ANNUAL REPORT
2013-14

Dr. Y.S.R. Horticultural University
Venkataramannagudem, West Godavari District – 534 101
www.drysrhu.edu.in

Published by :

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Edited by :

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Dr. B.M.C. REDDY
Vice-Chancellor
Dr. Y.S.R. Horticultural University

Foreword

I am happy to present the Sixth Annual Report of Dr.Y.S.R. Horticultural University. It is a compiled document of the University activities during the year 2013-14.

Dr.YSR Horticultural University was established at Venkataramannagudem, West Godavari District, Andhra Pradesh on 26th June, 2007. Dr.YSR Horticultural University is second of its kind in the country, with the mandate for Education, Research and Extension related to horticulture and allied subjects. The university at present has 4 Horticultural Colleges, 6 Horticulture Polytechnics, 27 Research Stations and 3 KVKs located in 9 agro-climatic zones of the state.

Dr.YSR Horticultural University offers B.Sc. (Hons.) Horticulture, M.Sc. (Horticulture) with specialization in four areas, namely i) Fruit Science, ii) Vegetable Science, iii) Floriculture & Landscape Architecture, iv) Spices, Plantation, Medicinal & Aromatic crops and Ph.D in Horticulture. The University runs on the land grant pattern followed in the USA, integrating Horticultural Education, Research and Extension. With an intension to provide self employment to rural youth and also to make use the services of rural youth, the university has established six Horticultural Polytechnics to offer two year Diploma in Horticulture.

The Dr.YSR Horticultural University Board of Management was not constituted during the year 2013-14. One Academic Council meeting, one REC meeting and three ZREAC meetings were held during the year.

A total of 229, 50 and 12 students in B.Sc. (Hons.) Horticulture, M.Sc. (Horticulture) and Ph.D (Horticulture) respectively along with 128 students in Diploma in Horticulture course are on rolls during the year under report.

The Dr.YSR Horticultural University is conducting basic, applied, location / region specific and anticipatory research for the overall development of horticultural crops in the state at 27 research stations.

Three Krishi Vigyan Kendras funded by ICAR are functioning to serve the farmers' needs and to impart technical knowhow in three districts

The University scientists are involved in popularizing the proven technologies and improved varieties developed through various extension activities viz., All India Radio, Print and Visual media, Participation in Exhibitions, Kisan melas, Rythu chaitanya yatra, Rythu Sadassulu and extension trainings.

I take this opportunity to thank the Indian Council of Agricultural Research and Government of Andhra Pradesh for their financial and technical support to the University.

I am thankful to Academic Council, Research and Extension Advisory Council for their timely guidance and cooperation extended in the university administration.

I am whole heartedly thankful to University Officers, Associate Deans, Principals, Heads of Research Stations, Programme Coordinators and supporting staff for their cooperation in preparation of the Annual Report.

(B.M.C. REDDY)
Vice-Chancellor

CONTENTS

SUMMARY

The Andhra Pradesh Horticultural University (APHU) was established by the Government of Andhra Pradesh with its headquarters at Venkataramannagudem, near Tadepalligudem in West Godavari District, Andhra Pradesh on 26th June, 2007 by Act 30 of 2007 and renamed as Dr.Y.S.R. Horticultural University w.e.f. 18th April, 2011 by Act 13 of 2011. It is the second Horticultural University in the country. The university runs on Land Grant Pattern followed in the USA, with emphasis on Education, Research and Extension of Horticulture and allied subjects. Presently this university has four constituent Colleges of Horticulture, 27 Research Stations, 3 KVKs and 6 Horticultural Polytechnics situated in 9 agroclimatic zones of Andhra Pradesh.

The University is governed by a Board of Management comprising of 21 members headed by the Vice-Chancellor. The Vice-Chancellor is supported by University Officers viz., Registrar, Dean of Horticulture, Director of Research, Director of Extension, Director of Industrial and International Programmes, Dean of PG Studies, Dean of Student Affairs, Controller of Examinations, Comptroller and Estate Officer in University management. The academic affairs of the University are governed by the Academic Council, UG and PG boards lead by the Vice-Chancellor, the Research and Extension services are guided by Research and Extension Council (REC).

EDUCATION

This university offers B.Sc. (Hons.) Horticulture in four constituent colleges namely HC & RI, Anantharajupeta (Kadapa District), College of Horticulture, Mojerla (Mahaboobnagar District), College of Horticulture, Rajendranagar (Ranga Reddy District) and HC & RI, Venkataramannagudem (West Godavari District), besides, the two years post graduate programme in M.Sc Horticulture with specialization in Fruit science, Vegetable science, Floriculture and land scaping architecture and Spices, plantation, medicinal and aromatic plants are being offered in the four consequent colleges in the university. At present the Ph.D. (Horticulture) degree programme is being offered in two colleges i.e. HC & RI, Venkataramannagudem and College of Horticulture, Rajendranagar. Besides the University has established six Horticultural Polytechnics in rural areas to offer two year Diploma in Horticulture. The Horticultural Polytechnics are located at Dasnapur (Adilabad district), Madakasira (Ananthapur district), Ramachandrapuram (East Godavari district), Nuzvid (Krishna district), Ramagirikhilla (Karimnagar district) and Kalikiri (Chittoor district).

Students on roll are 231, 48, 12 and 128 in B.Sc. (Hons.) Horticulture, M.Sc. (Horticulture), Ph.D (Horticulture) and Diploma in Horticulture respectively. NSS activities were organized at College of Horticulture, Anantharajupet, Mojerla, Rajendranagar and Venkataramannagudem and at five horticulture polytechnics.

RESEARCH

Crop Improvement

- FHIA 03 a dual purpose tetraploid hybrid banana recorded highest yield of 51.05 t/ha followed by Kothia (47.28 t/ha) in plant crop. Simalarly, in ratoon also FHIA-03 recorded highest yield of 50.00t/ha followed by Kothia (45 t/ha).
- The coconut hybrid, GBGD X PHOT found promising and proposed for release in Andhra Pradesh and Karnataka states based on its precocity, higher nut yield (125 nuts/palm/year), copra output (21.9 kg/palm/year), oil content (69%) oil yield (15.1 kg/palm/year) with good tender nut water content (395 ml) and TSS (6.2 ^{0}Brix) and another hybrid GBGD XLCOT also performing better and proposed for release for commercial cultivation in Andhra Pradesh and Karnataka states.
- Release proposals for high yielding chilli variety LCA-625 and paprika varieties LCA-424 and LCA-436 developed under Chillies Improvement Scheme were submitted for the state release.
- In Okra hybrid trial of AVT-1, among eight hybrids evaluated, 11/OKHYB-7 (163.9 q/ha) followed by 11/OKHYB-8 (160.6 q/ha) recorded highest yield over all the 3 Checks (HOK-152, Arka Anamika, and Pusa Sawani) while in AVT-II, 2010/OKHYB-4 recorded the highest yield (176.8q/h) among the nine hybrids evaluated and was on par with 2010/OHYB-8 (172.3 q/h) and were superior to checks.
- About seventy three custard apple, eleven aonla, forty one tamarind, nine ber and twenty pomegranate gremplasm lines are being evaluated and maintained under minor fruits at HRS,Anantapuramu.
- In tamarind germplasm, the maximum fruit yield per plant was recorded in Vellore – 2 (24.50 kg/plant) followed by Pollachi – 11 (22.50 kg/plant). Among Punganur selections, highest yield was recorded in PU – 15 (37.5 kg/plant) followed by PU – 13 (31.50 kg/plant). It was observed that Thettu tamarind selection outperformed other accessions for all the fruit parameters viz., fruit length (23.70 cm), fruit weight (49.83 g), pulp weight (23.39 g), shell weight (9.18 g) and pulp recovery (56.97 %).
- Among the nine cultivars of single type tuberose, Prajwal took minimum no. of days to flowering (65.5 days), maximum no. of flower spikes per plot was recorded in Arka Niranthara (45.3/2.4 sq.m) followed by Hyderabad single (44. 3/2.4 sq.m). Among the four double type tuberose cultivars, maximum number of flower spikes per plot was recorded in Hyderabad double (43.0/2.4 sq.m) followed by Calcutta double (37.6/2.4 sq.m).
- Among the twelve cultivars of Gladiolus, early flowering was observed in AC.No.7 (37 days) and Bindiya (37 days). Maximum spike length was recorded in Bindiya (109.67cm.) followed by AC.No.7 (108.87), no. of florets per spike were maximum in Arka Amar (16.40) and minimum in Dheeraj (9.93). Number of spikes per corm was maximum in Suchitra (1.83) followed by Darshan (1.80).

Crop Production

- In 12 years old sweet orange cv. Sathgudi, number of fruits per tree (345.69), fruit yield (61.69 kg/tree, 16.97 t/ha) were found significantly highest along with medium fruit quality (Juice 38.98%, TSS 9.67^{0} Brix and acidity 0.85%) in plants supplied with N and K at 75% recommended dose through fertigation with highest C: B ratio of 1:2.29.
- In regulation of flowering in acid lime, foliar spray with GA_3 50 ppm in June + Cycocel 1000 ppm in September is the most promising and economically viable technology for maximizing

the fruit yield, quality and benefit cost ratio(2.43:1) for the acid lime growers during summer in Andhra Pradesh.

- In pomegranate, highest fruit weight was recorded in the treatment IW/CPE of 0.8 at 75% RDN (206.86 g) followed by IW/CPE of 1.0 at 75% RDN (202.00 g) whereas highest yield per plant was recorded in IW/CPE of 1.0 at 75% RDN (7.07 kg/plant).
- Application of 200:200 g N & K/plant in 13 equal splits at 15 days interval along with 50g phosphorus/plant as basal dose recorded highest yield of 59.00 t/ha in tissue culture banana cv. Grand Naine.
- In sapota, highest number of fruits, fruit yield/tree and fruit yield/ha. was recorded in 10 x 10 m spacing (1045.00, 58.33 kg tree^{-1} and 5.83 t/ha), while 5.0 x 5.0 m spacing recorded maximum fruit yield ha^{-1} (10.41t.ha^{-1}). Though the yield per tree was lower than those at 10x10 m spacing, the yield per hectare was very high in 5x5 m spacing recording a cumulative yield of 136.77 t/ha (1999-2013).
- Studies on fertilizer application through micro-irrigation technique in coconut revealed that the maximum nut yield (91.61 nuts/palm) was recorded with 100% RDF through fertigation and is on par with 75% RDF (89.97 nuts/palm). The maximum nut weight (1099.86g), copra weight (131.86 g) and oil content was recorded with 100% RDF through fertigation and is on par with 75% of RDF. Highest C:B ratio of 2.69 observed in 75% of RDF fertigation followed by 100% RDF (2.46).
- In Ginger maximum yield (505 g/plant) was recorded in the treatment (T9) i.e. Oxyflurofen 23.5 % E.C, 0.3 kg a.i/ha 2nd day after sowing the rhizomes + Quazilofop ethyl 5% EC @ 0.05kg a.i./ha at 30days after planting + hand weeding at 30 days after application of Quazilofop ethyl i.e., 90 days after planting rhizomes and it was on par with weed free check plot.
- In chilli, Pendimethalin as pre emergence herbicide (0.75a.i./ha) in combination with its post emergence application at 25 and 50 DAS has recorded highest weed control efficiency (90.14%) and yield (24.5q/ha).
- Drip irrigation once in two days at 80% PE recorded maximum yield (42.0 t/ha) in turmeric followed by drip irrigation once in a day at 60% PE (41.3 t/ha) and drip irrigation once in two days at 60% PE (41.2 t/ha) which were on par with one another and significantly superior to surface irrigation at 5 cm, 0.9 IW/CPE (37.2 t/ha).

Plant Protection

- A total of nine sucking insect species, eight lepidopteron defoliator species and two coleopteran defoliators were found to be the major insects on aswagandha, bachi, tulasi, musk mallow, makoi and cowhage during the period of study.
- Inundative release of parasitoids and predators viz, *Bracon hebetor, Goniozus nephantidis, Brachymeria nosatoi* and *Cardiastethus exiguous* against black headed caterpillar outbreak in Visakhapatnam district led to suppression of the pest in 4 to 6 months period.
- FHIA 3, a dual purpose tetraploid hybrid and Yangambi KM-5, a triploid dessert selection of banana were resistant to race 1 of Panama wilt pathogen and rhizome rot and has good consumer preference.
- Among the different IPM modules, seed treatment with Imidacloprid @ 5 g/kg seed + application of neem cake @ 200kg/acre+ barrier crop with maize + monitoring with yellow sticky traps + Azadirachtin 1%@ 1 ml/lit + Fipronill @ 2ml/l (need based) was found effective in controlling thrips incidence.
- Neem formulation 10000 ppm @ 5ml/l followed by Thiamethoxam (0.025%) or Spinosad (0.002%) at 7 days interval was found significantly superior over control providing >80% control in the management of leaf miner incidence in Sweet Orange. In sweet orange, for effective control of citrus mite, two sprays of Ethion 50 EC (0.05%) or Propargite 57EC @

0.057% first at initiation of the pest infestation while second spray after 15 days thereafter, are recommended.

- ❖ Among the plant extracts screened against alternaria leaf blight on senna *Tinospora cordifolia* stem extract proved to be effective in reducing the disease with 11.55% increase in seed yield over control, while fungicide treatment increased the yield by 13.39%.
- ❖ RAPD PCR based studies of 35 Ganoderma isolates revealed that the isolates were grouped into two major clusters. The isolates KLC, NSP, MKW, DGM, KGP, VP, APP, VKR and GP were grouped in to one cluster and the remaining isolates into other cluster. The major clusters were separated into three sub-clusters (GL, GL3, GL2, GL4, GA2, A2, GA, GL5, GL6 and GW2); (KLC, NSP, MKW and DGM) and (KGP, VP, APP, VKR and GP). The genetic similarity among the isolates ranged from 0 to 88%. Maximum genetic similarity was observed between GL and GL3 (88%) followed by GA2 and A2 (83%).
- ❖ Application of potassium phosphonate (0.3%) as foliar spray + soil application of *Trichoderma harzianum* (MTCC-5179 10^8 CFU @ 50 g/vine with 1.0 kg of Neem cake (three time application i.e., before onset of monsoon (May 2nd fortnight), during monsoon (July 1st week) and after monsoon (September 1st fortnight) is recommended for the management of *Phytophthora* foot rot in black pepper.
- ❖ Indexing for CYMV and HLB was done through duplex PCR and identified 104 HLB and 13 CYMV infected plants out of 346 Sathgudi sweet orange mother trees. Three sprays of Hexaconazole (0.2%) + Streptocycline (100ppm), 1st spray immediately after pruning diseased and dead wood, 2nd spray two weeks after fruit set and 3rd spray two months after fruit set was found effective in management of sweet orange scab.
- ❖ Among different antibiotics sprayed in monsoon season at 30 days interval for three times, application of streptomycin (1g/10L) + copper oxychloride (3g/l) two times in the monsoon found to be effective in controlling the canker in acid lime and sweet orange.
- ❖ Tebuconazole 50% and Trifiloxystrobin 25% WG was found to be superior in controlling the purple leaf blotch in onion (19.24) and more yield (21.54t/ha) was recorded. Penconazole @ 0.5 ml/l was found to be superior in controlling the powdery mildew in capsicum under polyhouse conditions (7.28) with an yield of 16.28 t/ha.

Extension :

This University has three KVKs located at Pandirimamidi in East Godavari District, Venkataramannagudem in West Godavari District and Ramagirikhilla in Karimnagar District. Scientists of Dr.Y.S.R.H.U. have participated in diagnostic surveys, rythu chaitanya yatras, disaster management programmes, training programmes to farmers and officers of the State department of Horticulture and Agriculture, conducting field days, transfer of technology through mass media, publications, field demonstrations and village adoption programmes etc. ZREAC meetings were conducted in all the three zones viz., Coastal zone, Rayalaseema zone and Telangana zone involving scientists, departmental officers and local farmers. As a support to mass media cell of Commissioner of Agriculture, All India Radio and Doordarshan monthly calendar of operations of Horticultural crops was prepared well in advance and circulated to all the concerned stations and extension agencies in the state.

I. INTRODUCTION

The Andhra Pradesh Horticultural University was established by the Government of Andhra Pradesh by Act 30 of 2007 with its headquarters at Venkataramannagudem, near Tadepalligudem in West Godavari District and renamed as Dr.Y.S.R.Horticultural University w.e.f. 18th April, 2011 by Act 13 of 2011. It is the second Horticultural University in the country. The University runs on the Land Grant pattern followed in USA, with emphasis on Education, Research and Extension of Horticulture and allied subjects.

The University at present has four constituent Colleges of Horticulture, six Horticulture Polytechnics, 27 Research Stations and three KVKs across 9 agro-climatic zones of the state. Based on the present day need ongoing research programmes at 27 Research Stations have been re-oriented into eight thrust areas. Apart from the non-plan research programmes, nineteen All India Coordinated Research projects are also operating at different research stations of the University. Funds for research are provided by the State Government and also the Indian Council of Agricultural Research (ICAR). The ICAR provides 75 per cent of funds for conducting research under various All India Coordinated Research Projects of ICAR.

The University is governed by a Board of Management comprising of 21 members headed by the Vice-Chancellor. The Vice-Chancellor is supported by University Officers viz., Registrar, Dean of Horticulture, Director of Research, Director of Extension, Director of Industrial and International Programmes, Dean of PG Studies, Dean of Student Affairs, Controller of Examinations, Comptroller and Estate Officer in University management. The academic affairs of the University are governed by the Academic Council, UG and PG Boards led by the Vice-Chancellor. The Research and Extension services are guided by the Research and Extension Council (REC).

This university offers B.Sc. (Hons.) Horticulture, M.Sc. (Horticulture) with specialization in i) Fruit Science ii) Vegetable Science iii) Floriculture and Landscape Architecture, and iv) Spices, Plantation, Medicinal and Aromatic crops and Ph.D (Horticulture). The course curriculum prescribed by the IV Deans' committee of Indian Council of Agricultural Research is being followed for the degree programme. At under graduate level, besides course work, students to equip the practical field knowledge on the Horticultural crops, they shall also undergo Rural Awareness Work Experience Programme (RAWEP) and subsequently Experiential learning programme with subject modules, namely, (1) Commercial Horticulture (2) Protected cultivation of high value Horticulture crops (3) Processing of fruits & vegetables for value addition (4) Floriculture and landscape gardening. In RAWEP, the final year students are deputed to stay in villages and are attached to different host farmers for 90 days, where they will interact with farmers of the village, work with them, understand the field problems, apply the latest knowledge, acquire necessary skills and gain self confidence. In view of the globalization of horticultural trade and for imparting quality education and training in horticulture, to the students, the practical based training programmes i.e., RAWEP and Experiential Learning programme are useful to develop the manpower requirement with different technical expertise. Besides, with an intention to provide self employment to rural youth, and also to make use of the services of rural youth in rural development, the University has established six horticultural Polytechnics in non-municipal areas to offer two year Diploma in Horticulture.

The University scientists are involved in popularizing the proven technologies and improved varieties developed through various extension activities, namely; All India Radio, print and visual media, participation in Exhibitions, Kisan Melas, Rythu Chaitanya Yatra, Rythu Sadassus and Extension Training Programmes.

II. UNIVERSITY ADMINISTRATION

His Excellency, the Governor of Andhra Pradesh, **Sri E.S.Lakshmi Narasimhan** is the Chancellor of the University.

Dr. B.M.C. Reddy, Vice-Chancellor is the Academic Head and Principal Executive Officer of the University.

The organizational set up of the University is presented in flow chart.

The University is governed by the following authorities.

- Board of Management
- Academic Council

A. AUTHORITIES OF THE UNIVERSITY

1. Board of Management

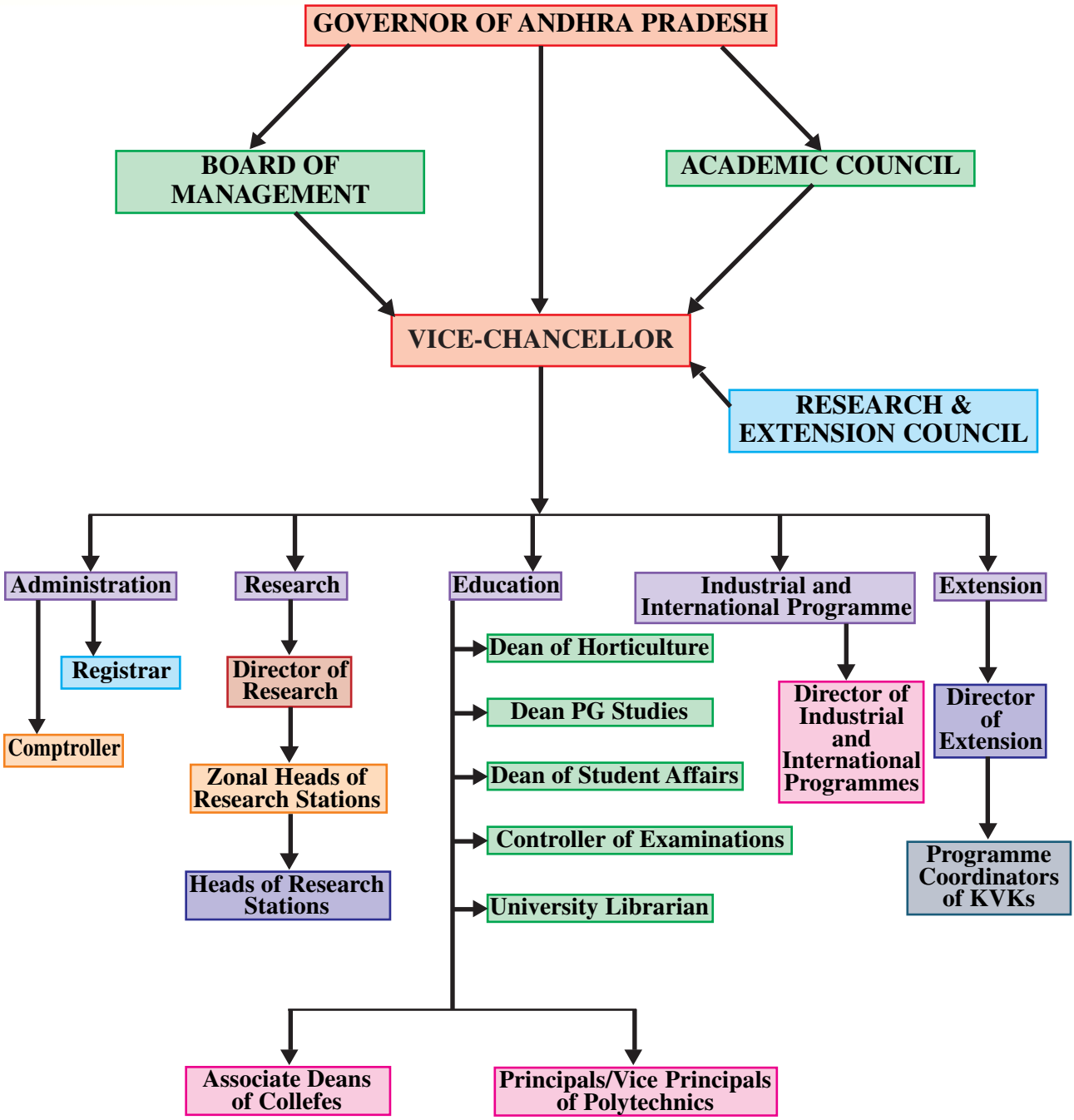
The Board of Management of Dr.YSRHU is the apex body, empowered to make policy decisions, with the Vice-chancellor as its Chairman who is also the Chief Executive of the University.

The Board of Management has representatives from State Legislature/Parliament (4 no.), the Horti-industry (2 no.) and State Chamber of Panchayat Raj (1) as well as Horticultural Scientific Community (1 no.). In addition, one representative from the Indian Council of Agricultural Research, three Members of Academic Council of the University, Secretaries to Government from Panchayat Raj and Finance Departments and Director of State Departments of Agriculture and Animal Husbandry are also the Members of the Board of Management of Dr.YSRHU. During the period under report the Board of Management was not constituted by Govt. of Andhra Pradesh except for the Ex-officio members.

Members of Board of Management, Dr.YSRHU

Ex-Officio Members	**Dr. C.V.S.K.Sarma**, I.A.S. Agril. Production Commissioner & Principal Secretary to Government, ATM & Vice-Chancellor (From 26.02.2011 to 18-08-2013)**Dr.A.Padmaraju**, Vice-Chancellor (FAC) (From 19-08-2013 to 19-12-2013**Dr.B.M.C. Reddy**, Vice-Chancellor (From 20-12-2013 onwards)**Dr.A.Padmaraju**, Vice-Chancellor, ANGRAU**Dr. Manmohan Singh,** IAS. Vice-Chancellor, SVVU **Smt.Ranjeev R. Acharya,** Agril. Production Commissioner & Principal Secretary to Government.**Sri. Anil Chandra Punetha,** I.A.S. Secretary to Government (IF) **Sri M. Papi Reddy,** I.R.T.S. Commissioner & Director of Horticulture

ORGANIZATIONAL STRUCTURE OF
Dr. Y.S.R. HORTICULTURAL UNIVERSITY



2. Officers of the University

The list of University Officers for the year is furnished as follows.

UNIVERSITY OFFICERS

Vice-Chancellor	**Dr. C.V.S.K.Sarma**, I.A.S. Agril. Production Commissioner & Principal Secretary to Government, ATM (From 26-02-2011 to 18-08-2013) **Dr. A.Padmaraju** (From 19-08-2013 to 19-12-2013 **Dr. B.M.C. Reddy** (From 20-12-2013 onwards)
Registrar	**Dr. B.Srinivasulu** (01-11-2011 onwards)
Comptroller	**Dr. B.Srinivasulu** (01-06-2011 onwards)
Dean of Horticulture	**Dr. M.Lakshminarayana Reddy** (12-07-2012 to 11-10-2013)
Dean of Horticulture	**Dr. M.Pratap** (12-10-2013 onwards)
Dean of Post Graduate Studies	**Dr. D.Srihari** (16-07-2012 to 11-10-2013)
Dean of Post Graduate Studies	**Dr. M.Lakshminarayana Reddy** (12-10-2013 onwards)
Dean of Student Affairs	**Dr. D.Srihari** (13-07-2012 to 16-10-2013)
Dean of Student Affairs	**Dr. K.Vanajalatha** (17-10-2013 onwards)
Director of Research	**Dr. B.Srinivasulu** (01-11-2011 to 02-09-2013)
Director of Research	**Dr. J.Dilip Babu** (03-09-2013 onwards)
Director of Extension	**Dr. M.B.Nageswara rao** (04-07-2012 to 03-10-2013)
Director of Extension	**Dr. M.Pratap** (04-10-2013 to 09-10-2013)
Director of Extension	**Dr. G.Srihari** (10-10-2013 onwards)
Director of Industrial & International Programmes	**Dr. M.B.Nageswara rao** (04-10-2013 onwards)
Controller of Examinations	**Dr. M.Pratap** (10-12-2012 to 12-10-2013)
Controller of Examinations	**Dr. D.Srihari** (13-10-2013 onwards)
Estate Officer	**Sri P.R.P.Raju** (05-03-2010 onwards)

3. Academic Council

The Academic Council is vested with the responsibility of implementing and monitoring all the academic programmes. The Council is headed by the Vice-Chancellor, as Chairperson and consists of Deans of Faculties, Directors of Research and Extension, Dean of Student Affairs, Controller of Examinations, University Heads of Departments and Professors as Members. In addition, the Council consists of ten academicians, representing different faculties nominated by the Vice-Chancellor and two representatives of the Board of Management. As Chief Executive of the University the Vice-Chancellor is vested with the powers and responsibilities for the academic administration.

MEMBERS OF ACADEMIC COUNCIL

Clause (i) **The Vice-Chancellor**	**Dr. B.M.C. Reddy,** Vice-Chancellor, Dr.YSRHU
Clause (ii) **The Vice-Chancellor, ANGRAU**	**Dr. A.Padma Raju,** Vice-Chancellor, ANGRAU

Clause (iii) **The Vice-Chancellor, SVVU**	**Dr.Manmohan Singh, I.A.S.,** Principal Secretary to Government, AH, DD & F Dept., A.P.
Clause (iv) **The Dean of Horticulture**	Dr. M.PratapDean of Horticulture, Dr.YSRHU
Clause (v) **The Directors**	Dr. J.Dilip Babu, Director of Research, Dr.YSRHU Dr. G.Srihari, Director of Extension, Dr.YSRHU
Clause (vi) **Dean of Students Affairs**	Dr.M.L.N.Reddy, Dean of PGs, Dr.YSRHU. Dr. K.Vanajalatha, Dean of Students Affairs, Dr.YSRHU
Clause (vii) **Controller of Examinations**	Dr. D. Srihari, Controller of Examinations, Dr.YSRHU
Clause (viii) **The University Librarian**	Dr. K.Veeranjaneyulu University Librarian, ANGRAU
Clause (ix) **The University Heads of Departments and Heads of Departments of College**	-
Clause (x) **The Associate Deans of Colleges**	Dr.A.Sujatha, Associate Dean Dr.R.Chandrasekhar, Associate Dean Dr.P.Veeranna Goud, Associate Dean Dr.P.Babu Ratan, Associate Dean
Clause (xi) **The Associate Directors of Research of the Regions / Zones**	Dr.B.V.K.Bhagawan, Principal Scientist(H) & Zonal Head Dr.L.Naram naidu Principal Scientist(H) & Zonal Head Dr.M.Vijaya, Principal Scientist (Plant Path.) & Zonal Head Dr.M.Rajkumar Principal Scientist(H) & Zonal Head Dr.K.Gopal Principal Scientist(Pl.Path) & Zonal Head
Clause (xii) **Three Principal Scientists (Crop)**	Dr.A.S.Padmavathamma Professor (Horticulture) Dr.M.Ramakrishna Principal (Horticulture)
Clause – xii (2)	-
Clause (xiii) **Members of Board of Management**	-
Clause (xiv)	Dr.A.B.Patil, Registrar

The eminent educationists from outside the University in the field of Horticulture	University of Horticultural Sciences, Bagalkot, Karnataka Dr.C.Ravisankar, Professor (Hort.) & Univ. Head (Retd.), ANGRAU
Clause (xv) **One nominee of the Indian Council of Agricultural Research**	Dr.S.Arulraj, Director, NRC Oil Palm
Clause (xvi) **Two Associate Professors and two Assistant Professors from the Faculties**	Dr.A.Girwani, Associate Professor (Horticulture) Dr.B.Sreenivasulu, Associate Professor (Horticulture) Dr.D.Venkata Swamy, Assistant Professor (Horticulture) Dr.D.Srinivasa Reddy, Assistant Professor(Entomology)
Clause (xvii) **Principals of Polytechnics**	Dr.R.Preetham Goud Vice-Principal, i/c. Sri M.Sattiraju, Vice-Principal
Clause (xviii) **The Registrar**	Dr.B.Srinivasulu, Registrar, Dr.YSRHU

B. MEETINGS OF THE AUTHORITIES OF THE UNIVERSITY

1. Academic Council

The Academic Council normally meets once in six months. 12th Academic Council meeting was held on 21-10-2013 at Bhoiguda Guest House, Secunderabad.

2. Research and Extension Council

The 5th REC meeting was held on 20.12.2013 at International Hostel, Venkataramannagudem.

C. FACULTY STRENGTH

The cadre-wise strength of teaching staff of Dr.YSRHU is as follows

Faculty Strength in Dr.YSRHU during 2013-14

Teaching Staff	
Post	**No.**
Professors	34
Associate Professors	28
Assistant Professors	98

III. EDUCATION

TEACHING INSTITUTES

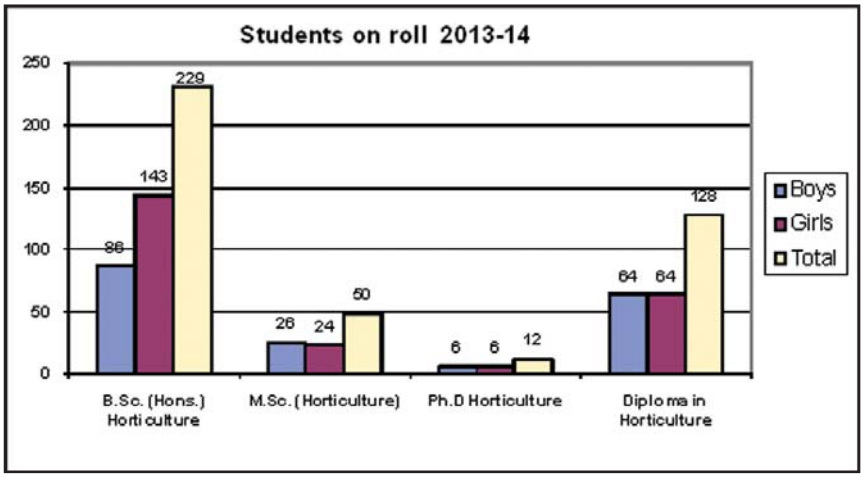
Dr.YSR Horticultural University (Dr.YSRHU) offers under graduate programme i.e. **B.Sc. (Hons.) Horticulture**,; post graduate programmes i.e. **M.Sc. (Horticulture)** with specialization in Fruit Science, Vegetable Science, Floriculture & Landscape Architecture and Spices, Plantation, Medicinal & Aromatic crops and **Ph.D (Horticulture)**. In addition to these, Dr.YSRHU is also offering two years Post-metric-diploma programme in horticulture.

The list of colleges and polytechnics with their location and courses offered is given in the Table.

S.No.	Teaching Institute with location	Courses offered
I.	**Colleges of Horticulture**	
	i) Horticultural College & Research Institute, Anantharajupet (Kadapa Dist.)	B.Sc. (Hons.) Horticulture. M.Sc. (Horticulture) with specialization in Fruit Science, Vegetable Science, Floriculture & Landscape Architecture and Spices, Plantation, Medicinal & Aromatic crops.
	ii) College of Horticulture, Mojerla (Mahaboobnagar Dist.)	B.Sc. (Hons.) Horticulture
	iii) College of Horticulture, Rajendranagar, Hyderabad (Rangareddy Dist.)	B.Sc. (Hons.) HorticultureM.Sc. (Horticulture) with specialization in Fruit Science, Vegetable Science, Floriculture & Landscape Architecture and Spices, Plantation, Medicinal & Aromatic crops and Ph.D (Horticulture)
	iv) Horticultural College & Research Institute, Venkataramannagudem (West Godavari Dist.)	B.Sc. (Hons.) HorticultureM.Sc. (Horticulture) with specialization in Fruit Science, Vegetable Science, Floriculture & Landscape Architecture and Spices, Plantation, Medicinal & Aromatic crops and Ph.D (Horticulture)
II.	**Horticultural Polytechnics**	
	i) Horticultural Polytechnic, Adilabad (Adilabad Dt.) ii) Horticultural Polytechnic, Kalikiri (Chittoor Dt.) iii) SSPG Horticultural Polytechnic, Madakasira (Anantapur Dt.) iv) Horticultural Polytechnic, Ramagirikhila (Karimnagar Dt.) v) SKPP Horticultural Polytechnic, Ramachandrapuram (East Godavari Dt.) vi) Horticultural Polytechnic, Nuzvid (Krishna Dt.)	Diploma in Horticulture in Telugu medium

ADMISSION STRENGTH OF STUDENTS

Course	Admission Strength including ICAR & In-service	Students admitted (2013-14)		
		Boys	Girls	Total
B.Sc. (Hons.) Horticulture	287	86	143	229
M.Sc. (Horticulture)	52	26	24	50
Ph.D. (Horticulture)	12	6	6	12
Horti. Polytechnic	128	64	55	119



SCHOLARSHIPS

Name of the Scholarship	No. of recipients	Amount received(Rs.)
BC Post Metric Scholarship	11	52,280
SC Post Metric Scholarship	16	60,080
ST Post Metric Scholarship	21	1,58,835
EBC Post Metric Scholarship	4	2,560
District Minority Department Scholarship	4	28,268

STUDENTS' HOSTELS

Institutions	No. of Hostels			No. of students accommodated		
	Boys	Girls	Total	Boys	Girls	Total
Horticultural Colleges	4	4	8	380	602	982
Horticultural Polytechnic Colleges	4	4	8	100	114	214

STUDENTS ACTIVITIES IN COLLEGES AND POLYTECHNICS

i) NSS & Other Activities:

Horticultural College & Research Institute, Anantharajupeta:

Sixth Annual College Day: "Sixth Annual College Day" was celebrated at HCRI, Anantharajupeta on 02-05-2013, Prof. (Smt) S.Ratna Kumari, Hon'ble Vice-Chancellor, Sri Padmavathi Mahila University, Tirupati, graced the occasion as Chief Guest. Dr. M.L.N. Reddy, Dean PG studies, Dr.YSRHU was the guest of honour.

Lighting of lamp by the chief guest

Fresher's day Celebrations:

Fresher's day was organized to welcome the newly admitted UG students during the academic year 2013-14 on 9-11-2013. Dr.K.Vanaja Latha, Dean of Students Affairs, Dr.Y.S.R.Horticultural University graced the occasion as chief guest and addressed the gathering.

Blood donation camp :

Blood Donation Camp was organized by NSS cell, HCRI, Anantharajupeta on 9th January 2013 on the occasion of 150th Birth anniversary of Swami Vivekananda.

Fresher's day Celebrations

Blood Donation Camp Organized by NSS cell, HCRI, Anantharajupeta

NSS Special camps:

Two NSS special programmes were organized from 19th to 25th March 2014 at Punnativaripalli (vil) of Obulavaripalli mandal, by NSS units 1 and 2 of HCRI, Anantharajupet and at Pullampet village by NSS Unit-2 of HC&RI,Anantharajupeta .

Dr. K. Vanajalatha, DSA, addressing the NSS volunteers on the valedictory and Planting a Sapling

Participation of NSS volunteers in Veterinary camp and deworming programme

Awareness Camp :

Regarding compulsory primary education to the children was conducted. A rally on abolition of child labour was taken up in the adopted village during NSS special camp. Other awareness programmes like i) Ill effects of smoking cigarettes, beedies, gutkas, drinking liquor, Conducted veterinary camp with veterinary assistant surgeons. Dr. D. Sudeesh Kumar, by doing vaccination to poultry birds, de-worming of goats, cattle, sheep, poultry etc. Cleaning and Leveling of farm & Planted 300 avenue plants.

Medical Camp:

Medical camp was conducted for the village people, Dr. Rathnamaiah, Medical officer was involved in eye & dental check up for the villagers. They were happy to have opportunity of having this facility at their village.

South India Educational Tour :

III year Students were taken to various Research Institutes in south India from 07-08-2013 to 17-08-2013 by Dr. K. Swarajya Lakshmi, Assoc. Prof. (Horti) and Dr. M. Ramaiah, Assistant professor, (Ento) and Sri Ravishanker, PD as tour leaders and visited places & institutions of horticultural importance in Bangalore, Mysore, Ooty, Coimbatore, Thrissur, Kanyakumari and Vittal.

III Year (2010 batch) wearing national flags near Vivekananada rock memorial during SI tour

Rural Awareness work Experience Programme (RAWEP):

The Final Year B.Sc (Hons) Horticulture (2010 admitted batch) students were sent to different villages, for attending their RAWEP.

Explaining about IPM techniques to the farmers at Pullaiahgaripalli Village

Explaining about Zero Energy Cooling Chamber at Pullaiahgaripalli Village

Demonstrating preparation of Bordeaux mixture at Kottambedu village

Demonstrating Application of Tricoderma viride at Kottambedu village

Papaya jam prepared by RAWEP students kept for sale at Exhibition at Pullaiahgaripalli Village

COLLEGE OF HORTICULTURE, MOJERLA

NSS Special Camp:

NSS special camp has been conducted with 45 volunteers of Final year B.Sc (Hons) Horticulture on the theme "Youth for Rural Reconstruction", by NSS Unit, College of Horticulture, Mojerla at Peddamandadi Village, Peddamandadi mandal, Mahabubnagar Dist. from 11-02-2014 to 18-02-2014 for the year 2013-14.

NSS Volunteers administering the de-worming medicine to calves as a part of Animal Health care camp

A rally on anti-alcoholism by NSS volunteers

Blood donation by NSS volunteers

Vanamahotsav by NSS volunteers

Voter's awareness camp :

was organized in the college by Eenadu Television on 27th March 2014. The Circle inspector, Sub inspector of Police, Peddamandadi, reporters of Eenadu, Associate Dean, COH, Mojerla, all the staff members and students were participated in this camp. All the dignitaries on the Dias, teaching staff, non teaching staff, out sourcing staff and students shared their views about the value of voting and the proper utilization of their vote in the process of electing the suitable leader for ruling the village, district, state and also the nation.

COLLEGE OF HORTICULTURE, RAJENDRANAGAR

Celebration of World Heritage Day:

World Heritage Day was organized on **18-04-2013** by NSS Unit –I. Program Officer while Associate Dean was the Chief Guest. Program Officer has briefed about the World Heritage Day. The Associate Dean stressed the need for protecting and preserving the ancient property in the country so that the present and future generations will know the culture and the treasure of our country.

Celebration of World Earth Day:

NSS Unit –I has organized the World Earth Day, 2013 in the College Auditorium on 22-04-2013

The National Education Day:

It was celebrated in the memory of **Abul Kalam Muhiyuddin Ahmed Azad's birthday** who was the 1st Minister of Education in Independent India at College of Horticulture, Rajendranagar on **11-11-2013.** Dr.P.Veeranna Goud, Associate Dean was the Chief Guest of the programme and spoke on the quality of present education system is notable. About seventy students have actively participated in the programme and discussions on the importance of education in society and national integration, the present system of education, hurdles for primary education in India, role of reservations in the quality of education, contributions of Moulana Azad in Indian education system etc., were held.

Organ Donation & Walk-on-Thorn:

An awareness class on "Organ donation" was conducted on **18.12.2013** at College of Horticulture, Rajendranagar. Students have participated in "Walk-on-Thorn", the awareness walk on organ donation on **29.12.2013** conducted by NGOs Mohan foundation & Vikastarangini followed by Sri Sri Sri China Jeeyar Swamiji's message on Organ donation.

Awareness class on "Organ donation" and "Walk-on-Thorn"Rally

South India Educational Tour:

The South India Educational Tour was conducted for 33 students of final year B.Sc (Hons.) Horticulture (2010 admitted batch) for the academic year 2013-14. from **10-08-2013 to 24-08-2013.** Dr. P.Saidaiah, Asst.Professor was the tour leader and organized South India Educational Tour to Kerala, Karnataka, Tamilnadu and Andhra Pradesh for fourteen days.

HORTICULTURAL COLLEGE & RESEARCH INSTITUTE, VENKATARAMANNAGUDEM

NSS Day Celebrations:

On the occasion of NSS Day on 24-09-2013, various competitions were conducted namely Poster presentation, Slogans/Quotes, Essay Writing, Elocution etc on various topics.

Free Eye Screening Camp:

With the help of Lion's Club International of Amalapuram, organized a free Eye Screening Camp. Dr.N.Sanjeeva Rao, Eye Specialist from Amalapuram along with five assistants conducted tests to 204 members (students, staff members and workers of the college and Administrative Office). Lion's Club has donated spectacles to the laborers.

Blood Donation Camp:

NSS Units of HC&RI, Venkataramannagudem has organized Blood Donation camp in association with Lion's Club International of Amalapuram on 23-09-2013 and Government Blood Bank, Eluru has collected the blood. About 22 units of blood were collected in the camp.

Service in the Oldage Home :

On 22-09-2013, around 25 volunteers visited Jeevana Sandhya Oldage Home at Tadepalligudem and cleaned the campus, removed weeds in the premises and shifted their luggage to the newly constructed buildings.

Campus Cleaning Programme:

NSS Volunteers have participated in the Campus Cleaning Programme on 18-09-2013 at Boys Hostel and on 19-09-2013 at Girls Hostel.

NSS Activities of HC & RI, Venkataramannagudem

Planting of Coconut seedlings:

NSS Volunteers have planted Coconut seedlings (42 seedlings) on road side of the college On 12-09-2013. NSS Programme Co-ordinator of the University & Dean of Student Affairs Dr.D.Srihari, and Dr.A.Sujatha, Associate Dean of the College have participated in the programme and planted coconut seedlings.

Observance of Non-Violence Day :

On the eve of International Non-Violence Day on 2nd October, students and staff members of HC & RI, VR Gudem took pledge on observance of Non-Violence in the presence of Dr.D.Srihari, Dean of Student Affairs.

Celebration of International Women's Day:

On the occasion of International Women's Day on 8th March, 2014, HC&RI, VRgudem has conducted competitions for the women (teaching, non-teaching and labour) of the college and distributed prizes to the winners.

National Voters' Day and National Science Day:

Celebrated the National Voters' Day on 25th January, 2014 and National Science Day on 28th February, 2014 by conducting various competitions like elocution, essay writing, debate, painting etc.

National Science Day :

Science exhibition was organized and students displayed various models depicting innovative technologies related to horticulture and agriculture.

Participation of NSS volunteers in Pre-Republic Day Parade Camp:

G. Sreenija

Two girl NSS volunteers of B.Sc. (Hons.) Horticulture (4th year) participated in the Pre-Republic Day Parade Camp organized at Gandhinagar, Gujarat from 06.11.2013 to 15-11-2013 representing Dr.YSRHU.

K.Kanchana

NSS Special Camp:

NSS Units of HC&RI, VR'Gudem have organized NSS Special Camps in the adopted villages namely Telikicherla and Koonavaram. Around 100 NSS volunteers have participated in the programme for one week from 14-03-2014 to 20-03-2014. Students took part actively in various activities.

Educational Tours:

The State level Educational Tour to II year B.Sc. (Hons.) Horticulture students with Dr.V.Sudhavani, Assistant Professor (Hort.) and Sri M.Paratpara Rao, Assistant Professor (Pl.Breeding) as tour leaders along with 40 students during July, 2013 was organized. They visited Horticultural Colleges and Research Stations in Andhra Pradesh.

The South India Educational Tour was conducted to III Year B.Sc.(Hons.) Horticulture students during August, 2013 with Dr.R.V.Sujatha, Assistant Professor (Ag.Econ) and Sri B.Chennakesavulu, Assistant Professor (Engg.) as tour leaders along with 60 students.

Students visited Central Tuber Crops Research Institute, Trivandrum

Students visited Horticultural College and Research Institute, Coimbatore

SKPP HORTICULTURAL POLYTECHNIC, RAMACHANDRAPURAM

Teachers Day Celebrations:

On the occasion of Birth Anniversary of Dr.Sarvepalli Radhakrishna the Teachers Day was celebrated on 5th September, 2013, SKPP HPT, R.C.Puram.

NSS Day:

NSS Day was conducted on 24th September, 2013 at SKPP HPT, R.C.Puram.

Gandhi Jayanthi and International Day of Non-violence and peace:

Gandhi Jayanthi and International Day of Non-violence and peace was celebrated on 2nd October, 2013, SKPP HPT, R.C.Puram.

AIDS Awareness Campaign :

The Campaign was conducted on 1st December, 2013 at SKPP HPT, R.C.Puram.

National voter's day :

National Voter's Day was celebrated on 25th January, 2014 at SKPP HPT, R.C.Puram.

NSS Special Camp:

Students of SKPP HPT, R.C.Puram conducted NSS Special Camp on 4th to 10th January 2014 at Velangi village, Karapa Mandal, E.G.Dist.

Educational Tour :

Organized an educational tour to the 2nd year Diploma in Horticulture students of SKPP Horticultural Polytechnic, Ramachandrapuram from 21-2-2014 to 24-2-2014.

Teachers Day Celebrations

International Day of Non-violence and peace

AIDS Awareness Campaign

NSS Special Camp

HORTICULTURAL POLYTECHNIC, KALIKIRI

NSS Special camp:

The NSS special camp with 41 students was conducted on 19.2.2014 to 25.2.2014 at Moorevandlapalli, Vayalpadu mandal, Chittoor district.

NSS General activity:

Veterinary camp was organized at Yellampalli and Harijanawada, Kalikiri mandal on 30.11.2103. Deworming of sheep (200 nos.) and application of Cypermethrin on cattles to control ectoparasites (250 nos.)

Educational Tour:

Organized educational tours for the students of 1st year and 2nd year Diploma in Horticulture polytechnic of Kalikiri from 29.1.2014 to 31.1.2014 & 5.2.2014 to 6.2.2014 respectively.

SSPG HORTICULTURAL POLYTECHNIC, MADAKASIRA

Dr.B.R.Ambedkar birthday :

Quiz Competitions were conducted separately for Boys and Girls on the Life History and Achievements of Dr. B R Ambedkar on 14th April 2013.

Independence Day Celebraitons:

On the eve of Independence Day on **15th August 2013,** the students and staff have planted 25 kasturi ganneru and 25 neerium in the Campus along the compound wall and 10 Hibiscus plants along the girls hostel compound wall.

NSS day :

Nss day was celebrated on *24th September 2013*: The Parthenium awareness programme was conducted in the campus by the NSS volunteers.

National voters day :

Conducted on 25.01.2014 at M.R.O. office, Madakasira and participated in Rangoli competitions conducted by Tahsildar, Madakasira.

Pulse Polio Programme:

The students and staff participated in this programme on 24.2.2014 at Ananthapuram village (NSS village).

NSS special camp:

The special camp was conducted in Ananthapuram village, Madakasira Mandal, Anantapur district from 3rd March, 2014 to 9th March, 2014. 42 NSS Volunteers have taken part in the Special Camping Programme. The Activities like anti-plastic rally, Clean and green, Sanitation, Tree plantation, Animal Health camp, Human Health camp and old age home Shramadhan conducted during special camp programme.

National voters day

NSS Volunteers in "Plastic ban Rally" at R.Ananthapuram

Free human health camp in the village.

Deworming the animals by spraying disinfectant

II) SPORTS, GAMES AND CULTURAL ACTIVITIES :

15th All India Inter Agricultural University Sports & Games Meet at Assam Agricultural University, Jorhat, Assam.

Forty students of Dr.YSR Horticultural University from its constituent colleges have participated in 15th All India Inter Agricultural University Sports & Games Meet at Assam Agricultural University, Jorhat, Assam from 24th to 28th March, 2014.

First time in the university girl students have won five prestigious medals in this national level sports & games meet held. In high jump, A. Rajyalakshmi (VH/11-72) has won Bronze medal and in 4X100 m relay, M. Lavanya (VH/12-22), P.J.S. Laksmi Durga (VH/10-29), B. Nagalakshmi (VH/10-33) and G. Sreenija (VH/10-65) have won bronze medals.

14th All India Inter University Youth Festival at UAS, Bangalore.

Students of the four constituent colleges of the University have participated in 14th All India Inter University Youth Festival organized by ICAR at UAS, Bangalore from 13th to 18th February, 2014. Students participated in cultural, music and fine arts.

Participation in Group dance

Participation in Skit by Dr.YSRHU students

4th Inter Collegiate Sports, Games, Cultural and Literary Meet (2013-14):

Fifty students from each college of four constituent colleges of Dr.YSRHU have participated in 4th Inter collegiate Sports, Games, Cultural and Literary meet from 5th-8th February, 2014 held at HCRI, Anantharajupeta.

Inauguration of sports meet

Lighting the torch by DSA & Dean PGS at sports meet

Marchfast and salutation of students

Prize distribution by Hon'ble Vice -Chancellor, Dr.B.M.C.Reddy

Valedictory function

HC & RI, V.R.Gudem team won the Overall Championship

2nd Inter Polytechnic Sports, Games, Literary and Cultural Meet 2013-14:

The students of five Horticultural Polytechnic colleges i.e. HPT, Ramachandrapuram, HPT, Madakasira, HPT, Kalikiri, HPT, Adilabad and HPT, Ramagirikhilla have participated in the 2nd Inter Polytechnic Sports, Games, Literary and Cultural Meet held at HPT, Adilabad from 9.4.2014 to 11.4.2014.

HPT, Ramachandrapuram won the Overall Championship.

University topper in U.G. programme:

Ms. P.Tanuja, I.D.No. MH/2009-36 received "Smt. Anne Shikhamany Memorial Gold Medal" for having secured the highest OGPA in B.Sc. (Hons.) Horticulture Degree among the girl students of all horticultural colleges of the university during 2009-2013.

University toppers in P.G. programme:

The university top rankers among 2012 admitted student batch in PG programme in department of fruit science, vegetables, floriculture and landscape architecture and plantation, spices, medicinal and aromatic crops in Dr.YSRHU is furnished hereunder.

