragolu - 532 484 Phone: 08942-279836	Rice and Rice based Cropping Systems, Technology for Tankfed Areas	Oilseeds, Pulses
Vizianagaram District			
22.	Agricultural Research Station, Vizianagaram- 531 202 Phone: 08922-225983	Ragi, Bajra	Oilseeds and Pulses
IV. SOUTHERN ZONE			
Chittoor District			
23.	Regional Agricultural Research Station, Tirupati - 517 502 Phone 0877-2248739	Groundnut and Groundnut based Cropping Systems, Soil and Water Management	Pulses, Bio-fuels, Watershed Management and Fodders
24.	Agricultural Research Station, Perumallapalli - 517 505 Phone: 0877-2276240	Sugarcane, Fingermillet	Pearlmillet and Sweet Sorghum
25.	Agricultural Research Station, Palamaneru	Fodder crops	

S. No.	Zone/Research Station	FUNCTIONS	
		Main	Verification
SPS Nellore District			
26.	Agricultural Research Station, Nellore - 524 004 Phone: 0861-2327803	Rice and Rice based Cropping Systems	Rice fallow Pulses, Groundnut, Sesamum,
27.	Agricultural Research Station, Kavali - 524 202 Phone: 08626-241528	Agro-forestry	Rice
28.	Agricultural Research Station, Podalakur - 524 345 Phone: 08621-225279	Sorghum based Cropping Systems, Pulses, Soil Management	Fodder Jowar and pulses
YSR (Kadapa) District			
29.	Agricultural Research Station, Utukur - 516 003 Phone: 08562-231150	Rice and Rice based Cropping Systems, Water Management	Oilseeds, Pulses and Sugarcane
V. SCARCE RAINFALL ZONE			
Kurnool District			
30.	Regional Agricultural Research Station Nandyal- 518 502 Phone: 08514-242296	Korra, Groundnut, Sunflower, Bengalgram, Tobacco, Sorghum, Cotton, Fodder crops, Water Management, Seed Production	Paddy, Mustard, Soybean, Maize, Castor, Redgram, Safflower
31.	Seed Technology Research & Production Centre, Thangadancha	Seed research, Seed Production	
Anantapuramu District			
32.	Agricultural Research Station Anantapuram 515 001 Phone: 08554-200303	Dry Farming, Groundnut, Arid Fruits, Pulses, Fodder Crops, Farm Implements, Watershed Management on Red Soils	Sorghum, Bajra, Korra, Horsegram, Groundnut, Field Bean, Pulses
33.	Agricultural Research Station Reddipalli 515 001 Phone: 08554-257239	Pulses, Groundnut, Cropping Systems	Dryland technology
34.	Agricultural Research Station, Kadiri - 515 591 Phone: 08494-221180	Groundnut and Groundnut based Cropping Systems	Sunflower

S. No.	Zone/Research Station	FUNCTIONS	
		Main	Verification
XI. HIGH ALTITUDE AND TRIBAL ZONE			
Visakhapatnam District			
35.	Regional Agricultural Research Station Chintapalle - 531 111 Phone: 08937-238244	Rice, Millets, Pulses, Niger, Watershed Management, *Podu* Cultivation	Farming Systems, Technologies for Tribal Areas
Srikakulam District			
36.	Agricultural Research Station Seethampet - 532 443 Phone: 08941-238628	Rice, Millets, Pulses, Oilseeds, Forage Crops and Grasses	Agro-forestry and Farming Systems for Tribals.

ANNEXURE VI

LIST OF ICAR COORDINATED RESEARCH PROJECTS OPERATED IN RESEARCH STATIONS

I. NORTH COSTAL ZONE

1. AICRP on Sugarcane, RARS, Anakapalle
2. AICRP on PHE and Technology, RARS, Anakapalle
3. AICRP on Biological Control, RARS, Anakapalle
4. AICRP on Small Millets, ARS, Vizianagaram
5. AICRP on Jute and Allied Fibers, ARS, Amadalavalasa
6. AICRP on IFS, ARS, Vizianagaram

II. GODAVARI ZONE

7. AICRP on Rice, RARS, Maruteru
8. AICRP on Cropping System Research (MAE), RARS, Maruteru
9. AICRP on Rodent Control, RARS, Maruteru
10. AICRP on Honey Bee Research & Training, ARS, Vijayarai

III. KRISHNA ZONE

11. AICRP on Pulses, MULLaRP, RARS, Lam
12. AICRP on Cotton, Main Centre, RARS, Lam
13. AICRP on Pulses (Pigeonpea), RARS, Lam
14. AICRP on Management of Salt Affected Soils and Use of Saline Water, Bapatla
15. AICRP on Post Harvest Technology, Bapatla