Department		Students name	ID No.	Year of admission	OGPA	Remarks
1.	Fruit science	Ms.L.Suhasini	RHM/2012-18	2012-13	8.94	University topper
2.	Vegetables	Ms.P.Shireesha	VHM/2012-16	2012-13	8.93	University topper
3.	Floriculture and landscape architecture	Mr.K.C.Bhanu Murthy	RHM/2012-03	2012-13	9.05	University topper
4.	Plantation, spices, medicinal and aromatic crops	Ms.V.Krishnaveni	RHM/2012-07	2012-13	8.83	University topper

IV. RESEARCH

The university is conducting basic, applied, location /region specific and anticipatory research for the overall development of horticultural crops in the state at 27 Research Stations located in 9 agro-climatic regions of the state. The research programmes are covered under three categories namely, Non plan projects/University projects, ICAR plan projects under All India Coordinated Research Projects and State Horticulture Mission projects.

The research activities of the university are being carried out in the following thrust areas.

1. Thrust areas of research

- Increasing productivity
- Sustaining productivity under biotic and abiotic stresses
- Improving nutritive value
- Environment protection
- Increasing profitability to the farmers
- Export promotion
- Minimization of post harvest losses
- Processing and value addition

2. Research Stations

Sl.No.	Horticultural Research Stations	Research Crops	AICRP on
1.	Horticultural Research Station, Chintapalle, Visakhapatnam District.	Spices, Flowers	Spices
2.	Horticultural Research Station, Pandirimamidi, East Godavari District.	Fruits, Vegetables, Palmyrah	Palms
3.	Horticultural Research Station, Ambajipeta, East Godavari District.	Coconut, Cocoa	Palms
4.	Horticultural Research Station, Kovvur, West Godavari District.	Banana, Elephant Foot Yam, Colocasia	Tropical fruits and Tuber crops
5.	Horticultural Research Station, Venkataramannagudem, West Godavari District	Sapota, Jack, Betelvine, Medicinal plants, Tapioca	Tropical fruits, Tuber crops, MAP & Betelvine
6.	Horticultural Research Station, Vijayarai, West Godavari District.	Oil Palm, Vegetables	Palms
7.	Mango Research Station, Nuzvid, Krishna District	Mango	-
8.	Horticultural Research Station, Lam, Guntur District.	Chilli, Vegetables, seed spices	Chilli, Vegetables, Grain spices
9.	Cashew Research Station, Bapatla, Guntur District.	Cashew	Cashew
10.	Horticultural Research Station, Darsi, Prakasam District.	Sweet orange, Vegetables	-

11.	Horticultural Research Station, Adilabad, Adilabad District.	Vegetables, Flowers	-
12.	Horticultural Research Station, Aswaraopet, Khammam District.	Mango, Guava, Vegetables	-
13.	Turmeric Research Station, Kammarapally, Nizamabad District.	Turmeric	Spices
14.	Horticultural Research Station, Mallepally, Nalgonda District.	Flowcrs	Floriculture
15.	JVR Horticultural Research Station, Malyal, Warangal District.	Mango, Chilli	-
16.	Floriculture Research Station, Rajendranagar, Ranga Reddy District.	Flowers	Floriculture
17.	Grape Research Station, Rajendranagar, Ranga Reddy District.	Grape	Fruits
18.	Herbal Research Station, Rajendranagar, Ranga Reddy District	Medicinal and Aromatic plants	-
19.	Vegetable Research Station, Rajendranagar, Rangareddy District.	Vegetables, Grain spices	Vegetables, Tuber crops,
20.	Fruit Research Station, Sangareddy, Medak District.	Mango, Guava, Custard apple	Fruits
21.	Horticultural Research Station, Anantapur, Anantapur District.	Arid Fruit crops	Pomegranate, Amla
22.	Horticultural Research Station, Anantharajupet, Kadapa District.	Fruit crops, vegetables, flowers	-
23.	Horticultural Research Station, Mahanandi, Kurnool District	Vegetables	-
24.	Citrus Research Station, Petlur, Nellore District.	Sweet orange and acid lime	-
25.	Citrus Research Station, Tirupati, Chittoor District.	Sweet orange and acid lime	Fruits
26.	Post Harvest Technology Research Station, Rajendranagar, Hyderabad	Fruits and vegetables	-
27.	Post Harvest Technology Research Station, Venkataramannagudem, West Godavari District.	Mango, Sweet orange	-

3. Seasonal conditions and crop performance:

During 2013-14, the mean minimum and maximum temperatures ranged from 19.6^{O} C to 31.7^{O} C while the highest temperatures of 40.4^{O} C was recorded during the month of May, 2013 and minimum of 9.9^{O} C was recorded during December, 2013.The mean RH was 81.4% (FN) and 48.8% (AN) while maximum and minimum humidity levels 89% (FN) & 32% (AN) were recorded during the months of October 2013 and May 2013 respectively. A total of 1020.9 mm rainfall was received in 61 rainy days while 80% of the total rainfall was received during June, July, August and October, 2013.

The area, production and productivity of horticultural crops in Andhra Pradesh during 2013-14 are presented below.

Statistics of Horticultural crops in Andhra Pradesh (including Telangana) during 2013-14

Sl. No	Crop Category	Area (000'HA)	Production (000'MT)	ProductivityT/ha.
1	Fruit Crops	1004.53	14951.54	14.88
2	Vegetables Crops	660.58	11797.04	17.86
3	Plantation Crops	331.20	1381.26	4.17
4	Spice Crops	303.54	1327.29	4.37
5	Flower Crops	27.26	242.06	8.88
6	Medicinal and aromatic crops	1.88	3.51	1.87
	Total	**2328.99**	**29702.70**	**12.75**

4. Salient Research Results during 2013-14

Proposals for the release of one chilli (LCA-625) and two paprika varieties (LCA-424, LCA-436) were submitted to the State Variety Release Committee

Chilli: LCA-625

- LCA-625 is a high yielding chilli variety with an yield advantage of 5-10% over LCA-353 and has proven for high colour and high pungency.

- Suitable for dry spice as an excellent powder, oleoresin recovery for the domestic & export market. Readily accepted by the export industry and farmers due to colour retention.

- Fruits of this new variety would retain their colour (bright red on drying) even after two to three months of storage in open conditions and even if plucking is delayed after ripening. Tahe pungency factor is the most striking feature of this variety.

Paprika: LCA-424

LCA-424 is slender, light green in colour and turns to deep red colour developing characteristic wrinkles at ripening stage. This variety possesses high colour value and is suitable for rain fed conditions of Andhra Pradesh. It has proven for high colour and low pungency. The variety has shown yield superiority upto 20% over Byadagi Kaddi.

Paprika: LCA-436

The fruits are of medium length, bold and slightly bulged at the base of calyx and is suitable for rain fed conditions of Andhra Pradesh. It has proven for high colour and low pungency. The variety has shown yield superiority upto 30% over Byadagi Dabbi.

AICRP on spices

- Proposals for the release of an ajowan variety (Lam Ajowan-2) and a fenugreek variety (Lam Methi-2) were submitted to the State Variety Release
- Coriander varieties Suguna (LCC-236 for grain) and LCC - 234 (leaf type) were approved for release as national varieties during 2012-13 and 2013-14 national workshops respectively.

AJOWAN - LTA-26 (Lam Ajowan-2)

- It is a high yielding variety, tolerates moisture stress better than the popular check LS-1 and suitable for rainfed conditions of Andhra Pradesh. Performs better than existing varieties with an yield advantage of 20 % - 66%.
- It is a long duration variety (145 – 175days) with an yield potential of 6 to 13 q/ha under rainfed and 12.0 to 15.0 q/ha under irrigated conditions.
- Grains are slender, thin and oblong in shape with attractive wheatish brown or dark brown colour. It has higher essential oil content (3% to 4%), flavour; aroma and pungency.
- Highly suitable for late *Kharif* while reasonably good yields can be expected during *Rabi* also.

FENUGREEK - LFC-84 (Lam Methi-2)

- High yielding variety suitable for rainfed conditions of Andhra Pradesh, which performs better than existing varieties with an yield advantage of 29 % - 36 %.
- Medium duration variety (80-90 days) under rainfed situation of Andhra Pradesh.
- Yields upto 7 - 9 q/ha. under rainfed and 12.0 - 15.0 q/ha. under irrigated conditions.
- Grains are flat, rectangular shaped with attractive brown colour. It has higher diosgenin content (0.45% to 0.83%) in comparison with check, Lam Selection-1 (0.41%).
- It also performs well under North Indian conditions extending its duration up to 120 days and is suitable for rainfed cultivation in these locations as it matures early when compared to North Indian varieties which comes to harvest in 135 to 160 days.

CORIANDER - LCC-236 (Suguna)

- High yielding variety suitable for Andhra Pradesh, Gujarat, Rajasthan, Tamil Nadu and Uttar Pradesh which performs better than existing varieties with an yield advantage of 15-65.6 % increase.
- A medium duration variety under rainfed situation of Andhra Pradesh and comes to maturity in 87 to 100 days.
- It also performs well in North Indian conditions extending its duration up to 125 to 135 days as a early variety.
- This variety gives an average yield of 7.5 to 13.5 quintals per hectare under rainfed conditions and 12.0 to 22.0 quintals under irrigated conditions.
- Grains small to medium, oval shaped with light attractive color. It has high volatile oil content (0.52%) in comparison with check, Sudha (0.46%).
- It is less susceptible to insect pests and diseases.

CORIANDER - LCC -234

- It is a high yielding leaf variety suitable for off-season production in Andhra Pradesh, Tamil Nadu and Rajasthan.
- Harvesting for greens can be taken from 35 to 55 days.
- This variety gives an average yield of 15 – 18 t/ha of greens in rabi season and 2.5-4.5 t/ha greens in off-season under 50% shade net.
- The variety has volatile oil content of 0.15% in herb.


Suguna (LCC -236) variety of coriander


LCC 234 - A leafy variety of coriander

Particulars of cultures under minikit testing

Name of the culture	Important features	
LCA-620 (III Year of testing)	• Bold and medium long pod· • Excellent dry pod colour, and medium pungency • 65-68 q/ha dry yield potential	
LCA-655 (II Year of testing)	• Fruits medium long, bold· • Parrot green in colour, rich in vitamin C with moderate pungency· • High yielding · • 200-210 q/ha green chilli.· • Suitable for fresh green and dry pod	

Varieties approved for minikit testing

Name of the culture	Year of minikit testing	Important features
LCA-639 (Hot Pepper)	I year	Excellent plant type, fruits medium long, highly pungent and very deep red in colour, high yielding.
LCA-442 (Paprika)	I year	Fruits bold, medium long with high colour (96 ASTA), moderately pungent (10,454 SHU) and suitable for pickles.
LCA-450 (Paprika)	I year	Fruits bold, long, high colour (92 ASTA) and very mild in pungency (2,196 SHU). It is a true paprika type.

A. CROP IMPROVEMENT

FRUITS

MANGO

Horticultural Research Station, Pandirimamidi

Observation trail on the performance and quality in mango var. Alphonso in the coastal districts of A.P

Highest yield was recorded in Mango cv. Alphonso treated with Paclobutrazol (115 kg/tree) compared to control. Alphonso fruits collected from vizianagaram recorded turmeric yellow with high percent of red blush compared to the samples collected from Pandirimamidi. Fruits collected from Vizianagaram recorded an average weight of 290 g. and 18^{O} Brix as against those collected from Pandirimamidi (220g; 16^{O} Brix).

Studies on the effect of topworking on performance and fruit quality in mango var. Alphonso.

Among different interstocks of mango fruit setting was more in Panchadara kalasa (67%) followed by Imampasand (62%), A.U Rumani (60%) and SuvaranaRekha(60%), where as lowest percent of fruit setting was observed in Alampur Baneshan(20%), Peddarasam (25%) and Hybrid 10(25%).

Fruit Research Station, Sangareddy

Studies on off season mango edible variety

Top working has been completed and data was recorded on two year old plants. IC number has been obtained from NBPGR: **IC-0598076**

Augumentation and evaluation of mango germplasm

Among the twelve mango accessions evaluated, maximum number of fruits (410/tree) and yield (114.8 kg/tree) was recorded in CISH-M2.

Testing of superior clones of Dashehari

Among the three mango cv. Dashehari clones evaluated, after 13 years, Dashehari-35 found to be vigorous and superior in growth parameters in terms of maximum plant height (5.42 m), and canopy spread (EW-6.36 m and NS 6.56 m) when compared to other clones. Dashehari – 35 recorded maximum yield (90.10kg/tree) compared to Dashehari local (2.37kg/tree) during 2013-14.

Testing of Promising Hybrids

Among the mango hybrids evaluated, Sunder Langra was found to be superior in terms of plant height (3.97 m) and canopy spread (E-W) (3.72 m) when compared with Hybrid-117 (plant height 1.90 m and canopy spread (E-W) 1.85 m) and has recorded higher yield (34.49 kg/tree) over Hybrid-117 (17.25 kg/tree).

Horticultural Research Station, Aswaraopet

Neeleshan recorded highest mean yield (147.26 kg/tree) followed by Navaneetham (89.25 kg/tree) and the lowest yield was recorded in Amrapali (36.81 kg/tree). Among different hybrids, Mallika recorded highest fruit weight (276.44 g) whereas TSS was more in Hybrid – 13 (21.4^{o} brix).

Among different Table varieties tested, Totapuri recorded highest mean yield (183.59 kg/tree) followed by Beneshan (127.79 kg/tree) and lowest mean yield was recorded in Dashehari (26.04 kg/tree). Alampur Beneshan recorded maximum fruit weight (314.32 g), While TSS was more in Imampasand (25.2 ° Brix).

Among different juicy varieties, Suvarna Rekha recorded highest mean yield (116.03 kg/tree) followed by Peddarasam (100.35 kg/tree) and the lowest mean yield was recorded in Hyder Saheb (41.11 kg/tree). Among different juicy varieties Pandurivari Mamidi recorded highest TSS (24.7 ° Brix) whereas fruit weight was more in Peddarasam (325.67 g).

Over 19 years, the hybrid Neeleshan recorded highest cumulative yield (1849.95 kg/tree) followed by Manjeera (1832.54 kg/tree). Among table varieties, Totapuri recorded highest cumulative yield (2614.27 kg/tree) followed by Beneshan (1016.05 kg/tree). Among juicy varieties, Suvarna Rekha recorded highest cumulative yield (681.95 kg/tree) followed by Navaneetham (676.71 kg/tree) and among pickle varieties, Tellagulabi recorded highest cumulative yield (1495.28 kg/tree).

GUAVA

Fruit Research Station, Sangareddy

Augumentation and evaluation of guava germplasm.

Among 24 guava accessions evaluated, maximum number of fruits (1016/tree) and yield (132.33 kg/tree) were recorded in Kohir long. Further maximum cumulative yield (2002-2014) was recorded in Lucknow-49 (884.52 kg/tree) as against 213.09 kg/tree in Seedless-I.

Varietal trial in guava

Among six varieties evaluated, significantly higher yield was recorded in Lucknow-49 (99.20 kg/tree) when compared to 31 kg/tree in Seedless.

SWEET ORANGE

Horticultural Research Station, Mallepally

Clonal selections in Sweet Orange

Maximum increase in plant height of 4.98 cm in MSS-1, plant girth of 1.55 cm in MSS-4, canopy spread, EW & NS of 3.25 cm & 3.17 cm in MSS-7, number of fruits 52.00 in MSS-1, yield of 8.45 kg in MSS-2, average fruit weight of 166.33 g in MSS-3, TSS of 9.08 ^{0}Brix and juice content of 43.50 % were recorded in MSS-4.
(# MSS-Mallepally Sweet orange selection)

SAPOTA

Horticultural Research Station, Aswaraopet

Cricket ball recorded highest cumulative yield (17 years) (1075.83 kg per tree) followed by Kalipatti (981.80 kg per tree) and lowest yield was recorded by Mirandi (236.71 kg per tree).

Horticultural Research Station, Venkataramannagudem

Among eleven cultivars, Kalipatti recorded highest mean number of fruits (1033.21) followed by Gowrayya (928.57) where as Cricket Ball recorded highest mean fruit yield per tree (102.13 kg)

followed by Kalipatti (91.28 kg). Highest fruit weight was recorded in Cricket Ball (120.38 g) followed by Gutti (91.68 g) whereas highest TSS was recorded in Pala (26.6^0 Brix) followed by Badami (25.9^0 Brix).

GRAPE

Grape Research Station, Rajendranagar

Evaluation of table and raisin varieties

Period of ripening: Cardinal has recorded minimum period for ripening (137.3 days) while maximum period was taken by Crimson Seedless after pruning (162.0 days).

Yield: Maximum yield per vine was recorded in A 18/3 (8.17 kg/vine) followed by Rizamat (5.30 kg/vine) where as minimum yield was recorded in Red Globe (0.38 kg/vine).

Quality: Highest T.S.S. was recorded in Merbean Seedless (22.15^O B) whereas lowest was recorded in Red Globe (14.65^{0}B).

Vigour: Based on the pruning weight, Thomson Seedless (7.76 kg/vine) and Crimson Seedless (7.67 kg/vine) in summer and Crimson Seedless (1.69 kg/vine) followed by Rizamat (1.56 kg/vine) in winter were found to be more vigorous.

Raisin recovery: Among the eight seedless varieties maximum raisin recovery was recorded in Merbean Seedless (23.40 %) followed by 2A clone (22.35 %).

Evaluation of juice and wine varieties

Vigour: Based on the pruning weight, E12-2 (6.26 kg/vine) was found to be more vigorous.

Yield: Maximum yield was recorded in Chenin Blanc (17.90 kg/vine) followed by Sauvignon (17.44 kg/vine).

Quality: Maximum TSS was recorded in Bangalore Blue (22.13 ^{0} Brix).

Juice Recovery: Maximum juice recovery was recorded in Chenin Blanc (73.55%).

Evaluation of commercial varieties on different rootstocks

Vigour: Based on the pruning weight, Thompson Seedless on SO4 rootstock (5.52and 2.9 kg/vine) was found to be more vigorous and Flame seedless on own root (2.16 and 1.12 kg/vine) was least vigorous both during summer and winter prunings respectively

Yield: Maximum yield was recorded in Kishmish Chorni on Dogridge (6.49 kg/vine)

Quality: Maximum TSS was recorded in Thompson Seedless on 1103P rootstock (20.25^0 Brix)

Collection, maintenance and evaluation of germplasm

Vigour: Based on the pruning weight, Shiraz (4.40 kg/vine) was found to be more vigorous and Pinot Noir (0.10 kg/vine) was least vigorous both during summer and winter prunings respectively.

Yield:

- Among fourteen seeded table varieties, E19-4 recorded highest yield of 9.01 kg/vine with 17.20^0 Brix.
- Among fifteen seedless table varieties, A 18/3 recorded highest yield of 6.12 kg/vine with 20.0^0 Brix.
- Among nine raisin varieties evaluated, Pusa Urvasi recorded maximum yield of 4.75 kg/vine with 18.0^0 Brix.
- Bangalore Blue has recorded highest yield of 11.68 kg/vine with 20.2^0 Brix among juice varieties tested.
- Among nine wine varieties and 12 cultivars tested, Shiraz recorded the highest yield of 16.37 kg/vine with 17.4^O Brix.

Root stocks:

Evaluation of wine grape varieties for recovery and quality of wine

- Maximum yield was recorded in Chenin Blanc (17.90 kg/vine) followed by Sauvignon Blanc (17.44 kg/vine) and minimum was in Symphony (1.54 kg/vine).
- Maximum TSS was recorded in Cabernet Sauvignon (21.9^0 Brix) while maximum acidity was recorded in Pinot Noir
- Juice recovery was highest in Chenin Blanc (73.55 %).
- Highest TSS, total sugars, reducing sugars and phenols were recorded in Pinot noir. The highest score for overall acceptability was obtained by Zinfandal and Shiraz.

POMEGRANATE

Horticultural Research Station, Ananthapuram

Seventeen germplasm lines viz., Ganesh, G-137, Muscat, Jodhpur Red, Jalore Seedless, P-23, Basin Seedless, Dorasut Malagi, Alan, Speendanadar, Tabast, Lupania, Dholka, Utakal, Badana Sadana, Suner Anar and Virupakshi were planted in the main field during October, 2013.

Among five pomegranate varieties evaluated, maximum plant height was recorded in Jalore Seedless (2.75 m) followed by Ganesh (2.21 m) and Mridula (2.19m). Number of branches/plant was highest in Bhagwa (4.63) followed by Ganesh (4.13) and Jalore Seedless (4.00). Plant spread in EW and NS direction was more in Jalore Seedless (2.29m EW and 2.28m NS) followed by Ganesh (2.13m EW and 2.09m NS) (Table – 1).

Hasta bahar crop was taken and the highest fruit yield was recorded in Ruby (5.39 kg/plant) with 40 fruits/plant, whereas Bhagwa recorded an yield of 4.98 kg/plant with 38.88 fruits/plant. The highest TSS content was recorded in Bhagwa (18.08 °Brix) followed by Ruby (16.25 °Brix).

Table-1: Growth, yield and quality parameters of pomegranate varieties in 2013 (Year of Planting 2008)

Variety	Plant height +(m)	No. of branches/ plant	Plant spread (m)		No. of fruits / plant	Fruit yield (kg/plant)	TSS (°Brix)
			EW	NS			
Ganesh	2.21	4.13	2.13	2.09	28.88	3.85	15.18
Mridula	2.19	3.88	1.74	1.76	26.75	3.85	15.45
Bhagwa	2.10	4.63	1.84	1.89	38.88	4.98	18.08
Ruby	1.95	3.13	1.74	1.74	40.00	5.39	16.25
Jalore seedless (check)	2.75	4.00	2.29	2.28	0.88	0.16	12.43
Statistics							
CD at *P*=0.05	*NS*	*NS*	*NS*	*NS*	*5.78*	*2.28*	*0.42*
SE.m±	*0.19*	*0.51*	*0.16*	*0.18*	*1.87*	*0.74*	*0.14*
CV (%)	*16.89*	*26.04*	*16.68*	*18.96*	*13.87*	*40.67*	*1.78*

CUSTARD APPLE

Horticultural Research Station, Ananthapuram

In custard apple germplasm (planted during 1999-2000), maximum plant height was recorded in Molkalmur S.No. 10 (3.1 m) followed by Molkalmur S.No.7 and Molkalmur S.No.9(2.9 m) (Table-1). Stem girth was more in Kadiri S. No. 169 (84.0 cm) followed by Yengalmapalli S.No.1 (74 cm) and Yengalampalli S.No.8 (72.8 cm). More number of branches/plant was observed in CRIDA Balanagar (6.4) closely followed by Molkalmur S.No.7(6.3). Plant spread was more in K.Dayalauripalli S. No.13 and Kadiri S.No.132 (3.0m EW and 2.8m NS) followed by Yengalampalli S.No.8 (2.9m EW and 2.8m NS). Number of fruits/plant was highest in Molkalmur S.No.7 (49.3) followed by Kadiri S.No.132 (47.7).

Results on quality parameters indicated that Pythota S.No.5 recorded maximum fruit weight (320.03g) and pulp weight (150.07g) followed by Arka Sahan (274.19 g and 118.50 g) (Table-10). TSS content was highest in Arka Sahan (32.0 °Brix) followed by Jambugumpala S.No.6 (29.25°Brix) and Atemoya X Washington (28.60°Brix).

In custard apple germplasm collections that were planted during 2005, highest plant height was recorded in SK - 4 (2.67 m) followed by SK – 6 and DC - 1 (2.53 m) (Table-11). Stem girth and number of branches /plant were more in SK – 2 (5.25cm and 63.5) followed by SK – 4 (5.00cm and 57.33). Plant spread was observed more in DC – 1 (2.30m EW and 2.23m NS) followed by DC – 3 (2.32m EW and 2.1m NS). DC – 3 recorded more number of fruits/plant (62.0) followed by SK – 2 (52.5).

Based on the performance over years (2005-2011), it was noticed that the highest mean fruit yield of 7.37 kg/plant was recorded in Arka Sahan followed by Bellary (7.18 kg/plant). The next best accession was Pythota No.3 with 6.18 kg/plant (Table-2). Though the yield per plant was high (9.85) in Nallaldadi No.2, it started bearing in 2011 only.

Table-2: Yield/plant (kg) in custard apple germplasm (2005-2011)

	2005	2006	2007	2008	2009	2010	2011	Mean
Arka Sahan	4.00	—	—	0.36	5.73	10.58	16.20	**7.37**
Atemoya × Balanagar	4.00	5.30	—	—	2.63	12.02	5.91	5.97
Red Sithaphal X Pond apple1	3.02	3.56	3.56	—	5.37	5.34	—	4.17
Atemoya × Washington	3.28	7.30	—	—	3.99	7.01	7.14	5.74
Balanagar	3.63	9.13	—	2.32	2.30	15.16	3.46	6.00
Bengaluru	4.18	1.20	—	—	—	—	—	2.69
Ballary	3.00	5.70	—	—	2.95	5.86	18.41	**7.18**
Ramaphal	2.93	7.14	7.14	2.46	2.48	9.14		5.21
Hyderabad	3.06	3.14	3.14	2.57	3.15	8.64	5.25	4.14
Jambugumpala No.1	1.73	—	—	1.73	2.99	5.28	4.71	3.29
Jambugumpala No.2	2.91	3.81	3.81	2.33	3.61	4.22	7.18	3.98
Jambugumpala No.3	2.82	5.12	—	1.41	4.57	4.93	4.35	3.87
Jambugumpala No.4	3.12	2.85	—	1.37	4.19	6.40	5.06	3.83
Jambugumpala No.5	3.93	5.17	—	1.86	5.67	6.60	5.01	4.71
Jambugumpala No.6	—	2.65	2.65	0.70	5.53	8.85	9.46	4.97
Jambugumpala No.7	—	—	—	3.12	4.45	5.08	3.89	4.14
K.Dayalauripalli No.13	3.67	—	—	4.24	1.87	5.60	2.53	3.58
K.E. Palli No.1	—	—	—	7.02	5.38	4.48	6.00	5.72
K.E. Palli No.2	3.43	—	—	3.53	2.52	5.60	4.85	3.99
K.E. Palli No.3	2.73	3.05		2.17	2.20	4.29	6.60	3.51
K.E. Palli No.7	1.81	—	—	—	—	—	—	1.81
Kadiri 305	3.45	—	—		2.98	6.21	3.53	4.04
Kadiri 306	3.86	—	—	1.39	3.96	5.50	3.80	3.70
Kadiri No. 132		—	—	1.29	1.86	5.24	2.82	2.80
Kadiri No. 169	3.00	—	—	—	5.27	1.59	4.93	3.70
Kadiri No.152	3.00	—	—	—	—	—	—	3.00
Kokkanti	4.66	—	—	—	3.59	7.16	3.65	4.77
Kokkanti No.307	1.89	—	—	—	2.97		2.75	2.54
Kokkanti No. 5	3.68	—	—	—	—	—	—	3.68
Molakalmur		—	—	1.29	—	—	6.96	4.13
Molakalmur No.1	3.78	—	—	1.09	3.09	6.16	8.46	4.52
Molakalmur No.2	4.12	—	—	—	—	—	—	4.12
Molakalmur No.3	4.33	—	—	—	—	—	—	4.33
Molakalmur No.4	3.62	—	—	2.43	—	—	—	3.03
Molakalmur No.5	3.66	—	—	—	—	—	—	3.66
Molakalmur No.6	4.91	—	—	1.88	3.22	7.58		4.40
Molakalmur No.7	4.83	4.23	4.23	—	4.32	9.17	4.07	5.14
CRIDA1	4.00	—	—	—	—	—	—	4.00
CRIDA15	—	—	—	0.82	—	—	—	0.82
Molakalmur No.8	0.96	5.63	5.63	1.09	4.46	5.23	6.51	4.22
Molakalmur No.8 a	—	—	—	—	—	—	7.19	7.19
Molakalmur No.9	—	5.50	5.50	2.68	5.07	4.11	4.67	4.59
Molakalmur No.10	—	3.62	3.62	2.35	4.68	4.79	4.52	3.93
Molakalmur No.12	—	3.12	3.12	1.30	3.78	3.45	4.38	3.19
Molakalmur No.13	—	—	—	1.99	15.07	3.07	2.94	5.77
Molakalmur No.14	—	—	—	2.01	5.43	4.03	3.01	3.62
Molakalmur No.15	—	—	—	—	4.78	3.57	—	4.17
Mutravanipalli No.1	3.01	5.87		2.10	3.73	6.25	3.96	4.15
Mutravanipalli No.2	3.12	—	4.90	2.83	4.85	4.68	5.73	4.35
Mutravanipalli No.12	—	—	—	0.62	—	—	—	0.62

Nallaldadi	—	—	—	—	5.25	8.11	6.01	6.46
Nallaldadi No.1	—	—	—	—	—	—	9.85	9.85
Nallaldadi No.2	3.21	—	4.31	1.51	4.02	3.30	5.85	3.70
Nallaldadi No.3	2.02	—	—	—	—	—	—	2.02
Nallaldadi No.4	—	3.69	3.69	1.01	3.95	6.17	12.33	5.14
Nallaldadi No.5	—	7.95	7.95	1.50	4.02	5.66	5.09	5.36
Nallaldadi No.6	—	—	—	0.53	—	—	—	0.53
Nallaldadi No.8	—	5.52	5.52	0.82	4.64	2.45	6.02	4.16
Nallaldadi No.9	0.93	2.72	2.72	1.14	—	4.96	9.62	3.68
Nalladadi No.10	3.00	2.17	2.17	1.51	2.95	10.30	6.31	4.06
Nallaldadi No.11	3.94	4.62	—	2.73	3.49	7.22	3.94	4.32
Nallaldadi No.12	0.59	4.13	4.13	—	3.78	6.11	4.43	3.86
Nallaldadi No.13	3.12	5.24	5.24	0.72	4.15	5.21	11.00	4.95
Pythota No.1	3.48	2.86	2.86	2.24	3.02	8.80	5.28	4.08
Pythota No.2	2.94	4.16	4.16	2.23	6.23	5.01	6.48	4.46
Pythota No.3	2.33	6.32	—	1.75	7.65	8.02	11.00	**6.18**
Pythota No.4	2.67	2.80	2.80	4.41	7.45	5.31	10.86	5.19
Pythota No.4 a	1.36	—	—	—	—	—	3.78	2.57
Pythota No.5	2.89	2.76	2.76	1.87	7.00	7.45	6.01	4.39
Pythota No.6	3.91	2.51	2.51	1.90	7.19	6.73	5.05	4.26
Pythota No.8	—	—	—	—	—	—	4.49	4.49
Pythota No.12	—	4.47	4.47	—	—	—	—	4.47
Yengalampalli	—	—	—		3.12	8.11	3.92	5.05
Yengalampalli No.1	1.83	—	—	1.47	4.79	14.61	5.31	5.60
Yengalampalli No.2	2.41	4.21	—	1.70	3.05	6.00	4.66	3.67
Yengalampalli No.3	0.99	—	—	0.98	—	—	—	0.99
Yengalampalli No.4	1.20	4.99	4.98	2.54	5.39	6.13	5.19	4.35
Yengalampalli No.5	3.21	—	—	1.03	2.25	6.14	3.17	3.16
Yengalampalli No.6	3.66	—	—	2.22	2.87	—	4.35	3.27
Yengalampalli No.7	—	—	—	2.29	5.35	4.98	4.73	4.34
Yengalampalli No.8	—	—	4.80	0.95	7.10	7.67	5.11	5.13
Yengalampalli No.9	2.91	—	—	1.46	2.22	1.60	4.29	2.50
Yengalampalli No.10	—	—	—	1.77	3.53	8.13	5.50	4.73
Yengalampalli No.11	1.88	—	—	1.55	—	—	—	1.72
Yengalampalli No.12	—	8.40	8.40	1.40	4.73	7.74	5.34	**6.00**
Yengalampalli No.13	2.63		6.10	1.40	4.17	6.98	5.20	4.41
Yengalampalli No.14	2.93	3.56	—	2.16	3.13	8.39	4.04	4.04
Yengalampalli No.15	2.98	—	5.60	—	2.86	3.07	7.20	4.34
Yengalampalli No.16	1.91	—	6.70	1.03	3.00	5.58	5.58	3.97
Yengalampalli No.17	1.50	—	5.50	1.24	2.66	3.60	5.86	3.39
Yengalampalli No.18	2.11	—	—	0.99	8.52	4.94	5.28	4.37

Among the six varieties under evaluation, APK (Ca -1) recorded maximum plant height (2.18 m) followed by Arka Sahan (2.11 m). Stem girth was maximum in APK (Ca-1) (37.88 cm) followed by Sinhan Local (33.38 cm). Number of branches/plant were high in Arka Sahan (3.63) followed by Sinhan Local (3.50). Plant spread was more in Sinhan Local (2.14m EW and 2.21m NS) followed by APK (Ca-1) (2.04m EW and 2.08m NS). With regard to fruit number/plant, Balanagar recorded more number of fruits per plant (19.5) followed by Arka Sahan (18.0) and APK (Ca-1) (17.13).

With respect to fruit quality, Arka Sahan was founad superior with maximum fruit weight (275.32 g), pulp weight (135.81 g) and TSS (28.48 °Brix) (Table-3). APK (Ca-1) recorded fruit weight of 210.02g with 72.26g pulp and 25.28 °Brix. Apart from Arka Sahan,

the pulp weight was maximum in Balanagar (85.24 g), Sinhan Local (80.60g) and Rayadurg (79.77g).

Table-3: Fruit quality parameters in Custard Apple varieties in 2013. (Year of Planting 2008)

Variety	Fruit Wt.(g)	Pulp Wt. (g)	Seed Wt.(g)	TSS (°brix)
Rayadurg	180.23	79.77	14.24	22.80
APK (Ca-1)	210.02	72.26	18.90	25.28
Red Sithaphal	172.85	77.76	13.10	22.78
Arka Sahan	275.32	135.81	15.22	28.48
Sinhan Local	201.76	80.60	17.15	23.90
Balanagar (check)	185.11	85.24	20.42	25.70
CD at *P*=0.05	*36.12*	*14.27*	*NS*	*2.97*
SE.m±	*11.98*	*4.73*	*1.85*	*0.97*
CV (%)	*11.74*	*10.70*	*22.41*	*7.95*

BANANA

Horticultural Research Station, Kovvur

Collection, conservation, characterization and maintenance of banana Germplasm

One hundred and twenty accessions are being maintained at HRS Kovvur and 101 accessions were deposited with NRC for Banana (NAGS) for registration and out of which 50 were given accession numbers.

Clonal selection in commercial banana varieties

- Dwarf Cavendish clone (KBS – 8) recorded an average bunch weight of 50.0 kg with an yield potential of over 115 t/ ha.
- A clone from Tella Chekkara keli variety of banana was identified which has 9 hands, 127 fruits with a bunch weight of 16 Kg and the clone is under field evaluation.
- Another clone of Tella Chekkara keli variety with 9 hands 216 fruits was identified from farmers' field and is under field evaluation.
- In Grand Naine, one clone was identified with 16 hands and 200 fruits from farmers' field and the clone is under field evaluation.
- A clone was identified with 7hands/bunch in Kovvur bontha clone which had rapid growth and some of the plants started shooting at 7th month itself.
- In KC Keli, one clone with more than 250 fruits was identified.

Evaluation of Promising clones of banana

Among the clones, NRCB -08 recorded highest plant girth and it was at par with Kovvur bontha. With respect to fruit characters, the total hands per bunch were highest in BCB-2 where as Manjira nendran-2 recorded the lowest no. of hands per bunch. The highest number of fruits in 2nd hand were recorded in KBS-8 followed by Manjiranendran-2, KC Keli and H-212. The bunch weight and yield per ha. were significantly highest in KBS-8 and it was on par with NRCB-08.

Evaluation of Culinary cultivars of banana

Among the yield attributing characters, higher no. of hands and fingers/ hand were recorded in FHIA 3 and Kothia whereas the fruit girth was higher in Kovvur bontha and Bangrier. No significant difference was observed among cultivars with regard to fruit length and total fruits/ bunch. The cultivar FHIA -3 recorded significantly higher yield of 51.03 t/ha and it was on par with kothia (47.28t/ha) and Bangrier (46.04t/ha).

BER

Horticultural Research Station, Ananthapuram

Among ber collections, maximum plant height was recorded in Gola (2.48m) followed by Kaithili (2.31m) and Gangaregu (2.24m). Stem girth and number of branches were observed more in Kaithili (83.24cm and 7.77, respectively). The plant spread was maximum in Kaithili (2.84m EW and 2.86m NS) closely followed by Gola (2.77m EW and 2.62m NS). With regard to yield and fruit quality parameters, maximum fruit yield was recorded in Umran (108.88 kg/plant) followed by Seb (95.10 kg/plant) and Gola (81.32 kg/plant). Maximum fruit weight (25.87g) and pulp weight (24.49g) were recorded in Umran which was followed by Seb (24.80g and 22.72g). Stone weight was high in Seb (2.08g) and low in Kaithili (0.59g). TSS content was high in Gola (13.0°Brix) followed by Seb (12.20°Brix) and Umran (12.0°Brix).

Table-4: Growth and yield parameters of ber germplasm during 2013 (Year of planting 1983)

Variety/ selection	Plant height (m)	No. of branches /plant	Stem girth (cm)	Plant spread (m)		Fruit yield (kg/ plant)	Fruit weight (g)	Pulp weight (g)	Stone weight (g)	Pulp to stone ratio	TSS (°Brix)
				EW	NS						
Seb	2.25	5.00	70.92	2.45	2.18	95.10	24.80	22.72	2.08	10.92	12.20
Gola	2.48	6.46	77.38	2.77	2.62	81.32	24.19	22.45	1.74	12.90	13.00
Mundia	2.27	6.46	78.38	2.58	2.39	77.20	15.40	13.78	1.62	8.51	11.80
Umran	2.08	5.96	77.17	2.48	2.44	108.88	25.87	24.49	1.38	17.75	12.00
Kaithili	2.31	7.77	83.24	2.84	2.86	75.00	20.21	19.62	0.59	33.25	11.87
Gangaregu	2.24	5.43	79.00	2.59	2.49	72.10	11.14	10.01	1.13	8.86	11.17

The pooled data (2003-2013) presented in Table-5 on growth and yield parameters of ber germplasm indicated that Umran was the highest yielder (67.99 kg/plant) and suitable for growing under southern region of Andhra Pradesh. With respect to quality parameters, Umran was found superior with maximum fruit weight (36.19 g), pulp weight (32.56 g) and an acceptable TSS content of 15.62^{o} Brix.

Table-5: Pooled data (2003 to 2013) on growth and yield parameters of ber germplasm

Variety/ selection	Plant height (m)	No. of branches / plant	Stem girth (cm)	Plant spread (m^3)	Fruit yield (kg/ plant)
Seb	2.53	4.80	60.62	15.19	57.96
Gola	2.49	5.16	62.35	15.76	59.73
Mundia	2.41	4.89	64.00	14.42	60.67
Umran	2.53	5.60	66.68	17.04	67.99
Kaithili	2.87	6.30	69.20	20.98	62.32
Gangaregu	2.47	5.52	78.91	17.41	57.86

Table-6: Pooled data (2003 to 2013) on fruit quality parameters of ber germplasm

Variety/ selection	Fruit volume (ml)	Fruit weight (g)	Pulp weight (g)	Stone weight/ fruit (g)	Pulp to stone ratio	TSS (°Brix)
Seb	22.15	29.42	26.22	1.94	13.52	16.27
Gola	25.45	28.52	24.56	1.82	13.28	16.91
Mundia	21.90	28.47	24.11	1.85	13.03	13.70
Umran	32.28	36.19	32.56	1.78	18.29	15.62
Kaithili	25.23	33.09	29.58	1.24	23.85	14.77
Gangaregu	11.63	18.74	14.20	1.33	10.68	14.10

AONLA

Horticultural Research Station, Ananthapuram

In Aonla collections, highest plant height was recorded in Local (6.6 m) followed by Lucknow (5.6 m) and PD (4.7 m) (Table-7). Number of branches per plant was maximum in Kanchan (7.5) followed by Local (7.0) and PD (6.5). The highest plant spread (6.9 m EW and 6.5m NaS) and stem girth (117.0 cm) were recorded in Local which was followed by PD with a plant spread of 5.7m EW and 5.6m NS and stem girth of 81.0 cm. Maximum fruit yield was recorded in NA-7 (Neelam) (48.0 kg/plant) followed by ATPS-1 (46.0 kg/plant) and NA-10 (Balwant) (45.7 kg/plant). Maximum fruit weight (35.69g) and pulp weight (34.0g) were recorded in ATPS-1, followed by Kanchan (Table-7). Highest seed weight was recorded in ATPS-2 (1.71g) and lowest seed weight in Neo-4 (0.68g). High TSS was observed in Local (14.8°Brix) followed by Neo-4 (13.5°Brix). Acidity content was high in Neo-4 (3.18%) followed by Local (2.87%).

Table-7: Growth, yield and fruit quality parameters of Aonla germplasm during 2013 (Year of planting 1993)

Growth and yield parameters of Aonla germplasm						
Variety/ selection	Plant height (m)	No. of branches / plant	Stem girth (cm)	Plant Spread (m)		Fruit Yield (kg/ plant)
				EW	NS	
NA-6 (Amrit)	3.5	4.0	67.0	3.7	3.7	45.0
PD	4.7	6.5	81.0	5.7	5.6	—
Neo-4	3.3	5.0	77.0	3.1	3.3	5.8
NA-7 (Neelam)	3.6	3.3	52.0	2.4	5.0	48.0
ATPS-1	2.8	5.0	55.0	2.8	2.7	46.0
ATPS-2	3.6	3.4	85.0	3.5	5.0	34.0
Kanchan	3.6	7.5	77.5	4.1	3.9	26.0
NA-10(Balwant)	4.1	4.5	76.0	4.6	4.9	45.7
Chakaiya	2.2	4.0	45.0	2.3	2.4	15.0
Lucknow	5.6	5.0	99.0	4.9	6.3	—
Local	6.6	7.0	117.0	6.9	6.5	8.6

Fruit quality parameters of Aonla germplasm

Variety/ selection	Fruit weight (g)	Pulp weight (g)	Seed weight (g)	TSS (°Brix)	Acidity (%)
NA-6 (Amrit)	31.92	30.64	1.28	9.80	1.92
PD	—	—	—	—	—
Neo-4	7.42	6.74	0.68	13.50	3.18
NA-7 (Neelam)	32.80	31.40	1.40	7.44	1.64
ATPS-1	35.69	34.00	1.69	9.70	2.24
ATPS-2	34.27	32.56	1.71	10.51	2.17
Kanchan	34.83	33.43	1.40	9.30	2.39
NA-10 (Balwant)	33.60	32.00	1.60	8.46	1.89
Chakaiya	26.10	24.80	1.30	7.24	1.42
Lucknow	—	—	—	—	—
Local	7.02	5.78	1.24	14.8	2.87

— represents no fruiting

Five aonla varieties were evaluated during 2013 for growth and yield parameters. BSR– 1 recorded maximum plant height (310.00 cm) followed by NA – 10 (278.8 cm) and Chakaiya (270.3 cm) (Table-8). Stem girth was more in NA-10 (34.9 cm), Chakaiya (31.3 cm) and NA – 7 (30.1 cm). Number of branches per plant was high in BSR– 1 (5.0) followed by NA – 7 (3.5). The plant spread was more in BSR– 1 (420.00cm EW and 460.00cm NS) followed by NA –10 (308.8cm EW and 348.8cm NS).

NA-10 was found superior with higher fruit weight (33.6g), fruit volume (32.0 ml), pulp weight (32.0 g), seed weight (1.6 g) and TSS (9.6 °Brix), which was followed by NA–7 (32.8 g, 31.8ml, 31.4 g, 1.4 g and 9.1° Brix respectively). Highest number of fruits per plant was recorded in NA – 7 (118.8) followed by CHES – 1 (102.3). Fruit yield was more in NA – 7 (3.88 kg/plant) and NA-10 (3.30 kg/plant).

Table-8: Plant growth parameters of Aonla varieties in 2013 (Year of Planting 2010)

Variety	Plant height (cm)	Stem girth (cm)	No. of branches /plant	Plant spread (m)		No. of fruits / plant	Yield (kg/ plant)
				EW	NS		
NA-7 (Neelam)	209.4	30.1	3.5	246.3	275.0	118.8	3.88
NA-10 (Balwant)	278.8	34.9	2.9	308.8	348.8	97.3	3.30
BSR-1	310.0	25.0	5.0	420.0	460.0	—	—
CHES-1	190.3	24.3	3.2	153.0	178.3	102.3	2.15
Chakaiya	270.3	31.3	3.0	250.0	256.3	55.0	1.38
Statistics							
CD at 5%	*NS*	*2.28*	*NS*	*NS*	*NS*	NS	NS
SE.m±	*54.69*	*0.74*	*0.73*	*62.85*	*69.73*	32.13	0.95
CV (%)	*55.88*	*5.09*	*56.53*	*61.34*	*61.78*	143.77	145.38

Table-9: Fruit quality parameters of Aonla varieties in 2013 (Year of Planting 2010)

Variety	Fruit volume (ml)	Fruit weight (g)	Pulp weight (g)	Seed weight (g)	TSS (°brix)	Acidity (%)
NA-7 (Neelam)	31.8	32.8	31.4	1.4	9.1	1.64
NA-10 (Balwant)	32.0	33.6	32.0	1.6	9.6	1.50
BSR-1	10.5	10.7	9.6	1.0	13.6	2.01
CHES-1	21.3	21.8	20.7	1.1	8.8	1.88
Chakaiya	20.0	26.1	24.8	1.3	7.2	1.42
Statistics						
CD at 5%	*2.08*	*1.72*	*1.76*	*0.19*	*1.87*	*0.16*
SE.m±	*0.68*	*0.56*	*0.57*	*0.06*	*0.61*	*0.05*
CV (%)	*5.85*	*4.47*	*4.81*	*9.67*	*12.56*	*6.24*

VEGETABLES

MUSKMELON

Horticultural Research Station, Anantharajupeta

Eleven local collections of muskmelon from kadapa district, 25 accessions from NBPGRI, Jodhpur and IIHR, Bangalore and 6 private hybrids were evaluated during the year. Among the local collections and accessions from public institutes, the number of fruits per vine ranged from 2.92 (IC321328) to 14.32 (Arka Jeet), yield per vine varied from 1.93 kg (IC321343) to 16.14 kg (IC321327), average fruit weight ranged from 237.0g (Arka jeet) to 2350 g (IC321327), Cavity diameter varied from 25.89 mm (IC321338) to 100.52 mm (Sharbath-e-nar), TSS ranged from 2.00^{O} Brix (IC321367) to 11.46^{O} Brix (Arka Jeet) and pulp thickness ranged from 15.14 mm (Arka jeet) to 42.22 mm (Sharbath-e-nar).

Among the hybrids evaluated, number of fruits per vine varied from 4.26 (Amul -9) to 11.80 (Bobby). Yield per vine ranged from 3.20 kg (Amul-9) to 10.15 kg (Muskan), average fruit weight varied from 751.3 (Amul-9) to 2301.9 (Muskan), cavity diameter ranged from 50.70 mm (Bobby) to 84.87 mm (NMMH-24), TSS ranged from 6.70 ^{0}Brix (NMMH-24) to 14.80^{O} Brix (Bobby) and pulp thickness varied form 32.53 mm (NMMH-24) to 54.83 mm (Kundan).

Arkajeet

Sirangi

Sharabath

Alpur (green)

Alpur (orange)

Papayee-II

Allanagaram

IC-321338

Muskan

Bobby (F1)

COOL SEASON VEGETABLES

Among cool season vegetables studied during 2013-14, maximum benefit cost ratio was recorded in sprouting broccoli (Fantasy F_1) (2.66) followed by red cabbage (2.60), cabbage (2.56) and knol-khol (1.77).

Early crop was taken from Knol-Khol (49 days) after transplanting, whereas Brussels sprout took 120 days to harvest from transplanting. Pest and disease incidence was low in knol-khol, carrot, broccoli and red cabbage in both the years.

Broccoli (Fantacy F_1)

From the two seasons it was inferred that all the four crops viz., Broccoli, Red cabbage, cabbage and knol khol can be grown as short duration cool season crops during December to March at Anantharajupeta.

DRUMSTICK

Among the annual drumstick cultivars, early flowering was observed in PKM-1 (118 days after planting), whereas Bhagya (KDM-1) took 173 days to flowering from planting. The pod length (75.88 cm), girth (20.58 mm), individual pod weight (146.68 g) and no. of seeds per pod (7.1) were maximum in PKM-2, whereas maximum TSS was observed in PKM-1. Number of pods per plot (125 sq.m) was maximum in Bhagya (85.00) from the two harvest, made so far, whereas yield per plot (125 sq.m) was maximum in PKM-1 (8.62 kg).

PKM-1 **Bhagya** **PKM-2**

TOMATO

Horticultural Research Station, Aswaraopet

Effect of mulching in increasing water use efficiency and yield in Tomato

Among different treatments, the treatment provided with 13000 l/day/ac under polythene mulch (25µ) recorded highest yield (2.407 kg/pl) which is on par with the treatment provided with 10800 l/day/ac. under polythene mulch (2.298 kg/pl).

RIDGE GOURD

Vegetable Research Station, Rajendranagar

Sixteen genotypes of ridge gourd were evaluated during *kharif* 2013, of which seven genotypes LA-37, LA-154, LA-155, LA-156, LA-157, LA-159 and LA-160 were found promising based on growth, earliness, fruit traits and consumer quality.

Horticultural Research Station, Lam

In AVT-II, seven ridge gourd varieties were sown along with two checks (Pusa Nasdar and local). Among the entries, significantly highest yield was recorded in 2011/RIGVar. 5 (20.6 q /ha) being on par with 2011/RIGVar. 2 (19.5 q/ha).

BOTTLE GOURD

Vegetable Research Station, Rajendranagar

Forty genotypes of bottle gourd were evaluated during *kharif* 2013, of which seven genotypes LS-16-2, LS-21-2, LS-53-2, LS-61, LS-111-2, LS-44-218, and LS-220 were found promising based on growth, earliness, fruit traits and consumer quality.

BITTER GOURD

Vegetable Research Station, Rajendranagar

Twenty genotypes of bitter gourd were evaluated during *kharif* 2013, of which ten genotypes MC-19, MC-31, MC-44, MC-47, MC-51, MC-55, MC-56, MC-57, MC-59 and MC-60 were found promising based on growth, earliness, fruit traits and consumer quality.

SPINE GOURD

Vegetable Research Station, Rajendranagar

One hundred and twenty female genotypes of spine gourd were evaluated during *kharif* 2013, of which eight genotypes RNK- 77, RNK-81, RNK-198, RNK-224, RNK-229, RNK-262, RNK-275 and RNK-313 were found promising based on growth, earliness, fruit traits and consumer quality.

SNAKE GOURD

Vegetable Research Station, Rajendranagar

Snake gourd var. IC – 426984 with a maximum fruit girth of 19.45 cm recorded maximum fruit yield per vine (8.54 kg).

ASH GOURD

Horticultural Research Station, Lam

In AVT-II, seven entries were evaluated against 3 checks (IVAG 90, Pusa Ujwal & Local). The highest yield was recorded in 2011/ASG Var. 6 (496.5 q/ha) which was on par with 2011/ASG Var. 1 (489.0 q/ha) which were significantly superior to all other entries.

Vegetable Research Station, Rajendranagar

In Ash gourd, fruit yield per vine was maximum in IC-382052 (18.54 kg) which has also recorded longest vines (7.37 m) with maximum fruit length (29.7 cm). Minimum fruit yield per vine was, however observed in IC-544625 (10.45 kg).

Five entries along with 2 checks (Pusa Ujwal and IVAG-90) were evaluated in Ash gourd AVT-I during kharif 2013. None of the entries were significantly superior to the best check IVAG-90 (320.42 q/ha). But the entries 2012/ASGVAR-3 (319.18 q/ha) and 2012/ASGVAR-2 (315.76 q/ha) were significantly superior to the check Pusa Ujwal (292.56 q/ha) in yield potential.

OKRA (BHENDI)

Horticultural Research Station, Lam

In IET, ten bhendi hybrids were evaluated against 2 resistant checks (HOK-152 and Arka Anamika) and one susceptible check (Pusa Sawani). Among the hybrids, highest yield was recorded in 2013/ OKHYB –1 (134.8 q/ha) which was on par with 13/ OKHYB-4 (129.4 q/ha) and 2013/ OKHYB –2 (122.6 q/ha) and these were significantly superior to all the entries tested. The incidence of YVMV was less in 2013/OKHYB-3 (7.4%).

In AVT-1, eleven bhendi hybrids were evaluated against two resistant checks (HOK-152 and Arka Anamika) and one susceptible check (Pusa Sawani). Among the hybrids, the highest yield was recorded in 12/ OKHYB –2 (181.9 q/ha) which was on par with 12/ OKHYB –7 (176.1 q/ha) and12/ OKHYB –1 (162.2 q/ha) and the three were significantly superior to all the entries tested. The incidence of YVMV was less in 2012/OKHYB-4 (3.2 %,).

In AVT-II, eight bhendi hybrids were evaluated against 2 resistant checks (HOK-152 and Arka Anamika) and one susceptible check (Pusa Sawani). Among the entries, significantly highest yield was recorded in 11/OKHYB-1 (155.2 q/ha) being on par with 11/OKHYB-2 (146.9q/h) and 11/OKHYB-7 (136.2q/ha)) and were significantly superior to all the three checks. The incidence of YVMV was less in 2012/OKHYB-5 (1.3 %).

Vegetable Research Station, Rajendranagar

Ten entries along with two varietal checks (Pusa Sawani and Arka Anamika) and one hybrid check (HOK-152) were evaluated in Okra Hybrid IET during *kharif* 2013. None of the entries were significantly superior to the hybrid check HOK-152 (173.29 q/ha) in yield potential.
Eleven entries along with two varietal checks (Pusa Sawani and Arka Anamika) and one hybrid check (HOK-152) were evaluated in Okra Hybrid AVT-I during *kharif* 2013, none of the entries were significantly superior to the hybrid check HOK-152 (178.64 q/ha) in yield potential.

Eight entries along with two varietal checks (Pusa Sawani and Arka Anamika) and one hybrid check (HOK-152) were evaluated in Okra Hybrid AVT-II during *kharif* 2013. None of the entries were significantly superior to the hybrid check HOK-152 (179.47 q/ha) in yield potential.

COWPEA

Horticultural Research Station, Lam

In AVT-I, five varieties were evaluated against three checks (Kasi Kanchan, Arka Garima, and Local). Among the entries tested, highest yield was recorded by 2012/COPBVAR-2 (53.3 q/ha) which was on par with Kasi Kanchan (51q/ha) and significantly superior to other entries.

In AVT-II, six varieties were evaluated against three checks (Kasi Kanchan, Arka Garima, Local). Among the entries tested, significantly highest yield was recorded by 2011/COPBVAR – 7 (53.8 q/ha) being on par with 2011/COPBVAR-5 (51.8 q/ha).

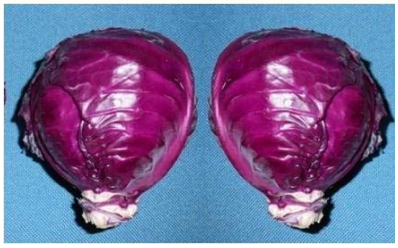
SPROUTING BRACCOLI

Horticultural Research Station, Aswaraopet

During the year 2013-14 exotic vegetable crop sprouting broccoli was tested under polyhouse, 50 percent shadenet and open conditions during winter season. Results revealed that highest curd weight was recorded in polyhouse (254.21 g) followed by sprouting broccoli grown in open condition (239.77 g). Curd weight was low in case of Shadenet grown crop (139.0 g). Curd quality was good in case of open cultivation with good colour and compactness. Number of days for curd initiation and curd development was more in case of crop grown under 50 percent shadenet.

RED CABBAGE

Horticultural Research Station, Aswaraopet



Exotic vegetable crop red cabbage was tested under polyhouse, 50 percent shadenet and open conditions during winter season. results revealed that highest head weight was recorded in polyhouse (175.32 g) followed by red cabbage grown in open condition (164.84 g). Curd weight was low in case of shadenet grown crop (123.05 g). Number of days for head initiation and curd development was more in case of crop grown under 50 percent shadenet.

CAPSICUM

Horticultural Research Station, Pandirimamidi

Studies on effect of training in capsicum under polyhouse conditions

Among the treatments plant height was highest (163cm) in T_1 (Three branches 60X60cm) and lowest (130cm) in T_6 (Control 60X40cm) which were significantly different. There was significant difference for days to 50% flowering in the treatments T_5 (Control 60X50cm), T_4 (Control 60X60cm) and T_3 (Three branches 60X40cm). Fruit diameter was significantly different to each other and highest in T_3. Plant yield was highest (1.78 kg) in T_4 followed by T_5 (1.63kg) and lowest (0.670kg) in T_1. The treatment T_2 was three branches 60X50cm.

Horticultural Research Station, Aswaraopet

Among different treatments, August transplanting recorded highest yield (3.03 Kg/Pl) which was on par with September transplanting (2.98 kg/pl). Lowest yield was recorded in December transplanting (1.96 kg/pl).

Horticultural Research Station, Lam

In AVT-II, eleven entries were evaluated against one national check Nishat-1.Among the entries tested, 2011/CAPVAR -2 recorded the highest yield (71.7 q/ha).

CAULIFLOWER

Vegetable Research Station, Rajendranagar

Five entries along with two varietal checks (Pusa Meghna and Pusa Early Syn) were evaluated in Cauliflower Early AVT-II during *rabi* 2013. The entries 2011/CAUEVAR-1 (169.23 q/ha) and 2011/CAUEVAR-4 (165.00 q/ha) were significantly superior to the best check Pusa Early Syn (145.46 q/ha) in yield potential.

Six entries along with one hybrid check (Pusa Kartik Shankar) were evaluated in Cauliflower Mid Hybrid IET during *rabi* 2013. The entry 2013/CAUMHYB-3 (193.61 q/ha) was significantly superior to the check Pusa Kartik Shankar (167.09 q/ha) in yield potential.

Five entries along with one hybrid check (Pusa Hybrid-2) were evaluated in Cauliflower Mid Hybrid AVT-II during *Rabi* 2013. The entries 2011/CAUEHYB-3 (206.08 q/ha), 2011/CAUEHYB-4 (198.60 q/ha), 2011/CAUEHYB-1 and 2011/CAUEHYB-2 (192.75 q/ha) were significantly superior to the check Pusa Hybrid-2 (160.88 q/ha) in yield potential.

AMARANTHUS

Vegetable Research Station, Rajendranagar

Among the entries AM4-4 recorded significantly highest yield (1126.33 g/pl) contributed by highest leaf yield (435.33 g/pl) and stem weight (611.67 g/pl) followed by HYDAM-1 which recorded an yield of 918.33 g/pl. contributed by leaf yield of 350 g/pl and stem weight of 794.20 g/pl. AMA-4 was high yielding with 7 cuttings followed by HYDAM-1 with 5 cuttings having attractive green coloured leaves.

IC-257792

IC-256828

IC-257791

FLOWERS

GLADIOLUS (Gladiolus byzantinus)

Horticultural Research Station, Anantharajupeta

Collection, maintenance and evaluation of Gladiolus germplasm

Among twelve cultivars of gladiolus tested, maximum plant height was recorded in AC.No.7 (78.67 cm) and Swarnima (72.13 cm) at 30 days after planting. Early flowering (less than 45 days) was observed in AC.No.7, Bindiya, Swarnima, Dharshan and Kajol. The spike length ranged from 70.87 cm (Sadhabahar) to 109.67 cm (Bindiya). Maximum number of florets per spike was recorded in Arka Amar (16.40) and least in Dhiraj (9.93). No. of spikes produced per plot was maximum in Suchitra (36.67) followed by Dharshan (36.00). Maximum numbers of tillers per plant were observed in Suchitra (1.90) and Kumkum (1.78). More number of corms per plant was recorded in Dharshan (2.03) and least was recorded in Golden goddess (1.00), whereas maximum weight of corms per plant was noticed in Swarnima (126.17 g) and minimum in Sadhabahar (41.50 g). Diameter of the corm was maximum in A.C.No.7 (74.98 cm) and Swarnima (77.03 cm) whereas minimum in Kumkum (49.67 cm). Number of cormels per plant was ranged from 3.88 (Sadhabahar) to 15.72 (Kajol).

Floricultural Research Station, Rajendranagar

Collection, maintenance and evaluation of Gladiolus germplasm

During 2013-14 seven new varieties were added to the existing collection of 55 varieties of gladiolus. The varieties ACC No.7, Arun and Hyb 94-101 were found to be suitable for Hyderabad conditions with good spike length, more number of florets per spike and maximum floret size (10.92cms.).

Evaluation of Gladiolus germplasm at HRS, Anantharaju peta


AC No. 7


Arka Amar


Bindiya


Darshan


Colden Goddess


Suchitra


Sadabhar


Sylvia


Deeraj


Kajol


Swarnima


Kumkum

Variability in gladiolus corms


Bindiya


Shagun


Snow white


Spic - n - span

Testing of new genotypes of gladiolus

Out of six newly evolved genotypes of gladiolus, the variety IIHR-G-12 was found superior with maximum plant height (100.6 cm), early spike emergence (63.2 days), maximum spike length (81.9 cm), rachis length (33.3 cm) and more no. of florets per spike (11.4).

CHRYSANTHEMUM

Floricultural Research Station, Rajendranagar

Collection, preliminary assessment and maintenance of chrysanthemum germplasm

Evaluation of 120 genotypes revealed that the varieties PAU-B-107 and Local Button showed better performance under Hyderabad conditions with more number of flowers/spray along with production of maximum suckers/plant and more number of flowers/plant respectively.

Testing of newly evolved genotypes of chrysanthemum

Studies on evaluation of new chrysanthemum varieties revealed that Agnipath recorded maximum spray length (69.6 cm) and Agnishika showed highest average flower weight (2.56 gm). Co-3 recorded highest number of flowers per plant (196.6) over check.

TUBEROSE

Floricultural Research Station, Rajendranagar

Genetic enrichment of tuberose

During the year, 13 germplasm lines were evaluated, out of which nine were of single flowered types and four were of double types. In tuberose, among singles, GK-T-C-4, Arka Niranatara and Prajwal were found to be superior and among doubles Suvasini and Hyderabad Double were found to be good.

Horticultural Research Station, Pandirimamidi

Observational trail on performance of tuberose in agency tracts of East Godavari District

Among the single types of tuberose, plant height was highest in Prajwal (95.05 cm) and the least was recorded with Phule Rajani single (72.5 cm). Yield per plot (4.4 kg/plot) and loose flower yield per plant was highest in Prajwal variety.

Among the double types, plant height was highest in Suvasini (86.2cm) and least was recorded in Calcutta double variety. Loose flower yield was highest in Suvasini variety (3.42 kg/plot).

Horticultural Research Station, Anantharajupeta

Among nine single flower type tuberose cultivars, number of florets per spike was maximum in GKTC-4 (31.87) which was on par with Hyderabad Single (31.47), Prajwal (30.93), Sikkim Selection (30.67), Rajith Rekha (29.33) and Sringar (29.00). In Rajith rekha (2.59) and Calcutta Single (2.51) maximum number of flower spikes per plant was recorded. Maximum yield per plant was recorded in Rajith Rekha (79.94 g) followed by Calcutta single (59.62g), whereas lowest yield per plant was recorded in Sikkim Selection (23.75 g) which took maximum number of days to flower initiation (115 days) compared to all other cultivars. Individual floret characters viz., maximum floret length (58.31 mm), floret diameter (7.64 mm) and floret weight (1.67 g) were recorded in Prajwal.

Among four double flower type tuberose cultivars, maximum number of spikes per plant (1.19), spike length (79.3 cm) and rachis length were observed in Hyderabad Double, whereas no. of florets per spike was maximum in Calcutta double (46.0).

Srinagar


Hyderabad Single

Rajith Rekha


Prajwal


GKTC-4


Calcutta single

CUT FOLIAGE AND FILLERS (asparagus, ferns and philodendron)

Collection, evaluation and improvement of cut foliage and fillers (asparagus, ferns and philodendron)

Among four Asparagus species, *Asparagus densiflorus var. sprengeri* was found to be suitable leaf filler for Andhra Pradesh conditions with good leaf characters. Among ferns, *Nephrolepsis biserrata furcans* recorded high petiole length (22.26 cm) while, *Blechnum*

Pennamarina showed better performance in leaf production interval (30 days). Among different philodendrons, *Philodendron williamsii* was found to be a better performer over other varieties. Among flower fillers, *Gypsophila elegans* was identified and recommended as good flower filler for this region.

HELICONIUM

Horticultural Research Station, Pandirimamidi

Observational trial on performance of Heliconium in agency areas of East Godavari District

Among nineteen varieties studied, four varieties flowered at 150 days after planting i.e Heliconia golden torch, Parrots beak, Rubra and Ladi di. Varieties like Alen Carle, Mass De Rooj, Latispatha C, Orange By Garo, Denciflora and Latispatha Big flowered at 180 days after planting. Heliconia varieties which flowered at 240 days after planting were Lobster Claw I, Claw II, Cinnamon twist, Wageneraria Peterson, Rostrata, Edin pink, and Richmond Red.

BIRD OF PARADISE

Horticultural Research Station, Pandirimamidi

Observational trial on performance of Bird of Paradise

At six months after planting, in Bird of Paradise 9.97 leaves were recorded at a height of 12.88 cm.

CROSSANDRA

Horticultural Research Station, Ananthapuram

Growth, flower characters and yield of different varieties of Crossandra

Maximum plant height was recorded in Lady Red Crossandra (44.00 cm) followed by Local (41.00 cm). The no. of spikes/plant was more in Lady Red Crossandra (15.50) followed by Delhi Crossandra (11.00). Spike length (11.10 cm) and no. of flowers/spike (23.72) were high in Lady Red Crossandra. Number of flowers/plant was more in Lady Red Crossandra (367.61) followed by Delhi Crossandra (257.40). The weight of hundred flowers was maximum in Delhi Crossandra (11.70 g) followed by Yellow Crossandra (11.32 g). Maximum yield was recorded in Delhi Crossandra (30.12 g/plant and 5.72 q/ac) and Lady Red Crossandra (24.52 g/plant and 4.66 q/ac).

TUBER CROPS

COLACASIA

Horticultural Research Station, Kovvur

Collection, conservation, cataloguing and evaluation of genetic resources of *colocasia*

Among 100 accessions of *colocasia* germplasm evaluated, among 29 accessions of long duration group KCS -2 recorded highest cormel yield of 45.15 t/ha followed by No 48(27.13 t/ha). Among 35 accessions of medium duration group, Satamukhi recorded highest cormel yield of 42.43 t/ha followed by C A-57(37.42 t/ha), while among 40 short duration accessions, KCS-3 recorded highest cormel yield of 54.72 t/ha followed by CA 35 (50.28 t/ha).

ELEPHANT FOOT YAM

Horticultural Research Station, Kovvur

Collection, conservation, cataloguing and evaluation of genetic resources of elephant foot yam

Total number of entries being maintained are 40 (Non irritant type -26; Irritant type-14). Among 26 non-irritant types, Gajendra has recorded highest yield of 57.44 t/ha followed by Ac 21 (56.0 t/ha) and AC 14 (55.67 t/ha) whereas among 15 irritant types, AC-8 has recorded the highest yield of 38.22 t/ha.

IET on greater yam (minimum 7 months duration)

Among the entries under evaluation, TGY12-3 has recorded significantly highest yield of 77.36 t/ha and was on par with Sreekarthika with an yield of 75.72 t/ha followed by TGY 12-2(56.6 t/ ha).

In vitro propagation in elephant foot yam

Callus produced in MS media supplemented with NAA (1.5 mg/l) and BA (2.0 mg/l) has produced green protocorms in all the 6 regeneration media under study. The root formation was observed but there was no multiplication of shoots.

Among the entries under evaluation, TGY12-3 has recorded significantly highest yield of 77.36 t/ha and was on par with Sreekarthika with an yield of 75.72 t/ha followed by TGY 12-2(56.6 t/ ha).

DIOSCOREA

Horticultural Research Station, Kovvur

Collection, Conservation, Cataloguing and evaluation of Genetic resources of Dioscorea

A total of 27 accessions of Dioscorea germplasm were evaluated. Among the Greater yam entries under evaluation, D4 has recorded highest tuber yield of 88.15/ha followed by D3 with 72.96 t/ha.

AMORPHOPHALLUS

Horticultural Research Station, Kovvur

Multi locational trial on Amorphophallus

Among the four entries under evaluation, AC-14 has recorded significantly highest yield of 34.64 t/ha and was on par with Gajendra with an yield of 33.09 t/ha. Among all the entries lowest percentage of oxalates was recorded in AC-14 (0.08%) followed by Gajendra (0.09%).Similarly high starch content was also recorded in AC -14 (14.95%).

Standardisation of protocol for in vitro regeneration of ornamentals

In Aeridesodoratum, among different media tried, 1st leaf initiation was observed in VW media (13-14 weeks after sowing) where as in Rhyncostylis retusa 1st leaf initiation was early in KC media (9-10 weeks after sowing) followed by VW media (11-12 weeks after sowing).The plants which are ready will be transferred to polybags and used for further studies.

SPICES

BLACK PEPPER

Horticultural Research Station, Chintapalli

Germplasm collection, characterization, evaluation and conservation in Black Pepper

This trail was initiated during 1987. So far forty two (42) cultivated biotypes and twenty five (25) wild collections were collected and maintained at HRS-Chintapalle. Among 22 accessions evaluated during the XI Plan period, it was observed that more number of spikes per vine was recorded in Vellanamban (1746.7) followed by Malamundi (1321). Maximum spike length was observed during last year in Panniyur – 1(14.79cm) followed by Accession Cuv.5308 (12.60cm), maximum number of berries was observed in Panniyur – 1(85.78) followed by Narayakkodi (85.3). Maximum fresh berry yield per vine was observed in Cuv.5308 (9.034kg). As per the data recorded during previous years, Accession Cuv.5308, which has other unique characters i.e., drought tolerance, field tolerance to P*hytophthora* foot rot disease, compact growth habit, bearing from the base of the standard tree, heavy bearing of spikes, bold berries, good setting even under drought conditions, field tolerance to low temperatures during winter months and Panniyur -1 can be recommended for commercial cultivation in High Altitude Tribal Zone of Andhra Pradesh. Sixteen (16) released varieties were collected during the year and are being maintained.

FENUGREEK

Horticultural Research Station, Lam

In fenugreek 124 germplasm lines along with four checks were evaluated. LFC-18 (7.01 g/plant), LFC-19 (6.59 g/plant), LFC-123 (6.435 g/plant), LFC-78 (6.41 g/plant) and LFC-34 (6.15 g/plant) were significantly superior over the check APHU Methi-1 (1.80 g/plant).
In fenugreek 7 lines in IET, 14 lines in CVT were evaluated and results showed that LFC-90 (1151.8 kg/ha), LFC-72 (1144.2 kg/ha), LFC-118 (1142.9 kg/ha), LFC-78 (1141.8 kg/ha) and LFC-85 (11136.8 kg/ha) in IET , FGK-47 (1660.9 kg/ha), FGK-48 (1618.6 kg/ha), FGK-41 (1617.2 kg/ha) and FGK-43 (1558.1 kg/ha)) in CVT recorded significantly highest yield over checks.

AJOWAN

Horticultural Research Station, Lam

In Ajowan, 61 germplasm lines were evaluated. Among the entries, maximum yield per plant was recorded in AA-23 (13.7 g/plant), AA-54 (12.7 g/plant), S-7 (10.6 g/plant) and JA-110 (9.5 g/plant) while the best check LTa-26 recorded 6.8 g/plant.

In germination studies of Ajowan, 24 hours hydropriming was found effective in improving the germination and hastening the germination under laboratory as well as field conditions

TURMERIC

Horticultural Research Station, Lam

Among the three varieties evaluated, Mydukur was found to be significantly vigorous and recorded highest fresh rhizome yield (632 g/plant) with a crop duration of 315 days.

Horticultural Research Station, Darsi

Eleven varieties of turmeric were planted in the month of July-2013. These varieties were grouped into two groups based on the duration. Among the medium duration group, KTS-6 recorded highest plant height (83.13cm), number of leaves (26.87), leaf length and leaf width. Allepy Supreme recorded highest fresh rhizome yield (21.68 (t/ha) followed by BSR-2. While in long duration group, Salem recorded highest plant height (89.93 cm), more number of tillers (3.73) and hight fresh rhizome yield (39.26(t/ha) which was followed by Tekurpet (34.44 t/ha).

CHILLIES

Horticultural Research Station, Lam

Hot pepper

A total of 150 working germplasm lines *i.e.,* lines collected over the years were evaluated. The selections were made within lines; the selected plants were selfed and multiplied for evaluation during 2014-15. The lines which shown variability during 2013-14 will be evaluated as per the descriptive blank keeping LCA-334 as check.
In Advanced Hybrid yield trial, 25 superior combinations selected in 2012-13 were evaluated in 2013-14 for yield and yield components along with a check Indam-5. The hybrid LCH 08-59 recorded highest dry pod yield 7346 kg/ha followed by LCH 08-64 (7158 kg/ha) and LCH 09-09 (6545kg/ha) over the check Indam-5 (5530kg/ha).
Single plants were selected for further generation advancement and evaluation from segregating material of F_2, F_3, F_4, F_5 and F_6. Promising single plants selected in F_6 generation will be evaluated in observation yield trial and used in hybridization.

Table - 10 Details of Progeny Evaluated

Generation	No. of crosses grown	No. of plants/ progeny in each cross	No. of single Plants selected
F_2	15	150	180
F_3	8	80	30
F_4	6	80	25
F_5	5	80	13
F_6	3	80	5

In Replicated Row Yield Trial 15 entries were evaluated against check LCA-334. Among the entries tested, RRYT-T_{8-} recorded highest dry pod yield (180 g/plant) followed by RRYT-T_1 (182g/plant), RRYT-T_4 (171g/plant) RRYT –T_{14} (145 g/plant) and RRYT-T_{10} (144g/plant) which were superior over the check LCA-334 (105 g/plant).

In Preliminary Yield Trial, 14 entries were evaluated against check variety LCA 334. The entry LCA- 647 recorded highest dry pod yield (7625 kg/ha) followed by LCA-686 (7417 kg/ha), LCA-675 (7083 kg/ha) and LCA-679 (7042 kg/ha) were superior over the check LCA -334 (5208 kg/ha).

In Preliminary Yield Trial for green chilli, 16 entries were evaluated against check variety CA-960. LCA-655 recorded significantly highest green pod yield (29583 kg/ha.) with highest vitamin 'C' content (105.22 mg/100g) followed by LCA-616 (29167 kg/ha) over the check CA-960 (23292 kg/ha). The entry LCA-655 also has recorded significantly highest dry pod yield (6333 kg/ha) followed by LCA-643 (6083kg/ha), LCA-616 (5750 kg/ha) and LCA-334 (5583 kg/ha) over check CA-960 (4208 kg/ha) indicating the suitability of LCA-655 for dual purpose.

In Advanced Yield Trial, 15 entries were evaluated against check LCA-334. The entry LCA-639 recorded highest dry pod yield of 7250 kg/ha with 393 pods per plant, followed by LCA-657 (7000 kg/ha), LCA-621 (6958 kg/ha), LCA-608 (6833kg/ha) over the check LCA -334 (5625 kg/ha).

PAPRIKA

In Paprika chilli, 40 germplasm lines were collected over the years and were evaluated. The selections were made with in lines; the selected plants were selfed and multiplied for evaluation during 2014-15. The lines which has shown variability during 2013-14 will be evaluated as per the descriptive blank keeping LCA- 436 as a check.

In Preliminary Yield Trial, 15 entries along with check entry, LCA-436 were evaluated. The entry LCA-466 recorded highest dry pod yield (6708 kg/ha) followed by LCA-470 (6458 kg/ha), LCA-501 (6375 kg/ha) and LCA-482 (6125kg/ha) over the check LCA-436 (4375 kg/ha).

In Advanced Yield Trail, 15 entries along with check LCA 436 were evaluated. The entry LCA-442 recorded highest dry pod yield (6167 kg/ha) followed by LCA-450 (6042 kg/ha) over the check, LCA -436 (4458 kg/ha).

AICRP (VEGETABLE CROPS):

In IET, four entries were evaluated against three national checks viz., LCA 334, Kasi Anmol and sindhur. Among the entries tested, 13/CHIVAR-3 recorded significantly highest yield (97.2 q/ha).

In AVT-1, seven entries were evaluated against two national checks *viz.* Kasi Anmol and LCA-334. Among the entries tested, 12/CHIVAR-4 recorded significantly the highest yield (75.8 q/ha).

In AVT-II, nine entries were evaluated against two national checks *viz.* KA 2 and LCA 334. Among the entries tested, 11/CHIVAR-9 recorded the significantly highest yield (116.1q/ha).

In IET, eight hybrids were evaluated against three checks *Viz.* BSS-453, ARCH-228 and Kasi Anmol. Among the entries 2013/CHIHYB – 6 recorded significantly maximum yield (154.8 q/ha).

In AVT-1, fourteen hybrids were evaluated against three checks *Viz.* BSS- 453, ARCH-228 and Kasi Anmol. Among the entries, maximum yield was recorded by 2012/CHIHYB – 15 (193.1 q/ha) which was on par with 2012/CHIHYB – 7 (184.8q/h) and 2012/CHIHYB-11 (172.8 q/h).

In AVT-II, seven hybrids were evaluated against two checks *Viz.* ARCH-228 and Kasi Anmol. Among the entries evaluated, significantly highest yield was recorded in 2011/CHIHYB – 4 (149 q/h).

CINNAMON

Horticultural Research Station, Pandirimamidi

Identification of Cinnamon varieties suitable for rainfed conditions of agency tract of East Godavari Dist.

Among the 4 clones SL-189 has recorded the highest plant height of 4.05 m and recorded the highest bark yield of 4.45 kg per plant.

CORIANDER

Horticultural Research Station, Lam

Sixty one germplasm lines were evaluated in Augmented Block Design with six checks. Among the entries evaluated, LCC-291 (5.04 g/plant), LCC-304 (5.04 g/plant), LCC-282 (5.4.89 g/plant), LCC-292 (4.16 g/plant) and LCC-298 (4.14 g/plant) were found significantly superior in yield over the best check Sudha (3.89 g/plant).

Sixty coriander germplasm lines received from six different coordinated centres were evaluated. The entries RD-387 (6.13 g/plant), NDC-14 (5.77 g/plant), NDC-31 (5.75 g/plant), LCC-170 (5.59 g/plant), 37-P (5.39 g/plant) and LCC-144 (5.39 g/plant) were found significantly superior in yield over the check Sudha (4.26 g/plant).

In coriander, 8 entries in IET, 21 entries in CVT were evaluated and results showed that LCC-268 (1326 kg/ha) in IET, COR-46 (1300 kg/ha) and COR-47 (1302.2 kg/ha) in CVT recorded significantly highest yield compared to check APHU Dhania-1 (1061 kg/ha).

Seven genotypes of coriander were evaluated for leaf production during off season and LCC-244 (4.00 t/ha) recorded highest green leaf yield followed by LCC-234 (3.74 t/ha) and CS-38 (3.36 t/ha) which were on par with one another and significantly superior to checks Sadhana (2.59 t/ha) and local (2.36 t/ha).

In mutation breeding of coriander, 121 M_5 and 22 F_4 materials were evaluated. Among the populations evaluated, maximum yield was recorded in S-98 (7.19 g/plant), followed by S-102 (6.77 g/plant), S-38 (6.72 g/plant), S-118 (6.34g /plant) and S-34 (6.28) which were found promising.

PLANTATION CROPS

OIL PALM

Horticultural Research Station, Vijayarai

Evaluation of new cross combinations in Oil Palm

Vegetative parameters Maximum palm height was recorded in NRCOP-4 (1.20 m) and minimum height in NRCOP-9 (0.83 m). Palm girth was not significantly influenced by various cross combinations (hybrids). Significantly higher number of leaves was recorded in NRCOP-4 (30.67) and minimum number of leaves was in NRCOP-6 (19.33).


NRC OP -4

Yield parameters No significant influence was observed among various hybrids on number of male inflorescences per palm. Among hybrids, NRCOP-4 recorded significantly higher number of female inflorescences (8.09) and NRCOP-8 recorded minimum (3.05). Significantly highest sex ratio of 87.93 per cent was recorded in NRCOP-5 and it was lowest in NRCOP-10 (67.58 per cent). Significantly higher number of bunches of 10.06 were recorded per palm in NRCOP-4 and lower count in NRCOP-5 (3.37). Significantly highest FFB yield was recorded in NRCOP- 4 (128.24 kg/palm/year) and minimum was in NRCOP-7 (57.61 kg/palm/year). Significantly highest average bunch weight per palm was recorded in NRCOP-4 (14.37 kg/palm/year) and lowest in NRCOP-8 (9.43 kg/palm/year). The hybrid NRCOP-4 produced highest yield of fresh fruit bunches (18.33 t/ha) and lowest yield was in NRCOP-7 (8.24 t/ha).

Evaluation of new cross combinations in Oil Palm

Significantly highest palm height was recorded in NRCOP-33 (40.36 cm) and minimum height in NRCOP-34 (28.64 cm). Palm girth did not vary significantly among different cross combinations (hybrids). Higher number of leaves per palm was recorded in NRCOP-34 (30.67) and minimum number of leaves was in NRCOP-35 (19.67).


Number of leaves per palm per quarter in NRC OP-39


Palm girth (cm) in NRC OP-33

Evaluation of new cross combinations in Oil Palm

Highest palm height was recorded in NRCOP-44 (4.57 cm) and minimum height was recorded in NRCOP-49 (3.32 cm). Highest palm girth of 49.10 cm in NRCOP-44 and minimum girth of 37.99 cm in NRCOP-49 was recorded. Significantly higher number of leaves was recorded in NRCOP-44 (16.00) and minimum number of leaves was in control (9.33).

Performance of cocoa varieties as an inter crop under Oil Palm plantations.

Plant height was not significantly influenced by various cocoa varieties. The variety VTLC-36 showed superiority in recording higher stem girth (15.44 cm) compared to other varieties. While, lowest girth of 7.65 cm was recorded in VTLCH-3 (7.65 cm). Number of branches per plant was significantly highest in VTLC-18 (25.47). Highest plant spread along the row in VTLC-20 (162.22 cm) and across the row in VTLC-128 (148.57 cm) was recorded.

PALMYRAH

Horticultural Research Station, Pandirimamidi

Survey, Collection and Evaluation of Palmyra germplasm

The survey for the collection of Palmyrah germplasm was taken up in South Kannada District of Karnataka during the month of April 2013 with scientists from AICRP coordinating centre, Killikulam and germplasm exploration division of NBPGR Regional Centre, Rajendranagar, Hyderabad.

The Palmyrah trees of South Kannada district of Karnataka were robust, sturdy with big sized leaves with long petioles and giving good neera yield when compared to the palmyrah trees in other states in the country. Altogether 7 accessions were collected and they were planted in the germplasm block of HRS, Pandirimamidi at a spacing of 4m x4m with 12 plants per each accession.

Performance of Palmyrah germplasm accessions at Horticultural Research Station, Pandirimamidi

Among the 1991 planted germplasm collection, maximum plant height, lamina width and stem girth was recorded with 4/91 accession and maximum number of leaves was produced by Acc.9/91. The lowest plant height was recorded with Accession 11/91. Flower initiation started in the month of October and was continued up to March. Mean number of bunches as well as fruits among all the germplasm accessions was 6.2 and 49.0 respectively.

The data recorded from the 1993 planted accessions showed maximum stem girth and number of leaves with 16/93 accession and accession 17/93 has recorded highest plant height and lamina width. The lowest plant height was recorded with Accession 14/93. Flower initiation was started in the month of November and was continued up to March. In all the accessions the mean number of bunches recorded was 5.0 and average number of fruits per bunch was 28.0.

The results from the data collected from 1994 planted accessions showed that maximum mean palm height was recorded with 26/94, lamina length and petiole length was recorded highest with 27/94. The lowest plant height and highest number of leaves was recorded with Accession 24/94. In all the accessions flower initiation was taken up in the month of October.

Among 4 accessions collected in 1995, the accession 41/95 recorded the lowest mean values in all the parameters which is very slow in growth. The maximum mean values in terms of stem girth and number of leaves was recorded with accession 38/95. Flower initiation was observed in the month of October and overall the mean number of bunches recorded was 6.0 and the average number of fruits per bunch was 13.0.

The results of the data recorded from the germplasm planted in 1998 indicated that the accession 57/98 recorded maximum values in terms of stem girth, lamina length and lamina width. The palm height and number of leaves recorded maximum with accession 56/98 and 52/98 respectively. The mean number of bunches recorded was 5.0 and the average number of fruits per bunch recorded was 11.0 in all the accessions.

Among the 1999 planted germplasm accessions, flowering was observed for the first time during this year in accession 60/99. The accession 60/99 has recorded the highest palm height whereas more number of leaves was recorded with accession 64/99. The lowest plant height was recorded with Accession 59/99.

The accessions planted during 2000 recorded maximum palm height with accession 83/00 and lamina width with accession 81/00. The maximum value in terms of number of leaves was recorded with accession 84/00. The lowest plant height was recorded with Accession 79/00.

The data collected from the accessions planted during the year 2001 indicated that a highest value in terms of palm height and lamina length was recorded with accession 121/01. The maximum number of leaves was recorded in the accession 115/01. The lowest value in terms of palm height, petiole length, and lamina length and lamina breadth was recorded with accession 108/01.

The germ plasm accessions collected from Nalgonda district of Andhra Pradesh during 2002 showed maximum lamina length, lamina breadth and petiole length with the accession 131/02 and accession 142/02 has recorded the maximum number of leaves. The lowest plant height was recorded with Accession 131/02. Among the germplasm collected during the year 2002 from Tamilnadu showed that the accession 155/02 recorded maximum palm height and number of leaves.

The results from 2003 planted accessions showed that maximum mean palm height and highest number of leaves was recorded with accession 161/03 and the lowest plant height was recorded with Accession 165/03.

Among the 2004 germplasm collections, accession 174/04 has recorded maximum values in terms of lamina length, lamina breadth and petiole length. The highest number of leaves was recorded with the accession 179/04. The lowest plant height was recorded in Accession 184/04.

The accessions planted during 2006 showed maximum palm height with accession 192/06. The maximum values in terms of lamina breadth, lamina width and petiole length was recorded with accession 197/06. The lowest plant height was recorded with Accession 188/06.

Among the germplasm accessions planted during the year 2007, maximum palm height as well as lamina width was recorded with the accession 203/07. The accession 206/07 has recorded maximum values in terms of number of leaves and lamina length.

The data collected from germplasm planted during the year 2008 showed maximum palm height and petiole length with accession 217/08.The accession 218/08 has recorded maximum values in terms of number of leaves and lamina length.

Among the germplasm accessions collected during the year 2009, accession 224/03 has recorded maximum palm height. Highest number of leaves was recorded with 225/09. The lamina length was maximum with accession 230/04, and lamina breadth was maximum with accession 226/04.

Root studies in Palmyrah

Under growth and development studies in Palmyrah, root studies were initiated to know the growth pattern of roots in different root zones around the Palmyrah tree. On farm trees of various age groups i.e., 5,10,15,20 and 25 years were selected for the study. The number of trees per age group is four.

Among all age groups 20 year old trees produced more number of roots in all zones. The average root distribution in twenty year old trees was 102 number of roots in zone A_1, 88 in zone A_2, 49 in zone A_3, 26 in zone B_1, 35 in zone B_2, 6 in zone B_3, 4 and 2 in zone C_2 and C_3 respectively and no roots in zone C_1. Twenty five year old trees have produced 64 average number of roots in zone A_1, 25 in zone A_2, 16 in zone A_3, 12 in zone B_1, 10 in zone B_2, 2 in zone B_3, 3 in zone C_2 and no roots in the zones C_1 and C_3. Fifteen year old trees have produced 56 average number of roots in zone A_1, 32 in zone A_2, 5 in zone A_3, 8 in zone B_1, 4 in zone B_2, 8 in zone B_3, 2 in zone C_2 and no roots in C_1 and C_3 zones. Five year old trees have recorded the lowest average number of roots compared to other age groups of trees and the average root distribution was 21in zone A_1, 12 in zone A_2, 3 in zone A_3, 1 in zone B_3 and no roots in B_1, B_2, C_1, C_2 and C_3 zones.

Feasibility study on transplanting of palmyrah trees of varying age groups

Among the one year old transplanted trees, out of five trees three has put forth new leaf at 30 to 40 days after transplanting and in October transplanting only one has survived. Among the 3 year old transplanted trees, out of five trees only one tree could survive in July and remaining four trees died within 10 days and in October all the five were died. Among the 5, 7 and 10 year old transplanted trees during both the seasons all the five trees of each group were died within 10 days and no success was recorded.

Studies on use of growth inhibiting substances for induction of early flowering in Palmyrah (*Borassus flabellifer L.)* through dwarfening mechanism.

A total of 63 number of palms of uniform age group of 2,4 and 6 years was selected for imposing the treatments. Chlormequat chloride in two concentrations i.e., 2 ppm and 4 ppm, Mepiquat chloride in two concentrations i.e., 2 ppm and 4 ppm and Triacontanol in two concentrations i.e., 2 ppm and 4 ppm along with control was applied at three months interval starting from October 2013. The chemicals were poured in the apical buds @ 50 ml per application (at varied concentrations). This process will be continued for three years i.e., four in a year and totally 8 applications in two years. The trial will be continued for two years. After two years, observations on growth parameters will be recorded and compared with the control plants of the same age group.

CASHEW

Cashew Research Station, Bapatla

Among the 40 germplasm lines evaluated, mean nut yield per tree was maximum in T.No.228 (16.17 kg) followed by BLA 39/4 (15.8kg).However, cumulative nut yield recorded was highest in the entry BLA 39/4 (98.65 kg /tree) followed by T.No.129 (74.17 kg /tree). Apple weight ranged from 33.7 g to 125 g among the top 18 genotypes.

In the MLT-III mean nut yield per tree during the year was highest in BPP-8 (10.31 kg) followed by H-32/4 (9.41kg). Cumulative nut yield per tree was also highest in BPP-8 which has given 32.06kg/tree at 6th harvest and was followed by H-32/4 with 23.41 kg/tree. Mean weight of the apple was highest in BPP-8 (63.16 g) followed by H-662 (43.43g).

H-32-4 CLUSTER BEARING TYPE under evaluation trial MLT-III

BPP-8 CLUSTER BEARING HIGH YIELDING VARIETY

During the year, a total of 950 crosses have been made between six cross combinations. Among the different hybrids of 1997 evaluated, duration of flowering ranged from 77 days in H-44 to 121 days in H-1. Annual nut yield at 11th harvest was highest in H-67 (32.95 kg/tree) closely followed by H-49 [26.6 kg/tree] and H-36 (24.45 kg/tree). However cumulative nut yield was

found highest with hybrid H-67 (139.25kg/tree) and closely followed by H-36 [121.25 kg/tree]. Lowest cumulative nut yield was recorded in H-42 (20.66 kg/tree) and H-46 (26.01 kg/tree).

Among different hybrids of 1998, duration of flowering ranged from 78 to 111 days. Annual and cumulative nut yields were found highest in H-94 (12.3 & 33.8kg/tree) followed by H-85 (9.95&28.16 kg/tree).

Among different hybrids of 1999 evaluated, duration of flowering ranged from 69 days in H-158 to 106 days in H-129. Annual nut yield at 4th harvest was highest in H-168 (14.10kg/tree) closely followed by H-136 (12.7 kg/tree) and H-151(12.5 kg/tree). However cumulative nut yield was highest with hybrid H-168 (42.5kg/tree) and closely followed by H-132 (39.82 kg/tree).

Among the different hybrids of 2000 evaluated, duration of flowering ranged from 65 days in H-199 to 125 days in H-218. Annual nut yield at 4th harvest was highest in H-180 (13.75kg/tree) closely followed by H-197 [13.3kg/tree] and H-200(13.3kg/tree). However cumulative nut yield was highest with hybrid H-180(40.60kg/tree) and closely followed by H-179 [39.02 kg/tree]. Lowest cumulative nut yields were recorded in H-189 (2.28kg/tree) and H-203 (4.30kg/tree).

Among the different hybrids of 2001 evaluated, duration of flowering ranged from 71 days in H-225 to 112 days in H-244. Annual nut yield at 4th harvest was highest in H-239 (19.40kg/tree) closely followed by H-230 (14.35kg/tree). However cumulative nut yield was found highest with hybrid H-239 (57.72kg/tree) and closely followed by H-230 (48.02 kg/tree). Lowest cumulative nut yields were recorded in H-224 (9.70kg/tree) and H-225 (12.87 kg/tree).

Among the different hybrids of 2006 evaluated, duration of flowering ranged from 79 days in H-334 to 119 days in H-322. Annual nut yield at 2nd harvest was highest in H-355 (15.90kg/tree) closely followed by H-317(10.20kg/tree) and H-365 [9.30kg/tree]. However cumulative nut yield was highest with hybrid H-355(27.15kg/tree) and closely followed by H-365 (18.10 kg/tree).

Among the 12 genotypes studied, highest nut yield/tree was observed in T.No.228 of 16.17 kg/tree followed by BLA-39/4 (15.8kg/tree). Maximum Apple and nut weights were recorded in Priyanka of 125.0 g and 11.56 g respectively. Highest apple to nut ratio was observed in BLA139-1 (13.65).

Total Soluble Solids ranged from 9.6^{o} Brix to 13.9^{o} Brix among the genotypes studied. However, highest was found in Priyanka (13.9 Brix). Highest vitamin-C content was registered in T.No.8/7 (100 mg/100 g). Lowest tannin content and lowest acidity was observed in Priyanka (3.16 mg/100 g and 0.48% respectively).

COCONUT

Horticultural Research Station, Ambajipeta

Collection, conservation and evaluation of local germplasm of coconut

So far 13 local elite germplasm accessions were collected from traditional coconut growing districts *viz* Srikakulam, East and West Godavari districts of AP and raised the seedlings. The experiment was laid out during February 2013. Five accessions *viz* Pillalakodi green (CRP 745), Pillalakodi brown (CRP 746), Jonnalarasi brown (CRP 748) , ECT green (CRP 750) and Gang Bondam (CRP 749) were planted in RBD with four replications @ 4palms/replication and remaining

accessions viz. Jonnalarasi green (CRP 747), ECT Brown (CRP 751), Itikulagunta ECT Big (CRP 754), Itikulagunta ECT Small, Saradapuram ECT (CRP 753), Srikakulam ECT (CRP 752), Vemulapalli ECT Big, Vemulapalli ECT Small were planted as an observational trial with 6 palms per genotype and is in establishment stage.

Evaluation of new coconut hybrids of location specific cross combinations

The cross combination seed nuts were received from CPCRI, nursery was raised and the experiment was planted in June 2011 and it is in vegetative stage. Due to Helen and Philin cyclones during October & November 2013, most of the accessions were died. Gap filling has been taken up during the month of February.2014 and the experiment is in vegetative stage and establishment stage.

During the year, ECT x Double Century cross combination recorded highest plant height (307.33 cm), leaf length (156.58 cm) and petiole length (63.0cm). However, the number of functional leaves showed non significant differences. Further, ECT x Double Century recorded highest right and left leaflet number of 33.11 and 31.27 and it is on par with Double Century x Gauthami Ganga with 24.57 and 23.39 respectively. Leaflet length (73.63cm) and leaflet breadth (3.01cm) were also high in ECT x Double Century.

Table-11: Growth attributing characters of new coconut hybrids

Treatments	Plant height (cm)	Total no of leaves	Leaf length (cm)	Petiole length (cm)	Leaflet no.		Leaflet length (cm)	Leaflet breadth (cm)
					Left	Right		
ECT x CC	129.49	6.26	78.43	41.99	15.10	14.64	50.33	2.03
GB x CC	75.20	5.0	58.36	25.86	13.63	12.30	36.40	1.57
ECT x DC	307.33	8.15	156.58	63.00	33.11	31.27	73.63	3.01
GB x PO	107.33	5.84	71.83	37.22	19.77	19.50	39.16	1.76
DC x GB	158.72	6.83	112.62	46.05	24.57	23.39	58.61	2.33
ECT x GB	125.18	11.84	88.76	37.38	20.22	19.13	50.32	2.36
S Em ±	19.38	1.90	7.33	3.78	3.07	2.76	3.20	0.17
CD at 5 %	61.87	NS	23.41	12.09	9.82	8.80	10.24	0.55

Trial of promising hybrids and varieties in coconut

The experiment was planted in 2002 with nine entries in three replications in randomized block design.

Among different hybrids and varieties evaluated, significant differences were recorded for number of bunches pazazroduced, nut yield, fruit length, fruit breadth, fruit weight, dehusked fruit weight, husk weight, copra content and oil content. Significantly highest number of bunches and nut yield/palm/year were recorded in Godavari ganga (12.33 and 138.65) followed by PHOT (11.95 and 116.83 respectively).

With regard to nut characters, bigger fruits and maximum fruit weight was recorded in Chandra sankara (1792.4 g) and it was on par with PHOT (1601.7 g). Copra content (g/nut) was highest in Chandrasankara (220 g/nut) followed by PHOT with 171.5 g/nut. However, the highest oil content of 67.3% was recorded in Godavari Ganga and was on par with Chandrakalpa and PHOT (64.3 %) (Table-13).

Table-12: Harvesting parameters of coconut hybrids and varieties:

Treatments	No. Bunches/palm/year	No. of nuts/palm/year
Chandrasankara (COD x WCT)	10.51	110.25
Lakshaganga (LCT x GBGD)	8.96	115.33
Keraganga (WCT x GBGD)	10.32	99.66
Chandralaksha	10.83	94.54
VHC-I (ECT x MGD)	10.1	114.65
VHC-II (ECT x MYD)	9.32	93.65
Chandrakalpa	9.84	114.78
PHOT	11.95	116.83
Godavari ganga (ECT x GBGD)	12.33	138.65
S Em ±	N.S	12.32
CD at 5%	1.20	35.41
CV%	5.45	21.34

Table-13: Fruit component traits of different coconut hybrids and varieties:

Treatments/Entries	Fruit Length (cm)	Fruit breadth (cm)	Fruit weight (g)	Dehusked fruit weight(g)	Husk weight (g)	Quantity of water (ml)	Kernel weight (g)
Chandrasankara (COD x WCT)	21.06	17.33	1792.4	716.5	677.5	119.16	285.1
Lakshaganga (LCT x GBGD)	22.60	15.76	1282.4	597.9	684.5	113.33	282.9
Kera ganga (WCT x GBGD)	21.20	14.63	1169.7	555.9	580.4	103.33	291.1
Chandralaksha	19.6	14.26	1042.3	487.9	521.1	141.66	254.6
VHC-I (ECT x MGD)	18.6	14.03	1010.5	417.8	559.3	86.67	255.8
VHC-II (ECT x MYD)	20.6	15.46	1093.3	461.5	725.3	155.00	222.1
Chandrakalpa	20.6	14.83	1029.5	441.9	677.8	86.67	232.1
PHOT	20.7	16.40	1601.7	699.0	569.3	170.00	340.6
Godavari ganga	20.1	15.33	1334.3	581.2	653.2	150.00	282.0
(ECT x GBGD)							
S Em ±	0.69	0.73	121.5	42.2	121.6	17.26	51.69
CD at 5%	2.09	NS	259.9	127.6	NS	52.19	17.09
CV %	5.83	8.28	11.79	13.26	33.57	15.64	10.89

Table-14: Fruit component traits of the coconut hybrids and varieties

Treatments	Kernel thickness (cm)	Shell thickness (cm)	Copra Content (g/nut)	Oil content (%)
Chandrasankara (COD x WCT)	1.23	0.3	220.1	56.3
Lakshaganga (LCT x GBGD)	1.23	0.36	156.2	60.0
Keraganga (WCT x GBGD)	1.16	0.26	156.8	60.0
Chandralaksha	1.20	0.3	144.4	58.0
VHC-I (ECT x MGD)	1.13	0.36	130.7	58.3
VHC-II (ECT x MYD)	1.16	0.33	127.9	55.6
Chandrakalpa	1.33	0.33	110.9	64.3
PHOT	1.26	0.43	171.5	64.3
Godavari ganga (ECT x GBGD)	1.23	0.33	151.5	67.3
S Em ±	0.061	0.041	16.49	1.60
CD at 5%	NS	NS	49.8	4.85
CV %	8.68	21.17	18.7	4.59

Performance of Tall x Tall hybrids in coconut in different agro-climatic regions

During the year, the Tall x Tall hybrids exhibited significant differences for all growth traits except leaf length, leaflet length and leaflet breadth. WCT x TPT recorded highest plant height of 242.83 cm and number of functional leaves (7.72) and it was on par with LCOT x ADOT with plant height of 187.11 cm and 7.55 number of functional leaves and BGR x ADOT with plant height of 182.16 cm and 7.55 number of functional leaves. WCT x TPT recorded highest left leaflet number (32.99) and right leaflet number (31.83) and it was on par with BGR x ADOT and LCOT x ADOT.

Performance of New (experimental) cross combinations of Tall x Tall hybrids in coconut in major agro-climatic regions

Due to Helen and Phailin cyclones during October & November 2013, some of the accessions were died. Gap filling has been taken up during the month of February.2014 and the experiment is in vegetative stage and establishment stage. During the year 2012-13, the observations were at par with each other in terms of growth attributing characters.

Performance of Dwarf x Dwarf hybrids in coconut in different agro-climatic regions

Treatments The experiment was planted in June 2012. Due to Helen and Philin cyclones during October & November 2013, some of the accessions were died. Gap filling has been taken up during the month of February 2014 and the experiment is in vegetative stage and establishment stage.

Among different D x D hybrids, significant differences were recorded during the year 2012-13 for plant height and petiole length and the remaining growth characters showed non significant effect. COD x MYD hybrid showed highest plant height (224.79 cm) and petiole length (95.16 cm) and it is on par with COD x MGD hybrid (200.55 cm and 94.60 cm).

Demonstration of released varieties of coconut in different agro climatic regions

The experiment was planted in June 2011. Due to Helen and Philin cyclones during October & November 2013, some of the accessions were lost. Gap filling has been taken up during the month of February.2014 and the experiment is in vegetative stage and establishment stage.

Table - 15 Details of seed nuts of newly released coconut varieties exchanged

S. No.	Name of accession	Accession number	Seednut Source Centre
1.	Kalyani coconut – 1	Jamaican Tall	Aliyarnagar
2.	Gautami Ganga	CRP 751	Ambajipeta
3.	Konkan Bhatiye Hybrid – 1	CRP 751 x CRP 509	Ratnagiri
4.	Kalpadhenu	Andaman Jaint	—-
5.	Kerakeralam	WCT	Veppankulam
6.	Kerabastar	Fiji tall	Ratnagiri
7.	Kalpaprathiba	Cochin china	Kasargod
8.	Kalpa mitra	Java tall	Kasargod
9.	Kalpa raksha	MGD	Kasargod
10.	Kahikuchi hybrid	IND 058 x Kerakeralam	Ratnagiri

With respect to growth attributes recorded during the year 2012-13, Konkan Bhatiye hybrid recorded highest plant height (358.1 cm), leaf length (236.8 cm), petiole length (117.8 cm) left leaflet number (63.9) and right leaflet number (62.6) leaflet length (81.2 cm) and leaflet breadth (4.05).

Screening of cocoa clones for their performance as a mixed crop in coconut gardens

Six cocoa clones *viz.,* VTLCC – 1, VTLCH – 1, VTLCH – 2, VTLCH – 3, VTLCH – 4, VTLC – 1 (Control) were planted in November, 2008, in RBD with four replications and gap filling was done during December 2012. Data on vegetative and fruit characters was recorded. Though non significant, maximum plant height (240.5 cm) was recorded by VTLCH – 4 followed by VTLCH – 2 (223.8 cm). Highest plant girth was recorded in VTLC -1 (28.3 cm) followed by VTLCH – 4 (25.8 cm). Observations on yield data revealed that, VTLC-1 and VTCH-4 recorded 1.5 kg dry beans per plant.

TAMARIND

Horticultural Research Station, Ananthapuram

Evaluation of tamarind germplasm

In tamarind, forty one germplasm accessions were evaluated for growth and yield parameters. Maximum plant height was recorded in Salem – 102 (5.10m) followed by Pollachi – 11 (5.00 m) and Vellore – 29 (4.95m). Maximum stem girth was observed in Pollachi – 11 (87.67 cm) followed by PKM – 1 (80.80 cm). Highest plant spread was recorded in PKM – 1 (7.28m EW and 6.70m NS) followed by Salem – 163 (6.10m EW and 6.57m NS) and Salem – 102 (6.23m EW and 6.10m NS). The number of primary branches/plant was highest in Pollachi – 11 and Bommidi-163 (8.67). Highest Fruit yield per plant was recorded in Vellore – 2 (24.50 kg) which was closely followed by Pollachi – 11 (22.50 kg).

Among Punganur (PU) selections, the maximum plant height was recorded in PU–10 and PU–24 (4.00 m). The stem girth was maximum in PU–19 (76.67 cm) followed by PU–14 (69.8 cm). PU–2 and PU–6 recorded maximum number of primary branches/plant (7.5). Plant spread was more in PU–7 (4.58m EW and 3.92m NS) and PU–5 (4.36m EW and 3.90m NS). Highest yield was recorded in PU–15 (37.5 kg/plant) followed by PU–13 (31.50 kg/plant).