16. AICRP on Farm Implements and Machinery, Bapatla

17. AINP on Soil Biodivesity & Biofertilizers, ARS, Amaravathi

18. AICRP on MULLaRP, ARS, Ghanatasala

19. AICRP on Dryland Agriculture, Voluntary Centre, ARS, Darsi

IV. SOUTHERN ZONE

20. AICRP on Groundnut, RARS, Tirupati

21. AICRP on Rice, ARS, Nellore

V. SCARCE RAINFALL ZONE

22. AICRP on Cotton, Sub-Centre, RARS, Nandyal

23. AICRP on Improvement of Small Millets, RARS, Nandyal

24. All India Network Project on Tobacco, RARS, Nandyal

25. AICRP on Oilseeds, Sub-Centre on Sunflower, RARS, Nandyal

26. AICRP on Chickpea, RARS, Nandyal

27. AICRP on Sorghum, RARS, Nandyal

28. AICRP on Dryland Agriculture, ARS, Anantapuramu

29. AICRP on Pearl Millet Improvement Project, ARS, Anantapuramu

30. AICRP on Agrometeorology, ARS, Anantapuramu

31. AICRP on New Operational Research Project, ARS, Anantapuramu

32. AICRP on Oilseeds, Main Centre for Groundnut, ARS, Kadiri

VI. HIGH ALTITUDE AND TRIBAL ZONE

33. AICRP on Integrated Farming Systems, ARS, Seethampet

ANNEXURE VII

LIST OF PROJECTS UNDER RASHTRIYA KRISHI VIKAS YOJANA

S. No.	Name of the Project	Name of the Principal Investigator	Amount sanctioned (Lakhs)	Remarks
	Ongoing Projects			
I	**Establishment of Liquid Bio-fertilizer Units**			
1	Establishment of Liquid Bio-fertilizer Unit	RARS, Anakapalle	40.0	
2	Establishment of Liquid Bio-fertilizer Unit	RARS, Tirupati	15.0	
3	Establishment of Liquid Bio-fertilizer Unit	ARS, Amaravati	15.0	
II	**Development of infrastructure facilities for research on virus indexing on Yellow Leaf Disease (YLD) in Sugarcane.**			
1	Development of infrastructure facilities for evolving sugarcane clones tolerant to YLD	RARS, Anakapalle	10.00	
III	**Enhancing productivity through development of varieties/hybrids with progressively high yield potential, resistance to abiotic and biotic stresses, desired cooking nutritive quality**			
1	Screening and evolving sugarcane varieties adapted to drought situation	RARS, Anakapalle	10.00	
2	Introgression of Low Grain Shattering Genes in Mega Rice Variety MTU 1010 through Marker Assisted Breeding	RARS, Maruteru	7.50	
IV	**Production and productivity growth in major food cropssuch as Paddy, Coarse Cereals, Minormillets, Pulses, Oilseeds, Cotton, Sugarcane etc.,**			
1	Evaluation of advanced stage YMV resistant lines of black gram for yield	RARS, Lam	5.00	
2	Micro propagation in Sugarcane	RARS, Anakapalle	5.00	
3	Seaweed cultivation for economic rehabilitation of coastal farmers in Andhra Pradesh sea coast. Saline Water Scheme, Bapatla.	RARS, Lam	5.00	

S. No.	Name of the Project	Name of the Principal Investigator	Amount sanctioned (Lakhs)	Remarks
4	Development of lodging resistant varieties for irrigated rice ecosystem using molecular markers.	RARS, Maruteru	6.00	
5	Development of multiple resistant rice varieties suitable for cultivation under direct seeding in Andhra Pradesh.	RARS, Maruteru	6.00	
V	**Promoting Production of Organic and Bio-fertilizers, Organic Pesticides etc.,**			
1	Strengthening of bio-pesticide unit	RARS, Tirupati	15.00	
2	Enhancing production of egg parasitoid	RARS, Anakapalle	5.00	
VI	**Defending against biotic stresses**			
1	Setting up of Pesticide Residue Testing Lab at Institute of Frontier Technology.	RARS, Tirupati	15.00	
2	Establishment of Pheromone lures making centre	ARS., Anantapuramu	8.00	
A.	**Breeder Seed Production**			
1	Source seed Subsidy (2015-16)	ARS, Kadiri	26,54,025	
		ARS, Ananthapur	42,750	
		ARS, Utukur	8,46,750	
		KVK, Utukur	78,750	
		RARS, Tirupati	4,86,900	
		ARS, Reddipalli	0.47250	
		Sub Total	**4109175.4725**	
2	Source Seed Subsidy (2016-17)	ARS, Kadiri	45,96,007	
		ARS, Utukur	8,60,625	
		RARS, Tirupati	4,86,900	
		Sub Total	**59,43,532**	
		ARS, Kadiri	3.76784	
		ARS, Ananthapur	0.31050 (T)	