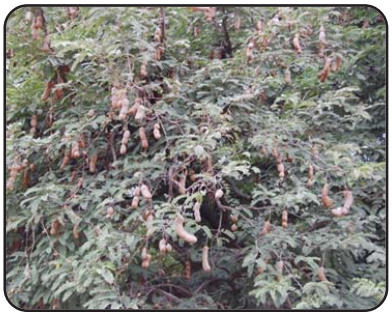
The performance of tamarind germplasm over years (2004-12) indicated that Vellore– 2 recorded a mean fruit yield of 13.31 kg/tree followed by ATPS-2 (10.32 kg/plant) and Vellore– 29 (9.17 kg/plant). Among Punganoor selections, PU–5 (8.75 kg/plant) and PU–1 (8.38 kg/plant) were found promising.

Evaluation of Elite Tamarind germplasm

The performance of Thettu tamarind selection was assessed in comparison with other tamarind germplasm accessions. It was observed that Thettu tamarind selection outperformed other accessions for all the fruit parameters viz., fruit length (23.70 cm), fruit weight (49.83 g), pulp weight (28.39 g) and pulp recovery (56.97%) (Table-16).

Table-16: Quality parameters of tamarind collections

Variety/Accessions	Fruit length (cm)	Fruit weight (g)	Pulp weight (g)	Shell weight (g)	Fibre weight (g)	Seed weight (g)	Pulp recovery (%)
Vellore1	15.96	20.58	8.90	4.52	0.66	6.06	43.25
Singapore Seedling	19.24	22.94	10.20	4.62	0.74	5.70	44.26
Punganoor 13	11.10	17.30	9.18	3.90	0.54	2.78	53.54
Punganoor 8	12.48	18.34	8.46	4.58	0.24	4.48	46.10
Red Tamarind	12.70	15.64	6.78	3.46	0.34	4.72	43.30
Pratistan	16.93	23.32	8.65	6.28	0.73	6.98	36.69
Punganoor 15	15.94	19.36	9.74	4.72	0.36	4.20	50.30
Punganoor 11	15.64	23.58	11.42	5.68	0.38	5.70	48.96
PKM1	13.86	14.44	6.54	3.30	0.16	3.58	45.34
Thettu Tamarind	**23.70**	**49.83**	**28.39**	**9.18**	**1.900**	**10.27**	**56.97**



Thettu Tamarind Tree

Thettu Tamarind Pods

Among the five tamarind varieties under evaluation, PKM–1 (2.60 m) recorded maximum plant height followed by Dharwad Sel.2 (2.53 m) and Dharwad Sel.1(2.51 m). Number of branches/ plant was more in PKM–1 (4.50) closely followed by Dharwad Sel.1 (4.41) and Pratistan (4.30). Plant spread in EW and NS direction was maximum in PKM-1 (2.46m EW and 2.70m NS) followed by Pratistan (2.51m EW and 2.64m NS) and Dharwad Sel.1 (2.39m EW and 2.48m NS). Stem girth recorded highest in PKM-1 (55.13 cm) followed by Pratistan (52.13 cm). The varieties started bearing during 2012. Among these, the highest fruit yield per plant was recorded in Dharwad Sel-1 (2.26 kg) followed by Dharwad Sel-2 (1.39 kg) (Table-17).

With regard to fruit quality characters, Dharwad Sel.1 was found superior with maximum fruit weight (20.90g), fruit length (15.50 cm), fruit width (6.75 cm), pulp weight (10.07 g) and shell weight (5.72 g) (Table-18). The fibre weight, number of seeds/pod and seed weight recorded in this variety were 0.72g, 6.00 and 4.21g, respectively. Next best variety in terms of fruit quality was Dharwad Sel.2 with 18.68g fruit weight, 14.63cm fruit length and 7.58g pulp weight. The variety Ajanta was found inferior in quality compared to other varieties. The incidence of pod and kernel borer was very high in Ajanta variety.

Table-17: Plant growth and yield parameters of Tamarind varieties in 2013. (Year of Planting 2008)

Variety	Plant height (m)	No. of branches/ plant	Plant spread (m)		Girth (cm)	Fruit yield (Kg/Plant)
			EW	NS		
Pratistan	2.41	4.30	2.51	2.64	52.13	0.38
Dharwad Sel. 1	2.51	4.41	2.39	2.48	45.38	2.26
Dharwad Sel. 2	2.53	4.00	2.48	2.36	47.00	1.39
Ajanta	1.61	3.30	1.55	1.64	44.25	0.58
PKM1 (check)	2.60	4.50	2.46	2.70	55.13	0.11
Statistics						
CD at P=0.05	0.65	NS	0.69	NS	NS	NS
SE.m±	0.21	0.46	0.22	0.27	4.05	0.44
CV (%)	18.00	22.44	19.75	22.44	16.63	172.91

Table-18: Fruit quality parameters of Tamarind varieties in 2013. (Year of Planting 2008)

Variety	Fruit Wt.(g)	Length (cm)	Width (cm)	Pulp Wt. (g)	Shell Wt. (g)	Fibre Wt. (g)	Seed Wt.(g)	No. of Seeds / pod
Pratistan	16.59	11.95	6.49	6.52	4.86	0.45	4.67	6.00
Dharwad Sel-1	20.90	15.50	6.75	10.07	5.72	0.72	4.21	6.00
Dharwad Sel-2	18.68	14.63	6.25	7.58	4.58	0.80	5.63	7.50
Ajanta	4.90	9.63	4.88	1.60	2.51	0.34	1.58	4.00
PKM-1 (check)	13.23	9.98	5.80	6.07	3.11	0.38	3.82	5.75
Statistics								
CD at P=0.05	4.87	1.68	NS	2.77	1.04	0.31	1.73	1.97
SE.m±	1.58	0.54	0.44	0.90	0.33	0.10	0.56	0.63
CV (%)	21.28	8.82	14.53	28.18	16.19	37.93	29.93	24.34

TAMARIND

Citrus Research Station, Petlur

Among 40 tamarind clones under evaluation, 13 clones are in bearing stage. Compared to 2012 the yield was moderate and in most of the varieties the flowering was very low and fruiting was recorded only in PTS-18, PTS-31, PTS-32 (27-32 kg) during 2013.

WOOD APPLE

Citrus Research Station, Petlur

Among 10 wood apple clones evaluated, PWAS-2, PWAS- 5 and PWAS-9 recorded good yields.

B. CROP PRODUCTION

FRUITS

MANGO

Mango Research Station, Nuzvid

Among various pruning methods centre opening, light pruning up to 2nd node followed by clipping of fruit stalks recorded highest number of fruits / tree (36.25), highest yield / tree (29.08 kg) and lowest number of thrips (2.05 thrips / panicle) and hoppers (3.5 hoppers / panicle).

Pooled analysis of four years data of various varieties under high density planting revealed that Totapuri recorded significantly highest fruit yield of 66.76 kg/tree and among hybrids Neeleshan recorded highest yield of 54.46 kg/tree.

Spraying of two percent potassium sulphate (K_2SO_4) 30 days before harvest on Kesar variety of mango resulted in minimum physiological loss of fruit weight (3.97%).

Spraying of potassium sulphate (K_2SO_4) at two percent concentration at 15 days interval starting from peanut stage on Baneshan variety recorded highest quantitative characters like fruit number / tree (69.75), fruit weight (274.15g) and fruit yield (18.57 kg/tree).

Fruit Research Station, Sangareddy

Rootstock trial (New) Banganpalli grafted on Nekkare rootstock was significantly superior in growth parameters in terms of maximum plant height (5.83 m) and spread (EW- 7.23 m) when compared to minimum plant height (4.90 m) and spread (EW-5.58 m) on Kensington rootstock. There is no significant difference in yield among different rootstocks. However, Banganpalli grafted on Nekkare rootstock recorded maximum cumulative (2004-14) yield (533.07kg/tree), least being 258.20 kg/tree in Mylepalion rootstock.

Pruning trial for high density planting (double hedge row) in mango

The treatment $M_2F_2T_1$ (i.e pruning of 20 cm terminal shoots, biennially immediately after fruit harvest) has recorded maximum number of fruits/tree (171.3) and yield (62.79 kg/tree) when compared to 30.87 kg /tree in control ($M_0F_0T_0$ without paclobutrazol).

Effect of different chemicals on regulation of flowering and fruiting in mango

Spraying of trees with KH_2PO_4 (1%) + KNO_3 (1%) has significantly increased fruit set/ panicle (9.5) fruit number/tree (192.0) and yield (87.37 kg/tree) when compared to 6.7 fruit set/ panicle, 96.2 fruits/tree and 33.8 kg/tree respectively in control.

Studies on flowering and fruiting behaviour of mango cultivars in relation to weather parameters (temperature, humidity, wind velocity and sun shine hours).

During 2013-14, the flower initiation was 16 days earlier in Suvarnarekha (4-12-2013) when compared to Banganpalli (20-12-2013). Further, Mallika has recorded significantly maximum yield (33.29 kg/tree) when compared to 17.89 kg/tree in Banganpalli.

Horticultural Research Station, Darsi

Testing of promising varieties of mango

Among eight varieties viz., Banganapalli, Totapuri, Imam Pasand, Suvarnarekha, Ratna, Navaneetham, Chinnarasam, Peddarasam and Ulavapadu mango planted during the year 2012, Totapuri recorded more plant height (1.76 m), stem girth (18.72 cm) and more canopy spread (1.66 m (NS) and 1.72 m (EW)) followed by Cherukurasam.

Citrus Research Station, Petlur

Among hybrids, highest fruit yield of 180.75 fruits per tree was recorded with A.U. Rumani weighing 85 Kg. which was closely followed by Neelgoa which yielded 170.8 fruits per tree. Among 4 table varieties evaluated, highest no. of 115.2 fruits per tree was recorded with Khader. Among four regular bearers, Bangalora gave highest no. of fruits per tree (800.4) followed by Pulihora which yielded 457.7 fruits per tree.

JAMUN

Fruit Research Station, Sangareddy

Varietal evaluation in Jamun (*Syzigium cuminii* Skeels)

In situ grafting was done during the year 2012-13 with scions collected from elite material from Herbal Garden, R. Nagar. Six accessions were collected from KRCCH, Arabhavi. The variety Konkan Bahadoli was collected from Dr. BSKKV, Dapoli and planted in February, 2014.

SWEET ORANGE

Horticultural Research Station, Darsi

Organic cultivation of sweet orange

Nine treatments were imposed in a trial initiated in the year 2012. Among the treatments, highest plant height (1.58 m) was observed in T6 (Application of 100 % fly ash) and more stem girth (13.58 cm) was noticed in T8 (Application of enriched coir).

Horticultural Research Station, Mallepally

Standardization of cultural practices for crop regulation in sweet orange

Removal of top soil in the basins up to 3 inches + mulching with block polythene sheet with perforations recorded maximum fruit number/tree (503.66), fruit yield/tree (84.70 kg), average fruit weight (168.90 g), TSS (9.13^{O} Brix) and juice content (43.66 %).

Response of sweet orange to different mulches in relation to growth, yield and quality

Maximum plant height (307.33 cm), girth (40.33 cm), canopy spread, East-West (316.33 cm), number of fruits per tree (154.00), yield (25.93 kg), average fruit weight (168.44 g) and TSS (9.23^{O} B) were recorded in T6 (Bi-colour polythene mulch of 100 micron) treatment.

Intercropping studies in sweet orange

The maximum plant height was recorded (245.05 cm) in intercropping sequence with dolichos bean. Highest net profit from intercropping sequence was obtained from marigold (Rs.64,666/ha) followed by water melon (Rs.63,333/ha) and lowest from cow pea (Rs.19,000 /ha).

BANANA

Horticultural Research Station, Kovvur

Validation of fertilizer adjustment equation in banana cv. Martaman.

No significant difference was observed among the treatments with regard to growth parameters except plant height where as in bunch characters viz; number of hands/bunch, fruits/

hand, total fruits/ bunch and per ha yield significant difference was observed. The highest yield of 40.22 t/ha was recorded with application of 169.24:28.55:219.78 NPK g/plant.

Studies on irrigation and nutrient interaction in banana cv Grand Naine

In plant crop, irrigation level I_3 (90 ER %) recorded significantly higher number of leaves and green leaves per plant. With regards to yield and yield attributes there was no significant difference among different treatments. In ratoon crop, no significant difference was observed in irrigation and fertilizer levels with regards to plant height, girth, green leaves and leaf width. With regard to fruit characters among irrigation levels, I_3 recorded highest number of fruits per bunch (120.13) as well as yield (39.32 t/ha).

Effect of plant density and nutrients on quality and productivity of banana cv. Martaman

Among different plant densities in plant crop, the treatment S_1 (2 × 2 m) recorded highest bunch weight, maximum fruit girth, highest number of hands per bunch and maximum number of fingers in 2nd hand. However, significantly highest yield was recorded in S_3 (2.5 × 1.25 × 1.25 m) as compared to S_1 (2 × 2 m) and S_2 (2.5 × 1.25 m). Among fertigation levels, the treatment F_1 (100% RDF-200:50:200 NPK g/pl) recorded highest yield, bunch weight, maximum fruit girth and maximum number of fingers in 2nd hand and it was on par with F_2 (75% RDF). Among different treatmental combinations, the yield was maximum (64 t/ha) for treatmental combination S_3F_1 and it was on par with S_3F_2 while minimum yield was recorded in S_1F_3.

Among different plant densities in ratoon crop, highest number of fingers in second hand, finger length and bunch weight were Recorded in S_3 spacing. Significantly highest yield of 55.64 t/ha was recorded in S_3 spacing followed by S_2. Among fertigation levels in ratoon crop, no significant difference was observed among yield parameters. Among different treatment combinations in ratoon crop, the treatment combination S_3F_1 (57.60 t/ha) recorded highest yield and it was on par with S_3F_3.

Studies on stage wise (sub cultures) proliferation efficiency of different banana cultivars (AAA, AAB and ABB) in micro propagation

Among different cultivars kept for initiation, Grand Naine and Dwarf Cavendish started proliferation at C_1 subculture stage, whereas in Martman and KC keli proliferation was noticed from C_3 subculture stage and highest proliferation was observed in Grand Naine (2.71) and DC (2.54).

Effect of micronutrients on productivity and quality of banana cv. Martaman

In plant crop, foliar spray of (T_7) $ZnSo_4$ (0.2%) + H_3Bo_3 (0.2%) + $FeSo_4$ (0.2%) and (T_8) Arka banana special recorded significantly higher yield of 40.88 t/ha and 40.66 t/ha respectively which were on par with each other. The number of fruits/hand was also reported to be higher in above treatments. Similarly, in ratoon crop also foliar application of (T_7) $ZnSo_4$ (0.2%) + H_3Bo_3 (0.2%) + $FeSo_4$ (0.2%) and (T_8) Arka banana special recorded higher yield and it was on par with T_3 ($FeSo_4$ (0.2%) and T_4 ($ZnSo_4$ (0.2%) + H_3Bo_3 (0.2%). The above treatments also recorded minimum percentage of lumps in fruits.

GRAPE

Grape Research Station, Rajendranagar

Standardization of fertigation in Thompson Seedless grapes grafted on Dogridge

Petiole Nutrient Status - Bud differentiation stage

Fertigation treatments receiving 80 per cent dose of RDF recorded high N content and was on par with soil application treatments irrespective of the fertilizer dose. Significantly highest petiole P was recorded with 100 % RDF followed by 80 % RDF. The petiole K content was significantly low in case of 30 % RDF. Irrespective of the fertilizer dose N, P and K recorded optimum status.

Full Bloom Stage

Petiole nutrient content at full bloom stage revealed that the treatments had no significant influence on N content. Significantly higher petiole P and K content were recorded in treatments receiving high dose of RDF. Significantly highest P was recorded with 100 % RDF. Based on the petiole nutrient norms at full bloom stage low N, optimum P and high K content was recorded irrespective of treatments.

Build up of soil nutrients

There was no build up in the N, a huge build up in the P and a slight build in the K level of the soil when compared to its initial status.

Standardization of irrigation in Thomson Seedless grapes grafted on Dogridge rootstock Yield

Significantly high yield, quality and water use efficiency was recorded in treatments irrigated at 60 % ET at shoot growth and berry setting to harvest and reducing the rates to 20% during bud differentiation and flowering stages. By this way 38 % of irrigation water can be saved when compared to irrigating continuously at 80 % ET.

Petiole Nutrient Content

There was no significant effect of irrigation treatment on petiole nutrient content at bud differentiation stage where all treatments recorded optimum status. At full bloom stage, significant increase in petiole N content was observed in 80-60-80-60-80-40 per cent ER and K content in 80 per cent ER. However there was no significant effect of irrigation treatment on petiole P content. Petiole nutrient status of N was low, P was optimum and K was high.

Build up of soil nutrients

There was no significant influence of irrigation treatments on soil pH, EC, N, P and K. There was no build up in the N, a huge build up in the P and a slight build in the K level of the soil when compared to its initial status.

GUAVA

Fruit Research Station, Sangareddy

Studies on the effect of NPK on yield and quality of guava under meadow system of planting

Planting of guava varieties Allahabad safeda and L-49 was taken up at a spacing of 2 x 1 m (Meadow system). Similarly, pink pulp varieties Lalith and Kohir Red were also planted at same spacing. Mulching with black polythene sheet of 100 microns has been done. Heading back of the plants was done during June, 2012 followed by periodical pruning till required frame work was obtained. During 2013-14, 135:60:60 g N P K per plant resulted in more yields in Lalith (13.3t/ha) and Allahabad Safeda (12.28 t/ha).

Horticultural Research Station, Aswaraopet

Effect of high density planting and training method on yield and quality of guava var. Arka Mrudula

During the fourth year, highest number of fruits was recorded in 1.0X2.0 m spacing with single stem and 3-4 branches at 1.5 meter height (33.25) which was on par with 1.5X2.0 m spacing in tatoora system and branching at 1 meter height. Highest yield was recorded in case of 1x1 m spacing where in number of plants accommodated per heactare was more. Highest yield was recorded in 1x1 m spacing with single stem and 3-4 branches at 1.5 m height (35.3 t/ha) which was on par with 1 X 1 m spacing with tatoora system at 1 m height (33.5 t/ac).

Horticultural Research Station, Darsi

Standardization of training and pruning practices in hedge row planting in guava

Two varieties viz., Allahabad Safeda and Lalith were planted during the year 2010 and 2011 respectively. During this year, highest fruit yield was recorded in H_2 M3 (plant height is 150 cm and pruning of 50 % current growth in the month of June and November) at 23.75 t/ha (14.85 kg/plant) followed by H_2 M4 (plant height is 150 cm and pruning of 50 % current growth in the month of July and December) at 19.83 t/ha (12.40 kg/plant) and lowest yield was observed in control 2.88 t/ha (10.03 kg/plant).

POMEGRANATE

Horticultural Research Station, Anantapuram

Effect of different Nitrogen and Water Regimes on Nitrogen Use Efficiency and Water Savings in Pomegranate (Cv. Bhagwa)

The experiment was carried out with three water regimes based on cumulative pan evaporation (CPE) with IW/CPE of 1.0, 0.8 and 0.6 and three nitrogen levels 100%, 75% and 50 % of recommended dose of nitrogen at monthly intervals. Recommended dose of fertilizers for 3-4 year old plants is 500 g N, 125 g P, 125 g K per plant/year. Among the treatments and their interactions, significant difference for all the growth parameters except number of stems per plant were recorded (Table-18). Maximum plant height was recorded in control (212.78 cm) followed by IW/CPE of 0.6 at 75% RDN (211.67 cm) and IW/CPE of 0.8 at 75% RDN (195.56 cm). Plant spread was more in control (210.00 cm EW and 206.67 cm NS) followed by IW/CPE of 0.8 at 75% RDN (194.44 cm EW and 201.11 cm NS).

Highest fruit weight was recorded in IW/CPE of 0.8 at 75% RDN (206.86 g) followed by IW/CPE of 1.0 at 75% RDN (202.00 g). Least fruit weight was recorded in IW/CPE of 0.6 at 75% RDN (110.99 g). Highest yield per plant was recorded in IW/CPE of 1.0 at 75% RDN (7.07 kg/plant) followed by control (7.00 kg/plant). However, N use efficiency was highest (9.91 kg fruits/kg N applied) with IW/CPE of 1.0 at 75% RDN followed by IW/CPE of 0.8 at 75% RDN (8.43 kg fruits/kg N applied) (Table-19).

Table-19: Effect of different water regimes and Nitrogen levels on growth parameters of pomegranate (Cv. Bhagwa) during 2013

Treatments		Growth Parameters			
IW/CPE[y]	% of RDN[z]	Plant height (cm)	Plant Spread (cm) North-South	East-West	# of Stems
	100	182.22	190.00	182.22	3.56
1.0	75	176.11	165.56	163.33	3.33
	50	192.22	188.89	191.11	3.78
	100	180.56	165.56	183.33	3.44
0.8	75	195.56	201.11	194.44	4.22
	50	188.33	171.11	176.67	3.67
	100	184.44	178.89	173.33	4.00
0.6	75	211.67	194.44	193.33	4.22
	50	192.22	170.00	181.11	3.67
Control		212.78	206.67	210.00	5.00
Unfertilized (N) control	166.67	147.78	153.33	3.67	
IW/CPE					NS
% of RDN					NS
Interaction					NS

Irrigation regimes based on Irrigation Water/Cumulative Pan Evaporation ratio[z] RDN indicates Recommended Dose of Nitrogen (at 3-4 yr RDN=500 g/plant)NS, *, **, *** indicates non-significant, significant at *P*=0.5, 0.01 and 0.001, respectively

Table-20: Effect of water regimes and Nitrogen levels on fruit quality parameters and yield of pomegranate (Cv. Bhagwa) during 2013

Treatments		Fruit quality parameters			Yield (kg/pl)	NUE[z] (kg fruit yield /kg N applied)
IW/CPE[x]	% of RDN[y]	Fruit wt (g)	wt of 100 arils (g)	TSS (°Brix)		
	100	175.85	29.00	17.67	6.80	6.89
1.0	75	202.00	26.83	17.00	7.07	9.91
	50	169.69	26.00	17.15	5.43	8.31
	100	166.67	29.67	18.00	6.00	5.54
0.8	75	206.86	26.67	18.50	6.39	8.43
	50	186.21	24.50	17.67	4.78	6.20
	100	124.44	25.29	18.71	4.16	1.86
0.6	75	a110.99	23.13	18.46	3.27	0.11
	50	123.13	21.80	18.30	3.29	0.24
Control		200.00	28.81	17.29	7.00	7.54
Unfertilized (N) control		122.49	20.33	15.80	3.23	—
IW/CPE		*	NS	NS	*	*
% of RDN		*	NS	NS	**	*
Interaction		*	*	NS	NS	*

[x] Irrigation regimes based on Irrigation Water/Cumulative Pan Evaporation ratio[y] RDN indicates Recommended Dose of Nitrogen (for 4 yr old plants RDN=500 g/plant)[z] NUE is Nitrogen Use Efficiency [NUE= (Yld of fertilized - Yld of unfertilized plants)/kg of N applied]NS, **,***, indicates non-significant, significant at *P*=0.01, and 0.001 respectively

Effect of different mulching material on growth and yield of pomegranate (Cv. Bhagwa)

Maximum plant height (1.20 m) was recorded in T_1 and T_4. No. of branches per plant was recorded more in control (4.08) which was closely followed by T_1 (4.02). More plant spread was observed in T_4 (1.13 m EW-1.20 m NS) followed by T_1 (1.18 m EW-1.10 m NS). The weed density was low in T_3 (2.6) and T_2 (3.0) (Table-21).

Table-21: Growth parameters of pomegranate Cv. Bhagwa under different mulch material

DOP – June, 2012

Treatment details		Plant height (m)	No. of branches per plant	Plant Spread (m)		Weed density (Plants per Sq.m)
				EW	NS	
T1	200 microns woven polypropylene ground cover	1.20	4.02	1.18	1.10	11.9
T2	100 microns polythene mulch (Silver color)	1.15	3.95	1.10	1.15	3.0
T3	100 microns polythene mulch (black color)	1.10	3.78	1.08	1.05	2.6
T4	Organic mulch(groundnut shells)	1.20	3.95	1.13	1.20	7.6
T5	Control (without mulch)	1.18	4.08	1.18	1.08	8.1
	SE.m±	***0.07***	***0.26***	***0.04***	***0.05***	***0.63***
	CD at 5%	***0.21***	***0.80***	***0.14***	***0.14***	***1.38***
	C V %	***11.83***	***13.19***	***7.92***	***8.10***	***15.92***

ACID LIME

Horticultural Research Station, Darsi

Performance of Acid lime selections/varieties suitable to Prakasam District.

Under this project six varieties namely Pramalini, Balaji, Petlur Selection-1, TAL 94/13, TAL-94/14 and RHRL-124 were planted during the year, 2012. Among the acid lime varieties planted, TAL-94/14 recorded highest plant height (1.55 m), stem girth (9.921 cm) and more canopy spread 1.67 m (NS) and 1.55 m (EW) followed by TAL-94/13.

Citrus Research Station, Petlur

Performance of Acid lime varieties

Seventeen varieties comprising of released and pre-released acid lime have established well and are in bearing stage. Among them Petlur Selection–1, Petlur Selection-21, Balaji are highly precocious followed by TAL-94-14. Even though TAL-94-14 is very high yielding the juice content is less and less preferred.

Effect of different potting mixtures on growth of acidlime seedings

The results indicated that different potting mixtures have got significant influence on growth of the seedlings. It was observed that treatment (T4) i.e Red Soil +FYM+ VAM + Pressmud produced significantly very vigorous seedlings than any other treatment and it was observed that in T4 maximum plant height (67.78 cm), fresh weight of seedling (36.63 gm), dry wt of the seedling (18.4 gm) and total dry matter (19.4%) was observed and the T_1 i.e Red Soil + FYM+ VAM + Vermicompost produced less vigorous seedlings.

CUSTARD APPLE

Horticultural Research Station, Ananthapuram

Standardization of pruning technology in custard apple (Cv. Balanagar)

Treatments include three pruning intensities (25, 50 and 75% of previous season's shoot) and three pruning timings (60, 75 and 90 days after harvest) including control with no pruning. Pruning treatments were initiated in January 2013. Pruning intensity and interaction effects significantly affected number of shoots, number of flowered shoots and per cent flowered shoots. Highest number of shoots was produced with 75% pruning intensity (4.75) and 25% pruning intensity (4.38) at 75 days after harvest of crop. Number of flowered shoots was high at 75% pruning intensity (3.80) and 25% pruning intensity (3.68) at 75 days after harvest of crop. Maximum per cent of flowered shoots was observed in 25% pruning intensity (83.78) at 75 days after harvest followed by 25% pruning intensity (83.47) at 60 days after harvest. Number of fruits per plant was more at 75% pruning intensity (32.88) followed by 25% pruning intensity (30.00) when plants pruned at 75 days after harvest.

PASSION FRUIT

Horticultural Research Station, Aswaraopet

Significantly highest fruit number (25.37g/pl) and fruit yield (1148.44 g/pl) and cumulative yield per plant (3250.99 g/pl) were recorded in Bower system. While the fruit quality in terms of TSS and fruit weight was not influenced by training method.

Horticultural Research Station, Pandirimamidi

Standardization of training system of passion fruit for the agency areas of East Godavari Dist.

Among the three different systems of training tried, highest fruit number (75.40 nos) and fruit weight (65.2g) was recorded with Bower system of training.

FLOWERS

MARIGOLD

Floricultural Research Station, Rajendranagar

Studies on year round flower production in marigold

In both African and French marigold, early flowering was observed in rabi plantings only i.e., Oct- Nov, while the growth characters were maximum in June – July plantings. Ultimately the yield was highest in July planting for African marigold while it was in September planting in case of French marigold.

JASMINE

Floricultural Research Station, Rajendranagar

tandardization of techniques for extension of flowering in Jasmine

Maximum plant height (116 cm), plant spread (139.3 cm), number of florets/plant (2144.6), weight of flowers/plant (104.6 gm), bud width (8.7 mm), duration of flowering (139 days) were recorded in split application of RDF at monthly interval. Minimum number of days taken for flowering (18) and highest bud length (22.64 mm) were recorded in CCC @ 1000 ppm. Minimum number of days taken for first bud appreance (17) was observed with GA3 @ 100 ppm.

GLADIOLUS

Floricultural Research Station, Rajendranagar

Fertigation studies in gladiolus

In American Beauty, maximum plant height (105 cm), spike length (91.8 cm), number of florets per spike (13.2) and diameter of second floret (11.9 cm) were recorded in 100% RDF (Soluble fertilizers through drip). Minimum no. of days taken for spike emergence (77.0 days), basal flower opening (83.5 days) and Maximum duration of flowering (8.7 days) were recorded in 80 % RDF. The maximum number of spikes/plot (18.0) was recorded in 100% RDF.

TUBEROSE

Floricultural Research Station, Rajendranagar

Irradiation studies in chrysanthemum and tuberose

During 2013-14, two new varieties of chrysanthemum Red and Lilith were irradiated with different doses of gamma rays and found that, in both the varieties the survival percentage was nil. In another flower crop gladiolus five varieties were irradiated at 25, 50 and 75 Gy doses. In two varieties the corms did not sprout while in remaining varieties though the sprouting was observed after 55 days, there was no further growth of the plants.

FOLIAGE PLANTS (*Aglaonema* and *Schefflera)*

Floricultural Research Station, Rajendranagar

Standardization of suitable containers for foliage plants

For *Aglaonema,* the ceramic containers of 25 cm size followed by earthen containers of 25 cm were found to be good for the good growth of the plants. Whereas for *schefflera*, earthen containers of 25 cm size was found to be good for its growth.

Standardization of media composition for foliage plants

In *Aglaonema,* the growth response in terms of plant height was maximum in T_1 (Soil + sand + FYM (2:1:1) followed by T_7 (Cocopeat + sand + FYM + vermicompost), while all other leaf characters like leaf length (37.20cm), width (8.27cm) and leaf area (225.0cm^2) were maximum in T_6 (Cocopeat + sand + vermicompost (2:1:1). In *Schefflera,* maximum increase in plant height and no. of leaves produced over the initial was noticed in T_3 (Soil + sand + FYM + vermicompost (2:1:1.0:0.5) followed by T_2 (Soil + sand + vermicompost 2:1:1).

Maintenance of compact growth form in foliage plants suitable for pot culture by using growth retardants.

The growth retardants Paclobutrazol @ 0.25 mg/pot followed by Ancymidol @ 1.0 mg/pot were effective in reducing the growth of *Aglaonema* and *Schefflera*.

Standardization of suitable growing environment for foliage plants

In *Aglaonema,* maximum leaf width (11.7 cm) was recorded in 35% shade net. Maximum number of leaves per plant (21.5) and petiole girth (2.2) was recorded in 50% shade net. Maximum plant height (53.8 cm) and petiole length (3.5 cm) in 75% shade net.
Schefflera recorded maximum leaf length (10.1 cm) and petiole length (8.8 cm) in 35% shade net. Maximum leaf width (8.9 cm), plant height (34.8 cm) and petiole girth (1.0) were recorded in 50% shade net. Maximum number of leaves per plant (19.8) was recorded in 75% shade net.

Survey, collection and evaluation of indigenous flower trees

Three new additions were made to the existing collection of fourteen species of ornamental trees. Among them, all the species started flowering except five tree species. Bottle brush tree took 315 days to flower followed by *Bauhinia tomentosa* (380 days). *Peltophorum pterocarpum* initiated flowering within 280 days which was collected during this year.

GERBERA

Horticultural Research Station, Pandirimamidi

Studies on production of gerbera under polyhouse conditions

At 60 DAP, plant spread and number of leaves per plant significantly differed in all varieties. Plant spread was highest in Debora (E-W 42.90 cm & N-S 42.15 cm) followed by Banesa (E-W 42.20 cm & N-S 42.30 cm). Number of leaves per plant was highest in Debora (17.15) and least in Avemaria (10.90).

Floricultural Research Station, Rajendranagar

Nutrient sprays in Carnation and Gerbera

In Carnation (var.Gaudina), maximum plant height (97.85 cm) and number of flowers per sq.m (33.60) were recorded in T_1S_1 (Control i.e., 100% RDF water soluble fertilizers (WSF) through drip) + mixture of 100 ppm of each micronutrient (B, Zn, Fe, Mg, Mn). Maximum diameter of flower stalk (7.29 mm) and bud width (21.67mm) were recorded in T_2S_1 (75% RDF (WSF) through drip + 25% RDF (WSF) through spray + mixture of 100 ppm of each micronutrient (B, Zn, Fe, Mg, Mn).

In Gerbera , maximum diameter of disc (3.76 cm), fresh weight of flower stalk (27.37 g) and number of flowers /m^2/month (31.40) were recorded in T_3S_2 (75% RDF (WSF) through drip +25% RDF (WSF) through spray + 150 ppm of micronutrients) over control, while maximum diameter of flower (11.59 cm) and diameter of flower neck (6.77 mm) were recorded in T_3S_3 (50% RDF 9 WSF) through drip + 50% RDF (WSF) through spray + Commercial formulation (Rexolin) over control.

TUBER CROPS

AMORPHOPHALLUS

Horticultural Research Station, Kovvur

Effect of micronutrients on growth and yield of Amorphophallus

The treatment T_6 ($FeSO_4$ (0.2%) + $MgSO_4$ (0.2%)) recorded higher yield compared to other treatments. However in pooled analysis, the treatment T_7 ($FeSO_4$ (0.2%) + $MgSO_4$ (0.2%) + $ZnSO_4$ (0.2%) + H_3BO_3 (0.2%)) recorded higher yield and it was on par with T_6 – ($FeSO_4$ (0.2%) + $MgSO_4$ (0.2%)).

Observational trail on the performance of open pollinated seed of *Amorphophallus paeoniifolius.*

Lot of variability was observed in the seedling progenies with regard to the frequency of sprouts from seeds, pseuodostem colour and texture, number of leaves at 5 MAP, growth characters, yield and yield attributing characters.

ELEPHANT FOOT YAM

Horticultural Research Station, Kovvur

Phenology of elephant foot yam in relation to climate change

During the phenology study of elephant foot yam, various growth and yield parameters were recorded at monthly intervals. Gajendra has sprouted 2 days early as compared to local cultivar. Plant height, culm girth, weight of main corm, number of leaflets, maximum leaflet length, leaflet width, leaf area, yield/plant and yield per hectare were found to be more in Gajendra than local cultivar.

Phenology of greater yam in relation to climate change

In greater yam, Sree keerthi sprouted 2.43 days earlier compared to local cultivar. Yield and yield attributing characters were better in local cultivar than Sreekeerthi.

Site specific nutrient management studies in elephant foot yam

In elephant foot yam, significantly highest yield of 63.43 t/ha was recorded when recommended dose of NPK was applied which was on par with the treatment T_2 (on soil test data) (53.04 t/ha) followed by the treatment T_4-Zero P, N&K based on soil test (50.33 t/ha).

Effect of different weedicides on growth and yield of elephant foot yam

There was no significant difference among the treatments in vegetative parameters. However, yield and yield attributing characters were significantly influenced by the treatments. Among various treatments, average yield per plant and yield per hectare were significantly highest in T_3 -Oxyflurofen (1-2 days immediately after planting) @ 0.25 kg ai/ha + Glyphosate (60, 90,150 days after planting) @ 1kg ai/ha(**58.63 t.ha^{-1}**)followed by T_1-Oxyflurofen (1-2 days immediately after planting) @ 0.25 kg ai/ha+ Manual weeding at 60, 90,150 days after planting(**53.52 t.ha^{-1}**). CB ratio was highest in T_3 (1.04). Lowest weed biomass (g/0.25 m^2) was observed in T_1 followed by T_3.

VEGETABLES

OKRA

Vegetable Research Station, Rajendranagar

Application of 180:75:75 kg ha^{-1} of NPK as straight fertilizers at weekly interval to okra with 10% of dose at 10 DAS stage and 70% of dose at 10 to 40th DAS of crop and 20% of dose at 50 to 90 DAS recorded an yield of 13.2 t ha^{-1} when compared to control yield of 8.75 t ha^{-1} which was 33% less.

BRACCOLI

Vegetable Research Station, Rajendranagar

In broccoli application of poultry manure @ 5 t ha^{-1} + half dose of NPK chemical fertilizer recorded highest yield of 10.44 t ha^{-1} with benefit cost ratio of 2.90.

LEAFY VEGETABLES

Vegetable Research Station, Rajendranagar

In summer, methi, coriander and palak crops grown under 35% shade net recorded higher yields of 35.6, 30.35 and 208 q ha^{-1}respectively, while these crops recorded lower yields in open field condition (27.91, 24.52 and 169 q ha^{-1}). Where as amaranthus recorded higher yield in open field condition (107.5 q ha^{-1}) than shaded condition (69.66 q ha^{-1}).

ONION

Horticultural Research Station, Mahanandi

Evaluation of onion varieties.

Among 18 onion varieties evaluated, maximum yield was recorded in Bhima Kiran (32.39 t/ha) followed by Agrifound Dark Red (32.26 t/ha).

Effect of different herbicides on growth and yield of onion.

Among the different herbicide sprays, pre-emergence spray with Pendimethalin @ 1.0 kg a.i. ha-1 + Oxyfluorfen @ 0.25 kg a.i. ha^{-1} as post emergence spray at 40 DAT found to be superior and recorded more plant height (44.94 cm), stem diameter (4.45cm), no.of flowers (6.67), diameter of the bulb (3.61 cm), weight of the bulb (56.95 g) and yield (11.45 t/ha).

DRUM STICK

Three varieties of moringa namely PKM-1, PKM-2 and Bhagya were planted in the month of January and at present these varieties are in vegetative stage. Early flowering was observed in PKM-1

CAPSICUM

Horticultural Research Station, Mahanandi

Studies on the production of capsicum under polyhouse condition.

Capsicum varities Indra (Green), Bomby (Red) and Orobelle (yellow) were planted on 01-10-2013, 15-10-2013 and 30-10-2013 in polyhouse. Among the combinations, the date of planting 01-10-2013 with Bomby variety, recorded more plant height (95.99cm), diameter of the stem (2.76cm), more fruit weight (127.95g), more fruit length (10.90cm) and more yield (15.54 t/ha) followed by Indra variety transplanted on 01.10.2013.

SPICES

CHILLI

Horticultural Research Station, Lam

Studies on the effect of NSKE and Neem oil on yield and quality parameters of chilli revealed that application of neem based products once after three sprays recorded highest yield (1144.91 kg/ha) and high photosynthetic rate (22.18). Among sub treatments, control recorded higher dry chilli yields (1375 kg/ha) which was on par with NSKE 5% and NSKE 10%.

Efficacy of different herbicides in chilli was tested and Pendimethalin as pre-emergence @0.75a.i/ha + Pendimethalin as soil application at 25 & 50 DAS has recorded significantly highest yield (2083kg/ha) with highest weed control efficiency (82.79%) and Weed Index (32.8%).

The studies on standardization of Nitrogen and Potassium requirement for pre-released hot pepper lines (LCA-620) revealed that recommended dose of fertilizers (i.e.300:60:120 N: P_2O_5:K_2O/ha) was sufficient for growing LCA-620 chilli variety.

Significant differences in yield were not observed between the seedlings raised in nursery and Protray methods. While maximum ripe chilli yield (7325.25 kg/ha) was recorded when 6 weeks old seedlings were transplanted in the main field.

CORIANDER

Horticultural Research Station, Lam

For off-season production of coriander leaf, application of 45:40:20 NPK + spraying with GA 15 ppm at 20DAS recorded maximum yield (3.9 t/ha) and was on par with application of 45:40:20 NPK + spraying with GA 10 ppm at 20DAS (3.84 t/ha), which were significantly superior to control (2.36 t/ha).

Among the PGPR bio-formulations tested in coriander (APHU Dhania-1), seed treatment with combination of FK14 (*Pseudomonas putida*) and FL18 (*Macrobacterium paraoxydans*) recorded maximum yield (1191.9 kg/ha) followed by seed treatment with FK-14

(*Pseudomonas putida*) (1186.7 kg/ha) which were on par with each other and significantly superior to untreated control (1104.5 kg/ha) and untreated local check Sudha (1008.0 kg/ha).

Efficacy of seven different post emergence herbicides was studied and the results indicated that highest yield was recorded in weed free control (917 kg/ha) which was significantly superior to all other treatments.

FENUGREEK

Horticultural Research Station, Lam

Among three PGPR bio-formulations evaluated in fenugreek, seed treated with combination of FK14 (*Pseudomonas putida*) and FL18 (*Macrobacterium paraoxydans*) recorded highest yield (1233.8 kg/ha) followed by FK-14 (*Pseudomonas putida*) (1220.5 kg/ha) and FL18 (*Macrobacterium paraoxydans*) (1216.9 kg/ha) which were on par with each other and significantly superior to untreated control (1108.6 kg/ha) and untreated local check LS-1 (991.8 kg/ha).

GARLIC

Horticultural Research Station, Mahanandi

Effect of different times of planting on growth and yield of garlic in Kurnool District.

Among seven sowing dates viz., 15-08-13, 01-09-13, 15-09-13, 01-10-13, 15-10-13, 01-11-13 and 15-11-13, sowing on 01-10-13 found to be superior. More plant height (49.58cm), more stem diameter (2.48 cm), more number of leaves (6.80), more diameter of stem (8.70cm), more weight of the bulb (18.46g) and more yield (6.54 t/ha) were recorded in 01.10.2013 sowing.

TURMERIC

Horticultural Research Station, Lam

In turmeric, drip irrigation once in a day at 80% PE (49.9 t/ha) recorded maximum yield followed by drip irrigation once in two days at 80% PE (49.5 t/ha) which were on par with each other and significantly superior to surface irrigation at 5 cm, 0.9 IW/CPE (45.0 t/ha).

MEDICINAL & AROMATIC PLANTS

Medicinal & Aeromatic Plants Research Station, Rajendrangar

Planting of *Phyllanthus amarus* at 15 x 10 cm spacing produced significantly higher dry herbage yield (13.49 q/ha). Among the different organic manures applied to *Phyllanthus amarus,* application of RDF resulted in higher herbage yield (13.82 q/ha).

Among the two spacings adopted, planting of amla at 45 x 45 cm produced higher herbage yield (37.66 t/ha). Application of 50% RDF + Neemcake 1.0 t/ha produced higher herbage yield (40.615 t/ha).

Among the two varieties of aloe studied, yellow flowering type produced higher leaf yield (118.01 t/ha). Planting of aloe at 45 x 45 cm produced higher leaf yield (135.65 t/ha) and was at par with planting of aloe at 75 x 30 cm (111.13 t/ha).

Among the different growth regulators applied to coleus, spraying of Cycocel @ 500 ppm produced 62.332 q/ha of fresh root yield and significantly superior over control. No significant influence of time of application of growth regulator was observed.

Planting of *Plumbago zeylanica* at 60 x45 cm produced higher dry root yield (3.15 t/ha). Among the organic manures, application of RDF (50-50-50 kg NPK/ha) produced higher yield (3.423 t/ha) and application of Neem cake @ 1.0 t/ha was at par (3.048).

Among different Isabgol varieties studied, Gujarath Isabgol -1 recorded higher seed yield (560.82 kg/ha) and was at par with Mayuri, Gujarath Isabgol -2, Mandsor -5. Jabalpur local recorded the lowest yield (444.09 kg/ha).

Planting of *Psoralea corylifolia* at 45 x 30 cm spacing produced significantly higher seed yield (6037.41 kg/ha) over other spacings adopted and direct sowing.

Planting of *Artemisia annua* on 15th October produced higher fresh leaf yield (21.41 t/ha). Planting at November 1st, October 1st and November 15th were at par.

Chakshu (*Cassia absus*) seeds treated with Sulphuric acid dip + soaking in ethrel 100 ppm for 24 hours resulted in higher germination (25.33%), average no. of pods/plant (15.8) and no. of seeds/pod (6.4). Seed yield/plant was 0.678 g.

PLANTATION CROPS

COCONUT

Horticultural Research Station, Ambajipeta

Development of coconut based integrated farming system model for different agro-climatic regions

Crop combinations: Coconut + Cocoa + Banana + Pineapple + Tomato + Heliconia (Elephant foot yam was replaced by tomato during 2012).
During XXI Annual group meeting of AICRP on Palms held at TNAU, Madurai workshop it was decided to divide the whole plot into 3 treatments.

Treatments: T1 - 2/3rd of Rec. fert. NPK + recycling biomass (vermi compost).
T2 -1/3rd of Rec. fert. NPK+ recycling biomass (vermi compost) + bio fertiliser application + green manuring + vermiwash application.

T3 – Fully organic with recycling biomass (vermi compost) + bio fertiliser application + green manuring + vermi wash application + husk burial + mulching with coconut leaves.

Number of replications: 7

Plot size/Treatment: Coconut: 4 palms, Cocoa: 6 trees, Banana: 16 plants
Pineapple: 4 beds, Heliconia: 1 bed Tomato: 1 bed

Table-22: NPK, Vermi compost, bio fertiliser for different crops

Crop	1/3rd of Rec. (T2)	2/3rd of Rec. NPK (T1)	Vermi compost	Bio fertiliser
Coconut (g/plant)	N: 167 P: 417 K: 333	N: 333 P: 833 K: 666	25kg/tree	Azospirillum:100gm/plant Phosphobacteria: 100g/plant
Banana (g/plant)	N:67 P:17 K:67	N:133 P:33 K:133	8 kg/tree	Azospirillum: 50gm/plant Phosphobacteria: 50g/plant
Cocoa (g/plant)	N:33 P:13 K:33	N:67 P:27 K:67	3 kg/plant	Azospirillum: 50gm/plant Phosphobacteria: 50g/plant
Pineapple (g/plant)	N: 5 P:0.66 K:1.33	N:11 P:1.5 K:2.7	5 t/ha	Azospirillum:2.5 kg/ha Phosphobacteria:2.5 kg/ha
Heliconia (kg/ha)	N:7 P:7 K:7	N:14 P:14 K:14	2.5 t/ha	Azospirillum: 2.5 kg/ha Phosphobacteria: 2.5kg/ha
Tomato (kg/ha)	N:16 P:8 K:8	N:32 P:16 K:16	2.5 t/ha	Azospirillum:2.5 kg/ha Phosphobacteria:2.5 kg/ha

(Vermicompost, biofertiliser and vermiwash applied twice a year)

The trial was initiated during November 2008 in 20 years old Godavari Ganga plot as an observational trial. The intercrops viz,. cocoa, banana, pineapple, elephant foot yam and heliconia were planted during November 2008 and the experimental plot is being maintained. From 2012 the plot was divided into treatments. During 2013 - 14 the data on coconut and intercrops viz,. Cocoa, banana, pineapple, and tomato were recorded. According to treatments inputs were applied and the new experiment is in initial phase. In coconut nut yield of 139.6 per palm was recorded while cocoa recorded an yield of 1.94 kg/tree, banana 23.3 kg/plant, pineapple 1060 g/plant and tomato recorded 490 grams fruits per plant. Soil moisture increased as depth of soil increases. The soil organic carbon, nitrogen, phosphorus and potassium contents increased in June 2013 compared to initial years. a

Observational trial on the performance of *Morinda Citrifolia* as mixed crop in coconut gardens

The observational trail on the performance of *Morinda citrifolia* (Noni) was initiated during August, 2008 with 25 no's seedlings and 25 tissue culture plants in the inter spaces of coconut. The growth parameters *viz*, plant height, number branches were recorded and the highest plant height (6.4 m) and mean number of branches per plant (69.6) were recorded in seedlings. Data on dry leaf biomass of noni plants revealed that, Seedlings recorded maximum biomass (9.6 kg/tree) compared to tissue culture plants (8.1 kg/tree).

The data on yield attributes of coconut revealed that the highest number of leaves on crown, mean number of spadices /palm and mean number of female flowers/ spadix were recorded in Noni seedlings plot when compared to Noni tissue culture plants (Table-23a).

Table-23a: Growth parameters of *Morinda citrifolia* under coconut

Planting material	Plant height (m)	Stem girth (cm)	No. of branches per plant	Fruits per plant	Total fruit weight per plant (kg)	Leaf Bio mass (Dry) (kg/tree)	TSS	Coconut yield per palm per year	
								Before planting	2013-14
Tissue cultured plants	5.3	53.4	54.2	195.0	4.30	8.1	11.8	104	123
Seedlings	6.4	39.2	69.6	209.0	5.27	9.6	10.8	98	134

Table-23b: Yield Attributes of Coconut

Yield Attributes of Palm	Noni seedlings Plot	Noni Tissue culture Plot
No. of leaves on crown	33.40	32.80
Mean no. of spadices	11.80	11.20
Mean no. of female flowers/spadix	22.00	18.15

Impact of organic manuring on yield attributes, pests and diseases of coconut:

Application of recommended dose of fertilizers and vermicompost @ 25 kg/palm/year were on par with each other in yield attributing characters like leaves per crown (32.8), number of spadices per palm (13.00) and number of female flowers per inflorescence (142.0). Application of RDF recorded significantly highest yield (84.37 nuts/palm/year) followed by application of vermicompost @ 25 kg/palm/year (81.69 nuts/palm). However, copra content and oil content showed non-significant differences among the treatments.

Study on quality aspects of copra in coconut and reasons for formation of wrinkles

Both copra and oil content were at par with respect to different drying methods, but significantly differed for age of nut and interaction between the drying method and age of nut in ECT cultivar. Twelth month harvested nuts recorded maximum copra caontent (138.3 g/nut) compared to 10th (102.6g/nut) month nuts. Godavari Ganga hybrid also recorded non significant values for different drying methods, but significantly differed with the age of nuts. Twelth month harvested nuts recorded maximum copra content (147.49 g/nut) compared to 10th (90.25 g/nut) and 11th month (129.95 g/nut) harvested nuts. Maximum oil content was recorded in 12th month harvested nuts, however there is no significant difference between different drying methods.

About 35% and 30% wrinkle free copra and 60% and 70% medium wrinkles in copra obtained from 12th month harvested nuts of ECT cultivar in sun and solar dryings respectively. In Godavari Ganga also recorded 40% wrinkle free copra and 60% medium wrinkled copra in 12th month harvested nuts in sun and solar dryings. In conclusion, in both the varieties (ECT and Godavari Ganga), copra obtained from 12th month harvested nuts are relatively free from wrinkles and recorded maximum copra and oil contents compared to 11th and 10th month harvested nuts. Among different drying methods solar drying was adjudged as the best followed by sun drying when compared to smoke drying in winter season.

OIL PALM

Horticultural Research Station, Vijayarai

Effect of NPK fertilizers on growth and yield of *Heliconia* sp. as an intercrop in coconut and oilpalm

Table - 24 Details of treatments

Sl.No.	Treatments	Fertilizer dose	Details
N_1:10 g/plant	P1:10 g/plant	K_1:10 g/plant	
N_2:20 g/plant	P_2:20 g/plant	K_2:20 g/plant	
1.	T_1	10:10:10 NPK/plant	$N_1 P_1 K_1$
2.	T_2	10:20:10 NPK/plant	$N_1 P_2 K_1$
3.	T_3	10:10:20 NPK/plant	$N_1 P_1 K_2$
4.	T_4	10:20:20 NPK/plant	$N_1 P_2 K_2$
5.	T_5	20:10:10 NPK/plant	$N_2 P_1 K_1$
6.	T_6	20:20:10 NPK/plant	$N_2 P_2 K_1$
7.	T_7	20:10:20 NPK/plant	$N_2 P_1 K_2$
8.	T_8	20:20:20 NPK/plant	$N_2 P_2 K_2$
9.	T_9	CONTROL (only organic source)	$N_0 P_0 K_0$

Plant height: Various treatments tried shown significant influence on plant height. Plants which received the treatment T_6 recorded significantly higher plant height (175.73 cm, 89.91 cm) under coconut and oilpalm respectively. Lowest plant height of 136.45 cm, 71.19 cm was recorded in T_9 under coconut and in T_2 under oilpalm respectively (Table-24).

No. of leaves: Significantly higher number of leaves (182.51 and 62.40) was recorded in T_6 in plants grown under coconut and Oil Palm, respectively. Minimum leaf count was noted in T_9 (60.10 and 21.53) under two types of plantations.

Girth of shoot: Significantly highest shoot girth of 7.85 cm and 5.77 cm was registered in T_6 and it was minimum in T_9 (4.69 cm) under coconut and T_8 (4.81 cm) under Oil Palm.

Leaf length: The data revealed that, plants which received the treatment T_6 developed significantly longer leaves (64.84 cm) and it was shortest in control (29.18 cm) in plants grown under coconut. Under Oil Palm plantations, T_6 produced longer leaves (43.83 cm) and minimum leaf length of 25.53 cm was observed in control treatment.

Leaf breadth: Under coconut, heliconia plants applied with T_6 recorded significantly more leaf breadth (20.93 cm) and it was minimum in control (13.23 cm). Significantly higher leaf breadth of 14.50 cm was recorded in T_6 and lowest in control (8.37 cm).

Number of shoots per clump: Data indicated that, the treatment T_6 produced significantly more number of shoots (47.00) and minimum number was recorded in control (22.45) under coconut. Significantly higher number of shoots (13.64) was recorded in T_6 under Oil Palm plantation.

Yield parameters

It was found that, there was significant influence of treatments on spike length in plants grown under coconut. However, none of the treatments showed significant influence on spike length under oilpalm. Significantly longer spikes (156.97 cm) were obtained in the treatment T_8. Bract count was significantly higher in plants which received the treatment T_8 (91.54, 14.23). Number of spikes produced per clump was significantly higher (22.67) in T_8 under coconut and T_8 recorded maximum number of spikes (3.00) under Oil Palm plantations. Plants which received the treatment T_6 took minimum period of 141.80 days under coconut and 177.00 days under Oil Palm for time required to reach reproductive phase. Significantly higher vase life of 11.04 days was recorded in T_8 under coconut.

Table-25: Effect of NPK fertilizers on vegetative parameters of heliconia as an inter crop in coconut and oilpalm plantations

Treatments	Plant height (cm)		Number of leaves		Shoot girth (cm)		Leaf length (cm)		Leaf breadth (cm)		No. of shoots per clump	
	Coconut	Oil-palm	Coconut	Oil-palm	Coconut	Oil-palm	Coconut	Oil-palm	Coconut	Oil-palm	Coconut	Oil-palm
T_1	145.03	77.44	129.67	29.53	7.13	5.65	60.50	37.49	15.06	10.97	41.20	8.06
T_2	175.23	71.19	110.40	40.93	7.43	5.53	57.20	36.15	13.68	10.03	38.27	7.53
T_3	165.16	71.91	124.40	30.40	7.38	5.09	64.57	35.60	14.69	10.23	37.60	7.02
T_4	170.15	75.14	126.88	48.13	6.83	5.38	53.20	35.67	14.59	11.35	43.60	8.97
T_5	170.31	85.43	120.02	28.27	6.75	5.71	58.22	40.74	14.61	11.78	25.53	8.77
T_6	175.73	89.91	182.51	62.40	7.85	5.77	64.84	43.83	20.93	14.50	47.00	13.64
T_7	152.22	81.26	93.38	28.27	6.48	5.20	56.57	40.74	16.38	11.36	28.87	7.89
T_8	159.62	71.89	101.84	35.40	6.75	4.81	55.47	36.53	13.75	11.28	33.93	8.98
Con trol (T_9)	136.45	72.81	60.10	21.53	4.69	5.19	29.18	25.53	13.23	8.37	22.45	6.04
CD (*P= 0.05*)	17.46	1.10	2.47	16.18	1.65	NS	15.34	4.41	1.63	1.66	14.37	0.46
S. EM ±	5.78	0.36	0.81	5.35	0.54	0.44	5.07	1.46	0.54	0.55	4.75	0.15
CV (%)	6.21	0.82	1.21	25.68	13.84	14.21	15.82	6.84	6.14	8.58	23.26	3.09

Table - 26 Effect of NPK on flower and yield of heliconia as an inter crop in coconut and oilpalm plantations

Treatments	Spike length (cm)		Number of bracts		No. of spikes	
	In coconut	In Oil Palm	In coconut	In Oil Palm	In coconut	In Oil Palm
T_1	156.38	10.24	57.77	6.87	16.27	1.07
T_2	142.71	21.93	55.83	8.66	17.00	0.40
T_3	152.80	23.33	75.49	9.22	19.20	0.97
T_4	152.73	29.89	80.54	12.37	18.47	2.33
T_5	151.07	29.79	64.15	9.45	11.30	1.00
T_6	139.21	25.08	76.46	7.56	22.40	1.47
T_7	137.93	29.50	71.09	11.22	18.13	0.60
T_8	156.97	61.87	91.54	14.23	22.67	3.00
Control (T_9)	122.23	3.96	51.85	9.37	14.04	0.33
CD (*P=0.05*)	11.96	N.S	4.63	4.33	2.69	0.82
S. EM ±	3.96	16.56	1.53	1.71	0.89	0.27
CV (%)	4.70	109.55	3.82	146.09	8.69	37.64

Table - 27 Influence of NPK on time required to reach reproductive stage and vase life of *Heliconia* sp. under coconut and oilpalm plantations.

Treatments	Time required to reach reproductive stage		Vase life (days)	
	In coconut	In Oil Palm	In coconut	In Oil Palm
T_1	195.22	203.00	6.88	4.33
T_2	166.00	181.00	7.96	6.64
T_3	194.07	207.00	6.32	5.34
T_4	195.20	235.00	8.93	6.00
T_5	205.85	241.00	7.40	5.88
T_6	141.80	177.00	6.80	6.21
T_7	168.08	188.00	5.93	5.22
T_8	168.74	201.33	11.04	7.33
Control (T_9)	225.33	275.33	5.17	4.56
CD (*P=0.05*)	6.26	10.36	0.67	-
S. EM ±	2.07	3.43	0.22	-
CV (%)	1.94	2.80	5.17	-

Effect of NPK fertilizers on growth and yield of red ginger in coconut and Oil Palm

Plant height: The information made available in the Table 4 revealed that, plant height was significantly influenced by various treatments under coconut and Oil Palm. The treatment T_4 recorded significantly highest plant height (39.46 cm, 44.14 cm) and lowest plant height of 26.54 cm and 31.89 cm, respectively was recorded in control treatment in plants grown under coconut and Oil Palm.

Number of leaves: Treatment influence was significant under coconut and Oil Palm. The treatment T_4 produced higher number of leaves per plant (48.35, 9.33). Minimum number of leaves was observed in control (18.87, 7.53).

Shoot girth: The treatment T_4 was significantly superior in recording highest shoot girth (8.73 cm) and it was minimum (1.54 cm) in control under coconut. Shoot girth did not vary significantly among various treatments in plants grown under Oil Palm.

Leaf length: The treatment T_7 (15.25 cm) under coconut and (14.41 cm) under Oil Palm recorded significantly highest length of leaf.

Leaf breadth: The treatment T_7 recorded significantly highest leaf breadth (5.97 cm) under coconut. None of the treatments show significant influence on leaf breadth under Oil Palm.

Yield parameters: Significantly longer spike (20.29 cm) in T_8, higher spike count (9.86) in T_6 and number of bracts (6.95) in T_4 was recorded in plants grown under coconut. Whereas, lowest number of spikes (2.77) and number of bracts (2.77) was recorded in control in plants grown under coconut.

Table 28 Influence of NPK fertilizers on yield parameters of red ginger under coconut

Treatments	Spike length (cm)	Number of spikes	Number of bracts
T_1	7.04	5.13	4.55
T_2	5.41	3.27	4.56
T_3	6.34	7.25	6.37
T_4	19.87	3.77	6.95
T_5	13.99	4.99	6.13
T_6	6.05	9.86	3.95
T_7	12.92	5.29	5.91
T_8	20.29	7.18	4.69
Control	6.91	2.77	2.77
CD (*P=0.05*)	1.32	0.63	0.56
S. EM ±	0.44	0.21	0.18
CV (%)	6.87	6.59	6.33

CASHEW

Cashew Research Station, Bapatla

High density planting with different levels of fertilizer doses in Cashew

Treatments:

Density 3 levels
1. 200 plants/ha (5m x 4m)
2. 400 plants/ha (6m x 4m)
3. 500 plants/ha (10m x 5m)

Fertilizer application - 3 levels
1. 75kg N - 25kg P2O5 - 25kg K2O/ha.
2. 150kg N - 50kg P2O5 - 50kg K20/ha.
3. 225kg N - 75kg P2O5 - 75kg K20/ha.

The pooled analysis data over past 10 years of the NPK fertilizer experiment had shown that the treatment N2P1K1 ie., a fertilizer dose of 1000N: $125P_2O_5$:125 K_2O had recorded significantly highest cumulative nut yield of 93.0kg/tree.

From the results obtained from planting densities cum fertilizer trial, it was evident that trees planted at closer densities i.e. 5m x 4m apart have given higher plant height and canopy height. However trees planted at 10m x 5m apart have given higher canopy surface area and trunk girth over trees planted at closer densities. Annual nut yield per tree was highest (11.43 kg/tree) in 10 x 5m applied with fertilizer levels @ 75:25:25 kg/ha (S_1M_1) which is followed by treatment S_1M_2 (10.40 kg/tree).

During the year 2012-13, maximum values for growth parameters were recorded in 4x4 m spacing i.e plant height and canopy height where as trunk girth, mean canopy diameter and canopy surface area were highest with trees planted at 8x8 m spacing.

During the year 2012-13, cluster bean, marigold, amaranth and gogu were grown as inter crops. Marigold with an yield of 5425 kg/ha had given higher cost benefit ratio (3.81).

C. POST HARVEST TECHNOLOGY

FRUITS

Post Harvest Technology Research Station, Venkataramannagudem

Study on the efficiency of fruit grading equipment for mango (*Mangifera indica* L.)

Table-30: Efficiency of fruit grading machine of Integrated Pack House for Mango (Variety: Panchadarakalasa)

Item	>500g		>300g		>250g		>200g		>Last grade		Total (kg)	
	Number	Weight (kg)	Number	Weight (kg)	Number	Weight (kg)	Number	Weight (kg)	Number	Weight (kg)	Number	Weight (kg)
1.Fruits graded properly	-	-	19	5.980	22	5.830	120	29.850	27	4.560	188	46.220
2.Fruits not graded properly	20	5.68	58	13.990	61	12.330	28	4.790	-	-	167	36.790
3.Fruits damaged	1	0.55	2	0.650	4	1.250	2	0.450	1	0.150	10	3.050
Total (kg)	21	6.23	79	20.620	87	19.410	150	35.090	28	4.710	365	86.060

Sl.No	Item	Weight (kg)	Percentage
	Total weight of the fruits	**100**	**-**
1.	Total weight of Fruits graded properly	46.220	46.20
2.	Total weight of Fruits not graded properly	36.790	36.80
3.	Total weight of Fruits damaged	3.050	3.00
4.	Total weight loss	13.040	13.00
		Number	
	Total number of fruits	**365**	
1.	Total Fruits graded properly	188	51.50
2.	Total Fruits not graded properly	167	45.75
3.	Total Fruits damaged	10	2.73

Table-31a: Efficiency of fruit grading machine of Integrated Pack House for Mango (Variety: Cherukurasam)

Item	>500g		>300g		>250g		>200g		>Last grade		Total (kg)	
	Number	Weight (kg)	Number	Weight (kg)	Number	Weight (kg)	Number	Weight (kg)	Number	Weight (kg)	Number	Weight (kg)
1.Fruits graded properly	-	-	55	17.410	40	10.810	120	29.850	8	1.840	223	59.910
2.Fruits not graded properly	27	6.450	124	30.730	53	11.180	28	4.790	-	-	232	53.150
3.Fruits damaged	2	1.200	12	3.800	3	0.850	2	0.500	-	-	19	6.350
Total (kg)	29	7.650	191	51.940	96	22.840	150	35.140	8	1.840	474	119.410

Table-31b: Efficiency of fruit grading machine of Integrated Pack House for Mango (Variety: Cherukurasam)

Sl.No	Item	Weight (kg)	Percentage
	Total weight of the fruits		**150 -**
1.	Total weight of Fruits graded properly	59.910	39.94
2.	Total weight of Fruits not graded properly	53.150	35.43
3.	Total weight of Fruits damaged	6.350	4.23
4.	Total weight loss	30.590	20.39
		Number	
	Total number of fruits	**474**	-
1.	Total Fruits graded properly	223	47.04
2.	Total Fruits not graded properly	232	48.95
3.	Total Fruits damaged	19	4.01

Fruits treated with growth regulators and stored in LDPE bags

Fruits treated with growth regulators and stored in gunny cloth bags

Fruits treated with BA 50 ppm stored in LDPE bags

Table-32: Efficiency of fruit grading machine of Integrated Pack House in terms of time, electricity consumed and cost of labour for Mango.

Sl.No	Item	Time taken for grading operation	Electricity consumed during grading	Unit cost (@ Rs.7/- per unit)	Cost of Labour (Aprox) Rs.-Ps.	Total Rs.-Ps.
1.	Variety-1 (100 kg)	20 Min	2 Units	14=00	1 person	-
2.	Variety-2 (150 kg)	30 Min	3Units	21=00	-	-
	Total (250 kg)	50 Min	5 Units	35=00	220=00	255=00
	Total (1000 kg)	200 Min	25 Units	175=00	220=00	395=00

1) Efficiency for other fruits was 1 ton / hour
2) Efficiency for Mango fruits was 0.33 ton / hour
3) Efficiency percentage of grading machine for mango is 33%

Effect of post harvest treatments with plant growth regulators with different packing material on shelf life of lime *(Citrus aurantiafolia Swingle).*

Among different treatments, the lowest physiological loss of weight was recorded in the limes treated with BA @ 50 ppm (19.50%) followed by GA_3 @ 100 ppm (23.50%) which were packed in LDPE bags, where as the maximum juice content was recorded in limes treated with BA @ 50 ppm (70.60%) followed by Cytokinin @ 10 ppm (69.34 %) which were packed in gunny bags. The fruit colour score of Green was observed in limes treated with BA @ 50 ppm (1.95) and packed in LDPE bags

The maximum spoilage percentage was observed in limes treated with GA_3 @ 200 ppm (83.33%) and packed in gunny bags and also in limes treated with GA_3 @ 300 ppm and packed in polynet bags. The highest shelf life was recorded in limes treated with BA @ 50 ppm (24.50 days) followed by GA_3 @ 100 ppm (21.00 days) which were packed in LDPE bags where as the maximum Total Soluble Solids was recorded in limes treated with GA_3 @ 100 ppm (9^o Brix), followed by Cytokinin @ 20 ppm (8.90^o Brix) which were packed in LDPE bags

The percentage of acidity was more in limes treated with GA_3 @ 200 ppm (9.85% and 8.64%) which were packed in LDPE bags and Gunny bags respectively whereas the ascorbic acid content was highest (38.75 mg/100ml) in limes treated with GA_3 @ 100 ppm followed by Cytokinin @ 10 and 30 ppm which were packed in LDPE bags and the limes treated with BA @ 200 ppm (38.50 mg/100ml) in poly net bags. The disease occurrence was more in limes treated with Cytokinin @ 20 ppm (66.66%) followed by BA @200 ppm and GA_3@ 300 ppm which were packed in LDPE bags.

CASHEW

Cashew Research Station, Bapatla

During the year, the organoleptic evaluation of RTS for different varieties of cashew apple recorded higher scores with cashew variety BPP-8 with respect to colour, flavour, appearance, sweetness and overall acceptability. Regarding shelf life, BPP-1, 2, 5 & 9 have shown spoilage after 120 days and turned to red which indicates growth of fungi and bacteria.

BANANA

Fruit Research Station, Sangareddy

Studies on Modified Atmosphere packing of banana at ambient conditions

20 pore poly propylene bags were effective in maintaining quality and improving shelf life.

Studies on Modified Atmosphere packing of banana at cold storage conditions

20 pore poly propylene bags were effective in maintaining quality and improving shelf life.

SITAPHAL

Fruit Research Station, Sangareddy

Studies on post harvest quality and shelf life of Sitaphal varieties and Hybrids and Ramaphal at ambient conditions.

All the varieties attained respiration peak on third day based on CO_2 % levels measured in Check Mate equipment. Atemoya X Balanagar and Islandgem recorded maximum TSS.

AONLA

Horticultural Research Station, Anantapuram

Physiological and physico-chemical changes during storage of aonla fruits.

Data indicated significantly more PLW in ATPS–1 (20.16 g) followed by NA–6 (Amrit) (14.98 g) and NA-10 (Balwant) (14.81g). The PLW was minimum in Chakaiya (6.65 g), Kanchan (9.45 g) and NA-7 (Neelam) (9.99 g).
Highest per cent decay loss was recorded in NA-10 (Balwant) (42.70) followed by NA-6 (Amrit) (40.13) and least percent decay loss was recorded in Chakaiya (8.60). TSS and Acidity increased with the increase in storage life of fruits under room temperature.

POMEGRANATE

Horticultural Research Station, Anantapuram

Effect of different packaging methods and storage temperatures on shelf life of pomegranate arils

The results of the study on post-harvest shelf life of pomegranate arils revealed that the physiological loss in weight of arils was minimum when arils were packed in polythene standing

pouches (400 gauge) with 1% vent and stored at 7-8°C. TSS and acidity of arils decreased during storage whereas, pH of arils increased during storage upto 12 days.

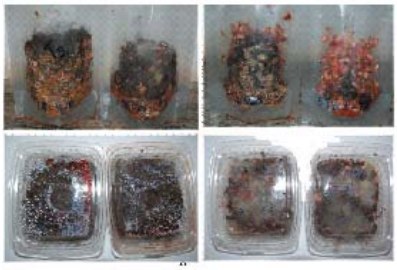
Pouches

Punnets

Treatments at Room temperatures

Treatments at 7-8°C

Treatments at 0°C



Spoilage of arils on 8th day at room temperature

CASHEW APPLE

Horticultural Research Station, Pandirimamidi

Studies in clarification of cashew apple juice

Experiment was conducted for clarification of cashew apple juice using micro filtration. The results revealed that the astringency and sedimentation were reduced drastically and gave positive results up to 60 days of storage. Further standardization process is in progress.

JAMUN

Horticultural Research Station, Pandirimamidi

Studies on standardization of jamun wine preparation

Among the dilutions, pulp with water @1:¾ with DAHP resulted highest percent of alcohol (9.8%) with an acidity of 0.49 and alcohol percentage was lowest in Jamun pulp without dilution (6.5%).

FLOWERS

GLADIOLUS

Floricultural Research Station, Rajendranagar

Post harvest package technology for distant marketing of gladiolus spikes

The gladiolus spikes harvested at Stage–1 took more days for basal floret to open (2.9 days) and showed more vase life (7.2 days). The spikes harvested at Stage-2 (4-5 florets showing colour) recorded more opened florets (67.9%) and more floret size (8.4 cm). Among wrapping material, maximum vase life (7.2 days) was recorded in pp100 and cellophane sleeves.

Standardization of modified atmosphere (MA package) storage of gladiolus cut spikes.

MA package of gladiolus spikes revealed that increase in storage duration, significantly decreased vase life, floret size, number and percent of florets opened and increased fresh weight loss. Among different packing materials maximum vase life (6.4 days) was recorded in cellophane packing. Minimum fresh weight loss (8.5%) was recorded in LDPE 200 gauge. Different packing materials have no effect on floret size, number and percent of floret opening.

CHRYSANTHEMUM

Floricultural Research Station, Rajendranagar

Standardization of package technology for chrysanthemum for local and nearby markets.

Packing of chrysanthemum stems in cellophane sleeves recorded maximum vase life in terms of 50 % flowers wilt (10.6 days) and 50 % leaves wilt (8.4 days). Correspondingly the minimum values were recorded in control (9.0 days 7.2 days respectively). The loss in fresh weight after simulated transit was minimum in LDPE100 sleeves (8.2 %). The water absorption by cut stems and size of the flower were not affected by any of the treatment.

Standardization of post harvest technology of chrysanthemum for distant marketing.

Maximum vase life in terms of 50% flowers wilt (12.1 days) was registered in pp 100 and cellophane sleeves while that of 50% leaves wilt was noticed in cellophane (9.5 days). Loss in fresh weight was minimum in LDPE 100 sleeves (9.3 %). Flower diameter and water absorption by stem were not influenced by any of the packing material.

Studies on the effect of thidiazuron on post harvest leaf yellowing in chrysanthemum flower stem

Thidiazuron spray delayed yellowing (50% of leaves) from 6.1 days in control to 7.3 days (30 ppm thidiazuron spray). Increase in storage duration decreased vase life both in terms of flowers and leaves wilted. Flower diameter, water absorption by stems or fresh weight were not influenced by the chemical.

Standardization of techniques of dry flower production for carnation, asters and chrysanthemum plants

Micro oven drying and shade drying registered better results in all the crops studied viz. carnation, chrysanthemum and aster. The decrease in flower size was minimum with micro oven drying or shade drying irrespective of the crops. The shape retention and brittleness of flowers were moderate as compared to poor in hot air oven or sun drying.

TUBEROSE

Floricultural Research Station, Rajendranagar

Standardization of post harvest technology for short distant market of tuberose

The tuberose stems (var.Hyd. double) packed in cellophane sleeves exhibited maximum vase life of 5.5 days against 4.5 days in control. The loss in fresh weight was minimum with LDPE 100 packing. The floret diameter and water absorption by tuberose cut stems were not influenced by any packing material studied.

Studies of MA storage of tuberose cut stems

MA Storage of tuberose by different packing materials indicated the increase in storage duration gradually decreased the vase life. The cut stems lost firmness when stored beyond 6 days in cold storage. Different packing materials did not influence the vase life. The floret diameter or water absorption by cut stem were also not influenced by any of the treatments.

Effect of packaging and storage on keeping quality of garland flowers of tuberose

Loose single flowers of tuberose exhibited a gradual decrease in shelf life with increase in storage duration. The florets could not be stored beyond 6 days in cold storage (4^0 C). Among different treatments, the florets stored in CFB boxes with 100 guage PE lining performed better. The floret size was not influenced by any of the treatments.

CARNATION

Floricultural Research Station, Rajendranagar

Standardization of pulsing treatments to increase the vase life of Carnation cut flowers (var. Corsa)

Pulsing treatment of cut carnation flowers (var.Corsa) indicated that the treatment with Sucrose 10% + 8HQC 300 ppm+ BA (15ppm) for 8h recorded maiximum vase life of 8.2 days against 6.2 days in control. No significant variation was noticed in absorption of water or pulsing solution.

MARIGOLD

Floricultural Research Station, Rajendranagar

Studies on post harvest packing of loose marigold flowers

Among different packing materials tested, maximum shelf life (6.2 days) was recorded in plastic crates. No significant variation was recorded regarding weight loss after simulated transit.

PLANTATION CROPS

PALMYRAH

Horticultural Research Station, Pandirimamidi

Standardization of the tapping techniques for extraction of inflorescence sap from palmyrah

Shape of cut surface influenced the yield of inflorescence sap. Four angles of 15^o, 30^o, 45^o and 60^o were followed to cut the spathe for inflorescence sap collection in both male and female palms. Total of 32 spathes taken for experiment consists of 16 from male and 16 from female palms. All spathes sliced for 20 days for sap collection in which 5 days for each angle at various stages as per experimental design.

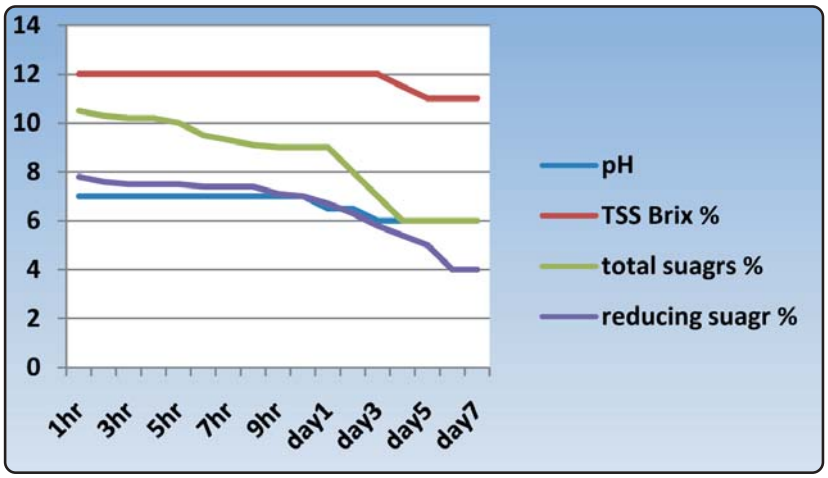
Yield of Neera from male palms at 30 degree angle of cut gave more yield (26.7 lit) followed by 45 degrees and control (23.1 lit). Incase of female palms 45 degree angle gave more yield (31.4 lit) followed by 60 degrees and control (27.5 lit).

Development of RTS Neera RTS beverages by collecting inflorescence sap using CPCRI method and traditional method and using lime was evaluated. In general, sap collected with CPCRI method was preferred over its lime coated and traditional beverages. However, for male palms it is not effective as compared to female palms. Colour retention was observed to be more in lime coated beverages than in CPCRI method beverages. Further studies are in progress.

CPCRI

Storage stability of RTS sap under different conditions

Storage study of different RTS sap was carried out under ambient and refrigerated conditions (8-10°C). The sap collected through CPCRI method was selected for this purpose. RTS was then filled in 200 ml glass bottles and pet bottles stored under the respective conditions. The changes in pH, TSS, total sugars and reducing sugars and sensory quality were determined during storage. The results revealed that odd flavour increased with the progression of storage period. pH, TSS, total sugars, reducing sugars decreased during storage but under refrigerated condition up to 10 hours no significant change was observed. RTS sap through CPCRI method had a storage life of 10 hours with out any preservative. The study suggested that the RTS beverages maintained under refrigerated condition, showed minimum deviation in quality from their initial value. These beverages remained in acceptable condition for one day. Further physico-chemical properties and microbial quality studies are in progress.



CFig-1:Quality of neera from female palms up to 7 days under ambient conadiations

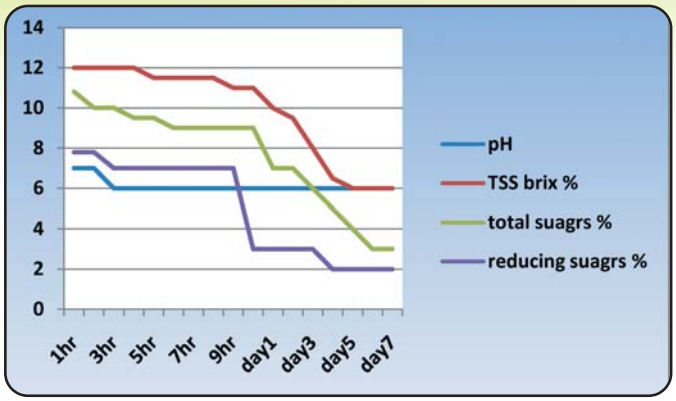


Fig-2:Quality of neera from female palms up to 7 days under refrigerated conditions

Standardization of Tuber flour based food products (like pizza, bakery items, confectionery, health mix etc.)

Standardization of maturity stage of palmyrah tuber (apicolon)

Palmyrah tubers were collected at different stages i.e 120, 135 and 150 days from the planting and analysed for proximate composition and physical properties. The protein and fat content was more at the age of 120 days as compared to others. Fibre content was more in 150 days tubers (Table-33).

Table-33: Proximate composition of palmyrah tubers at different stage of harvesting..

Age of tubers Days	Mc (%w.b)	Protein (%)	Fat (%)	Ash (%)	Fibre (%)
120	10.3	2.1	0.50	2.17	10.2
135	7.8	2.9	0.45	1.92	11.0
150	8.0	1.8	0.36	2.53	11.6

Physical properties of palmyrah tubers were studied at 120, 135 and 150 days from planting and it was found that 120 days tubers were having more weight and length as compared to both whole tuber and peeled tubers.

Table-34: Physical properties of palmyrah tubers at different stage of harvesting.

	Whole tuber			Peeled tuber		
Age of tuber(days)	120	135	150	120	135	150
Weight, g (10tuber)	2216	2016	1912	2024	1800	1710
Length(cm)	48.3	45.5	43.6	30.5	30.6	28.8
Dia(cm)	9.5	9	9.1	8.2	8	7.6

From the data it is found that the tuber of 120 days to 135 days is suitable for flour production.

Development of tuber based products (osmotic dehydration)

Osmotic dehydration of tuber pieces was carried out in the sugar syrup having different concentrations (40, 50 and 60% w/w), tuber thickness (mm) and sample to sugar syrup ratio (1: 2, 1: 4 and 1: 6). They were evaluated for weight loss and solid gain of tuber pieces due to the effect of sugar syrup concentration, size of the tuber piece and sample to sugar syrup solution.

Weight loss and solid gain were observed with increase in sugar syrup concentration and sample to sugar syrup ratio and it increased with decrease in tuber thickness. The experimental design of osmotic dehydration of tuber pieces was prepared and the combinations of different parameters were studied. Two factor ANOVA of weight loss and solid gain of all experiments indicated that osmosis time of tuber sample and sugar syrup solution concentration, sample to sugar ratio and tuber piece thickness were highly significant where as combination of osmosis time and sugar syrup concentration, sample to sugar ratio and tuber thickness were non significant. The experiment on tuber piece osmosis indicated that, the osmotic time of 5 to 6 hours was required to attain maximum weight loss and solid gain by tuber pieces. Further optimisation and rehydration studies are in progress.

Storage studies of tuber flour

Storage study was carried out with two packaging materials viz., low density polyethylene (LDPE) and high density polyethylene (HDPE) to study the storage behavior of developed composite flour under accelerated study condition i.e. 90% RH and 40 °C temperature. Fifty grams each of the composite flour samples were filled in separate packets and the mouth of the packet closed by heat sealing, taking care that minimum possible air space remained in the packets. One packet each of different packaging materials was taken out from the desiccators at an interval of 10 days upto 90 days was analyzed for moisture content and infestation. The increase in moisture content with time was recorded highest in case of those packed in LDPE as compared HDPE. Infestation was observed after 30 days in LDPE and after 50 days of storage in HDPE.

Preparation of tuber flour based products and sensory evaluation

Bread and cookies were prepared with developed composite flours, and found that bitterness increased with increase of tuber flour. The proximate composition of composite flour and cookies and bread prepared from the composite flours was studied. Variations were observed in proximate composition of composite flour and their respective breads and cookies.

Standardization of preservation technique for palmyrah tender fruit endosperm

The analysis of nutrient content of palmyrah tender fruit endosperm at 70 days from fruit formation was done. The nutrient value of nungu was moisture content 93% (w.b), protein 0.6%, fat 0.1%. Experiments were conducted for tender fruit endosperm (nungu) kept in sugar syrup of brix of 40^{o}, 50^{o} and 60^{o} and stored in deep freezer. The results revealed that 50^{o} brix treated nungu quality was good up to one year.

The dehydrated samples treated with sugar syrup concentration of 50^{o} and 60^{o} Brix was found acceptable in sensory qualities except slight colour change on storage.

D. ENTOMOLOGY

FRUITS

MANGO

Mango Research Station, Nuzvid

Survey of major pests of mango in Krishna district

Survey was conducted in mango gardens of various mandals of Krishna district for the incidence of different pests during the year. Severe incidence of hoppers and thrips was observed through out the flowering and fruit development stages. Apart from flower feeding caterpillars mango fruit borer incidence was recorded at low to medium level.

Fruit Research Station, Sangareddy

Screening of germplasm against pests of mango

A total number of 90 accessions including clones, seedling selections and hybrids were screened for the incidence of hoppers, thrips, scales, mealy bugs and fruit. borer. Among different Plant parts highest hopper population (8.33 panicle^{-1}) was observed in Dashehari -35 followed by Dashehari Local. Screening for other sucking pests such as thrips revealed incidence of highest thrip population in Dashehari Local (10.66 panicle^{-1}). Among the germplasm screened, four entries were resistant (1-20%) and thirty six (36) entries were moderately resistant to scale insects, and eight (8) entries were resistant and nineteen (19) entries were moderately resistant to mealybug.

Population dynamics of major pests of mango (hopper and fruit fly)

The studies of population dynamics of fruit flies during 2013 revealed that peak activity was noticed in 20th standard week i.e. last week of March in mango cv. Banganpalli (41.2 fruit flies/trap). The incidence was continued up to 3rd week of June. The fruit fly populations were positively correlated with minimum and maximum temperatures and negatively correlated with RH. The population dynamics of hoppers during 2013-14 indicated that peak activity was noticed in 6th standard week i.e. second week of February in cv. Banganpalli (13.64 hoppers/panicle). The population of hoppers on panicle *(Ideoscopus clypealis)* was less and declined after fourth week of March. The correlation co-efficients calculated with minimum and maximum temperature, RH and rainfall revealed negative correlation with the hopper populations.

Cost effective management strategies for fruit flies in mango/guava

Studies on evaluation of different fruit fly traps in trapping the fruit flies in mango and guava revealed that the treatment-2 (Hanging of wide mouth glass bottle trap containing 0.1% methyl eugenol and 0.1% DDVP @ 10 traps /ha. (solution should be changed at weekly interval) is superior and trapped highest fruit fly populations (43.8 and 62 fruit flies/trap, respectively) followed by treatment -3 (Hanging of Rakshak (Dapoli) trap with methyl eugenol lure @ 5 traps / ha (replace the lure at two months interval) with 35.4 and 47.6 fruit flies/trap respectively. The species observed in the traps were *B. dorsata* and *Batocera zonata*.

Integrated Pest management in mango

Under integrated pest management of mango; Module III (First spray of thiamethoxam (0.008 %) @0.3g/lit at panicle emergence stage followed by or profenophos (0.05%) @1.5ml/lit of water second spray (21 days after first spray) was found to be superior in controlling the hoppers.

Survey and surveillance of pollinators

The major pollinating insects recorded were paddy butterfly, blue butterfly (*Danius flexipus*,), Honey bees (*Apis indica*), House fly, (*Coccinella septumpunctata)* and other Hymenopterans. Maximum numbers of pollinators were recorded in the middle of the tree (2-4 meter of height) during second week of February where maximum flowering was noticed.

JACK FRUIT

Horticultural Research Station, Kovvur

Survey and incidence of insect pests of Jack Fruit

Fruit borer was the major pest observed on jack fruit in all the surveyed areas and infestation was 0-32 per cent. Severe infestation of papaya mealy bug was also observed on jackfruit in Gopalapuram village. Leaf webber infestation ranged between 0 to 7 per cent.

GRAPE

Grape Research Station, Rajendranagar

Survey for major pests of grape and their natural enemies

Fixed plot survey conducted at Grape Research Station, Rajendranagar indicated that thrips incidence *(Scirtothrips dorsalis, Rhipophorothrips cruentatus)* was very severe during first fortnight of January. Peak incidence of mealy bug was noticed in first fortnight of March. Flea beetle damage was negligible during the year. Stem borer infestation was also severe in February to April months. Stray appearance of *Spodoptera* and *Helicoverpa* in grape was noticed in the roving survey.

Survey was conducted in 25 vineyards in Rangareddy and Medak districts. The results indicated that out of 25 vine yards surveyed mealy bug *(Maconellicoccus hirsutus)* incidence was high in 1 (4%) vineyard whereas moderate infestation was observed in 5(20%) vineyards. Thrips *(Scirtothrips dorsalis, Rhipophorothrips cruentatus)* incidence was severe during the year and severe incidence was noticed in 20 vine yards (80%).The level of flea beetle infestation was low in 24 (96%) vineyards. Stem borer (*Coelosterna scrabrator*) infestation was severe in 5 (20%) vineyards. Mite *(Tetranychus sp*) infestation was low in 12 vineyards (48%).Natural enemies such as spiders, coccinellid beetles, lace wing bugs and predatory bugs were noticed.

Management of thrips in grape

Thrips *(Scrirtothrips dorsalis)* population was high in 10th to 12th leaf compared to other leaves. Among the tested treatments Spinosad 45% SC @ 0.3 ml/lt of water recorded maximum percent reduction of thrips population followed by Fipronil 5% SC @ 1ml /lt of water at 15 days interval.

Management of mealy bugs in grape

Among all the tested treatments on grape bunches in variety Thompson seedless, Spirotetramat @ 0.5 ml/lit of water was very effective against grape mealy bug compared to other treatments followed by Buprofezin@1.25ml/lit of water.

Biointensive: Among all the biopesticides tested, *Verticilium lecani* @ 5 gm/lt of water was found to be effective with 1.18 mealy bug colonies followed by *Cryptoleamus montrouzieri* (1.63 mealy bug colonies) after the second spray.

Management of mites in grape

Mite infestation (red spider mite *Tetranychus sp*) was severe during the second fortnight of Febraury to last week of March. Among all the treatments, Abamectin @ 0.3ml/lit of water was statistically superior in controlling the mites (92.83 percent reduction over control) in comparison with all the other treatments followed by Spirotetramat @ 0.5ml/, (86.53) after two sprays.

Management of stem borer in grape

Among all the tested treatments, stem injection with Dichlorvos 76 EC (80ml/livehole) and Aluminium phosphide tablets @ 1g/live hole gave 100 percent reduction in live tunnels and was significantly superior over the other treatments .Superiority of both these treatments may be due to good fumigant action. Injection of Chloroform, carbon disulphide and methyl bromide recorded 76.39, 63.5 and 58.31 percent reduction in live tunnels respectively.

Evaluation of bioefficacy of Imidacloprid soil drenching

Thrips During the period, thrips (*Scirtothrips dorsalis*) was very severe compared to the previous year.Among all the treatments soil drenching of Imidacloprid 70 WG @ 0.45 g/lit per vine at 20 and 40 days after pruning was effective in management of thrips.

Jassids Jassid population was negligible during the period. However stray appearance of jassids was noticed in the border plants.

Mealy bugs Mealy bug incidence was noticed in the last week of January. Imidacloprid 70 WG @ 0.45 g/lit per vine soil drenching at 20 and 40 days after pruning recorded least mealy bug population (2.05) followed by Imidacloprid 200SL soil drenching at 20 and 40 days after pruning (2.25).

Screening of germplasm for the incidence of pests in grape

The vines grown on own root were less susceptible to pest compared to those vines grown on rootstock**.** The pest incidence was more on table varieties compared to juicy varieties. The grape variety Muscat of Hamberg was less susceptible to thrips whereas Thompson seedless, Red globe, Kutta Kurgoan, Rizamat,A17-3, Anab-e-shahi, Gulabi X Banglore purple were highly susceptible. The accessions H-23,E12/2, Kishmish Rozoviz, Kishmish Beli were less susceptible to mealy bugs and Thompson seedless, Queen of vineyard, Anab eshahi were highly susceptible.

VEGETABLES

CABBAGE

Vegetable Research Station, Rajendranagar

In an experiment on Seasonal incidence of major insect pests in important vegetable crops; staggered sowing of cabbage was taken and observations on pest incidence showed that *Brevicoryne brassicae* was the dominant pest & recorded throughout the crop growth period with a peak accurence during first week of December. *Spodoptera litura*, *Plutella xylostella* was observed at low level and *Crocidolomia binotalis* population increased towards the end of March.

ONION

Horticultural Research Station, Mahanandi

Survey and surveillance of pests on major vegetable crops in Kurnool district.

Roving survey was conducted in the vegetable growing areas of Kurnool district. In brinjal, 10-21 per cent fruit and shoot borer damage and 1-6 per cent jassids were recorded. In bhendi. 6-

11% fruit and shoot borer, 2-13 per cent jassids and 4-10 per cent mites, in tomato, 6-13% fruit borer, 1-5 per cent white flies were identified. 4-13 per cent thrips in onion and 2-5 per cent thrips in chillies were observed.

Development of IPM package for the management onion thrips (*Thrips tabaci)*

Among the different IPM modules, Seed treatment with lmidacloprid @ 5g/kg seed + Application of Neem cake @ 200 Kg/acre + Barrier crop with Maize + Monitoring with yellow sticky traps +Azadirachtin 1 % @ 1 ml/lit + Fipronil @ 2ml/lit (need based) was found good in controlling thrips population with an yield of 24.86 t/ha.

Evaluation of newer insecticides against onion thrips (*Thrips tabaci)*

Diafenthiuron 50 WP @ 1 g/lit spray was found effective in controlling onion thrips with an yield of 23.76 t/ha.

SPICES

CHILLIES

Horticultural Research Station, Lam

Screening of germplasm/cultivars for resistance to thrips, mites, blossom midge and pod borers

Forty four entries were screened against thrips, blossom midge, and pod borer incidence. Thrips population ranged from 1.2 to 9.5, pod borer ranged from 0.0 to 19.35 per cent and blossom midge incidence ranged from 0.0 to 11.11 per cent. Among these entries only 8 entries recorded zero incidence of pod borer. Very low incidence of blossom midge was recorded in all entries including check.

Population dynamics of chilli pest complex in relation to abiotic and biotic factors

During the year 2013-14, the incidence of thrips, whitefly, blossom midge and podborers was recorded on standard week basis and correlation and regression analysis was done and results are given below .

i) Thrips *(Scirtothrips dorsalis)*

The correlation between thrips and weather parameters revealed that there was no significant correlation to any of the weather parameters. However, maximum temperature and morning relative humidity had positive correlation with thrips incidence and remaining were negatively correlated. R^2 value is equal to 0.48 which implies that weather parameters contributed only 48% in the thrips incidence.

ii) Whitefly (*Bemisia tabaci*)

The studies on correlation between whitefly population and weather parameters indicated tha there was no significant correlation. However all the weather factors were negatively correlated with whitefly population except morning relative humidity. R^2 is equal to 0.39 which means that weather parameters contributed to an extent of 39% in the variation of whitefly population.

iii) Blossom midge (*Ashondylia capsici)*

The correlation studies between blossom midge and weather parameters revealed that maximum temperature and morning relative humidity were negatively correlated with blossom midge incidence. R^2 is equal to 0.25 which means that weather parameters contributed to an extent of 25 per cent in the development of blossom midge

iv) Pod borers (*Spodoptera litura)*

The correlation studies between pod borer incidence and weather parameters revealed significant positive correlation of the pest with rainfall where as maximum temperature was negatively correlated. R^2 value is equal to 0.740 which implies that weather parameters contributed only 74 per cent in the *Spodoptera litura* incidence.

Evaluation of certain insecticides against chilli pest complex

Thirteen insecticides were evaluated against chilli pest complex and results revealed that Spinosad @ 0.25 ml/lt and Diafenthiuron @ 1.5 g/lt were found to be significantly superior to control and other treatments in controlling thrips. Significant the lowest pod borer incidence was recorded in treatments sprayed with Spinosad followed by Flubendiamide, Rynaxypyr. With regard to yield, Spinosad @ 0.25 ml/lt and Diafenthiuron @ 1.5 g/lt were significantly superior to control and other treatments.

Integrated Pest Management on chillies

The IPM plot has recorded an yield of 2433 kg/ha against 2917 kg/ha in non IPM plot. The pest population in both the practices was recorded. The pests viz. thrips, whiteflies, pod borers and blossom midge were low in non IPM than IPM plots.

Studies on compatibility of certain new insecticides and fungicides used in chilli.

Six insecticides viz. Spinosad, Diafenthiuron, Spiromesifin, Flubendamide, Acetamiprid and Emamectin Benzoate with two fungicides viz. Azoxystrobin and Difenconazole were tested for their compatibility and results revealed that they are physically compatible and no phytotoxic effect was recorded. For bio efficacy studies, thrips, pod borers, fruit rot incidence was recorded. The insecticides which were effective against thrips and pod borers were found equally effective in combination with fungicides.

In case of fruit rot, efficacy of Azoxystrobin was reduced when combined with Spinosad, Difenthiuron, Spromesifin, Flubendamide and Acetamiprid. A synergistic effect was found between Difenconazole and Acetamiprid, Difenconazole and Flubendamide and decreased the fruit rot incidence.

Vegetable Research Station, Rajendranagar

In an experiment on evaluation of new insecticide molecules against sucking pests of chilli, application of Emamectin Benzoate 5 SG @ 0.4 g/lt recorded lowest thrips population which was followed by Thiacloprid 21.7 SC @ 0.6 ml/lt and highest chilli yield (10.91 t/ha) was recorded.

PLANTATION CROPS

COCONUT

Horticultural Research Station, Ambajipeta

Survey and monitoring of pest problems in coconut (eriophyid mite, rhinoceros beetle, red palm weevil, black headed caterpillar and other pests).

Roving survey Roving survey was carried out in major coconut growing districts of Andhra pradesh *viz.,* East Godavari, West Godavari, Visakhapatnam and Srikakulam districts. Rhinoceros beetle, red palm weevil, black headed caterpillar and eriophyid mite are the major pests infesting coconut in this region. The infestation by rhinoceros beetle was in the range of 5.5 to 35.0 per cent in all the four districts. Its maximum incidence was observed in Srikakulam district while minimum incidence

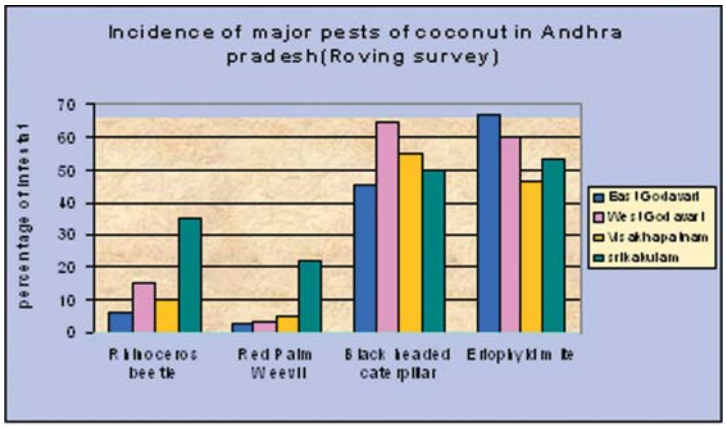
was observed in East Godavari district. The incidence of red palm weevil was maximum in Srikakulam district (22.0 per cent) followed by Visakhapatnam district (5.0 per cent).

The infestation of black headed caterpillar was noticed in all the districts. Its incidence in isolation in Chittavaram village was observed in West Godavari district and was upto 65.0 per cent. In Srikakulam (50.0 percent) Visakhapatnam (55.0 per cent) and in East Godavari district in isolation at Rayavaram village (45.0 percent) incidence of this pest was recorded. The infestation of eriophyid mite was recorded from all the plantations observed in all districts and was in the range of 46.66 to 66.66 per cent. Maximum incidence was observed in East Godavari (66.66 per cent) while minimum incidence was observed in Visakhapatnam (46.66 per cent). Intensity of mite was mild to medium in all the districts.

Table-35: Mean Incidence of major coconut pests in important districts of Andhra Pradesh during 2013-2014

District	Black headed caterpillar Mean Incidence (%)	Rhinoceros beetle Mean Incidence (%)	Red palm weevil Mean Incidence (%)	Eriophyid mite Mean Incidence (%)
E.Godavari	45.0±5.80*	5.5 ±0.55	2.5 ±0.37	66.66±5.08
W. Godavari	65.0 ±6.01	15 ± 1.39	3.5 ± 2.3	60.0 ± 2.62
Visakhapatnam	55.0 ±6.61	10 ± 0.95	5.0 ± 0.61	46.66 ± 2.65
Srikakulam	50.0 ± 6.14	35 ± 2.90	22.0 ±1.87	53.33 ±1.99

*Values represent Mean ± Standard error



Fixed plot survey Fixed plot survey was under taken in Palivela village in Kothapeta mandal and Korlapativaripalem in Ambajipeta mandal of East Godavari district. Low intensity of rhinoceros beetle leaf damage was noticed in both the gardens and it ranged from 6.40 to 9.59 per cent at Korlapativaripalem and 12.33 to 18.17 per cent at Palivela Village. No spindle damage was observed in the fixed plot gardens. Hundred per cent incidence of eriophyid mite was observed, however medium scale of mite intensity upto November 2013 and mild scale in February 2014 was noticed in both the fixed plot survey villages. No incidence of red palm weevil and coconut black headed caterpillar was recorded in fixed plot survey villages.

Management of eriophyid mite in coconut gardens

The trial was conducted on farmer's field in Korlapativaripalem village of East Godavari district. The pre treatment observations were recorded before applying the treatments. Post treatment observations were recorded at four, eight and twelve month's intervals. Simultaneous observations were also made in control plot. Before tha application of treatments, it was observed that the eriophyid mite infestation was 58.94, 68.66 and 62.20 per cent in different gardens. After twelve months interval, the mite infestation gradually decreased from 58.94 per cent to 48.42 per cent in treatment T_1 and from 68.66 per cent to 48.45 per cent in treaaztment T_2. But in control the mite infestation increased from 62.20 to 73.3 per cent (Table-36).

Table-36: Per cent nut damage due to eriophyid mite infestation in experimental plots Korlapativaripalem village of East Godavari district (2013-2014)

Treatment	Per cent infestation of mite			
	Pre treatment	1st Quarter After 4 months	2nd Quarter After 8 months	3rd Quarter After 12 months
T_1 (With root feeding)	58.94(50.13)	40.48(36.32)	46.63(43.06)	48.42(44.08)
T_2 (Without root feeding)	68.66(56.08)	48.45(44.10)	49.26(43.79)	48.45(44.10)
T_3 (Control)	62.20(51.95)	70.62(61.39)	69.33(59.02)	73.3(61.31)
S.E.	—	6.17	1.39	2.39
C.D (5%)	N.S.	17.8	4.04	6.93
C.V (%)	—	45.1	11.1	18.6

Figures in parenthesis are sin transformed values

Regarding eriophyid mite intensity, the initial MDGI was in the range 1.62 to 2.15 with scale being medium to severe. After four, eight and twelve month's interval, the grade index in treated plots gradually declined to mild. However severe scale after eight months and medium scale after twelve months was recorded in control indicating significant effect of the treatments over control from fourth month after treatment imposition. After twelve months, T_1 (IPM with root feeding) and T_2 IPM garden (Without Root feeding) recorded lower mite grade index (mild). (Table-37)

Table-37: Mean damage grade index of eriophyid mite in experimental plots Korlapativaripalem village of East Godavari district (2013-14)

Treatment	Mean damage grade index (2013-2014)			
	Pre treatment	1st Quarter After 4 months	2nd Quarter After 8 months	3rd Quarter After 12 months
T_1 : IPM garden (With Root feeding)	1.62(1.25)	0.42(0.95)	0.50(1.00)	0.60(1.02)
T_2 : IPM garden (Without Root feeding)	1.49(1.22)	0.88(1.16)	0.60(1.05)	0.75(1.08)
T_3 : Control	2.15(1.62)	1.82(1.10)	2.10(1)	1.53(1.17)
S.E.	0.07	0.04	0.02	
C.D (5%)	0.20	0.14	0.07	N.S.
C.V(%)	20.3	17.6	7.5	

Figures in parenthesis are square root transformed values

Evaluation of improved strains of parasitoids (Braconid) (*Goniozus nephantidis* – larval parasitoids) in the field against *O.arenosella.*

The field trail was conducted in Coconut black headed caterpillar out break garden in Chitavaram village of Yelamanchali mandal in West Godavari district in the month of November 2013 as per CPCRI guidelines. There was a high initial larval population ranging from 29.1 to 41.3 numbers per ten leaflets in November 2013 and gradually decreased to 28.2, 9.4 and 0.2 numbers/ten leaflets in treatment T_1 (Conditioned) and 37.7, 21.3 and 1.2 numbers/ten leaflets in treatment T_2(Unconditioned) . In untreated control the larval population of 29.1 numbers /ten leaflets was recorded and showed an increase to 42.8 and 35.7 numbers/ten leaflets in first and second months, later decreased in third month. The Conditioning of parsasitoids treatment had more impact on reducing black headed caterpillar population when compared to non conditioned parsasitoids (Table -4).

Table-38: Evaluation of pre-conditioned parasitoid *G.nephantidis* against *O. arenosella* in Andhra Pradesh (2013-14) **Average of ten palms**

Treatment	Avg. No. of Larvae/ ten leaflets (Pre release count)	(*O. arenosella* larval population/ ten leaflets) (Post release count)		
		After one month	After second month	After third month
T_1(Conditioned)	**33.8(5.83)**	**28.2(5.35)***	**9.4(3.16)**	**0.2(1.07)**
T_2(Unconditioned)	**41.3(6.43)**	**37.7(6.19)**	**21.3(4.62)**	**1.2(1.34)**
T_3 (Control)	**29.1a(5.62)**	**42.8(6.56)****	**35.7(5.79)**	**5.4(2.30)**
S.E.±		0.26	0.49	0.26
C.D. (5%)	N.S	0.78	1.44	**0.77**
C.V. %		**13.9**	**34.1**	**52.7a**

*Fig. in parenthesis is square root transformed

** Increase in pest population

Studies on field efficacy of commercially available pheromones against coconut pests *viz.*, rhinoceros beetle and red palm weevil

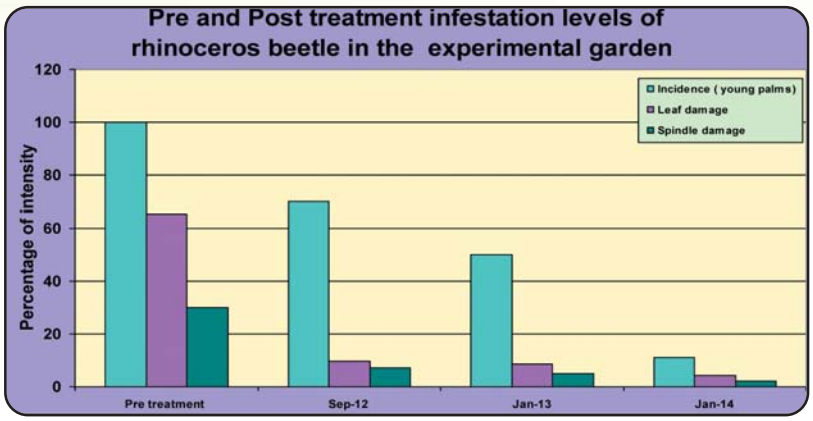
The CPCRI NPM lure trapped significantly higher number of red palm weevils (150.25/ trap) as against PCI lure (68.25/trap) and control (2/trap) during the period from April to December 2013. From January 2014 the traps containing CPCRI NPM lure along with Kairomone blends were found to trap 34 weevils and was followed by CPCRI NPM lure alone which trapped 23.25 weevils/trap.