S. No.	Name of the Project	Name of the Principal Investigator	Amount sanctioned (Lakhs)	Remarks
B. New Projects sanctioned for the year 2016-17				
Natural Resource management:Rs.99.12 lakhsfor three years for Six Zones – 1st Instalment				
1. a	Influence of natural farming on soil properties, crop protection and production of quality produce RARS, Maruteru RARS, Lam RARS, Tirupati RARS, Nandyal	RARS, Chintapalle RARS, Anakapalle	32.05	-
Natural Resource management: Rs.99.12 lakhs for three years for Six Zones and Nodal Officer– 2nd Instalment				
b	Influence of natural farming on soil properties, crop protection and production of quality produce	RARS, Chintapalle RARS, Anakapalle RARS, Maruteru RARS, Lam RARS, Tirupati RARS, Nandyal	8.764	
2	Situational analysis for benchmarking of practicing natural farming in Andhra Pradesh – An assessment of practices, innovations, stakeholders and institutions.	RARS, Tirupati	11.52	
Agricultural Extension				
3	Standardization and popularization of millet based products	Director of Research Office, ANGRAU	11.48	
4	A comparison of nutritive values, sensory qualities and food safety of organically and conventionally grown foods	Associate Dean, College of Home Science, Guntur	22.98	
5	Exploring the linkages between soil quality, nutritive profile of foods and human health	Associate Dean, College of Home Science, Guntur	15.05	

ANNEXURE VIII

LIST OF EXTENSION CENTRES
KRISHI VIGYAN KENDRAS (KVKs)

Krishi Vigyana Kendra Amadalavalasa – 532 185 Srikakulam Dist.	*Krishi Vigyan Kendra* Rastakuntabai – 535 523 (via) Gummalaxmipuram Vizianagaram Dist.
Krishi Vigyan Kendra H.No. 4-41 B Caritianpeta **Undi – 534 199** West Godavari Dist.	*Krishi Vigyan Kendra* Ghantasala - 521133 Krishna Dist.
Dr.K.L.Rao *Krishi Vigyan Kendra* Garikapadu – 521 175 Krishna Dist.	*Krishi Vigyan Kendra* Agricultural Research Station Darsi – 523 247 Prakasam Dist.
Krishi Vigyan Kendra Agricultural Research Station Nellore – 524 004 SPS Nellore Dist	*Krishi Vigyan Kendra* Kalikiri – 517 234 Chittoor Dist.
Krishi Vigyan Kendra Agricultural Research Station Utukur – 516 003 YSR (Kadapa) Dist	*Krishi Vigyan Kendra* Banavasi, Yemmiganur Kurnool – 518 003 Kurnool Dist.
Krishi Vigyan Kendra Bukkarayasamudram, Reddipalli Anantapuram – 515 001 Anantapuram Dist.	*Krishi Vigyan Kendra* Garudapuram, Kalyandurg – 515 761 Anantapuram Dist.
Krishi Vigyan Kendra Kondempudi, Dr.No. 6-89, Opp. Sakha Grandhalayam Main Road, Ravikamatham Visakhapatnam. Dist. – 531 025	

DISTRICT AGRICULTURAL ADVISORY & TRANSFER OF TECHNOLOGY CENTRES (DAATTCs)

District Agricultural Advisory & Transfer of Technology Centre Agricultural Research Station Amadalavalasa - 532 185 Srikakulam Dist.	District Agricultural Advisory & Transfer of Technology Centre Agril. Marketing Committee Premises Vizianagaram – 535 001 Vizianagaram Dist.
District Agricultural Advisory & Transfer of Technology Centre Regional Agril. Research Station Anakapalle – 521 001 Visakhapatnam Dist.	District Agricultural Advisory & Transfer of Technology Centre Agril. Marketing Committee Premises Mohor Mansion Main Road Kakinada – 533 004 East Godavari Dist.
District Agricultural Advisory & Transfer of Technology Centre Agril. Marketing Committee Premises Eluru – 534 005 West Godavari Dist.	District Agricultural Advisory & Transfer of Technology Centre ARS, Pedana Farm Machilipatnam – 521 001 Krishna Dist
District Agricultural Advisory & Transfer of Technology Centre RARS, Lam Farm Guntur – 500 034	District Agricultural Advisory & Transfer of Technology Centre Agril. Marketing Committee Premises Trovagunta – 523 002 Prakasam Dist.
District Agricultural Advisory & Transfer of Technology Centre Agricultural Research Station Nellore – 524 004 SPS Nellore Dist.	District Agricultural Advisory & Transfer of Technology Centre Agril. Marketing Committee Premises Chittoor – 517 001 Chittoor Dist.
District Agricultural Advisory & Transfer of Technology Centre ARS, Utukur – 516 003 YSR (Kadapa) Dist.	District Agricultural Advisory & Transfer of Technology Centre Agril. Marketing Committee Premises Kurnool – 518 001 Kurnool Dist.
District Agricultural Advisory & Transfer of Technology Centre Agril. Marketing Committee Premises (Traders Guest House) Anantapuram – 515 001 Anantapuram Dist.	

FARMERS CALL CENTRE

Toll Free No.1800 425 0430
Agricultural Information & Communication Centre, Flat 402, Srinivasa Citadel,
Opp. Hosanna Mandir, Guntur - 522 034

Field visit of Hon'ble Members of Board of Management at KVK, Amudalavalasa on 12-11-2016

Field visit of Sri B. Rajasekhar, IAS, Special Chief Secretary to Govt. of Andhra Pradesh and Hon'ble Vice Chancellor of ANGRAU

Proposed Architectural Modal for the Integrated Administrative Building of ANGRAU at Lam, Guntur, Andhra Pradesh.