Against rhinoceros beetle the CPCRI NPM lure trapped significantly higher number of rhinoceros beetles (27 / trap) as against PCI lure (4.75/ trap).

Validation of integrated pest management technology for *Oryctes rhinoceros* in different regions.

Nagullanka village, P.Gannavaram Mandal, East Godavari district was selected for the experiment from 2012. The Metarrhizium and Baculovirus culture were obtained from CPCRI, Kayangulam and are being maintained at HRS, Ambajipeta. Pheromone lures were obtained from M/s. PCI Ltd and installed in the gardens. The pre treatment infestation data showed 100 per cent incidence and a damage of 65.46 and 30.00 percent leaf and spindle damage. In January 2013, the damage incidence decreased by fifty percent and a leaf damage of 8.50, spindle damage of 5.00

and by January 2014 the intensity came down to a low of 11 per cent and leaf and spindle damage reduced to 4.40 and 2.00 in the experimental field.



Multi-location field evaluation of talc formulation of *Hirsutella thompsonii* (CPCRI isolate) against coconut eriophyid mite at AICRP palm centres

The experiment was initiated in the month of February 2012 with four treatments and 20 palms in each treatment

T_1: Spraying talc formulation of *H.thompsonii* @ 20 g/palm–3 sprays during October / November, January/February and April/May.

T_2: Spraying *H.thompsonii*@20g/palm during October/November and January/February, followed by Botanical formulation (2% Neem oil – garlic – soap emulsion) during April/May.

T_3: Spraying Palm oil – sulphur emulsion – 3 sprays / year during October / November, January/ February and April/May.

T_4: Control.

The mite pre treatment population which ranged from 0.69 to 1.36/1mm^2 in February 2013 decreased in all the treatments by February 2014 except in control. However, an increase in predator population was observed in the November 2013 and February 2014 sample nuts as compared to February 2012 sample nuts. The lowest mite population of 0.57, 0.51 and 0.43 /1mm^2 was continuously recorded in Treatment T_3 (Spraying Palm oil – sulphur emulsion) during the entire observational period. (Table-39)

Table-39: Population count of eriophyid mite and its predators / 1mm^2 during the observational period in the experimental garden

Tr. No.	(February 2013) Pre treatment		(November 2013)		(February 2014)	
	Mite population	Predator population	Mite population	Predator population	Mite population	Predator population
T_1	0.69(1.09)	0	0.65(1.05)	0.30(0.84)	0.70(1.08)	1.00(1.15)
T_2	0.94(1.20)	0	0.81(1.13)	2.30(1.57)	0.66(1.04)	4.00(2.00)
T_3	0.57(1.03)	0	0.51(0.99)	2.20(1.50)	0.43(0.95)	1.80(1.44)
T_4	1.36(1.36)	0	1.40(1.35)	2.50(1.56)	1.37(1.34)	5.70(2.20)
SE(m)	NS	NS	0.06	0.19	0.07	0.26
CD	-	-	0.18	0.55	0.20	0.76
CV	-	-	17.9	43.8	19.6	48.8

Figures in parenthesis are square root transformed values.

Mass multiplication of parasitoids of *Opisina arenosella*

About 32.3 lakhs parasitoids were reared in the bio control laboratory during the year 2013-14 and 24.6 lakhs Parasitoids were supplied to the farmers in coconut black headed caterpillar infested villages in the following districts of Andhra Pradesh.

Table - 40 Details of districts Supplied with parasitoids

District	Village
East Godavari	S.Yanam, Dwrapudi, Chinthalapalli, Vemulapalli, Ramavaram, Sakhinetipalli, Ankampalem, APR Lanka, Allavaram, Battelanka, Neredupalli, Turupulanka.
West Godavari	Kalavapudi, Saripalli, Paszaladeevi, Poduru, Mathyapuri, Nowduru, Palakollu, Nelapogula, Badava, polamuru, Mattaparru, Panjavemavaram, Vedangi, Ullaparru, Mattaparru, Penumadam, Zunnur, LRpeta, Uootada.
Visakhapatnam	S.Rayavaram, Nakkapalli, Ligarajupalem, Gunupudi.
Srikakulam	Sompeta, Baruva, Jagati, Rushi kudda, Gollagandi,Bidimi

Studies on the seasonal incidence and management of cocoa pests

The cocoa pest succession and intensity was studied at HRS, Ambajipeta. A very low incidence of hairy caterpillars, mealy bug, bag worm and bark eating caterpillar were observed between the December 2013 to March 2014.

Studies on field evaluations of new systemic insecticides against coconut pests through root feeding

Among various insecticides tested against black head caterpillar (*O. arenosella*) by root feeding method, absorption and mortality was observed with Monocrotophos (36% SC) followed by Emamectin Benzoate (1% EC) and Imidacloprid (17.8 SL). Absorption of insecticides thiamethoxam 25%WG, Fipronil 5 % SC, Thiacloprid 21.7% SC was not observed.

CASHEW

Cashew Research Station, Bapatla

Among the insecticides evaluated as post extraction prophylaxis, Chloropyriphos @ 0.2 per cent offered protection to the tune of 86.3 per cent without re-infestation or persistent attack followed by Monochotophos @ 0.2% with 63.63 per cent without re-infestation or persistent attack. Among other treatments neem oil has offered 54.54 percent protection without re-infestation or persistent attack and was superior over the control. This recorded 31.8 per cent protection without re-infestation or persistent attack.

Preferential zone of attack was collar in 38.63 percent of trees (34/88) followed by root in 31.82 percent of trees (28/88) followed by collar and root 21.59 percent (19/88).

Exudation of gum and frass material from CSRB affected tree

Cashew stem and root borer grub

Relationship of percent leaf and blossom webber damaged shoots with selected weather variables was subjected to multiple regression analysis. Results revealed that all weather variables together in question accounted for 80.56 percent variation in percent shoot damage by leaf and blossom webber (R^2=0.8056). However none of the variables was found to influence the damage by LBW independently.

Results indicated that all five independent variables in question have accounted for 37.29 per cent of total variation in per cent leaf damage by leaf miner (R^2=0.3729). However none of the variables was found to influence the damage by leaf miner independently.

Relationship between percent leaf folder damaged leaves with selected weather variables was subjected to multiple regression analysis. Results revealed that all weather variables together in question accounted for 42.44 percent variation in percent leaf damage by leaf folder (R^2=0.4244). Data revealed that all variables in question combinedly could not account for significant variation in percent leaf folder incidence. However, of the five variables selected Relative Humidity could influence the pest incidence independently, which means one percent rise in relative humidity (RH m) is expected to bring down leaf folder incidence by 0.38 percent, when all other variables tested are at their mean level.

All five independent variables have accounted for 58% of total variation in percent shoot damage by shoot tip caterpillar (R^2=0.5891). Data revealed that all variables in question combinedly could not account for significant variation in percent shoot damage by shoot tip caterpillar incidence. However, among the five independent variables in question, relative humidity RH (m) was found to exert significant negative effect on percent shoot damage which means that 1% increase in maximum relative humidity RH (m) is expected to bring down percent shoot damage by 0.49 times when all other variables tested were at their mean level (Ceteris paribus- holding other things constant).

With regard to apple and nut borer (ANB), all five independent variables have accounted for 52% of total variation in percent nut damage by ANB (R^2=0.52278). However none of the variables was found to exert any influence on the incidence of ANB independently.

Among the 40 accessions screened to identify the tolerant lines against the pests of cashew, T.No.233 has recorded highest incidence of leaf and blossom webber (7.03%) and T.No. 129 recorded the lowest incidence (0%).

The accession ABT-3 has recorded highest incidence of leaf miner (13.39%) and T. No.6/14 has recorded lowest incidence (1.28%). With regard to the incidence of leaf folder, T.No.268 has recorded highest incidence (7.59%) and T.No.244 has recorded lowest incidence (0.93%). The accession T.No. 268 has recorded highest incidence of shoot tip caterpillar (10.9%) and T.No.2/5 recorded lowest incidence (1.41%). The accession line BLA.39/4 has recorded highest incidence of apple and nut borer (19.53%) and T.No.275 has recorded with the lowest incidence (0%).

E. PLANT PATHOLOGY

FRUITS

MANGO

Fruit Research Station, Sangareddy

Screening of germplasm against powdery mildew of mango

Among the 312 mango cultivars screened, Himsagar, Hindustan, Jogri, Kachameta, Kalapari, Kala Alphonso, Kala pasand, Neeluddin, Neelum, Sardar, Seetha bhog and Sensation were disease free towards powdery mildew disease.

Studies on mango malformation

Among 256 mango cultivars screened Alampur Baneshan, Almas, Aman, Amini, Himayat, Himayuddin, Hindustan, Hyder saheb, Jehangir, Jalal, Java, Kasiratnalu, Vazir pasand, Yeramulgoa, Zafarani fazri, Zarda and Zardalu were found resistant to floral malformation of mango.

Epidemiological studies of mango powdery mildew

The epidemiological studies of powdery mildew disease revealed that the disease was first noticed in last week of January 2014 in Banganpalli and Dashehari. In both the varieties the maximum PDI (Baneshan -9.96% and Dashehari – 12.4%) was observed in 4th week of February and the disease was continued upto March first week. A range of critical temperatures (15.1^{0}C -31.2^{0}C) and relative humidity (73.1%) were found congenial for development of the disease. The correlation studies with the weather parameters indicated that the minimum temperature was negatively and maximum temperature was positively correlated with PDI of powdery mildew. The relative humidity at fore noon was negatively correlated with the disease development.

Management of mango anthracnose

Evaluation of different fungicides to manage the anthracnose disease of mango revealed that Tricyclazole @ 0.1% was found better (8.3%) in reducing the incidence of disease followed by Chlorothalonil @ 0.2% (8.6%).

Seasonal occurrence of different diseases of mango.

Roving survey conducted in major mango growing areas, revealed that anthracnose disease was severe during rainy season (24.0%) when compared to winter (17.3%) and summer (6.3%). The powdery mildew (12.6%) and malformation (20.3%) diseases were severe during February month. The maximum disease severity of grey blight (7.3%) and blossom blight (2.6%) was observed in the winter season, where as red rust (12.6%), gummosis (12.6%), sooty moulds (18.3%) and bacterial blight (14.0%) diseases were recorded in summer season.

Fixed plot survey at FRS, Sangareddy for seasonal occurrence of diseases in mango revealed that anthracnose disease was observed throughout the year, but maximum intensity (21.0%,) was recorded during October. Maximum incidence of powdery mildew (10.9%) and malformation (21.0%) was recorded during the month of February. The sooty mould occured throughout the year but maximum severity (17.6%) was recorded during June, whereas the bacterial blight disease incidence was maximum (15.3%) during May month. The other diseases like red rust (12.3% in June), grey blight (6.6% in June) and blossom blight (1.4% in March) were recorded in traces.

Cost effective management of post harvest anthracnose of mango by pre and post harvest treatments.

Evaluation of different pre and post harvest treatments indicated that, the treatment-T_7 (Two sprays of carbendazim + hot water treatment with carbendazim) has given better performance (6.0%) when compared to control (27.3%).

BANANA

Horticultural research station, Kovvur

Survey of fungal, bacterial and viral diseases of banana

Sigatoka disease was the most prevalent disease recorded in all locations surveyed and disease incidence ranged between 1-76 percent.

Among viral diseases BBrMV was the major disease of banana and highest incidence (57%) was observed in K. C. Keli cultivar. BSV has become a problem in tissue culture plants and incidence ranged between 0-22 per cent. BSV was more evident during winter season and caused mortality of young plants. Rhizome rot particularly in Grandnine and Tella Chakkera keli cultivars was the major bacterial disease and incidence ranged between 0-77 percent. K.C. Keli resistant to rhizome rot was also affected during summer months and incidence ranged between 0-3 per cent. However, further study is required to establish the incidence of the disease. Among the other diseases Cordana leaf spot, Deightoniella leaf spot, Freckle leaf spot were noticed with low incidence.

Studies on sigatoka or prevalent leaf spot disease epidemiology

The experiment revealed that shooting to harvest was the critical time for the crop with respect to sigatoka disease infection. It can be concluded that April to June is the ideal period for planting sigatoka susceptible banana cultivar for avoiding disease and obtaining higher yields.

Management of sigatoka or prevalent leaf spot disease with oil based formulations

T_4-Difenconazole @ 1 ml/l (0.1%), T_3: Propiconazole @1 ml/l (0.1%), T_6: Petroleum based mineral oil (1%) (T_2) + Propiconazole @ 0.5 ml/l (0.05%) + Petroleum based mineral oil (1%) and T_8: Difenconazole @1 ml/l (0.1%) + Petroleum based mineral oil (1%) were the most effective treatments which recorded 51.28 and 59.89 PDI respectively. The average bunch weight of 21.50**,** 21.08, 20.83 and 20.50 Kg. was recorded in the T_6, T_8, T_4 and T_3 respectively which were on par with each other and significantly higher than all other treatments.

Diagnosis of banana viruses in germplasm and planting material used in experiments

All genotypes in banana germplasm were screened for the presence of known viruses based on symptoms (BBTV and BSV) and ELISA (BBrMV). Among the 107 accessions, 47 BBrMV and 56 BSV/CMV infected plants were observed. None of the genotypes was infected with BBTV.

Screening banana genotypes for *Fusarium wilt* disease

One hundred and seven banana genotypes were screened in *Fusarium* wilt sick plot (*Fusarium oxysporum* f sp *cubense* Race-1, VCG 0124). Among 107 collections, 54 showed resistance where as the remaining varieties showed varying degree of susceptibility.

Table-41 Tentative grouping of banana genotypes against Fusarial wilt

Categories	Genotypes
Resistant	Grand Naine, Robusta, Yangambi Km 05, Amritsagar, Gross Michel, Tatillakunnan, Namarai, Pisang Jaribuya, Pisang Mas, Poyo, Dwarf Cavendish, GCTCV-215, Valery, Williams, Red Banana, Manoranjitham, Pisang Nangka, Karpura Chakkerakeli, Pisang Ceylon, Motta Poovan, H-02, Sonkela, Pisang Rajabulu, Pisang Raja, KBS-05, PachaBontha Batheesa, Pisang Seribu, Rajapuri, Pachanandan, Assam Wild, FHIA-03, FHIA-17, PA-03-22, PA-03-44, NRCB-01, Jurmony, Musa laterita, Krishna Vazhai, Kallar, Wather, KBS-01, Gandevi Collection, FHIA-01, Srisaialam Collection, Tellachakkerakeli, KBS-09, Boodida Bontha Bothesa, Calcutta-04, Cultivar Rose, Alpan, Burro Cemsa, Gowria
Moderately resistance	KBS-04, Kappukadali, GCTCV-119, KBS-08, Mortman, Co-01,Uthiran, Nookala Bontha, Kalibow, Saba, Nepali vannan, Srisaialam Collection, Virupakshi, Selection-79, Nendrapadathi, Musa balbisiana, Bluggoe, Lady finger
Moderately susceptible	Attaikol, MC 94-02, Ney poovan, Agnishwar, Mitli, Pisang Lilin, Matti, Srimanthi, Nepali Chinia, Sannachenkadali, Simla, Sirumalai, MC 93-02, Jillellagudem Collection, KBS-03, Bharataratnavali, Boodida bukkisa, Kovvur Bontha
Susceptible	Amritapani, Ayiranga Rasthali, Rasthali, Doodhsagar, Nendran, Kunnan, ValiaKunnan, Njali Poovan, Yellakki bale, Monthan, Eleswaram Bukkisa, Malbhog, NRCB-03, Manjira Nendran, KBS-02, Karpuravalli, Manohar, Chinia, Komarada Bukkisa

Studies on post harvest diseases of banana

The pathogenicity test revealed that *Botryodiplodia theobromae, Colletotrichum gloeosporioides and Fusarium semitectum* caused crown rot disease when they were inoculated singly into crown surfaces of healthy banana hands. These fungi grew rapidly to cover the entire crown region, caused the disease on the crown region and spread towards the finger stalks of the hand. These fungi were successfully re-isolated from the diseased crown tissues at the end of an incubation period of 10 days. *Aspergillus flavus, Aspergillus niger* and *Aspergillus terreus* were also inoculated into healthy crown tissues and grew to cover the crown surface. However, they did not cause the disease and were not successfully re-isolated from the diseased crown tissues.

Horticultural research station, Mahanandi

Management of sigatoka leaf spot disease of banana (*Mycosphaerilla musicola)*

Mineral oil @ 1% + Tebuconazole 50% + Trifloxystrobin 25% WG @ 0.5 g/L was found superior in controlling the Sigatoka leaf spot in banana (16.21) with an yield of 59.46 t/ha.

GRAPE

Grape Research Station, Rajendranagar

Survey of grape growing areas for important diseases to develop digital disease map

Twelve vineyards in Rangareddy (dist.) were visited periodically after foundation and forward pruning and intensity of different diseases was recorded.

Anthracnose: Incidence of this disease was recorded after foundation pruning which was in the rage of 6.66 to 11.66 PDI (Percent Disease Index) in June-2013, 7.5 to 35 in July-2013, 12. to 27.5 PDI in Aug-2013, 10 to 2 PDI in Sept-2013 and 1 to 30 PDI was recorded in Otober-2013. After forward pruning this disease was recorded in the range of 5 to 12.5 in November-2013, 7.5 to 14.16 PDI in Dec-2013, 7.5 to 14.16 PDI in Jan-2014, 5 to 15 PDI in Feb-2014 and 5 to 10 PDI in Mar-2014.

Downy mildew: Incidence of this disease was recorded after foundation which was in the rage of 5 to 13.33 PDI in June-2013, 22. To 42.5 PDI in July-2013, 20 to 35 PDI in Aug-2013, 15 to 30 PDI in Sept-2013 and 20 to 35 PDI in Oct-2013. After forward pruning PDI recorded in the range in Nov-2013, 15 to 32.5 PDI in Dec-2013, 5 to 20 PDI in Jan-14, 7.5 to 18.5 in Feb-2014 and 2.5 to in Mar-2014.

Powdery mildew: Incidence of this disease recorded after foundation pruning was in the range of 12.5 to 22.5 PDI in July-2013, 10 to 22.5 PDI, 10 to 25 PDI in Aug-2013, 8.33 to 27.5 PDI in Sep-2013 and 15 to 30 in Oct-2014, after forward pruning 5 to 12.5 in Jan-2014, 6.5 to 15 in Feb-2014 and 5 to 20 PDI in Mar-2014.

Alternaria leaf blight: Incidence of this disease was recorded in the rage of 6.66 to 10 PDI in June-2013, 17.5 to 24.16 in July-2013, 15 to 30 PDI in Aug-2013, 10 to 25 PDI in Sep-2013 and 17.5 to 30 PDI in Oct-2013, after forward pruning this disease incidence recorded in the rage of 5 to 12.5 in Jan-2014, 8 to 20 PDI in Feb-2014 and 10 to 17.5 in PDI in Mar-2014.

Bio-efficacy of growth stage specific schedule for the management of downy mildew and powdery mildew

Four growth specific schedules tested spray Copper hydroxide - Add 5g /L Propineb with Hydrogen cyanamide paste - Propineb 70WP -(Iprovalicarb + Propineb)66.25WP – Phenomidone + Mancozeb 10+50 60WG –Phosetyl al 80WP - Phenomidone + Mancozeb 10+50 60WG - Pyraclostrobin + Metiram55% 60WG - Triadimefon 25WP – Penconazole 10EC – Tebuconazole – Myclobutanil 10WP – Azoxystrobin @ 0.5ml/L – Sulphur 80 WDG were sprayed at growth specific shedule of grape after forward pruning was proved superior for the management of downy mildew and powdery mildew diseases over spray of Copper hydroxide - Paste Hydrogen cyanamide paste - Cymoxanil + Mancozeb) 72WP – (Famaxodone 16.6% + Cymoxanil 22.1) 38.7 SC – potassium salt of phosphrous acid – Kresoxim methyl - (Famaxodone 16.6% + Cymoxanil 22.1) 38.7 SC - Fusilazole 40EC – Penconazole 10EC – Tebuconazole – Myclobutanil 10WP – Azoxystrobin 23SC – Sulphur 80 WDG.

SAPOTA

Horticultural Research Station, Kovvur

Survey and incidence of disease in sapota

Phaeophleospora and Pestalotiopsis leaf spots were the major diseases recorded during the survey. Red rust and flat limb at very low level were observed.

SWEET ORANGE

Horticultural Research Station, Darsi

Survey and surveillance of sweet orange diseases in Prakasam District

Survey was conducted in 18 mandals. Dry root rot incidence was more (12.78 %) followed by fruit drop (11.05 %). Dry root rot incidence was more in P.C palli (31.31%) followed by Yerragondapalem (19.85 %) and CS Puram (15.56 %) mandals.

Integrated Management of dry root rot in sweet orange

Trichoderma longibragum formulation (TCT_4) was collected from CRS, Tirupathi and distributed to twelve (12) farmers. Out of 75 plants treated with culture, 63 plants were recovered from the infection.

Horticultural Research Station, Mallepally

Development of IDM for management of dry root rot in sweet orange

Integration of chemical treatment (Mancozeb @.25%) along with bio control agent (*Trichoderma* Spp) at monthly interval from the onset of monsoon has effectively managed the dry root rot symptoms.

JACK FRUIT

Horticultural Research Station, Kovvur

Survey and incidence of diseases in jack fruit

Survey conducted during 2013-14 revealed that fruit rot and leaf spot diseases were the most prevalent diseases recorded in all the locations surveyed. Fruit rot was the major disease of jackfruit and highest incidence of 52 per cent was recorded in V. R. Gudem, West Godavari district. Leaf spot was a common disease of jackfruit and incidence ranged between 1-17 per cent. A new wilt disease was reported from V. R. Gudem experimental fields and one per cent plants died due to wilt.

PAPAYA

Horticultural Research Station, Kovvur

Survey of fungal and viral diseases of papaya

Papaya ring spot was observed up to 100 per cent in West Godavari, East Godavari and Vizianagaram districts. Wilt incidence up to 100 per cent recorded during November 2012.
Papaya ring spot disease was the most prevalent disease recorded in all locations surveyed and disease incidence ranged between 38-100 percent. Severe incidence (40-88 %) of collar rot disease was recorded in Vizianagaram district during November 2013 due to continuous rainfall. Fruit rot was recorded between 0 to 6 per cent. PaLCV and PMV diseases were not reported during the survey.

WATERMELON

Horticultural Research Station, Darsi

Effect of staggered sowing on the incidence of diseases in watermelon

Thrips population decreased from 15th October to 1st week of December and the population increased from 1st January to 15th February. Similarly, watermelon bud necrosis virus severity was

significantly less (33.33%) when the crop was sown on 15th December than in crop sown on 1st December (41.66%), 1st January (55.55%) and 15th January (52.77%).

ACIDLIME

Citrus Research Station, Petlur

Survey and monitoring of important diseases of acid lime in Nellore district

Diseases: Greasy spot incidence was moderate to severe in majority of the orchards where as low incidence of bacterial canker was noticed in P.S-1 and Balaji and severe incidence in local variety. This year due to failure of north east monsoon low incidence of pink disease was recorded. Among post harvest diseases sour rot disease incidence noticed in major form and caused 15-20% losses and 20-35% of the plants were affected by root rots.

Pests: During this year sucking pest infestation like aphids, black fly, leaf miner thrips, mangu mites and snow scales were the major pests compared to the previous year causing considerable damage and yield loss to the farmers.

Disorders: Majority of the acid lime orchards shown iron chlorosis and zinc & boran deficiency symptoms.

Studies on sour rot disease in acid lime

Fourteen clones were screened against sour rot and recorded sour rot incidence and it was low in local variety of acid lime (5.3 %) and highest in Petlur selection-21 (25.3 %). Among different fungicides, Benomyl (0.1%) was found to be the best followed by Mancozeb + Carbendazim (0.2%).

Validation of IDM technology for management of dry root rot in acid lime

Five villages representing five mandals were selected and in each village dry root rot affected plants were selected and applied IDM package two times i.e., at pre monsoon season and at post monsoon season and recorded 47-67 % per cent recovery from dry root rot compared to farmers package of practice.

Epidemiology and control of greasy spot of acid lime

Severity of the disease was positively increased from August to February and observed that a positive relation with rain fall and dew formation. Among different fungicides, Pyraclostrobin (0.1%) sprayed three times in June, July and August at monthly intervals recorded less disease severity (5.9 %).

Post harvest losses in acid lime and its management

Survey was conducted at different markets of Gudur division to know the post harvest losses and it was observed that the losses were more at retail level mainly in January (36.5%) and November months (30.5%) when compared to the wholesale level (10.8%).During survey, it was found that among several diseases, sour rot and *Aspergillus* rot were the major diseases. Some safe chemicals were tested against sour rot and aspergillus rot, among different chemicals boric acid (1%) and sodium salicylate (1%) were found to be best for both pathogens.

Effect of different antibiotics on canker disease of acid lime

Two different antibiotics like Bactrinol and Bacteriocare were tested at two concentrations i.e at 250 and 500 ppm alone and in combination with COC was compared with common practice of Streptomycin sulphate(500ppm) + COC (3000ppm). The canker severity was less in streptomycin sprayed plants (8.50%) and it was on par with the bacteriocare used with 500ppm in combination with COC (9.98%).

POMEGRANATE

Horticultural Research Station, Ananthapuram

Survey of pomegranate orchards was carried out in Ananthapuram and Chittoor districts for recording the incidence of various diseases. In Ananthapuram district, incidence of bacterial blight was recorded in 64 per cent of the gardens. During the year the disease incidence and intensity was low compared to previous years. Maximum per cent severity on a tree (6.9) was recorded in Ananthapuram district. Incidence of fungal fruit spot and wilt was also recorded.

Management of bacterial fruit spot in pomegranate

Disease incidence was recorded on leaf, stem and fruit and per cent severity on the tree was calculated and yield was recorded in treatment (management schedule) and in farmer's practice. Results revealed that management schedule effectively reduced the disease incidence and severity of bacterial blight compared to farmer's practice.

Table-42: Influence of spray schedule on the incidence of bacterial blight in pomegranate during 2013-14

Particulars	Incidence			Severity			% Severity on a tree	Yield (area in Ha)
	Leaf	Stem	Fruit	Leaf	Stem	Fruit		
Treatment	16.40	18.80	15.67	7.20	6.40	5.67	5.97	7.8 tons
Farmer's practice	64.00	65.60	66.00	15.60	17.20	14.67	15.27	3.7 tons

Treatment: Pruning twigs and branches 2 inches below the canker followed by 1% Bordeaux mixture spray. Cut ends should be applied with Bordeaux paste (10%) immediately after pruning. Second spray at foliage initiation with Streptocycline (250 ppm) + Copper oxychloride (0.25%) and third spray at 15 days interval with Bordeaux mixture (0.5%) followed by fourth spray with Streptocycline (250 ppm) + Carbendazim (0.1%) and adopt phytosanitation.

BER

Horticultural Research Station, Ananthapuram

During 2013, the initiation of powdery mildew was delayed and it appeared in traces during 41st standard week as against the normal occurrence of 35th or 36th standard week. Even further progress of the disease was also less due to prevalence of dry weather conditions. Correlation studies revealed that PDI was significantly and negatively correlated with maximum and minimum temperatures and positively correlated with relative humidity (RH1) and sunshine hours. Favourable conditions for the disease development are temperature below 23.7°C & RH above 75.5%.

For disease initiation: Temperature (min) < 23.7 °C, RH1 >75.5 and Sunshine hours >6.06 are favourable.

Bio-control of powdery mildew of ber

During 2013, the disease was initiated very late in the season i.e. 41st Standard week and even further progress of the disease was also low in all the treatments including control. All the treatments differed significantly with the control in reducing the disease incidence. However, lowest percent disease index (16.1) was recorded with 0.1% Karathane alone and which differed significantly with other treatments (Table-43).

Table-43: Effect of bio-agents on powdery mildew of ber during 2013

Treatment		Mean percent disease index		Per cent disease control over check
T_1 :	0.1% Karathane	16.1	(23.65)*	54.6
T_2 :	0.05% Karathane	20.5	(26.88)	42.1
T_3 :	1% *P.fluorescens* (CIAH 196) + 0.05% Karathane	24.8	(29.83)	30.0
T_4 :	1% *P.fluorescens* (CIAH NR) + 0.05% Karathane	25.5	(30.32)	27.9
T_5 :	1% *Trichoderma* (CIAH 240) + 0.05% Karathane	26.2	(30.79)	25.9
T_6 :	1% *Trichoderma* (CIAH NR) + 0.05% Karathane	25.4	(30.19)	28.2
T_7 :	1% Super *Pseudomonas* + 0.05% Karathane	27.5	(31.63)	22.3
T_8 :	Carbendazim (Bavistin)	24.5	(29.69)	30.7
T_9	Unsprayed check	35.4	(36.53)	—
	SE.m±	**0.97**		
	CD at 5%	**2.92**		
	C V %	**5.65**		

*** Figures in the parentheses indicate the transformed values**

FLOWERS

CROSSANDRA

Horticultural Research Station, Ananthapuram

Integrated management of collar rot in crossandra

Lowest percent of wilt (51.5%) and highest flower yield of 33.6 kg/ha was recorded with the treatment integration of *Trichoderma viride* and drenching + spraying with carbendazim @ 1g/lt followed by the treatment drenching + spraying with carbendazim @ 1 g/lt (55.3%) and application of *Trichodema viride* along with FYM + neem cake (225 kg FYM + 25 kg Neem cake + 2.5 kg *Trichoderma viride*/ha) (57.6) which were on par with each other and differed significantly with other treatments (Table-44).

Table -44: Effect of different treatments on incidence of collar rot / wilt of crossandra during 2013

S. No.	Treatments	Mean Percent wilt		Flower Yield (kg/ha)
T1	Application of *Trichoderma viride* through FYM + neem cake (225kg FYM + 25 kg Neem cake + 2.5 kg *Trichoderma*/ha)	57.6	(49.48)*	22.13
T2	Drenching + spraying with Tebuconazole @ 2 ml/ltr	68.2	(56.72)	19.76
T3	Drenching + spraying with carbendazim @ 1 g/l	55.3	(48.21)	23.44
T4	Spraying with Copper oxychloride @ 3 g +streptocycline @ 0.01 g/lit	73.1	(59.13)	17.22
T5	T1 + T2	76.1	(60.81)	12.75
T6	T1 + T3	51.5	(45.83)	33.60
T7	Spraying with Bacterimycin @ 0.1%	74.2	(60.34)	15.08
T8	Application of Carbofuran granules @ 25kg /hectare	73.9	(59.34)	14.70
T9	Control	79.2	(62.89)	11.84
	SE.m±	**5.73**		**6.12**
	CD at 5%	**17.01**		**18.14**
	C V %	**17.53**		**56.32**

*** Figures in the parentheses indicate the transformed values**

VEGETABLES

Horticultural Research Station, Lam

Survey and surveillance of diseases in important vegetable crops in the farmers field at periodical intervals

Survey was conducted in fields of surrounding villages of Guntur for recording the disease incidence in vegetable crops like chilli, tomato, bhendi, brinjal, bottle gourd, ridge gourd. In chilli 6-15% of damping off, 15-20% of choanophora blight, 15-25% of wilt, 10-30% of cucumber mosaic virus, 5-35% of leaf curl virus (Gemini virus), 15-20% of powdery mildew, 10-25% of fruit rot and 6-7% of bacterial leaf spot were recorded. In ridgegourd 5-15% of Mosaic and 5-20% of downy mildew were recorded. In tomato 5-16 % of early blight, 5-8% of peanut bud necrosis virus and 6-25% of tomato leaf curl virus were recorded. In bhendi 5-25% of Yellow Vein Mosaic Virus was recorded. In brinjal, 5-25% of fruit rot, 5-15% of mosaic, 10-15% of leaf spot and bacterial wilt were recorded. In bottle gourd 5-15% of PBNV was recorded.

Epidemiology of most important diseases of commercially important vegetable crops of the locality

Regression equation developed for the chilli leaf curl virus revealed that the independent variables, maximum temperature, relative humidity (FN) rainfall and whitefly population were positively correlated with disease incidence where as minimum temperature and relative humidity(AN) were negatively correlated with disease incidence. Further the coefficient of multiple determination R^2 value was equal to 0.635 which implies that 63.5% of variation in the development of chilli leaf curl virus was explained by the five independent variables and whitefly population. R^2 was significant.

From the regression equation of tomato early blight, it was found that the independent variables, maximum temperature, relative humidity (FN) and rainfall were positively correlated with disease incidence except minimum temperature and Relative Humidity (AN). Further the

coefficient of multiple determination R^2 value was equal to 0.581 which implies that 58.1% of variation in the development of early blight was explained by the five independent variables. Similarly for tomato leaf curl virus, the independent variables maximum temperature, minimum temperature, relative humidity (FN), rainfall and whitefly population were positively correlated with disease incidence except relative humidity (AN). The coefficient of multiple determination R^2 value was equal to 0.731 which implies that 73.1% of variation in the development of chilli leaf curl virus was explained by the five independent variables and for whitefly population R^2 was significant.

ONION

Horticultural Research Station, Mahanandi

Survey and surveillance of diseases in major horticultural crops existing in Rayalaseema Zone

Survey was conducted in vegetable and fruit crop growing areas in Kurnool, Anantapur and Prakasam districts of Andhra Pradesh. In Kurnool district more intensity of purple leaf blotch (25.5%) was observed in kharif season in onion. Low intensity of disease (20.5%) was recorded in rabi-2013-14. Early blight disease (26.54%) and Bud necrosis virus (15.0%) were observed in tomato crop. Fruit rot and die back (18.0%), wilt (5%) and powdery mildew (15.0) were observed in chillies.

Studies on epidemiology of major diseases of horticultural crops

Purple leaf blotch disease was recorded from July 1st week to 1st week of November. The results indicated that the leaf blotch disease incidence had significant negative correlation with maximum temperature (-0.0857) and negatively correlated with minimum temperature (-0.5979) while the disease incidence was positively correlated with morning relative humidity (0.5291) and evening relative humidity (0.5187) and negatively correlated with rainfall (-0.1260).

Management of alternaria leaf blotch (*Alternaria porri)* of onion (*Allium cepa)*

Tebuconazole 50%+Trifloxystrobin 25% WG was found to be superior in controlling the purple leaf blotch in onion (19.24%) with maximum yield of 21.54 t/ha.

Studies on post harvest diseases in onion crop

Among the post harvest diseases caused by different pathogens more incidence of *Fusariums* sp., *Rhizopus* sp., *Aspergillus* sp. and *Alternaia* sp. were recorded.

Screening of onion varieties against fungal diseases

Among 18 onion varieties, purple leaf blotch disease (15.0%) was recorded in NHRDF (RED-2) L–355, smut (24.50%) and basal rot (15.0%) diseases were recorded in Bhima swetha.

TOMATO

Horticultural Research Station, Mahanandi

Early blight disease was recorded from July 1st week to 3rd week of November. The results indicated that the disease incidence was significantly correlated with maximum temperature (-0.0490) and negatively correlated with minimum temperature (-0.5739) and the disease incidence was positively correlated with morning relative humidity (0.5045) and evening relative humidity (0.4094) while it was negatively correlated with rain fall (-0.1357).

CAPSICUM

Horticultural Research Station, Mahanandi

Management of powdery mildew in capsicum under poly house conditions

Penconazole @ 0.5 ml/lt was found to be superior in controlling the powdery mildew in capsicum under polyhouse conditions (7.28%) with a maximum yield of 16.28 t/ha.

SPICES

CHILLI

Horticultural Research Station, Lam

Screening of chilli germplasm, breeding and advanced breeding material against different diseases occurring on chilli

A total of 51 entries were screened against fruit rot caused by *Colletotrichum capsici* and chilli leaf curl virus diseases. Among the entries screened, only 4 entries shown zero incidence and 41 entries shown resistance (<5%) to fruit rot disease against 28.5% incidence in susceptible check under field conditions. For chilli leaf curl virus, 6 entries shown resistance and 15 entries shown moderate resistance, 17 entries were susceptible and 13 entries were highly susceptible to CLCV

Integrated management of chilli leaf curl virus (Gemini virus) in chilli

The experiment was conducted to control the chilli leaf curl virus incidence by controlling the vector population with spraying of different insecticides in alternate sprays. Among the treatments spraying of NSKE 5% at 1 WAT, Thiomethoxam @ 0.02% at 2 WAT, Neem oil 10,000 ppm @ 1.5 ml/L at 3 WAT, Spiromesifin @ 0.4 ml/L at 4 WAT, repeated spraying till 21 WAT and spraying of NSKE 5% at 1 WAT, Acetamiprid @ 0.3g/lt at 2 WAT, Neem oil 10,000 ppm @ 1.5ml/L at 3 WAT, Triazophos @ 2ml/L at 4WAT, repeated spraying till 21 WAT recorded lowest virus incidence and highest yield.

Nursery disease management using bio agents and new fungicides in chillies, tomato and brinjal

The experiment on efficacy of different bio agents and fungicides against damping off disease in chillies, tomato and brinjal indicated that seed treatment @ 4g/kg seed, soil application @ 10g/sqm and soil drenching @ 5% of *Trichoderma viride*-2 (IIVR) and *Pseudomonas fluorescence* were at par with each other and significantly superior over other treatments and recorded highest germination percentage and lowest damping off incidence in all three crops

Okra Yellow Vein Mosaic Virus (YVMV) resistant trial (IET, AVT-I, AVT-II)

In AVT-I, six hybrids were screened against YVMV with four checks. Among the hybrids zero incidence (0 %) was recorded in 2012/OKYVRES-2 and 2012/OKYVRES-5 with an yield of 89.06 and 82.36 q/ha respectively. In AVT-II, none of the three hybrids screened was superior to check

Horticultural Research Station, Darsi

Fungicidal management of powdery mildew in chilli

Eleven fungicides were tested and among these fungicides, Triademifon (19.66%), Myclobutanil (20.01 %) and Azoxystrobin (21.02%) reduced the disease severity of powdery mildew effectively after 2nd spraying and also recorded higher yields (Triademifon (48.11 q/ha), Myclobutanil (33.55 q/ha) and Azoxystrobin (41.77 q/ha)).

TURMERIC

Horticultural Research Station, Mahanandi

Turmeric leaf spot disease incidence was recorded from July 1st week to November 3rd week. The results indicated that disease incidence has negative correlation with maximum temperature (-0.0102) and minimum temperature (-0.6008) and morning relative humidity (0.5188) and positive correlation with evening relative humidity (0.4420) and negative correlation with rain fall (-0.1577).

PLANTATION CROPS

COCONUT

Horticultural Research Station, Ambajipeta

Etiology and epidemiology of basal stem rot disease of coconut

Activity I: Collection of *Ganoderma* isolates from various locations.

Thirty one isolates of *Ganoderma* isolated from basal stem rot infected coconut palms from Andhra Pradesh, Karnataka and Tamil Nadu and one isolate from basal stem rot infected oil palm were used in the study. As per the suggestions of the 21st annual group meeting, three cultures of *Ganoderma lucidum* (DMR 44, DMR 45 and DMR 86) were obtained from Directorate of Mushroom Research Centre, Solan, Himachal Pradesh. All these thirty five isolates of *Ganoderma* were used for pathogenic virulence studies on bengal gram indicator plant and molecular characterization studies.

To identify pathogenic virulence of *Ganoderma* isolates to coconut using sterilized soil

Pathogenic virulence studies were conducted on indicator plant bengal gram. Thirty five isolates were tested for their virulence against bengal gram plants in pot experiment. The isolates Ga, Ga1, Ga2, A2, Gl, Gl2, Gl3, Gl4, Gl6, GW1, GW2, MKW, PVI2, CRS5, DMR 86, DMR 44 and DMR 45 were found to be more virulent when compared to the others and showed more than 90% of the seedling death within 30 days of inoculation. Where as the isolates Gl5, NJL, KLC, and OP were moderately virulent and showed more than 50% death of seedlings during the same period. The remaining isolates ANT, NSP, DGM, VKR, KGP, VP, GP, APP, VPM1, VRM1, PVI1, CRS1, CRS2 and CRS4 were less virulent and showed less than 50% of seedling death within 30 days of inoculation.

Activity II: Conservation and molecular characterization of *Ganoderma*

Analysis of isozyme profile of *Ganoderma* isolates by native PAGE

Genetic diversity analysis and grouping of the twenty four Ganoderma isolates through isozyme analysis was carried out using esterase, catalase, peroxidase and malate dehydrogenase enzymes. The esterase profile of the isolates showed 3 to 7 bands where as that of peroxidase profile from 1 to 3. Majority of the isolates showed 8 bands in the catalase profile except VP (6 bands) and Ga (4 bands). The malate dehydrogenase profile grouped majority of the isolates in to two categories except four isolates. The isolates Ga1, Ga2, Gl2, Gl5, Gl6, GW1, GW2, NJL and A2 produced three bands where as the isolates Gl, Gl3, Gl4, KLC, ANT, KGP, DGM, VKR, MKW and APP showed five bands indicating similarity among them. The remaining isolates NSP, GP and VP showed four bands and Ga showed two bands indicating variation (Table- 45).

Table-45: Isozyme profile of 24 *Ganoderma* isolates

S. No	Isolate	Esterase	Peroxidase	Catalase	Malate dehydrogenase
1	Ga	7	3	4	2
2	Ga1	7	3	8	3
3	Ga2	7	3	8	3
4	Gl	7	3	8	5
5	Gl2	7	3	8	3
6	Gl3	7	3	7	5
7	Gl4	7	3	8	5
8	Gl5	6	1	8	3
9	Gl6	5	1	8	3
10	GW 1	6	1	8	3
11	GW 2	6	1	8	3
12	NJL	6	1	8	3
13	OP	1	3	4	1
14	A2	6	3	8	3
15	KLC	6	2	8	5
16	ANT	3	2	8	5
17	KGP	6	2	8	5
18	VP	3	2	6	4
19	DGM	3	3	8	5
20	VKR	6	3	8	5
21	MKW	6	2	8	5
22	APP	6	2	8	5
23	NSP	7	2	8	4
24	GP	7	2	8	4

Analysis of RAPD PCR profile of thirty five *Ganoderma* isolates

Ten fungal specific primers were used for RAPD analysis which detected a total of 158 fragments with an average of 15.80 fragments per primers and fragments were 100% polymorphic. The number of scorable bands produced per primer ranged from 13 to 19 and size of the products ranged from 200bp to 3.0kb.

The maximum number of polymorphic bands (19) obtained with Rfu-06 and minimum number (13) was obtained with primer Rfu-01. 100% polymorphism was observed in all primers (Table – 46).

Table-46: RAPD Primers used to detect polymorphism, number of band for polymorphism between *Ganoderma* isolates per primer

S.No	RAPD Primer	Total No. of bands	Polymorphic bands	% Polymorphism
1	Rfu1	10	10	100
2	Rfu 2	14	14	100
3	Rfu 3	14	14	100
4	Rfu 4	14	14	100
5	Rfu 5	17	17	100
6	Rfu 6	19	19	100
7	Rfu 7	18	18	100
8	Rfu 8	15	15	100
9	Rfu 9	18	18	100
10	Rfu 10	16	16	100
	Total	158	158	
	Mean	15.8	15.8	100

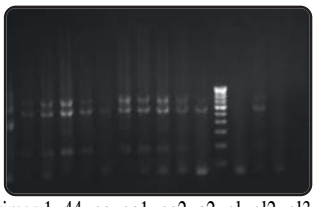
Genetic similarities based on RAPD markers

The maximum genetic similarity value was 0.884 between isolates Gl and Gl3 followed by 0.839 similarity between Ga2 and A2 isolates, while the lowest genetic similarity value of 0.000 was between isolates of CRS2 and Ga, GW1, VPM1, VRM1, DMR 86, DMR 45, KLC, NSP; ANT and CRS5.

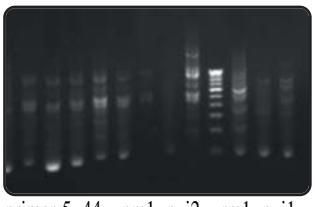
Phylogenetic analysis based on RAPD – PCR

The phylogenetic relationships among 35 isolates of *Ganoderma* were analyzed by an UPGMA method. The cluster results showed that two major clusters having KLC, NSP, MKW, DGM, KGP, VP, APP, VKR and GP in one cluster and remaining isolates in other cluster. The major clusters were separated in to three sub-clusters i.e., Gl, Gl3, Gl2, Gl4, Ga2, A2, Ga, Gl5, Gl6 and GW2 first sub-cluster; KLC, NSP, MKW and DGM second sub-cluster; KGP, VP, APP, VKR and GP third sub-cluster. However, Ga1, GW1, VRM1, NJL, DMR 44, PVI2, OP, VRM1, CRS1, PVI1, CRS4, ANT, CRS5, CRS2, DMR 86 and DMR 45 did not form any sub-cluster (Fig 1 & 2).

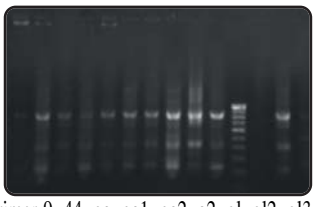
Fig 2: PCR banding profile of the isolates with few of the RAPD primers:



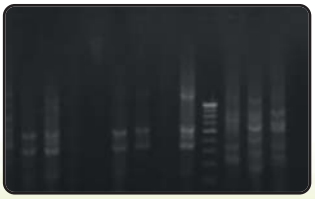
primer 1, 44, ga, ga1, ga2, a2, gl, gl2, gl3, gl4, gl5, gl6, M, gw1, gw2, NJL



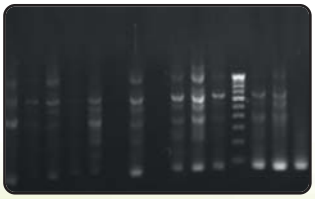
primer 5, 44, vpm1, pvi2, vrm1, pvi1, crs1, crs5, crs2, crs4, M, oilpalm, 86, 45



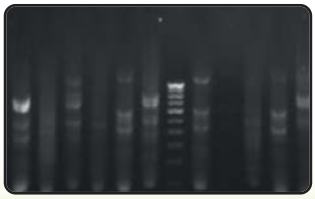
primer 9, 44, ga, ga1, ga2, a2, gl, gl2, gl3, gl4, gl5, gl6, M, gw1, gw2, NJL



primer 3, 44, vpm1, pvi2, vrm1, pvi1, crs1, crs5, crs2, crs4, M, oilpalm, 86, 45

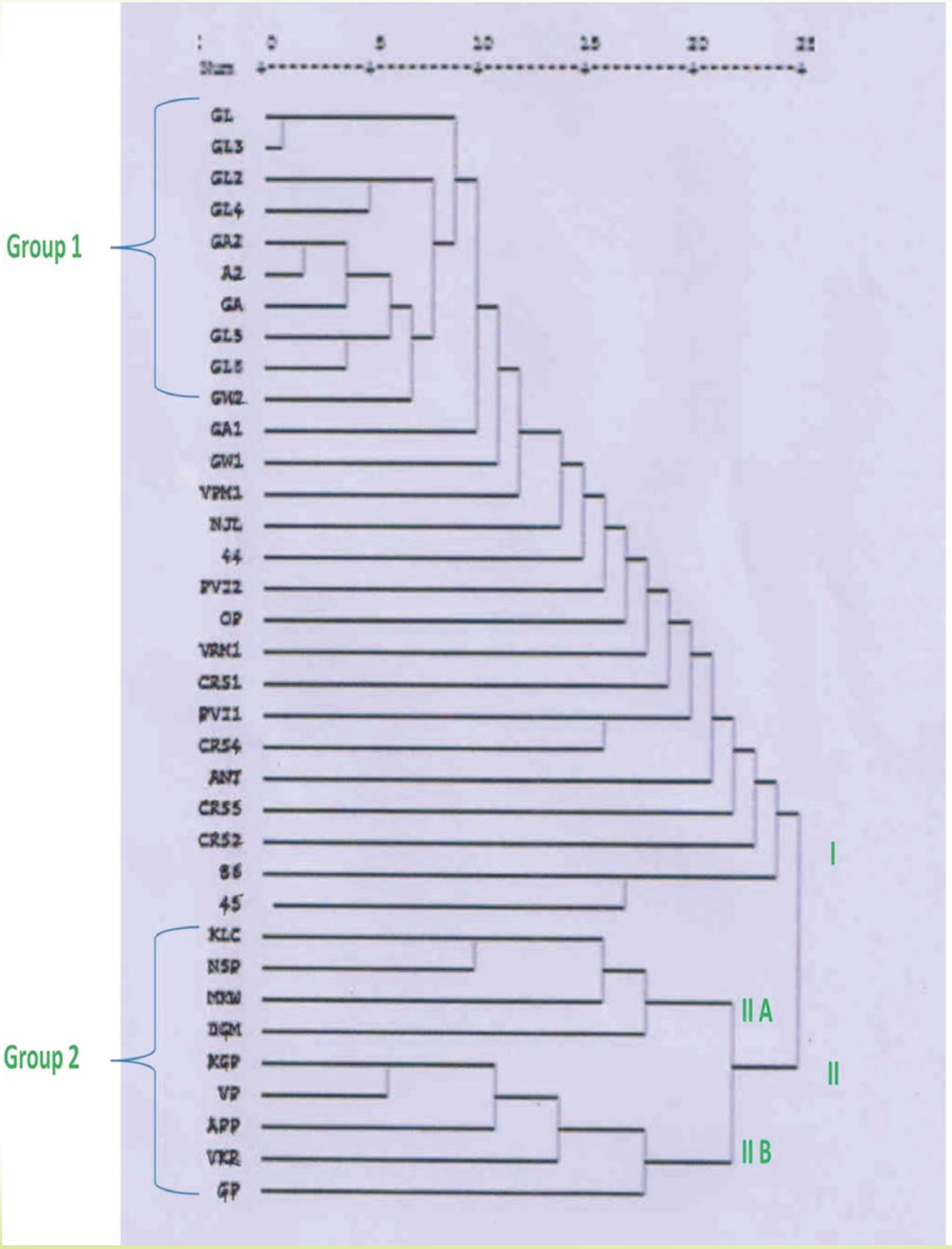


primer 10, 44, ga, ga1, ga2, a2, gl, gl2, gl3, gl4, gl5, gl6, M, gw1, gw2, NJL



primer 3, 44, klc, ant, nsp, dgm, vkr, mk, M, kgp, vp, gp, apl, NJL

Dendrogram depicting variation among isolates of *Ganoderma* based on RAPD analysis



Grouping of *Ganoderma* isolates based on molecular characters, sero types and pathogenic races and establishing relationship between molecular characters and virulence of the pathogen

Grouping based on isozyme analysis Genetic diversity analysis and grouping of the twenty four *Ganoderma* isolates through isozyme analysis was carried out using esterase, catalase, peroxidase and malate dehydrogenase enzymes. The esterase profile of the isolates showed 3 to 7 bands where as that of peroxidase profile from 1 to 3. Majority of the isolates showed 8 bands in the catalase profile except VP (6 bands) and Ga (4 bands). The malate dehydrogenase profile grouped majority of the isolates in to two categories except four isolates. The isolates Ga1, Ga2, Gl2, Gl5, Gl6, GW1, GW2, NJL and A2 produced three bands where as the isolates Gl, Gl3, Gl4, KLC, ANT, KGP, DGM, VKR, MKW and APP showed five bands indicating similarity among them. The remaining isolates NSP, GP and VP showed four bands and Ga showed two bands indicating variation (Table-47).

Table-47: Grouping based on malate dehydrogenase isozyme profile of the *Ganoderma* isolates:

Group 1	Group 2	Group 3
3 bands	5 bands	4 and 2 bands
Ga1, Ga2, Gl2, Gl5, Gl6, GW1, GW2, NJL and A2	Gl, Gl3, Gl4, KLC, ANT, KGP, DGM, VKR, MKW and APP	NSP, GP and VP – 4 bands Ga – 2 bands

Grouping based on pathogenic virulence studies of *Ganoderma* isolates in indicator plant bengal gram

The isolates Ga, Ga1, Ga2, A2, Gl, Gl2, Gl3, Gl4, Gl6, GW1, GW2, MKW, PVI2, CRS5, DMR 86, DMR 44 and DMR 45 were found to be more virulent when compared to the others and showed more than 90% of the seedling death within 30 days of inoculation. Whereas the isolates Gl5, NJL, KLC, and OP were moderately virulent and showed more than 50% of the dead seedlings during the same period. The remaining isolates ANT, NSP, DGM, VKR, KGP, VP, GP, APP, VPM1, VRM1, PVI1, CRS1, CRS2 and CRS4 were less virulent and showed less than 50% of seedling death within 30 days of inoculation

Grouping of *Ganoderma* isolates based on RAPD PCR analysis

The RAPD PCR cluster analysis showed that two major clusters having KLC, NSP, MKW, DGM, KGP, VP, APP, VKR and GP in one cluster and remaining isolates in other cluster. The major clusters were separated in to three sub-clusters i.e., Gl, Gl3, Gl2, Gl4, Ga2, A2, Ga, Gl5, Gl6 and GW2 first sub-cluster; KLC, NSP, MKW and DGM second sub-cluster; KGP, VP, APP, VKR and GP third sub-cluster. However, Ga1, GW1, VRM1, NJL, DMR 44, PVI2, OP, VRM1, CRS1, PVI1, CRS4, ANT, CRS5, CRS2, DMR 86 and DMR 45 did not form any sub-cluster

Grouping of the *Ganoderma* isolates on the basis of isozyme analysis, pathogenic virulence studies and RAPD PCR analysis

Based on the isozyme analysis, pathogenic virulence studies and RAPD PCR analysis, the *Ganoderma* isolates can be grouped in to two major groups. The isolates, Ga2, Gl2, A2, GL6, GW2, Ga1, GW1, Ga, Gl, Gl3 and Gl4 showed more virulence, with three bands in malate dehydrogenase isozyme profile and grouped in to one cluster in RAPD PCR studies. Whereas the isolates, MKW, DGM, VKR, KGP, GP, NSP, APP, VP and KLC showed moderate or less virulence, with 4 or 5 bands in malate dehydrogenase analysis and grouped in to one cluster in RAPD PCR studies .

Activity III: Epidemiology and disease forecasting

Impact of other palms and intercrops in coconut on occurrence and spread of disease

The study was initiated in November 2010 to study the impact of other palms and intercrops in coconut on occurrence and spread of basal stem rot disease. Fifty palms in the field with sole coconut and field with coconut + banana were selected in Gannavaram village of East Godavari district. In sole coconut crop, out of 50 palms, five coconut palms were infected with the disease till June 2012. The number of diseased palms was increased to seven by the end of July 2012, to eight by the end of August 2012 and to nine palms by the end of February 2013.

Coconut intercropped with banana

In coconut intercropped with banana, out of fifty palms, eight palms showed the symptoms till November 2012. The number of diseased palms increased to nine by the end of December 2012, and to 10 by the end of February 2013.

This year, a new plot with coconut and banana was selected in the same farmer's garden during July 2013 as the banana crop was removed in the earlier plot. Out of fifty palms, fifteen palms showed the symptoms during July 2013 and the diseased palms remained same by the end of March 2014 (Table -48).

Table-48: Impact of other palms and intercrops in coconut on occurrence and spread of disease: Coconut intercropped with Banana

Linear spread in cms.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
July'13	123	110	89	Mid	25	Mid	30	Mid	15	148	Mid	77	45	26	68
Aug'13	123	110	89	Mid	25	Mid	31	Mid	15	148	Mid	77	45	26	68
Sep'13	123	110	89	Mid	25	Mid	31	Mid	15	149	Mid	77	45	26	68
Oct'13	123	110	89	Mid	25	Mid	31	Mid	15	149	Mid	78	46	26	68
Nov'13	132	110	89	Mid	25	Mid	31	Mid	15	38	Mid	78	46	26	68
Dec'13	134	110	90	Mid	26	Mid	31	Mid	15	39	Mid	78	46	27	68
Jan'14	134	110	90	Mid	26	Mid	73	Mid	15	39	Mid	78	46	27	68
Feb'14	134	110	90	Mid	61	Mid	89	Mid	15	43	Mid	78	112	67	68
Mar'14	136	110	90	Mid	61	Mid	89	Mid	15	43	Mid	78	112	79	68

Management of basal stem rot disease in coconut

Activity-I: Collection, conservation and characterization of bio agents from different locations

Soil samples were collected from Rhizosphere region of coconut palms and isolated *Trichoderma spp* by using *Trichoderma* specific medium. The plates were incubated for 4 days in dark at 28^{o}C and typical *Trichoderma spp* colonies were identified according to the identification key (Rifai, 1969) based on the branching of conidiophores, shape of the phialides, emergence of phialophores and phialospores. The identified *Trichoderma spp* are *T.viride, T.harzianum, T.hamatum, T.longibrachiatum, T.virens* and *T.polysporum. Pseudomonas fluorescens* was isolated by using King's B media.

In addition, seventeen new *Trichoderma* isolates were collected from Rhizosphere region of coconut palms from different villages of East Godavari, West Godavari, Srikakulam and Visakhapatnam districts viz., Y.Ramavaram, Sivakodu, Kaviti, Nandampudi, Peruru, Antervedi, Tallavalasa, Kesanapalli, Gopalapuram, Tallarevu, Zinnuru, Kaviti kothuru, Dagguluru, Gannavaram, Vanapalli and Allavaram using *Trichoderma* specific medium. The isolated species when tested for antagonistic activity against *Ganoderma applanatum* and *Ganoderma lucidum* in dual culture studies were found effective and are under the process of identification.

The dual culture plate assays of *Trichoderma species* against *Ganoderma applanatum* and *Ganoderma lucidum* proved that the tested *Trichoderma species* were effective against the basal stem rot pathogen. Per cent inhibition of *Trichoderma species* against *Ganoderma applanatum* ranged from 72.22 to 100 (Table-14). And the per cent inhibition of *Trichoderma species* against *Ganoderma lucidum* ranged from 56.67 to 100 (Table- 15). Over all the *Trichoderma species* showed greater percent inhibition of *Ganoderma applanatum* than *Ganoderma lucidum* the causal agents of basal stem rot disease of coconut. The *Trichoderma species* isolated from Antarvedi and Gannavaram villages of East Godavari district and Tallavalasa village of Visakhapatnam district showed 100 per cent inhibition against *Ganoderma lucidum* pathogen. The *Trichoderma species* isolated from Antarvedi, Kesanapalli, Tallarevu and Gannavaram villages of East Godavari district and Gopalapuram village of West Godavari district showed 100 per cent inhibition against *Ganoderma applanatum* pathogen.

Table-49: Antagonistic activity of *Trichoderma* spp. on *Ganoderma applanatum*

Sl. No.	*Trichoderma* collected from	District	Radial growth of test pathogen in mm	Percent inhibition of test pathogen over control
1	Y.Ramavaram	E.G.Dt.,	21	76.67
2	Sivakodu	E.G.Dt.,	19	78.89
3	Kaviti	Srikakulam	29	67.78
4	Nandampudi	E.G.Dt.,	21	76.67
5	Peruru	E.G.Dt.,	25	72.22
6	Antarvedi	E.G.Dt.,	0	100.00
7	Tallavalasa	Visakhapatnam	17	81.11
8	Kesanapalli	E.G.Dt.,	0	100.00
9	Gopalapuram	W.G.Dt.,	0	100.00
10	Tallarevu	E.G.Dt.,	0	100.00
11	Zinnuru	W.G.Dt.	31	65.56
12	Kaviti kothuru	Srikakulam	30	66.67
13	Dagguluru	W.G.Dt.	23	74.44
14	Gannavaram	E.G.Dt.,	0	100.00
15	Vanapalli	E.G.Dt.,	21	76.67
16	Allavaram	E.G.Dt.,	12	86.67
Control			90	0

Table - 50 Antagonistic activity of *Trichoderma* Spp. on *Ganoderma lucidum*

Sl. No.	*Trichoderma* collected from	District	Radial growth of test pathogen in mm	Percent inhibition of test pathogen over control
	Y.Ramavaram	E.G.Dt.,	31	65.56
2	Sivakodu	E.G.Dt.,	25	72.22
3	Kaviti	Srikakulam	39	56.67
4	Nandampudi	E.G.Dt.,	28	68.89
5	Peruru	E.G.Dt.,	37	58.89
6	Antarvedi	E.G.Dt.,	0	100.00
7	Tallavalasa	Visakhapatnam	0	100.00
8	Kesanapalli	E.G.Dt.,	30	66.67
9	Gopalapuram	W.G.Dt.,	0	100.00
10	Tallarevu	E.G.Dt.,	21	76.67
11	Zinnuru	W.G.Dt.	12	86.67
12	Kaviti kothuru	Srikakulam	29	67.78
13	Dagguluru	W.G.Dt.	23	74.44
14	Gannavaram	E.G.Dt.,	0	100.00
15	Vanapalli	E.G.Dt.,	29	67.78
16	Allavaram	E.G.Dt.,	19	78.89
Control				90 0

Activity-II: Rhizosphere management – integrated methods involving bio agents, botanicals and INM

The BSR management trial was initiated in August 2010 at Kesanapalli village of East Godavari District. The treatments were imposed at the specified time intervals with the bioagents, *Trichoderma viride* and *Pseudomonas fluorescens.* As the pathogen first infects the root system which was underground and visual identification was not possible, palms were selected in a way that palms with and without symptom development on the stem were included in each treatment.

Among the two methods of application, basal application was found effective when compared to root feeding method. Of the sixteen treatments, basal application of *T. viride* gave significant results. The mixture of 50g of *T. viride* talc formulation + 5 kg of neem cake (T_4) as basal application per palm per year was most effective and none of the palms treated with this method showed symptom development even after 3 years (Zero per cent PDI). It was followed by the mixture of 50g of *P. fluorescens* + 5 kg of neem cake (T_{11}) as basal application per palm per year, root feeding of culture filtrate of *T. viride* at six months and yearly interval in combination with basal application (T_6; T_7) and root feeding of culture filtrate of *P. fluorescens* at quarterly and yearly interval in combination with basal application (T_{12}; T_{14}). All these treatments showed only one palm (25% PDI) infected with the disease out of four palms by the end of March 2012 (Table-16). In the control palms, even though all the four palms were healthy before treatment application, two out of four palms were found infected with the disease (50 % PDI) by the end of March 2012. Overall yield performance of the field after treatment imposition was found to be good. Nut yield

per acre before treatment imposition was recorded as 700 whereas that after treatment imposition was 1000.

Table-51: Effect of bio control agents and method of application on basal stem rot disease of coconut

S. No.	Treatment	Horizontal spread		Vertical spread in cm	
		PDI (BTA)	PDI (ATA)	Mean of disease spread (BTA)	Mean of disease spread (ATA)
1	T_1: Root feeding of 100%culture filtrate of *T. viride* (25ml at quarterly interval)	100	100	121.0	157.8
2	T_2: Root feeding of 100%culture filtrate of *T. viride* (25ml at 6 month interval)	50	75	75.0	90.0
3	T_3: Root feeding of 100%culture filtrate of *T. viride* (25ml/ year)	50	75	60.0	90.0
4	T_4: Basal application of *T. viride* (50g) + neem cake (5kg)/year	0	0	0.0	0.0
5	T_5: $T_1 + T_4$	25	50	22.5	75.0
6	T_6: $T_2 + T_4$	0	25	0.0	32.5
7	T_7: $T_3 + T_4$	0	25	0.0	18.5
8	T_8: Root feeding of 100%culture filtrate of *P. fluorescens* (25ml at quarterly interval)	0	75	0.0	74.0
9	T_9: Root feeding of 100%culture filtrate of *P. fluorescens* (25ml at 6 month interval)	0	50	0.0	42.3
10	T_{10}: Root feeding of 100%culture filtrate of *P. fluorescens* (25ml/ year)	25	75	21.3	89.5
11	T_{11}: Basal application of *P. fluorescens* (50g) + neem cake (5kg)/palm/year	0	25	15.0	32.5
12	T_{12}: $T_8 + T_{11}$	0	25	0	25.5
13	T_{13}: $T_9 + T_{11}$	25	50	23.0	73.8
14	T_{14}: $T_{10} + T_{11}$	0	25	0	13.0
15	T_{15}: Neem cake (5kg) per palm/year	0	50	0	34.8
16	T_{16} : Control	0	50	0	35.5
	CD		30.505		29.452
	SE(m)		10.028		9.682

PDI: Percent Disease Incidence; BTA: Before Treatment Application; ATA: After Treatment Application.

The new BSR management trial with the following treatments was initiated during September 2012 with *Trichoderma viride* and *Pseudomonas fluorescens* formulations. The following treatments are being imposed at the specified time intervals with the bioagents, *Trichoderma viride* and *Pseudomonas fluorescens*. The data is being recorded at monthly intervals.

Table-52: Treatment details of the new experiment

T_1	SA of talc based formulation of 125g of *Trichoderma viride* (T.v.) + 1kg of neem cake / palm at quarterly intervals.
T_2	SA of talc based formulation of 250 g of *Trichoderma viride* (T.v.) + 2 kg of neem cake / palm at six monthly intervals.
T_3	Soil Application of 500 g of talc based formulation of *Trichoderma viride* (T.v)) + 4 kg of neem cake / palm / year.
T_4	SA of talc based formulation of 125 g of *Pseudomonas fluorescens* (P.f.) + 1 kg of neem cake / palm at quarterly intervals.
T_5	SA of talc based formulation of 250 g of *Pseudomonas fluorescens* (P.f.) + 2 kg of neem cake / palm at six monthly intervals.
T_6	SA of talc based formulation of 500 g of *Pseudomonas fluorescens* (P.f.) + 4 kg of neem cake / palm / year.
T_7	Soil Application of 125 g of talc based formulation of *Trichoderma viride* (T.v) and *Pseudomonas fluorescens* (P.f.) + 1 kg of neem cake / palm at quarterly intervals.
T_8	Soil Application of 250 g of talc based formulation of *Trichoderma viride* (T.v) and *Pseudomonas fluorescens* (P.f.) + 2 kg of neem cake / palm at six monthly intervals.
T_9	Soil Application of 500 g of talc based formulation of *Trichoderma viride* (T.v) and *Pseudomonas fluorescens* (P.f.) + 4 kg of neem cake / palm / year.
T_{10}	Control
T_{11}	Root feeding of 1ml of Hexaconazole in 100ml water thrice in a year + 5kg of neem cake + soil application of 200g of *Trichoderma viride*/ palm/ year
T_{12}	T_{11} + micronutrient mixture for coconut @ 1kg/ palm/ year

Each treatment was imposed to a total of five palms. Diseased palms for treatment imposition were selected in such a way that each treatment included palms with no disease or low level of disease incidence (A), medium level of disease incidence (B) severe bleeding disease incidence (C), and the data revealed that some of the treatment imposed palms started showing drying of the symptoms from July 2013 onwards. All the treatments showed drying of the bleeding symptom at least in one palm out of five treated palms in each treatment. Among all the treatments, T_3, T_4 and T_9 showed good result. All the three diseased palms in each above treatments showed drying of the bleeding symptom by the end of March 2014. The treatments, T_3 and T_4 showed drying of the bleeding symptom from September 2013 onwards whereas T_9 showed drying of the symptom in March 2014. Remaining treatments also showed drying of the bleeding symptom in one or two palms out of five treated palms. The experiment is in progress.

Bio control of bud rot and stem bleeding diseases of coconut

Stem Bleeding: Field evaluation of antagonists against stem bleeding disease in coconut

Field experiment on evaluation of paste application of *T. viride* against stem bleeding disease of coconut was carried out from 2008 to 2012. A total of 2719 palms at HRS, Ambajipeta were checked and paste application of *T. viride* to the infected palms was carried out at monthly interval. Percent disease incidence at monthly interval was recorded from April 2008 to March 2012. The lowest mean percent disease incidence was recorded during June month followed by July, August and May months. Higher mean percent disease incidence was recorded during October to February months.

During the XX biennial group meeting, it was suggested to include cake formulation of *Trichoderma* from CPCRI, Kasaragod also against stem bleeding disease along with paste application of *Trichoderma* species. Effect of *Trichoderma virens* cake formulation as well as *Trichoderma viride* paste formulation was tested against stem bleeding disease of

coconut under field conditions from April 2012. Out of 30 treated palms, cake formulation showed 5 diseased palms where as paste formulation showed 10 diseased palms by the end of July 2013. In case of control 24 palms were found to be infected with the disease. During November 2013, 10 out of 30 treated palms with cake formulation showed the appearance of disease and 13 out of 30 treated palms with paste formulation showed the appearance of the disease. The infected palms were again treated with cake formulation and paste application of *Trichoderma*. And by the end of March, 27 palms treated with cake formulation and 22 palms treated with paste formulation were disease free. In case of control, 18 palms were diseased by the end of March 2014 (Table-53).

Table-53: Field evaluation of *T. virens* cakes and *T. viride* paste application against stem bleeding disease of coconut

S. No	*Treatment*	No of treated palms	Nov 2012		Jul 2013		Nov 2013		Mar 2014	
			Disease free palms	Diseased palms	Disease free palms	Diseased palms	Disease free palms	Diseased palms	Disease free palms	Diseased palms
1	*Trichoderma virens* cake application	30	25	5	25	5	20	10	27	3
2	*Trichoderma viride* paste application	30	20	10	20	10	17	13	22	8
3	Control	30	9	21	6	24	10	20	12	18

In vitro* antagonistic studies of native *Trichoderma* species against *Phytophthora palmivora

The dual culture plate assays of *Trichoderma* species against *Phytophthora palmivora* proved that the tested *Trichoderma* species were effective against the Bud Rot pathogen, *Phytophthora palmivora*. Inhibition of *Trichoderma* species against *Phytophthora palmivora* ranged from 54.44 to 100 (Table-54).

Table-54: *In vitro* antagonistic effect of *Trichoderma spp* on mycelial growth of *Phytophthora palmivora*

S. No	Trichoderma collected from	District	Radial growth of test pathogen in mm	Percent inhibition of test pathogen over control
1	Y.Ramavaram	E.G.Dt.,	39	56.67
2	Sivakodu	E.G.Dt.,	21	76.67
3	Kaviti	Srikakulam	41	54.44
4	Nandampudi	E.G.Dt.,	25	72.22
5	Peruru	E.G.Dt.,	29	67.78
6	Antervedi	E.G.Dt.,	30	66.67
7	Tallavalasa	Visakhapatnam	23	74.44
8	Kesanapalli	E.G.Dt.,	21	76.67
9	Gopalapuram	W.G.Dt.,	21	76.67
10	Tallarevu	E.G.Dt.,	19	78.89

11	Zinnuru	W.G.Dt.	27	70.00
12	Kaviti kothuru	Srikakulam	32	64.44
13	Dagguluru	W.G.Dt.	25	72.22
14	Gannavaram	E.G.Dt.,	39	56.67
15	Vanapalli	E.G.Dt.,	0	100.00
16	Allavaram	E.G.Dt.,	36	60.00
17	Control		90	0

Field evaluation of Vanapalli isolate of *Trichoderma viride* against bud rot disease of coconut

As per the recommendations of 21st annual group meeting, the identified Vanapalli isolate of *Trichoderma viride* was multiplied in large scale and field evaluation of the isolate was carried out. 5 gm of talc formulation of *Trichoderma viride* was applied in the nursery seedlings of coconut. The percentage disease incidence observed in the *Trichoderma viride* treated palms was low when compared to the control plants. A total of 300 nursery seedlings were selected and treatment was imposed on the plants. The percentage disease incidence in the treated plants was 3.33, 2.66 and 1.66 when compared to 3.66, 4.66 and 2.66 in case of control during Aug 2013, Nov 2013 and Mar 2014 months respectively. (Table-55)

Table-55: Field evaluation of Vanapalli isolate of *Trichoderma viride* on bud rot disease of coconut

S. No	Treatment	PDI before treatment (Aug 2013)	PDI (Nov 2103)	PDI (Mar 2013)
1	Vanapalli isolate of *Trichoderma viride*	3.33	2.66	1.66
2	Control	3.66	4.66	2.66

Survey and surveillance on diseases of coconut (bud rot, stem bleeding and ganoderma wilt)

Surveys were conducted in different mandals of East Godavari, West Godavari and Krishna districts of Andhra Pradesh during 2013-14. The major diseases observed in coconut gardens were basal stem rot, bud rot and stem bleeding along with minor incidence of grey leaf spot. Mean per cent disease incidence of basal stem rot, stem bleeding and bud rot diseases were 14.07, 2.17 and 1.44 respectively (Table-56).

Table-56: Incidence of major diseases of coconut in Andhra Pradesh

S.No	District	Mandal	Village	Percent disease incidence (%)		
				Basal stem rot	Stem bleeding	Bud rot
1	East Godavari	Gannavaram	Gannavaram	27.5	2.0	1.5
		Aalamuru	Kalavacharla	34.5	2.0	2.0
		Malkipuram	Kesanapalli	25.0	1.5	2.0
		Sakhinetipalli	Antarvedi	26.0	2.0	1.0
		P. Gannavaram	Munganda	5.5	2.5	2.0
		Amalapuram	Bandarulanka	6.0	3.5	1.5
		Razole	Kadali	11.0	2.0	1.0
		Kothapeta	Degalavaripalem	6.5	4.0	2.0
2	West Godavari	Narsapuram	Narsapuram	17.5	3.4	1.5
		Palakollu	Dagguluru	15.0	1.0	1.0

			Lankala koderu	12.0	2.3	1,.0
3	Krishna	Medapadu Kruttivennu	Yelamanchili Pallepalem	11.0 5.5	2.5 1.5	2.5 0.5
			Kruttivennu	7.2	1.5	1.0
		Bantumilli	Pendurru	7.0	1.0	1.0
			Bantumilli	8.0	2.0	1.5
Mean				14.07	2.17	1.44

BSR: Basal stem rot; SB: Stem bleeding; BR: Bud rot

Early detection of basal stem rot disease in coconut

Activity-I: Development of Diagnostic Kit for early detection of Basal Stem Rot Disease:

Sero detection of *Ganoderma applanatum*

Detection of *Ganoderma applanatum* by slide agglutination test: This test was performed in the cavity slides. Positive reaction with antiserum was seen with pure cultures of *G.applanatum* (Table-57). The positive reaction was showed by the formation of precipitation. Antigen of *G.applanatum* formed a weak precipitation with antiserum with in 30 min where as a strong precipitation reaction was observed only after 45 min. and very strong precipitation was observed at 60 min. Higher amount of precipitation was formed with pure cultures indicating that a high title of antigen. No precipitation reaction was recorded in 15 min incubation period.

Detection of *Ganoderma applanatum* by Glass Capillary tube test: A Glass capillary tube with 2 mm diameter was used. The amount of precipitation formed valid with the time taken for precipitation. Strong precipitation reaction was formed with antigen of *G.applanatum* after 45

Table–57: Detection of *Ganoderma applanatum* by slide agglutination test and glass capillary tube test

	Time taken for precipitation (min)											
Antigen	Slide agglutination test						Glass capillary tube test					
	15	30	45	60	75	90	15	30	45	60	75	90
Gapplanatum	-	++	+++	+++	+++	+++	-	+	++	+++	+++	+++

- No precipitation, + weak precipitation, ++ strong precipitation, +++ very strong precipitation.

Sero detection of *Ganoderma spp* by indirect form of Enzyme Linked Immuno Sorbent Assay (ELISA): Indirect form of ELISA procedure using alkaline phosphatase as a label were compared for their sensitivity in detecting *Ganoderma SPP* with polyclonal antisera raised in New Zealand white rabbit.

***Ganoderma spp* detection by Indirect form of ELISA (I-ELISA)**: Pure cultures of *Ganoderma spp* was used in Indirect form of ELISA procedure using polystyrene ELISA plates with flat bottom 96 wells (Dynatech Lab. Inc. Alexandrial VA 22134). The buffer served as control. The following procedures were commonly adopted for indirect form of ELISA method.

Indirect form of ELISA (I-ELISA): *Ganoderma. Spp* antisera was diluted in carbonate buffer, pH 9.6, was added to the plate. Then test samples were added. Second Antisera added next at the same dilutions as the first antisera. This was followed by anti-rabbit Fc specific enzyme conjugate. Then substrate was added & absorbance's were recorded with ELISA reader at 405 nm. The Indirect form of ELISA was found to be more sensitive in detecting the *Ganoderma applanatum* with

antisera dilution of 1 : 1000 and with antigen dilution up to 10^{-1}, 10^{-2}, 10^{-3} & 10^{-4} gave absorbance values at 405 nm were between 2.676 – 3.454 and 0.067 – 0.99 for buffer in ELISA reader (Table-23). The indirect form of ELISA was able to detect the *Ganoderma applanatum* even at 1: 500 antisera dilution tested.

Table -58: Sero detection of *G. applanatum* by indirect form of *ELISA* (OD values at 405 nm)

Antibody dilutions		Antigen dilutionsa											
		10^{-1}			10^{-2}		10^{-3}			10^{-4}			Buffer
		1	2	3	4	5	6	7	8	9	10	11	12
1:500	A	3.302	3.443	3.443	3.001	2.934	3.443	3.443	3.443	3.443	3.443	3.443	0.067
	B	3.131	3.131	3.034	3.131	3.034	2.830	3.397	3.131	3.397	2.779	2.779	0.091
	C	2.862	2.707	2.862	3.008	3.371	2.804	3.008	3.371	2.753	3.008	3.371	0.078
1:1000	D	2.768	3.023	2.877	3.023	2.877	3.245	3.120	2.877	3.245	2.819	2.819	0.075
	E	2.887	2.836	3.091	3.188	3.091	3.188	3.454	3.313	2.945	3.313	3.313	0.086
	F	2.788	3.228	3.494	2.876	3.131	3.494	3.131	3.228	3.052	3.353	3.228	0.099
1:5000	G	2.936	3.179	2.827	2.702	3.445	3.304	3.445	3.082	2.781	3.445	3.003	0.077
	H	3.341	2.831	2.898	2.676	2.831	2.898	3.199	3.074	2.831	3.074	3.341	0.080

Absorbances were between 2.676 – 3.454 and 0.067 – 0.99 for buffer Enzyme linked anti-rabbit FC specific antibodies produced in goat 1:10000 Indirect ELISA was employed with various antigen dilutions for detecting the *Ganoderma applanatum*.

Sero detection of *Ganoderma lucidum*

Detection of *Ganoderma lucidum* by slide agglutination test: This test was performed in the cavity slides. Positive reaction with antiserum was seen with pure cultures of *G. lucidum* by the formation of precipitation. Antigen of *G. lucidum* formed a weak precipitation with antiserum with in 40 min where as a strong precipitation reaction was observed only after 60 min. And very strong precipitation was observed at 80min. Higher amount of precipitation was formed with pure cultures indicating that a high titer of antigen. No precipitation reaction was recorded in 20 min incubation period.

Detection of *Ganoderma lucidum* by glass capillary tube test: Glass capillary tubes with 2 mm diameter were used. Strong precipitation reaction was formed with antigen of *G.applanatum* after 60 min, while weak precipitation after 40 min. Very strong precipitation was observed at 80 min. No precipitation reaction was noted at 20 min incubation (Table-59).

Table-59: Detection of *G. lucidum* by slide agglutination test and glass capillary tube test.

Antigen	Time taken for precipitation (min)											
	Slide agglutination test						Glass capillary tube test					
	20	40	60	80	100	120	20	40	60	80	100	120
G.lucidum	-	+	++	+++	+++	+++	-	+	++	+++	+++	+++

-No precipitation, + weak precipitation, ++ strong precipitation, +++ very strong precipitation.

Sero detection of *G.lucidum* by Indirect form of ELISA

The indirect form of ELISA was found to be more sensitive in detecting the *Ganoderma lucidum* with antisera dilution of 1 : 5000 and with antigen dilution up to 10^{-1}, 10^{-2}, 10^{-3}, 10^{-4}, gave absorbance values at 405 nm were between 1.902 – 3.395 and 0.088 – 0.106 for buffer in ELISA reader (Table-60).

Table-60: Sero detection of *G.Lucidum* by Indirect form of ELISA (OD Values at 405 nm)

Antibody dilutions		Antigen dilutionsa											
		10^{-1}			10^{-2}		10^{-3}			10^{-4}			Buffer
		1	2	3	4	5	6	7	8	9	10	11	12
1:500	A	2.917	2.695	2.917	3.093	2.741	3.093	3.359	3.359	2.792	2.850	2.850	0.087
	B	3.317	2.574	3.317	2.699	2.808	2.612	2.954	2.653	2.574	2.954	3.051	0.106
	C	2.706	2.619	2.581	3.325	2.338	3.325	2.183	2.430	3.183	2.882	2.757	0.103
1:1000	D	3.045	2.948	2.647	2.744	2.948	2.501	2.744	2.392	2.744	2.802	2.606	0.088
	E	3.042	2.838	3.042	2.963	3.264	2.700	1.902	2.741	2.787	2.838	2.627	0.085
	F	2.849	3.151	3.275	3.054	3.275	3.054	2.062	2.234	2.099	1.493	2.673	0.091
1:5000	G	3.254	3.032	3.032	3.254	2.886	3.032	3.395	2.731	3.395	2.689	3.032	0.091
	H	3.160	3.302	3.302	2.792	2.792	2.596	3.160	3.035	2.938	3.302	3.160	0.088

Absorbance value were between 1.902 – 3.395 and 0.088 – 0.106 for buffer Enzyme linded anti-rabbit Fc specific antibodies produced in goat 1:1000

Identification of specific markers for detection of *Ganoderma* pathogen:

From the literature, the *Ganoderma* specific primers for the available genomic sequence of *Ganoderma boninense* accession no. X78749 was selected and used for identification. Primers were designed for the ITS 1 region of ribosomal DNA of *G. boninense.* The selected primer sequences were listed in the Table -61

Table -61 : List of Primer sequences used in the study:

S. No	Primer	Name	Primer sequence
1	Left Primer	GAN1	5' – TTG ACT GGG TTG TAG CTG-3'
2	Right Primer	GAN2	5' – GCG TTA CAT CGC AAT ACA-3'

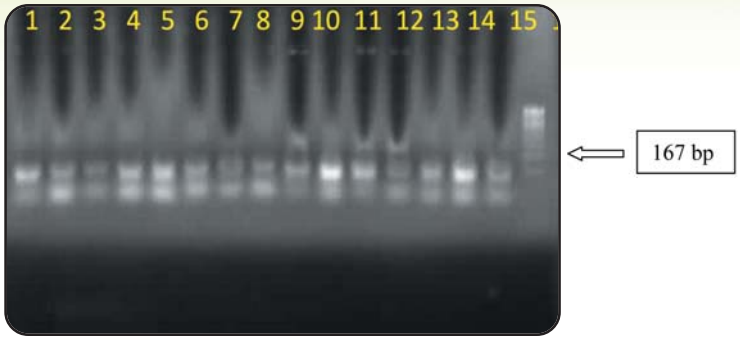
PCR reaction conditions were as following

An initial denaturation cycle was carried out at 95°C for 10 min. It was followed by the three step cycle of denaturation temperature at 94°C for 1min, annealing temperature at 58°C for 1min and renaturation temperature at 72°C for 1 min. These three steps were repeated for 35 number of cycles and the final extension was carried out at 72°C for 10 min. After amplification, the pcr mix was loaded in the 0.8% agarose gel and observed under UV transilluminator.

All the fifteen *Ganoderma* isolates showed amplification at the expected size of 167 bp confirming the specificity of the primer sequences in detection of *Ganoderma* pathogen (Fig 3). Further studies are in progress for identification of the pathogen from diseased palms.

Fig 3: Gel picture depicting the amplification of *Ganoderma* isolates

167 bp



Activity II: Identification of indicator plants for basal stem rot disease

Studies were repeated for validating bengal gram plant as indicator plant for basal stem rot disease during 2013-14. Artificial inoculation of 35 pure cultures of *Ganoderma* pathogen to the sterilized soil was done with each isolate before transferring of the germinated bengal gram seedlings in pots. Infected plants showed withering, yellowing, browning of the lower set of leaves followed by upper leaves and drying of the plants. When the infected seedlings were uprooted and observed, whitish fungal growth was observed on the cotyledons. In later stages, complete rotting of the basal stem region and death of the plants were observed. Entire symptoms were visible within a month under artificial inoculation studies. Pure culture of *Ganoderma* was isolated from the basal stem regions of infected bengal gram plant. Indicator plant studies are being carried out at Gannavaram village of East Godavari district in sick soil. Bengal gram seeds were sown in BSR infected coconut palm basins for their reaction. The study is in progress.

Identification of coconut types resistant to ganoderma wilt disease

The following seedlings planted at Gannavaram village of East Godavari district were lost because of the cyclonic rains during 2013 (Table -62).

Table -62: Screening germ plasm resistant to basal stem rot disease of Coconut

S. No	Variety	Number of	Number of seedlingsseedlings survived	Reason
1	Java Giant	5	3	2 (BSR)
2	Chandra Kalpa (LO)	4	3	1 (BSR)
3	Spicata	5	4	1 (BSR)
4	Laccadive Micro	8	6	2 (BSR)
5	ECT	14	8	6 (BSR)
6	Ceylon Red	3	2	1 (BSR)
7	GB X ECT	7	5	2 (BSR)
8	Pillalakodi (Local variety)	3	0	3 (Bud rot)
9	Jonnalarasi (Local variety)	3	0	3 (Bud rot)

Six seedlings each of available germplasm (ECT, GB X ECT, Pillalakodi, Jonnalaraasi) at Horticultural Research Station, Ambajipeta were again planted in basal stem rot sick garden at Gannavaram village. Seed nuts of Laccadive Micro, Spicata, Chandra kalpa, Java giant were collected and are being raised in nursery.

Non Plan:

Survey and surveillance of diseases of cocoa and their management.

Surveys conducted during the year 2013-14, indicated that pod rots and stem canker are the major diseases on cocoa. Among the pod rots, rots caused by *Phytophthora palmivora, Botryodiplodia sp* and *Erwinia carotovora* were observed. Percent disease incidence of *Phytophthora* pod rot and stem canker during last year was 8.91 and 10.4 respectively. In addition to the *Phytophthora* pod rot, minor incidence of pod rot caused by *Botryodiplodia sp* was observed during last year from January 2014 onwards during dry climatic conditions. Bacterial pod rot caused by *Erwinia carotovora* was identified at Indian Type Culture Collection Centre at IARI, New Delhi. The percent incidence of the bacterial pod rot during last year was observed up to 2.45% (Table-28).

Further, a leaf spot on cocoa was also observed on cocoa during the surveys in East and West Godavari districts of Andhra Pradesh. When the spores from the leaf spot of cocoa were observed under the microscope, they were found to be similar to *Pestalotiopsis sp*. The pure culture was sent to culture identification centre at Agharkar Research Institute. The causal organism was identified as *Pestalotiopsis species.*

Table-63 : Percent Incidence of diseases of cocoa

S. No	Disease	Causal organism	Percent Incidence
1	Pod rot		
a	Fungal	*Phytophthora palmivora*	8.91
b	Fungal	*Botryodiplodia sp.*	1.21
c	Bacterial	*Erwinia carotovora*	2.45
2	Stem canker	*Phytophthora palmivora*	10.4
3	Leaf spot	*Pestalotiopsis sp*	Traces

The temperature and pH studies showed that the bacterium could survive at a pH range of 6.0 to 9.0 and at temperature between 20°C to 40°C. Among the four chemicals viz., copper oxy chloride, bleaching powder, streptomycin and a combination of streptomycin with copper oxy chloride tested against *Erwinia carotovora*, the combination of copper oxychloride with streptomycin followed by streptomycin alone were effective in inhibiting the growth of the bacterium under *in vitro* conditions (Table-64).

Table-64: *In vitro* effect of chemicals on the growth of the bacterium

S.No	Chemical	Concentration used	Growth of the bacterium after 24 hrs
1	Copper oxy chloride	2.5g/l	++
2	Bleaching powder	10%	+
3	Streptomycin	100ppm	No growth
4	Copper oxy chloride and Streptomycin	As above	No growth
5	Control	-	+++

Management of Phytophthora pod rot of cocoa: Biological control

In vitro antagonistic activity of the fungal bio agents against *Phytophthora* pod rot of cocoa

In vitro interaction studies of the selected antagonistic fungi (*Trichoderma viride, Trichoderma harzianum* and *Trichoderma hamatum*) against *Phytophthora palmivora* was carried out. Among

the three bio control used *Trichoderma viride* found to be superior in suppressing the *Phytophthora* mycelium with a per cent inhibition of 72.22% followed by *Trichoderma harzianum* (67.77%) and *Trichoderma hamatum* (64.44%) (Table-65).

Table-65: In vitro antifungal activity of the Trichoderma species against *Phytophthora palmivora* pathogen of cocoa

S. No	Name of the bio agent	Growth of the test pathogen (*Phytophthora palmivora*) (mm)	Per cent inhibition over control
1	*Trichoderma viride*	25	72.22
2	*Trichoderma harzianum*	29	67.77
3	*Trichoderma hamatum*	32	64.44
4	Control	90	0

Efficacy of plant extracts against the pathogens of cocoa pod rots under in vitro conditions

Studies were also carried out to know the efficacy of various plant extracts against Phytophthora pod rot cocoa under in vitro conditions. Among the varoius botanical extracts tested against *Phytophthora palmivora* under in vitro conditions, *Morinda citrifolia* followed by *Datura stramonis*, *Aloe barbadensis*, *Annona squamosa* and *Glyricidia sepium* showed inhibitory effect on the growth of *Phytophthora palmivora*. The plant extract of *Morinda citrifolia* was able to reduce the growth of *Phytophthora palmivora* pathogen to an extent of 88.8% followed by *Datura stramonis* (86.6%), *Aloe barbadensis* (84.4%), *Annona squamosa* (73.3%) and *Glyricidia sepium* (70.0%) (Table-66).

Table-66: Efficacy of plant extracts against *Phytophthora palmivora*

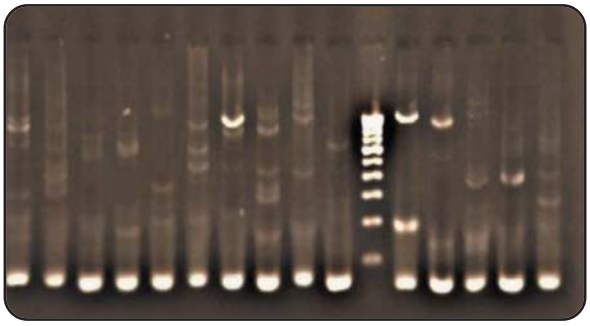
S. No	Name of the botanical plant	Efficacy of plant extract	
		Growth of the test pathogen *(Phytophthora palmivora)(mm)*	Percent reduction over the control
1	*Azadirachta indica*	80	11.1
2	*Cocos nucifera*	59	34.4
3	*Annona squamosa*	24	73.3
4	*Parthenium hysterophorus*	72	20.0
5	*Tridax procumbens*	44	51.1
6	*Pongamia pinnata*	80	11.1
7	*Ocimum sanctum*	64	28.8
8	*Mimosa pudica*	89	1.1
9	*Allium sativum*	65	27.7
10	*Zingiber officinale*	75	16.6
11	*Lawsonia inermis*	4.9	45.5
12	*Glyricidia sepium*	27	70.0
13	*Morinda citrifolia*	10	88.8
14	*Theobroma cocoa*	87	3.3
15	*Aloe barbadensis*	14	84.4
16	*Manilkara zapota*	65	27.7
17	*Mangifera indica*	45	50.0

18	*Piper betle*	75	16.6
19	*Datura stramonis*	12	86.6
20	*Phyllanthus neruri*	83	7.7
21	*Centella asiatica*	89	1.1
22	*Acalypha*	89	1.1
23	*Euphorbia hirta*	76	15.5
24	*Achyranthus aspera*	43	52.2
25	*Crotolaria juncea*	85	5.5

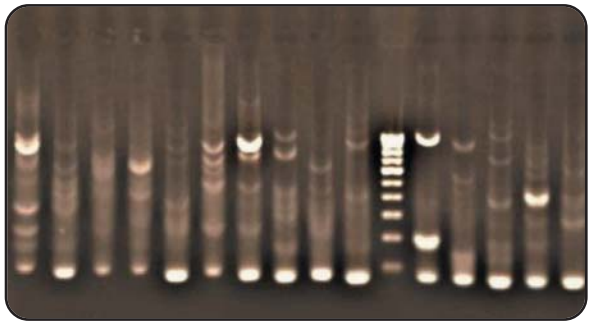
DNA finger printing of coconut varieties and hybrids of Andhra Pradesh

DNA was isolated from varieties, East Coast Tall, Ganga Bondam, Pillalakodi, Jonnalaraasi and hybrid Godavari Ganga. Plant specific primers, OPA and OPM series (each a set of 20 primers) were obtained and RAPD PCR was carried out with the above said genomic DNA. None of the germplasm, except Pillalakodi exhibitied amplification with OPA and OPM series primers. Multiple banding pattern was observed for Pillalakodi variety with OPM series primers. Further, the coconut specific SSR markers were identified from the literature and used for PCR studies with the above said DNAs.

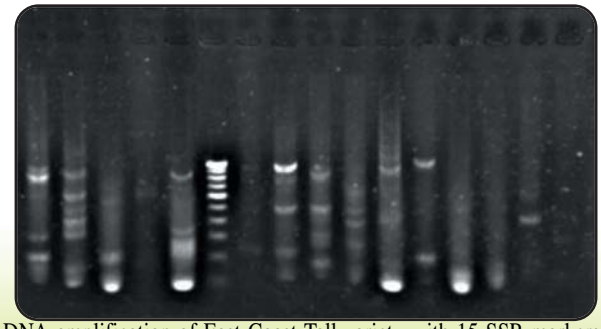
Fifteen coconut specific SSR primers were used for RAPD analysis. All the primers detected amplification in the coconut varieties Gangabondam, Pillalakodi, East Coast Tall and Jonnalaraasi. The number of scorable bands produced by the primers ranged from two to 7. 100% polymorphism was observed in all primers. Studies are in progress with the other varieties for developing the dendrogram and relationship among them.



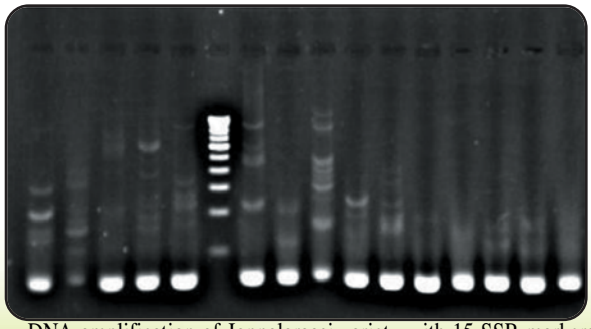
DNA amplification of Gangabondam variety with 15 SSR markers



DNA amplification of Pillalakodi variety with 15 SSR markers



DNA amplification of East Coast Tall variety with 15 SSR markers



DNA amplification of Jonnalaraasi variety with 15 SSR markers

F. SOIL SCIENCE AND AGRONOMY

MANGO

Fruit Research Station, Sangareddy

Evaluation of substrate dynamics for IPNM in mango

During the year, there was no significant difference among different treatments. However, the treatment T_7 (1/2 RDF and 50kg FYM along with 250g Azotobacter) has recorded highest cumulative yield (524.98 kg/tree) from 2005 to 2014.

Development of organic package of practice for mango (*Mangifera indica* L.)

During 2013-14, even though highest number of fruits (195 per tree) was recorded in the trees treated with T_7 (Vermicompost @50 kg/tree along with *Azospirillum* @250 g/tree + PSB @ 50 g/tree and vermiwash spray), it was on par with the treatment T_5 -Vermicompost @ 50 kg/tree and *Azospirillum* @250 g/tree + PSB @250 g/tree (173 per tree).

GUAVA

Fruit Research Station, Sangareddy

Evaluation of substrate dynamics for IPNM in guava

Application of 25 kg of FYM along with 250 g *Azotobacter* has reduced the RDF to half (T7) and recorded highest yield (94.27 kg /tree), cumulative yield (782.71 kg/tree) from 2006 to 2013 as well as higher average fruit weight (295 g).

Development of organic package of practice for guava

The treatment T_1 (FYM @30 kg/tree) has recorded maximum cumulative yield of 205.25 kg/tree from 2011 to 2013 as well as highest benefit to cost ratio (2.33).

GRAPE

Grape Research Station, Rajendranagar

Nutrient content of commercial varieties raised on different rootstocks

At bud differentiation petiole N content was significantly high on all rootstocks except So_4. Whereas at full bloom it was high on Dogridge rootstock. At both bud differentiation and full bloom stages, significantly high petiole P content was recorded in own rooted vines and it was on par with 1103P, while high K content was recorded on own rooted vines which was also on par with Dogridge whereas high Ca content was recorded on So4 which was on par with own roots. In case of petiole Na content, it was significantly high on Dogridge which was on par with ownroot whereas significantly low petiole Na content was recorded with 1103P at both the stages

Special variability of residual soil nutrients in vineyard fertilized for 12 years

It was observed that the pH and EC of soil increased 30 cm away and 30-60 cm below from the point of fertilizer application. There was not much residual build up of nitrogen, whereas there was huge build up of phosphorus and a slight build in potassium level in soil at the point of fertilizer application as compared to the point away from the fertilizer application.

ACIDLIME

Citrus Research Station, Petlur

Organic cultivation of citrus (acid lime) in Petlur selection -1 and Balaji

Among the 10 treatments of acid lime of organic farming experiment T_7 [Vermicompost (On N equivalent basis of RDF) + Trichoderma (harzianum/viride) + Azadirachtin (1% at 3-4 ml/ litre as spray) + Pseudomonas (fluorescense/striata)] recorded maximum height of 71.2 cm and the lowest plant height of 55.8 cm was recorded in [T_6 Vermicompost (On N equivalent basis of RDF) + Trichoderma (harzianum/viride) + Azadirachtin (1 % at 3-4 ml/litre as spray)].

Micronutrient management in acid lime cv. Petlur selection -1

Among the 10 treatments of acid lime of organic farming experiment, treatment T_5 [$ZnSO_4$ Soil application + $FeSO_4$ fermented 2 days in FYM (Slurry) + $MgSO_4$ Soil application] recorded maximum height of 1.42 m and the lowest plant height of 1.11 m was recorded in the treatment T_7 [$ZnSO_4$ foliar spray + $FeSO_4$ foliar spray + $MgSO_4$ foliar spray].

Effect of mulching material on growth and yields of acid lime (Petlur Selection -1)

Among the 7 treatments, treatment T_1&T_6 – 100 microns Black polythene & Sunhemp (green manure) recorded maximum height of 1.94 m and the lowest plant height of 1.46 m was recorded in the treatment T_7 – control.

Survey and monitoring of important nutritional deficiencies of acid lime in Nellore district

Fifteen acid lime orchards were surveyed in different mandals of Nellore district. Out of which twelve gardens were bearing orchards and the remaining three were in pre-bearing stage. Most of the surveyed orchards (60%) displayed visual deficiency symptoms of micronutrients in general and Fe and Zn in particular. Few orchards did not show any deficiency symptoms due to good orchard management. Most of the soils of surveyed orchards were alkaline - calcareous and non-saline in nature.

Water analysis data revealed that the irrigation water used were moderately saline to saline and the electrical conductivity (E.C.) ranged from 0.89 – 2.31 dSm^{-1}. The residual sodium carbonate (RSC) content in all samples was in traces.

The leaf nitrogen concentration was low to moderate, ranging from 1.55 – 2.63%. Some of the orchards were under deficiency range of nitrogen.

V. EXTENSION

A. On Farm Testings (OFTs) & FLDs :

A total of twenty four technologies were assessed/demonstrated by the Krishi Vigyan Kendras Venkatramannagudem and Pandirimamidi to test the performance of selected improved technologies in agriculture, horticulture, fisheries, animal husbandry and home science in order to find their suitability to the climatic conditions in the respective district. The details are as given below:

Krishi Vigyan Kendra, Venkataramannagudem:

Crop/ Enterprise	Season	Title of the programme	Technology Demonstrated	Extension activities
Vegetables	Kharif	Evaluation of Dolichos bean var. RND-1	Assessment of performance of Dolichos bean -RND -1	OFT, field diagnostic visits and pest management
Mango	Rabi	Induction of flowering in mango	1)Pruning of flowered panicles upto 5cm after harvest & recommended dose of fertilizer application 2) Spraying of $Znso_4$ @ 2g/L + Borax @ 2g/L + Urea @ 10g/lt on new flush and KNO_3 @ 10 g/L during October & November.	Field visits, literature, demonstration
Flowers	Rabi	Introduction of marigold var. Pusa Narangi	Assessment of performance of marigold var. Pusa Narangi	FLDs, field visits & disease management
Paddy	Kharif	Direct seeding in paddy	Weed management in Drumseeder cultivation in rabi paddy	Field day, diagnostic visits, field visits & method demonstration
Maize	Rabi	STBFR in rabi maize	Application of Zinc Sulphate to control Zinc deficiency in rabi maize	FLDs, field day & diagnostic visits
Blackgram	Rabi	Performance of bio fertilizers in blackgram	YMV resistant blackgram variety PU-31	FLD, field diagnostic visit & pest and disease management
Paddy	Rabi	Evaluation of paddy varieties MTU-1010 vs MTU-1121	MTU-1121 having features of non lodging. palatable, good for cooking, non grain shredding, resistant to BPH, medium duration (135 days) and high yielding.	FLD, field diagnostic visit & pest and disease management
Fisheries	Kharif	Introduction of murrel culture along with IMC in small culture tanks	Murrel fish has good market price and the 200 plankton in the pond can be effectively used	OFT, seed release and field visits

Krishi Vigyan Kendra, Pandirimamidi:

Crop/ Enterprise	Season	Title of the programme	Technology Demonstrated	Extension activities
Mango	Rabi	Induction of flowering in mango	1)Pruning of flowered panicles upto 5cm after harvest & recommended dose of fertilizer application 2) Spraying of $Znso_4$ @ 2g/L + Borax @ 2g/L + Urea @ 10g/l on new flush and KNO_3 @ 10 g/L during October & November	OFT, field diagnostic visits and pest management
Turmericc	Kharif	Introduction of turmeric cv.Selam	Turmeric cv. Selam and RDF (last ploughing-FYM-10t, neem Powder-200kg, SSP-150kg, MOP-25kg;40 DAP-neem powder-200kg, Urea-50kg;80 & 120 DAP - Urea-50kg, MOP-25kg per acre	Field visits
Cashew	Rabi	Management of Tea mosquito bug and inflorescence blight in cashew	Scheduled spraying with 20 days interval (I) Chloropyriphos @ 2.5 ml/L + Copper oxy Chloride @ 3g/L, January month (II) Profenophos @ 1 ml/L + Carbendazim @ 1g/L - February month (III) Lambda Cyhalothrin @ 1.2ml/L + Mancozeb @ 2.5 g/L - March month	Field visits, literature, demonstration and field day
Paddy	Rabi	Introduction of short duration paddy variety	Short duration paddy variety JGL-17004, need based pesticides spraying and balanced fertilizer application	Field visits, literature, demonstration and field day
Paddy	Kharifc	Evaluation of hybrid rice DRRH-3	Hybrid rice in SRI method	Field visits, literature, demonstration and field day
Mango	Kharif/Rabi	Management of flower and fruit drop in mango	Spraying of Planofix @ 1ml/4.5 L at peanut stage & and lemon fruit size + spraying of urea@10g/L at peanut size & after 20 days.	Field visits, literature, demonstration
Cashew	Kharif/Rabi	Rejuvenation of old/senile cashew orchards	Pruning after harvesting and application of recommended dose of fertilizer application +Application of Chloropyriphos 2.5ml on new flush	Field visits, literature, demonstration

Sweet Orange	Kharif/Rabi	Correction of micro nutrient deficiency in sweet orange	Applicatoin of IIHR special (Citrus special) 75g/15 L of water on new flush and at peanut size	Field visits, literature, demonstration
Blackgram	Rabi	Demonstration on blackgram variety PU-31	Introducing resistant variety PU-31 seed treatment with Imidacloprid @ 5gr/1kg, need based sprayings with Acetamiprid @ 0.2g/L at 30 DAS followed by spraying with chlorpyriphos @ 2.5ml/Lat 45 DAS followed by Acephate @ 1.5 g/L at 60 DAS stage.	Field visits, literature, demonstration and field day
Paddy	Kharif	Integrated pest management in paddy MTU - 1075	a) Application of carbofuran granules in nursery @ 160 g/cent b) Application of Cartap hydrochloride granules in main field @ 8kg/acre at 20 DAP c) Acephate spray @ 1.5g/L at 50 DAP d) Cartap hydrochloride 50% SP spray @ 2g/L at 80 DAP	Field visits, literature, demonstration and field day
Gingelly	Rabi	Demonstration of high yielding gingelly variety	YLM-66 (Sarada), need based sprayings.	Field visits, literature, demonstration and field day
Ragi	Rabi	Demonstration of white seeded ragi variety	Ragi seed(VRW-936)	Field visits, literature, demonstration and field day
Poultry	2013-14	Promotion of backyard poultry	Vanaraja birds	Field visits and vaccination
Kitchen garden	Rabi	Promotion of backyard kitchen garden	Vegetable seed (bhendi, clusterbean, cucumber, palak, amaranthus, ridgegourd, bottlegourd, bittergourd, methi, coriander etc.)	Field visits
Fisheries	Kharif/Rabi	Composite fish culture	Catla, Rohu, CC fish fingerlings and rice bran	Field visits
Fodder	Kharif/Rabi	Fodder production	Co-4, barseem	Field visits

Evaluation of Hybrid Rice ($DRRH_3$)

Introduction of Short duration Paddy variety

Introduction of Turmeric cv.Salem

Management of Tea mosquito bug and inflorescence blight in Cashew

Management of flower and fruit drop in mango

Rejuvenation of old/senile Cashew orchards

Correction of micro nutrient deficiency in sweet orange

Demonstration on blackgram variety PU-31

Integrated pest managent in Paddy MTU - 1075

Demonstration of white seeded ragi variety VRW - 936

Demonstration of high yielding sorghum variety PSV-56

Promotion of backyard poultry

Composite fish culture

Promotion of Maize cultivation in Addateegala block

B. Training Programmes Conducted:

Krishi Vigyan Kendras:

Training being one of the mandate of KVKs, about fourteen training programmes including the vocational programmes were conducted with a duration of one to six days to improve skills of farmers and rural youth. The details of the programmes conducted are:

Krishi Vigyan Kendra, Venkataramannagudem

Seven one day (both on & off campus) training programmes were conducted viz. Production and Usage of Organic Manures & Bio fertilizers"(3.4.2013), "Scientific dairy management" to dairy enterprenures & PKP beneficieries (23.03.2013), "Parthenium weed eradication"(21.08.2013), "Mango seasonal crop management practices" (3.2.2014), "Cocoa cultivation, pest & disease management" (5.2.2014), & "Oil palm cultivation" at Krishnapuram, KVK, Prakashraopalem, Telikicharla, Kalavalapalli, and Venkataramannagudem Villages by the KVK technical team Dr.E.Karuna Sree, Programme Co-ordinator, Dr.K.Vijaya Prakash, SMS (V.Sci), Ch.Kiran Kumar, SMS (SSAC) and Ms.S.Visala, RA (Horti).

On campus training progrmames conducted at KVK, V.R.gudem

Off campus training programmes condcted at Krishnapuram, PRpalem, Telikicharla & Kalavalapalli villages by the technical team of KVK, V.R.Gudem

Vocational Trainings Programmes:

Four vocational training programmes including the sponsored training programmes by the Coconut Development Board, Hyderbad, Andhra Bank Institute of Rural Development, Eluru were conducted as detailed below: A three days vocational training on "Millet based bakery products preparation" to 25 rural young girls in KVK operational area from 12th – 14th November, 2013 by Dr. E. Karuna Sree, Programme Coordinator, KVK, V.R.gudem A six days skill development training programme was conducted by Dr.E.Karunasree, Programme Co-ordinator, Kum. S.Vishala, RA (Hort.) on "Mushroom cultivation" at KVK, Venkataramannagudem.

Sponsored Training Programmes

Conducted two training programmes of six days duration on "Friends of Coconut Tree (FoCT)" from 20.01.2014 to 25.01.2014& 24.03.2014 to 29.03.2014 with the collaboration of Coconut Development Board (CDB), Kochi. In which 40 coconut climbers were trained on the use of palm climbing device and on successful completion of the training, a palm climbing device, certificate and one year free accidental insurance was given to the trainees.

Officials of CDB, Hyderabad & University Officers, Dr YSRHU interacting with the trainees

KVK, Pandirimamidi: The detais of training progrmmes conducted by KVK, East Godavari are as follows:

Sl. No	Title of the programme	Sponsored Institution	Date	No. of participants/ demonstrations
1	Promotion of Maize cultivation in Addateegala block of East Godavari District	ATMA, East Godavari District	18.12.2013	50
2	Promotion of Maize cultivation in East Godavari District	DMR, New Delhi	19.12.2013	50
3	**Capacity building training programmes in Korukonda block**			
	1.Backyard poultry management	ATMA, East Godavari District	20.02.2014	50
	2.Maize cultivation and management practices	ATMA, East Godavari District	21.02.2014	50
	3.Off season vegetable cultivation	ATMA, East Godavari District	22.02.2014	50
	4. Summer vegetable cultivation	ATMA, East Godavari District	01.03.2014	50
	5. Summer vegetable cultivation	ATMA, East Godavari District	03.03.2014	50
4	**Technology demonstrations in Rampachodavaram, Korukonda, Jaggampeta block**			
	1. Promotion of kitchen gardening	ATMA,	Rabi 2013-14	07
	2. Introduction of fodder variety Co4	ATMA, East Godavari District	Rabi 2013-14	04
	3. Introduction of Azolla cultivation	ATMA, East Godavari District	Rabi 2013-14	01
	4. Introduction of backyard poultry	ATMA, East Godavari District	Rabi 2013-14	17
	5. Introduction of sweet corn	ATMA, East Godavari District	Rabi 2013-14	01
	6. Tea mosquitobug management in Cashew	ATMA, East Godavari District	Rabi 2013-14	03
	7. Fish seed stocking	ATMA, East Godavari District	Rabi 2013-14	03
			Total	**386**

Training programe on Backyard poultry management

Training programme on off season vegetable cultivation

Training programme on Promotion of Maize Cultivation

Research Stations: A total of seventeen training programmes were conducted by the research station to impart the latest technologies on fruit, spice, plantation and medicinal plants as follows:

Horticultural Research Station, Ambajipeta:

- Dr. G. Ramanandam, Principal Scientist (Hort.) & Head and Dr. N. B. V. Chalapathi Rao, Senior Scientist (Ent.), conducted farmers training and awareness (FTA) programme at Nakkavaripeta, Mummidivaram mandal on 02.05.2013.
- Dr. G. Ramanandam, Principal Scientist (Hort.) & Head and Dr.N.B.V.Chalapathi Rao, Senior Scientist (Ent.), conducted an awareness meeting on coconut pest management at Rayavaram village of Visakhapatnam on 27.05.13.
- Dr. G. Ramanandam, Principal Scientist (Hort.) & Head and Dr.N.B.V.Chalapathi Rao, Senior Scientist (Ent.), conducted an awareness meeting on coconut black headed caterpillar management at Thotada Junction of Anakapalli on 28.05.13.

On & Off campus trainings conducted by HRS, Ambaji pet

- Dr. G. Ramanandam, Principal Scientist (Hort.) & Head and Dr.N.B.V.Chalapathi Rao, Senior Scientist (Ent.), conducted an awareness meeting on leaf eating caterpillars of coconut and their management at Horticultural Research Station, Ambajipeta to the Horticultural Department officials of East & West Godavari districts on 29.05.13. Dr. B.V.K.Bhagawan, Zonal Research Head attended the meeting.
- Dr. G. Ramanandam, Principal Scientist (Hort.) & Head, Dr. N.B.V. Chalapathi Rao, Senior Scientist (Ent.), conducted an awareness meeting on "Coconut slug caterpillar management" at Gondi Village of East Godavari district on 30.05.13.
- Dr.G.Ramanandam, Principal Scientist (Hort.) & Head, Dr.N.B.V.Chalapathi Rao, Senior Scientist (Ent.), and Smt.E.Padma, Scientist, (Hort.) organized a three day training programme on Cocoa at Tuni from 27th -29th June, 2013 funded by DCCD.

Cocoa training programme in Tuni

FoCT training programme 4th batch

- Horticultural Research Station, Ambajipeta celebrated the World Coconut Day on 2nd September, 2013 as state level function and conducted Farmer Scientists interaction meeting in which Dr. G. Ramanandam, Principal Scientist (Hort.) & Head, Sri. K. Ravindra Kumar Scientist (Hort.) & Dr.A.Snehalatha Rani, Scientist (Plant Pathology), Horticultural Research Station, Ambajipeta explained about the importance and management of coconut orchards.

World Coconut Day celebrated at HRS, Ambajipeta

Sri. M. Mukteswara Rao, Vemulapalli felicitated as best coconut farmer

Farmers interaction meeting at Mukkammala

- Dr. G. Ramanandam, Principal Scientist (Hort.) & Head, Dr. N.B.V. Chalapathi Rao, Senior Scientist (Entomology) and Dr. A. Snehalatha Rani, Scientist (Pl. Path.) participated in an interaction meeting organized by Bharatiya Kisan Sangh, Konaseema division on nature of damage caused by Helen cyclone to the horticultural crops and the extent of damage at Amalapuram and participated in a field day on organic farming at Mukkamala organized by RAWEP students and Abhyudaya Karshaka Parishath, Mukkamala on 30.11.13.
- Horticultural Research Station, Ambajipeta in collaboration with Department of Horticulture conducted an interaction meeting with farmers on rejuvenation of coconut gardens affected by Helen cyclone on 04.12.2013.
- Horticultural Research Station, Ambajipeta conducted rythu sadassu on "coconut and coconut based cropping systems for sustainable returns". A total of 60 farmers have participated including 20 RAWEP students from HC & RI, Venkataramannagudem on 23.12.13.

Cashew Research Station, Bapatla

District level seminar on "Advances in Cashew Production Technology" was organized by Sri K. UmaMaheswara Rao, Scientist (Hort) & Head at NGO Home, Narsipatnam, Visakapatnam (Dist) on 11.03.2014 in association with ITDA, Paderu. The programme was sponsored by DCCD, Cochin for the benefit of cashew farmers in the tribal area. About 200 farmers from Koyyuru, Kasimkota, Anakapalli and Narsipatnam mandal have participated.

Training programme on Cashew at Narsipatnam

Horticultural Research Station, Lam

Five farmers training programmes were organized under CSS (NHM) programme sponsored by DASD, Calicut on chilli, turmeric and grain spices. Scientists of HRS, Lam have participated and delivered lectures on the relevant subjects.

Horticultural Research Station, Mahanandi:

Training programme on "AJWAN" crop

Training programme on "AJWAN" crop in Molagavalli village, Alur Mandal was organized by Dr. Ch. Ruth Scientist (Pl.Path) & Dr. Naram Naidu PS (Hort.), Dr. Surya Kumari PS (Hort.) and Dr. Giridhar Scientist (Hort.), from HRS,Lam, Guntur on 05-03-14, in which Alur Agri. Officer, Adarsa Rythulu and 150 farmers have participated and learned about the cultivation aspects of grain spices in general and Ajwain in particular.

Medicinal and Aromatic Plants Research Station, Rajendranagar:

Training programmes (4 Nos.) were conducted under the project Facilitation Centre sanctioned by National Medicinal and Aromatic Plants Board, New Delhi involving the other institutions like KVKs, DAATCs and TTDCs as follows:

Date	Location	Title of the Training programme	No. of Participants
13-11-2013	KVK, Jammikunta, Karimnagar Dist	Cultivation and marketing of Medicinal plants	86
22-11-2013	KVK Madanapuram, Kothakota, Mahaboobnagar	Cultivation and marketing of Medicinal plants	59
25-1-2014	DAATT Centre, Kurnool	Cultivation and marketing of Medicinal plants	113
22-2-2014	TTDC, Adilabad	Cultivation and marketing of Medicinal plants	111

Trainings at various locations conducted on Cultivation & Marketing aspects of Medicinal Plants (1. KVK, Karimnagar, 2. KVK, Mahaboobnagar, 3. DAATTC, Kurnool & 4. TTDC, Adilabad)

District level Training programme conducted on Cultivation of aromatic plants on 24-3-2014 under National Horticultural Mission (NHM) at Auditorium, ANGRAU, Rajendranagar, Hyderabad.

Fruit Research Station, Sangareddy

- Scientists of Fruit Research Station, Sangareddy organized one day awareness cum training programme on "Nursery Accreditation and Rating procedure and orchard management" to nursery men on 22-02-2014.
- Organized one day e-SHORT training programme to Horticultural Officers of Telangana region on 22-02-2014. The Director of Research, Dr YSRHU & the Commissioner of Horticulture has distributed hand held devices to the trainees.



e-SHORT Programme at HRS, Sangareddy&HRS, Kovvuru - Distribution of hand held devices to HOs

- Organized five NAIP training programmes on "Production Technology of Mango and Guava" at Pinireddy gudem, Garla (M) Khammam (D) on 10-10-2013 Ramaram (V), Gundala (M), Nalgonda (D) on 21-10-2013 Madikonda (V) Hanumakonda, Warangal (D) on 22-10-2013 Kallur (V) Khammam (D) on 26-10-2013 & Mahaboobnagar on 28-10-2013 by Dr. A. Kiran Kumar, Senior Scientist (Hort), HRS, Sangareddy.
- Training programme on e-SHORT project was conducted and distributed hand held devices to Horticultural officers of Andhra Pradesh region at HRS, Kovvur from 11-03-2014 to 13-03-2014, by Dr. A. Kiran Kumar, Senior Scientist (Hort.), HRS, Sangareddy.
- Dr.A.Kiran Kumar, Senior Scientist (Hort) organized a training programme on e-SHORT project and distributed hand held devices to Horticultural officers of Rayalseema region at CRS, Tirupathi from 19-03-2014 to 21-03-2014.
- Dr.M.Raj Kumar, Principal Scientist (Hort) & Head and Dr.A. Kiran Kumar, Senior Scientist (Hort) conducted a brain storming session on "Ginger cultivation" at Ranzole village in Zaheerabad mandal on 15-3-2014.

C. Diagnostic Visits :

KRISHI VIGYAN KENDRAS :

Krishi Vigyan Kendra, Venkataramannagudem:

The technical team of KVK proceeded to different villages of West Godavari district for diagnostic visits (153 No's) in Agriculture, Horticulture, Animal Husbandry and Fisheries and suggested remedial measures.

Details of Diagnostic Visits Conducted by Krishi Vigyan Kendra, Venkataramannagudem:

Date	Problems noticed	Village	Scientist participated
10.04.13	Filed diagnostic visit to Paddy field	Kaldari	Ch. Kiran Kumar, SMS (SSAC)
12.04.13	Visit to fertilizer recommendation in Maize	Chodavaram	Ch. Kiran Kumar,SMS (SSAC)
16.04.13	Field diagnostic visit in Blackgram	Telikicharla	Ch. Kiran Kumar,SMS (SSAC)
26.04.13	Field diagnostic visit in FLD Boran application in Cucurbits	Ramannagudem & Venkataramannagudem	Dr. E. Karuna Sree, PC & S. Visala, RA (Hort.)
27.04.13	Performance of Bio fertilizer in Blackgram	Telikicharla & Venkataramannagudem	Dr. E. Karuna Sree, PC Ch. Kiran Kumar, SMS (SSAC)
21.05.13	Identification of multi nutritional deficiencies in guava garden and suggested for two micro nutrient sprays @ 5 g/L with 1 days interval	Avupadu	Ch. Kiran Kumar, SMS (SSAC) & Dr. A. Ashok, Scientist, HRS, Vrgudem
30.05.13	Diagnostic visit to Paddy fields	Gundugolanu	Ch. Kiran Kumar, SMS (SSAC)
13.06.13	Visited Shrimp culture fields and suggested for feed management by check tray method	Allampuram	N. Veerabhadra Rao SMS (Fisheries)
17.06.13	Identified root wilt and micro nutrient deficiencies Guava orchards and suggested drenching with COC @ 3g/L and micro nutrient spray @ 5g/L.	V.R.Gudem and Vellamilli	Dr. E. Karuna Sree, PC & S. Visala, RA (Hort.)
7.06.13	Field diagnostic visit to fish culture ponds for disease management and suggested for application of Ivermethrin @ 1kg/ac.	Ramapuram	N. Veerabhadra Rao, SMS (Fisheries)
08.07.13	Observed YMV incidence in greengram and blackgram fields and suggested to go for resistant varieties	A. Gokavaram, Narayanapuram and Chinna vellamilli	Ch. Kiran Kumar, SMS (SSAC)
29.07.13	Visited paddy fields and suggested weed management in director sown paddy through use of chemicals	kaldari	Dr. E. Karuna Sree, PC & Ch. Kiran Kumar, SMS (SSAC)
30.07.13	Field diagnostic visit for paddy and blackgram fields	Telikicharla & Ramannagudem	Dr. E. Karuna Sree, PC & Ch. Kiran Kumar, SMS (SSAC)
31.07.13	Filed diagnostic visit to Fish ponds suggested for pettlted feed for maintenance of water quality in culture ponds	Rachuru	N. Veerabhadra Rao, SMS (Fisheries)

06.08.13	Visited to paddy fields and suggested application of zinc as foliar spray @ 2g/L	Telikicharla	Dr. E. Karuna Sree, PC & Ch. Kiran Kumar, SMS (SSAC)
07.08.13	Weed management in direct sown paddy	V.R.Gudem	Ch. Kiran Kumar, SMS (SSAC)
13.08.13	Visited Guava orchards for demonstration of pruning technology	Kadiayadda	Dr. E. Karuna Sree, PC & S. Visala, RA (Horti)
19.08.13	Visited to paddy INM OFT plots & suggested application of N & K as top dressing	Telikicharla & chodavaram	Dr. E. Karuna Sree, PC, Ch. Kiran Kumar, SMS (SSAC)
24.08.13	Diagnostic visit to paddy fields	V.R.Gudem	Ch. Kiran Kumar, SMS (SSAC)
30.08.13	Field visit and farmers interaction	Chodavaram	Dr. E. Karuna Sree, PC, Ch. Kiran Kumar, SMS (SSAC) & S. Visala, RA (Hort.)
18.09.13	Diagnostic visit to blackgram fields	Prakasaraopalem	Ch. Kiran Kumar, SMS (SSAC)
25.09.13	Diagnostic visit to top worked mango orchard and suggested to leave a single branch to supplement nutrition to the tree till new flesh grows.	Lemalla, Krishna District	Dr. M.B.N. Rao, Director of Extension & Dr. E. Karuna Sree, PC
05.10.13	Filed diagnostic visit to guava field	Kadiyadda	Dr. E. Karuna Sree, PC & S. Visala, RA (Hort.)
08.10.13	Diagnostic visit to vegetable fields	Telikicharla	Dr. E. Karuna Sree, PC & S. Visala RA (Horti)
25.10.13	Field visit in flood effected areas and suggested contingency plan to Practicing Farmers	Chodavaram & Telikicherla	Ch. Kiran Kumar, SMS (SSAC) & S. Visala, RA (Hort.)
28.10.13	Field visit in flood effected areas and suggested contingency plan to Practicing Farmers	Tadepalligudem & Nandamuru	Dr. E. Karuna Sree, PC, & Ch. Kiran Kumar, SMS (SSAC)
04.11.13	Diagnostic visit to blackgram and paddy fields	Telikicharla & V.R.Gudem and Kaldari	Ch. Kiran Kumar, SMS (SSAC)
12.11.13	Diagnostic visit to blackgram fields	Telikicharla & Prakasaraopalem	Ch. Kiran Kumar, SMS (SSAC)
15.11.13	Visited vegetable nursery	Chagallu	Dr. E. Karuna Sree, PC & S. Visala, RA (Hort.)
19.11.13	Visited guava orchards and suggested control measures against wilt	Nallamadu	Ch. Kiran Kumar, SMS (SSAC) & S. Visala, RA (Horti)
22.11.13	Diagnostic visit to paddy fields	Settipeta	Ch. Kiran Kumar, SMS (SSAC)
25.11.13	Diagnostic visit in Helen cyclone effected areas	PR palem, Telikicharla & Chodavaram	Dr. E. Karuna Sree, PC, Ch. Kiran Kumar, SMS (SSAC) & S. Visala, RA (Hort.)

25.11.13	Diagnostic visit in Helen cyclone effected areas	PR palem, Telikicharla & Chodavaram	Dr. E. Karuna Sree, PC, Ch. Kiran Kumar, SMS (SSAC) & S. Visala, RA (Hort.)
26.11.13	Diagnostic visit with DAATTC,Eluru for flood effected areas	Palakollu & Narsapuram	S. Visala, RA (Hort.)
27.11.13	Diagnostic visit in paddy fields with university expert team	Palakollu, Mogalturu	Ch. Kiran Kumar, SMS (SSAC) & S. Visala, RA (Hort.)
06.12.13	Field diagnostic visit to maize filed	Chodavaram	Ch. Kiran Kumar, SMS (SSAC)
24.01.14	Field diagnostic visit to drumstic field	Pentapadu village	Dr. E. Karuna Sree, PC & S. Visala, RA (Hort.)
12.02.14	Diagnostic visit in Paddy field	V.R.Gudem and Telikicherla	Ch. Kiran Kumar SMS (SSAC)
14.02.14	Field visit to Vegetable crops and suggested control measures	Jaggannapet & Ramannagudem	Dr. E. Karuna Sree, PC & S. Visala, RA (Hort.)
21.02.14	Diagnostic visit to guava orchards.	Kadiyadda	Dr. E. Karuna Sree, PC & S. Visala, RA (Hort.)
28.02.14	Diagnostic visit to Rabi paddy fields	Jagannapeta	Ch. Kiran Kumar, SMS (SSAC)
15.03.14	Field diagnostic visit in mango fields	Prakasaraopalem	Dr. E. Karuna Sree, PC & S. Visala, RA (Hort.)
18.03.14	Field diagnostic visit in mango orchards	V.R.Gudem	Dr. E. Karuna Sree, PC & S. Visala, RA (Hort.)
20.03.14	Field diagnostic visit to Vegetable crops	Prakasaraopalem	Dr. E. Karuna Sree, PC & S. Visala, RA (Hort.)
21.03.14	Field diagnostic visit to paddy drumseeder cultivation and mango orchards	Venkataramannagudem and Jaggannapeta	Ch. Kiran Kumar, SMS (SSAC)

Glimpses of field diagnostic visits conducted by technical team of KVK, VRG

RESEARCH STATIONS:

Hortiucltural Research Station – Ambajipet

Date	Problems noticed	Village	Scientist participated
03.04.13	Incidence of coconut black headed caterpillar and released the parasitoids	Dwarapudi, East Godavari	Dr. N.B.V. Chalapathi Rao
11.04.13	Incidence of coconut black headed caterpillar and released the parasitoids	Gachakayalapora, Pallamkurru, & S.Yanam, East Godavari	Dr. N.B.V. Chalapathi Rao
24.04.13	Incidence of coconut black headed caterpillar and released the parasitoids	Gundepudi, East Godavari	Dr. N.B.V. . Chalapathi Rao
26.04.13	Incidence of coconut black headed caterpillar and released the parasitoids	Dindi, East Godavari	Dr. N.B.V. Chalapathi Rao
9.05.13	Incidence of coconut black headed caterpillar and slug infested gardens and released the parasitoids	Chinchinada, Badava, narsapuram &Marteru, West Godavari	Dr. N.B.V. Chalapathi Rao
17.05.13 19.05.13	Collected elite palms data for & coconut germplasm	Guntur & Krishna districts	Dr. G. Ramanandam & Dr.N.B.V. Chalapathi Rao
2.06.13 3.06.13.	Incidence of coconut black & headed caterpillar and slug infested gardens and released the parasitoids	Visakhapatnam distirct	Dr. N.B.V. Chalapathi Rao
15.07.13	Incidence of coconut black headed caterpillar and slug infested gardens and released the parasitoids	Gachakayalapora & S.Yanam, East Godavari	Dr. N.B.V. Chalapathi Rao
19.07.13	Incidence of coconut black headed caterpillar and slug infested gardens and released the parasitoids	Dwarapudi, East Godavari	Dr. G. Ramanandam & Dr.N.B.V. Chalapathi Rao
30.08.13	Incidence of coconut black headed caterpillar and slug infested gardens and released the parasitoids	Gollagondi & Baruva, Srikakulam district	Dr. G. Ramanandam
14.10.13 to 20.10.13	phailin cyclone affected gardens of coconut	kaviti, Sompeta, Ichapuram, Palasa, Santabommali, Kalingapatnam, Tekkali, Katabommali, Narasannapeta mandals of Srikakulam district	Dr. G. Ramanandam & Dr.N.B.V. Chalapathi Rao

30.10.2013	flood affected horticultural crops	treyapuram, P.Gannavaram, Alamuru, Ravulapalem, Kothapeta mandals of East Godavari	Dr. G. Ramanandam & Dr.N.B.V. Chalapathi Rao
17.11.13	Incidence of coconut black headed caterpillar and slug infested gardens and released the parasitoids	Pidingoyyi, East Godavari	Dr. N.B.V. Chalapathi Rao
23.11.13	Helen cyclone affected areas	Allavaram, Katrinikona D.Donthamuru, Amalapuram &Vodalrevu, East Godavari	Dr. G. Ramanandam & Dr.N.B.V. Chalapathi Rao
24.11.13	Helen cyclone affected horticultural crops	Ambajipeta, P.Gannavaram, Malkipuram, Sakinetipalli Razole, I.Polavaram, Tallarevu mandals of East Godavari district and Bhimavaram, Mogalthuru mandals of West Godavari district and Kruttivennu, Bantumilli mandals of Krishna district	Dr. G. Ramanandam, Dr. N.B.V. Chalapathi Rao, Sri. K. Ravindra Kumar and Dr.A.Snehalatha Rani
26.11.13	Helen cyclone affected horticultural crops	Yalamanchili, Narsapuram, West Godavari & Bantumilli and Badava, East Godavari	Dr. G. Ramanandam, Dr. N.B.V. Chalapathi Rao and Dr. A.Snehalatha Rani
18.03.14	Incidence of coconut black headed caterpillar and slug infested gardens and released the parasitoids	Gollagondi & Baruva, Srikakulam district	Dr. G. Ramanandam

Horticultural Research Station – Ananthapur

Dr. K. Subramanyam, Principal Scientist & Head visited guava and pomegranate gardens at Iruvendala on 18-4-2013 and Kanekal on 29-6-2013 to suggest improved management practices. Dr.B.Srinivasulu, Senior Scientist (Hort.) visited papaya garden at Donlamakulapalli on 17-5-2013 and suggested best management practices for higher yields.


Field diagnostic visit to pomegranate and papaya gardens

Horticultural Research Station – Kovvur

Date	Problems noticed	Village	Scientist participated
04-11-13 & 5-11-13	Visited the flood effected fields and suggested revival measures	East Godavari and Vizianagaram Districts	Smt K Mamatha, Scientist (Hort) and Dr.T. Rajashekharam, Scientist (PP)
21.11.13 22.11.13	Visited the flood affected & areas and suggested the revival measures	West Godavari District	Dr.M.M.Naidu, Senior Scientist (Hort) and Dr T. Rajashekharam, Scientist (PP)
26-11-13	Visited the Helen cyclone affected areas and suggested the revival measures.	East and West Godavari Districts	Dr B.V.K.Bhagavan, PS (Hort.)

Horticultural Research Station, Lam

Date	Problems noticed	Village	Scientist participated
26-11-2013	Diagnostic visit in chilli fields	Warangal.	Dr.L.Naram Naidu, Principal Scientist (Hort.)
13-12-2013	Diagnostic visit in beans fields	Hanumanjunction and adjoining villages in Krishna district	Dr.L.Naram Naidu, Principal Scientist (Hort.)
30.12.2013	inspected the crop failure field of chilli hybrid Anuj (welcome company)	Kondrupaka village in Gollapalli mandal of Karimnagar district	Dr. C.Venkata Ramana, Scientist (Hort), LAM, Guntur &Dr. R.V.S.K. Reddy, Principal Scientist (Hort.), VRS, Rajendranagar
30.12.2013	Visited turmeric fields (prathibha variety)	Gundimeda, Morampudi and Kunchanapalli villages of Krishna district	Dr. S.Surya Kumari, Principal Scientist (Hort.) & Sri K.Giridhar, Scientist (Hort.)
21-1-2014	Diagnostic survey on crop failure of brinjal	Yanamadala	Dr.C.Sarada, Senior Scientist (Hort.)
14-2-2014	Attended survey on crop failure of chilli	Jupudi village of Amaravathi mandal	Dr.C.Sarada, Senior Scientist (Hort.)
28-2-2014	Attended field visit of turmeric	Eepuru village of Kollur mandal	Dr. S.Surya Kumari, Principal Scientist (Hort.) & Sri K.Giridhar, Scientist (Hort.)

3-3-2014.	Inspected on farm demonstrations (minikits) of LCA 620 and LCA-625	Mandepudi village of Guntur district	Dr. L. Naram Naidu, Principal Scientist (Hort.), Dr.C.Venkata Ramana, Scientist (Hort.) & Smt. A.Rajani, Scientist (Hort.)
5-3-2014.	Inspected on farm demonstrations (minikits) of LCA 620 and LCA-625	Punuru village of Yaddanapudi mandal in Prakasam district	Dr. L. Naram Naidu, Principal Scientist (Hort.), Dr.C.Venkata Ramana, Scientist (Hort.) & Smt. A.Rajani, Scientist (Hort.)
15th to 17th October, 2013	As a member of disaster management team, attended survey in phailin cyclone affected fields of horticultural crops	Srikakaulam district	Dr.L.Naram Naidu, Principal Scientist (Hort.)
31-10-2013	Surveyed the cyclone affected fields of horticultural crops in along with ADH, Guntur – II.	Ponnur Division, Guntur district	Smt. A. Rajani, Scientist (Hort.)
01-11-2013	Surveyed the cyclone affected areas to assess the horticultural crop damage along with ADH, Guntur – II.	Kolluru, Epuru, Munnangi, Pidparthipalem, Kollipara of Tenali division	Smt. T.Vijaya lakshmi, Scientist (Pathology)
05-11-2013	Visited chilli fields to record the problems after floods (heavy rains) as part of e-short programme	Amaravathi and Satenapalli	Dr. C.Venkata Ramana, Scientist (Hort.)
28-10-2013	Attended survey to assess the flood damage in jasmine and brinjal crops along with JDA and DD, ATMA.	Vedullapalli village	Dr.C.Sarada, Senior Scientist (Hort.)

Horticultural Research Station - Mahanandi

Date	Problems noticed	Village	Scientist participated
18-11-13 & 20-11-13	Conducted field visit inTurmeric crop and observed yellowing of leaves due to potassium deficiency and drying of leaves due to leaf spot	Gajulapalli and Billalapuram villages	Dr. Ch. Ruth,Scientist (Pl.path) & Head
24.10.2013	Identified early blight in tomato	Banaganapalli	Dr. Ch. Ruth,Scientist (Pl.path) & Head

Mango Research Station - Nuzvid

Date	Problems noticed	Village	Scientist participated
26-6-2013	Participated in field visits and advised farmers during fruit growth stages in mango organized by NESTHAM, NGO	G.Konduru, Teladevarapadu, Pitrampadu, Munagapadu, Sunnampadu, Gangineni, Dugiralapadu	Smt. D.Aparna, Scientist (Hort.) & Head

Horticultural Research Station - Pandirimamidi

Date	Problems noticed	Village	Scientist participated
08.07.13	Observed wilt in marigold and suggested recommendations	Folkapeta	Dr.K.Rajendra Prasad, Scientist (Hort.)
18.10. 13 to 23.10. 13	Diagnostic visit in Phailin effected horticultural crops in different mandals and also suggested the curative measures to the farmers and extension functionaries	Srikakulam	Dr.K.Rajendra Prasad, Scientist (Hort.)
29.10.2013 to 1.11.2013	Diagnostic visit on Phailin effected Srikakulam and also attended the review meeting conducted by Hon'ble Chief minister of A.P Sri.N.Kiran kumar Reddy on Phailin affected areas	Srikakulam	Sri.G.N.Murthy, Scientist (Hort.) & Head Dr.K.Rajendra Prasad, Scientist (Hort.)
20.02.14	Horticulture department nursery inspection along with ADH-I	Tetagunta	Dr.K.Rajendra Prasad, Scientist (Hort.)
14.03.14	Diagnostic visit on cashew for Tea mosquito and mealy bug along with Horticultural officer	Rampa yarrampalem	Dr.K.Rajendra Prasad, Scientist (Hort.)
30.4.2013	Diagnostic visit in cashew orchards and pineapple for pests and diseases	Kota	G.Narasimha Murthy, Scientist (Hort.)
31.5.2013	Diagnostic visit on cashew for pests and diseases	Chelakaveedhi	G.Narasimha Murthy, Scientist (Hort.)
22.6.2013	Conducted diagnostic survey on vegetable crops	Regulapadu and Timmuru	G.Narasimha Murthy, Scientist (Hort.)
14.10.2013 to 19.10.2013	Diagnostic visit on Phailin effected horticultural crops in different mandals and also suggested the curative measures to the farmers and extension functionaries	Srikakulam district	G.Narasimha Murthy,Scientist (Hort.)

Grape Research Station, Rajendranagar

Date	Problems noticed	Village	Scientist participated
14th and 15th March 2014	Survey of hailstorm affected areas: A survey was conducted on the extent of damage caused due to recent extreme weather events	Parvathapur (Zaheerabad), Yadaram (Shameerpet) & Komaravelli (Siddipeta)	scientists of AICRP on fruits (Grape)
14.10.2013 to 19.10.2013	Assessed crop loss in cyclone affected areas of Ranga Reddy Dist. Surveyed vineyards for recording the incidence of pests, disease and nutritional disorders in the commercial vineyards	Surrounding villages of Hyderabad	Dr.G.Ram Reddy, Senior Scientist (Pl.Path)

Medicinal & Aromatic Plants Research Station - Rajendranagar

Date	Problems noticed	Village	Scientist participated
9th May, 2013	visited Aloe vera field	Yeddyllagudem Valigonda (Mandal), Nalgonda District	Dr G.S.N.Reddy, Pr. Scientist & Head
4-10-2013	Coleus fields	Devarakadra and Kothakota mandals of Mahaboobnagar	Dr. G. Sathyanarayana Reddy, Pr. Scientist & Head and Dr T. Susila, Sr. Scientist (Hort.)
11-2-2014	Visited Palmarosa and Stevia fields	Aminpur,Chinna Mangalaram villages of Moinabad mandal, Rangareddy	Dr. G. Sathyanarayana Reddy, Pr. Scientist & Head and Dr T. Susila, Sr. Scientist (Hort.)
14-3-2014	Visited Palmarosa fields, Visited GHMC nursery to see the availability of *Decalepis hamiltoni* seedlings & Aloe processing plant of Sri Yadagiri Reddy	Nagarjuna sagar right bank & Gonegul, Rangareddy district & Peddaura village of Nalgonda district	Dr. G. Sathyanarayana Reddy, Pr. Scientist & Head and Dr T. Susila, Sr. Scientist (Hort.)

POLYTECHNIC COLLEGES:

SKPP Horticultural Polytechnic, Ramachandrapuram

Date	Problems noticed	Village	Scientist participated
9-4-2013	Visited the oil palm, mango and cashew orchards	R.Kothuru, Billawaka, Nagaram, Jaggampeta & P.Nayakampalli	Sri M. Satti Raju, Vice-Principal

Fruit Research Station - Sangareddy

Date	Problems noticed	Village	Scientist participated
26-07-2013	Visited for incidence of pest and diseases of mango during the rains	Narsapur	Dr. K. Jyothirmai Madhavi, Scientist (Pl.Path.)
26-07-2013	Visited for incidence of pest and diseases of mango during the rains	Narsapur	Dr. K. Jyothirmai Madhavi, Scientist (Pl.Path.)
26-08-2013	Visited for incidence of pest and diseases of mango during the rains.	Peddaapur	Dr. K. Jyothirmai Madhavi, Scientist (Pl.Path.)
26-08-2013	Visited mango gardens for nutritional deficiencies	peddapur	Dr. K. Prabhavathi, Scientist (SS& AC)
13-09-2013	Visited for incidence of pest and diseases of mango during the rains.	Shivampet	Dr. K. Jyothirmai Madhavi, Scientist (Pl.Path)

D. Training Programmes Participated (HRD Programmes):

College of Horticulture, Rajendranagar:

- Dr.Ch.Raja Goud, Asst. Professor participated as a delegate in the national Cyber Safety and Security Standards Summit, 2013 at Chennai held on 27th and 28th of April, 2013.
- Dr.A.Girwani, Assoc. Professor, participated in a training programme as resource person on "Pula sagu lo melakuvalu" at Horticultural Training Institute, Mahabubnagar (Dist.) on 27-09-2013.
- Smt.G.Jyothi, Asst. Professor has participated in 21 days training on "Advanced Techniques and Professional Management of Research" at Home Science, CAFT (Centre for Advanced Faculty Training), ANGRAU, Hyd from 20th Nov – 10th Dec, 2013.
- Dr.A.S.Padmavathamma, Professor attended management and development programme on "Stress management" at NAARM, Rajendranagar, Hyd from 21st - 24th Jan, 2014.

College of Horticulture, Mojerla:

- Dr.S.Natarajan, Associate Professor attended training programme on "Cyber safety and security" in Chennai on 22nd and 23rd May, 2013.
- Dr.B.Pedababu, Scientist attended 21 days training programme on "Agroforestry as a strategy for adaptation and mitigation of climate change in rainfed areas" conducted at CRIDA, Santoshnagar, Hyderabad during September 4th -24th, 2013.
- Dr.V.V.Padmaja attended 21 days training programme on "Climate change and abiotic stress" conducted at NDUAT, Faizabad, UP during 11th September to 1st October, 2013.
- Dr.Ravi Chandrasekhar, Associate Dean have under gone training on "Science, Administration and Research Management" sponsored by DST, Govt. of India, New Delhi held from 10th - 21st February, 2014 at Administrative Staff College of India, Hyderabad, AP.
- Dr.S.Natarajan, Associate Professor attended training programme on "Awareness of e-courses on B.Sc. (Hort.) on Model platform" on March 13-14 in OUAT, Bhubaneshwar, Orissa.

SSPG Horticultural Polytechnic, Madakasira

- Dr.M.Ramakrishna, Principal attended National seminar on "Relevance of Organic Farming in Indian Agriculture" held at NIAS, IIS, Bangalore from 3rd to 4th February, 2014.

Research Stations:

Horticultural Research Station, Ambajipeta

- Smt.E.Padma, Scientist (Hort.) attended 21 days training programme from 1st – 21st May'13 at CRIDA, Hyderabad on "Agrometerological aspects of extreme weather events" and received best project proposal award during the training.
- Smt.E.Padma Scientist (Hort.) attended Brain storming session on "*Ganoderma* disease management" in coconut and arecanut" held on 1.06.2013 at CPCRI, Kasaragod.
- Dr.G.Ramanandam, Principal Scientist (Hort.) & Head, Dr. N.B.V. Chalapathi Rao, Senior Scientist (Ento.), Dr. A. Snehalatha Rani Scientist (Pl.Path.) & Smt. E. Padma, Scientist (Horticulture) participated in the XXII Annual Group meeting of AICRP palms conducted at Indira Gandhi Krishi Viswa Vidyalaya, Raipur from 21st – 25th July, 2013 and presented the progress report for the year 2012-13 of different disciplines (Horticulture, Entomology & Pathology).
- Dr.N.B.V.Chalapathi Rao, Senior Scientist (Ent.) participated in ICAR short course on "Detection and measurement of insecticide resistance including molecular aspects in insect pests" from 2nd to 11th September' 2013 at NABII, Bangalore.
- Sri.K.Ravindra Kumar, Scientist (Horticulture) attended the ICAR short course on "Recent Advances in conservation of Genetic Resources of Plantation crops" form 22nd to 31st October, 2013 at CPCRI, Kasaragod.

Horticultural Research Station, Ananthapuramu

- Dr.B.Srinivasulu, Senior Scientist (Hort.), attended farmers training programme on "Pomegranate Growers Meet" conducted by NRC on Pomegranate, Solapur at Anantapuram on 26-03-2014 as resource person.

Horticultural Research Station, Kovvur

- Training programme was conducted at HRS, Kovvur to the Horticultural officers on 13-3-2014 on e-solutions for horticultural crops in Andhra Pradesh. Under above programme, Dr. J.Dilip Babu, Director of Research, Dr.YSRHU distributed tabs to horticultural officers.

Horticultural Research Station, Lam

- Dr. L.Naram Naidu, Principal Scientist (Hort.) attended "Pre-seasonal workshop" of Dept. of Agriculture at RARS, Lam on 2-4-2013.
- Dr.C.Venkata Ramana, Scientist (Hort.) participated as chilli crop specialist in the ZREAC meeting of Telangana zone held at Khammam on 21-5-2013.
- Dr.C.Venkata Ramana, Scientist (Hort.) participated as chilli crop specialist in the ZREAC meeting of Rayalasema zone held at Tirupati on 24-5-2013.
- Dr.L.Naram Naidu, Principal Scientist (Hort.) attended Brain storming session on "3rd party evaluation of RKVY" at Admn. Staff College & Institute (ASCI), Hyderabad on 4-6-2013.

- Dr.L.Naram Naidu, Principal Scientist (Hort) & Dr.C.Venkata Ramana, Scientist (H) visited IBT, ANGRAU, Rajendranagar to discus and finalize the Biotech projects under RKVY on chilli with Dr Anada Kumar, Director, IBT, Rjendranagar on 8-10-2013.
- Dr.L.Naram Naidu, Principal Scientist (Hort) attended World Trade Fair at Hyderabad from 4th to 6th Nov, 2013.
- All the scientists of HRS, Lam attended farmer scientist interaction meeting on "Cost reduction technologies in crop production" organized by ATMA Guntur at RARS, Lam on 26-11-2013.
- Dr.L.Naram Naidu, Principal Scientist (Hort), Dr.C.Venkata Ramana, Scientist (Hort) attended e-SHORT training at HRS, Kovvur on 13-3-2014.

HRS, Mahanandi

- Dr.Ch.Ruth, Scientist (Pl.Path) attended and presented work done report of Horticulture, Entomology, Plant Pathology – 2012 in Pre ZREAC 2013-14 and technical programme of 2013-14 of Horticultural Research Station, Mahanandi at Citrus Research Station, Tirupati on 09.04.2013.
- Dr.Ch.Ruth, Scientist (Pl.Path) attended ZREAC meeting of Rayalaseema zone 24.05.2013 at Veterinary auditorium, Tirupati and presented research highlights of Horticulture, Entomology and Plant Pathology of Horticultural Research Station, Mahanandi.

Citrus Research Station, Petlur

- Dr.P.T.Srinivas, Senior Scientist (Horticulture) and Sri.D.Sreedhar, Scientist (Horticulture) attended two days training programme on "Right to Information Act" from 18th to 19th March, 2013.

Fruit Research Station, Sangareddy

- Dr. K. Jyothirmai Madhavi, Scientist (Pl.Path) attended 21 days training programme on "Plant disease management approaches using microbial and plant genomic resources" organized by Department of Biotechnology, UAS, Dharwad at Dharwad from 24-01-2014 to 13-02-2014.
- Dr. A. Bhagwan, Senior Scientist (H) and Dr. A. Kiran Kumar, Senior Scientist (H) attended training programme on "PGR on mango and guava" at CISH, Lucknow from 06-03-2014 to 07-03-2014.

PHTRS, Venkataramannagudem

- Dr.B.Prasanna Kumar, Principal Scientist (Hort.) attended one day training programme on "Web counselling for admissions into UG courses for the academic year 2013-14" conducted at Central Library, ANGRAU, Hyderabad.
- Dr.B.Prasanna Kumar, Principal Scientist (Hort.) participated in the 'Appraisal cum Data Validation workshop for the Nodal Officers of NISAGENET' at UAS, Bangalore conducted by ICAR, New Delhi from 9.1.2014 to 10.1.2014.
- Dr.B.Prasanna Kumar, Principal Scientist (Hort.) attended "District Level Seminar on Cashew" at Narsipatnam, Visakhapatnam district and delivered a lecture on "Cashew production technology" as resource person.

Krishi Vigyan Kendras of Dr YSRHU:

Krishi Vigyan Kendra, Venkataramannagudem:

Name of the staff	Name of the training programme	Name of the Institute	Date	Duration
Dr.E. Karuna Sree, Programme Coordinator	Attended SAC meeting	KVK, CTRI, Rajahmundry	17.04.2013	One day
Dr.E. Karuna Sree, Programme Coordinator	Brain Storming session	EEI, ANGRAU, Hyderabad	26.04.2013	Two days
Dr.E. Karuna Sree, Programme Coordinator	Annual action plan meeting	EEI, ANGRAU, Hyderabad	07.05.2013	Three days
Dr.E. Karuna Sree, Programme Coordinator along with team of scientists	Attended ZREAC meeting of Coastal Zone	Lam, Guntur	17.05.2013	One day
Dr.E. Karuna Sree, Programme Coordinator	KVK's Annual Zonal workshop, Zone-V	PDKVV,Akola, Maharastra	29.07.2014	Three days
Dr.E. Karuna Sree, Programme Coordinator	8th National Conference of KVK's - 2013	UAS, Bangalore	23.10.2013	Three days
Dr.E. Karuna Sree, Programme Coordinator	QRT review meeting of AICRP on palms centres of AP	DOPR, Pedavegi, West Godavari District	12.02.2014	One day
Sri Ch. Kiran Kumar, SMS(SSAC)	Deputed to Phailin cyclone effected areas	Palkol & Narsapuram mandals of West Godavari	04.11.2013	Two days
Ms. S. Visala RA (Horti)	Deputed to Heline cyclone effected areas	TP gudem, Nallajerla, Peravali, Kalla & Nidadavolu mandals of West Godavari	04.11.2013	Three days

Krishi Vigyan Kendra, Pandirimamidi

Name of the staff	Name of the training programme	Name of the Institute	Duration
Dr.A.Srinivas, Programme Coordinator	Attended SAC Kharif 2013 meeting	KVK, CTRI, Rajahmundry	One Day
Dr.A.Srinivas, Programme Coordinator	Brain Storming session	EEI, ANGRAU, Hyderabad	One Day
Dr.A.Srinivas, Programme Coordinator	Annual action plan meeting	EEI, ANGRAU, Hyderabad	Three Day
Dr.A.Srinivas, Programme Coordinator	Attended Divisional Rythusadassu	Dept. of Agriculture, Jaggampeta division, East Godavari district	One Day
Dr.A.Srinivas, Programme Coordinator along with scientists	Attended ZREAC meeting of Coastal Zone	Lam, Guntur	One Day
Dr.A.Srinivas, Programme Coordinator	Attended Divisional Rythusadassu	Dept. of Agriculture, Rampachodavaram division,East Godavari district	One Day
Dr.A.Srinivas, Programme Coordinator	Attended ATMA management committee Meeting	PD-ATMA, Kakinada, East Godavari District	One Day
Dr.A.Srinivas, Programme Coordinator	KVK's Annual Zonal workshop, Zone-V	PDKVV,Akola, Maharastra	Three Day
Dr.A.Srinivas, Programme Coordinator	8th National Conference of KVK's - 2013	UAS, Bangalore	Three Day
Dr.A.Srinivas, Programme Coordinator	Deputed to Helen cyclone effected areas	Rajolu and P.Gannavaram divisions East Godavari district	One Day
Dr.A.Srinivas, Programme Coordinator	Kisan mela	Rampachodavaram division East Godavari district	Two Day
Dr.A.Srinivas, Programme Coordinator	SAC meeting	KVK, Venkataramannagudem	One Day
Dr.A.Srinivas, Programme Coordinator	QRT review meeting of AICRP on palms centres of AP	DOPR, Pedavegi, West Godavari District	One Day
Dr.A.Srinivas, Programme Coordinator	Cashew production technology	CTRI, KVK	One Day
Dr.A.Srinivas, Programme Coordinator	DLCC meeting	DATTCC, Kakinada	One Day
Dr.A.Srinivas, Programme Coordinator	Annual review meeting	CIFA, Kakinada	One Day
Sri V.Govardhan Rao, SMS(Plant Pathology)	Divisional Rythusadassu organised by Department of Agriculture	Krishnunipalem division, East Godavari District.	One Day

Sri V.Govardhan Rao, SMS (Plant Pathology)	Divisional Rythusadassu	Rampachodavaram division, East Godavari District	One Day
Sri V.Govardhan Rao, SMS (Plant Pathology)	Promotion of millets in agency area for nutritional security	Tallapalem village	One Day
Sri V.Govardhan Rao, SMS (Plant Pathology)	"Yeruvaka-Purnima"	Jaggampeta	One Day
Sri V.Govardhan Rao, SMS (Plant Pathology)	Deputed to Phailin cyclone effected areas	Gollaprolu, Inavalli mandals in East Godavari District	Three Day
Sri V.Govardhan Rao, SMS (Plant Pathology)	Deputed to Helen cyclone effected areas	Razole and P.Gannavaram division in East Godavari	One Day
Sri V.Govardhan Rao, SMS (Plant Pathology)	Summer management of newly planted Cashew orchards	Maredumilli mandal	One Day
Sri B.Bhaskar Rao, SMS (Horticulture)	Divisional Rythusadassu	Rampachodavaram division, East Godavari	One Day
Sri B.Bhaskar Rao, SMS (Horticulture)	Promotion of millets	Tallapalem village	One Day
Sri B.Bhaskar Rao, SMS (Horticulture)	Promotion of millets	Tallapalem village	One Day
Sri B.Bhaskar Rao, SMS (Horticulture)	ITK's for sustainable Agriculture	NIRD, Rajendranagar, Hyderabad.	Five Day
Sri B.Bhaskar Rao, SMS (Horticulture)	ATMA Management Committee (AMC)	ATMA, East Godavari District, Kakinada.	One Day
Sri B.Bhaskar Rao, SMS (Horticulture)	District level seminar on Cocoa	CTRI, KVK, Rajahmundry	One Day
Sri B.Bhaskar Rao, SMS (Horticulture)	Heline cyclone affected area	Ambajipeta	One Day
Sri B.Bhaskar Rao, SMS (Horticulture)	AMC meeting of the ATMA, Kakinada.	ATMA, East Godavari District, Kakinada.	One Day
Sri B.Bhaskar Rao, SMS (Horticulture)	Summer management of newly planted Cashew orchards	D.N.Palem, Devipatnam mandal	One Day
Sri B.Bhaskar Rao, SMS (Horticulture)	Summer management of newly planted Cashew orchards	Gangavaram mandal	One Day
Sri B.Bhaskar Rao, SMS (Horticulture)	Summer management of newly planted Cashew orchards	Rampachodavaram mandal	One Day
Dr.K.Dhanasree, SMS (Home Science)	Divisional Rythusadassu	Rampachodavaram division, East Godavari District.	One Day
Dr.K.Dhanasree, SMS (Home Science)	Initiative for Nutritional security through millet Promotion	Tallapalem village	One Day

E. Method Demonstrations:

Method demonstrations conducted at Various Research Stations and KVKs in order to demonstrate different skills involved in adoption of new technologies are as follows:

Horticultural Research Station, Anantharajupeta

Demonstrated organic cultivation of turmeric in farmers field in Balireddypalli village of Obulavaripalli mandal and found that during marketing of the dry rhizomes, the farmer got better price for the organic turmeric (Rs.5432/q) compared to conventionally (Rs.5090/q) grown turmeric.

Farmer Sri.P.Jayavardhan Reddy of Balireddypalli village, Obulavaripalli Mandal at the demonstration plot

Seed treatment with Trichoderma spp @ 10g/L

Citrus Research Station, Petlur

- Dr.B.Prathap, Scientist (Agronomy) conducted method demonstration on "preparation of Vermicomposting & Bordeaux paste" in Inugunta, Ozili mandal with RAWEP students on 8-12-2013.

Horticultural Research Station, Pandirimamidi

- Dr.K.Rajendra Prasad, Scientist (Hort.) conducted method demonstration on "Grafting technique in mango and Cashew" to the degree students of Botany at Rampachodavaram on 13.11.2013.

Krishi Vigyan Kendra, Venkataramannagudem

- Dr.G.Srihari, Director of Extension, participated as chief guest in demonstration and farmer' interaction programme on power weeder for intercultural operations in horticultural crops conducted by Dr.E.Karuna Sree, Programme Co-ordinator and Sri.Ch.Kiran Kumar, SMS (SS&AC) on 12.11.2013.
- Sri.Ch.Kiran Kumar SMS (SS&AC) conducted demonstration on Paddy drumseeder at Telikicharla village on 07.12.2013.

Demonstration of farm machinery by KVK, Venkataramannagudem

Horticultural Research Station, Mahanandi:

- Dr.Ch.Ruth, Scientist (Pl.Path) visited Regadaguduru and Abdullapuram villages in Velgod mandal of Kurnool (dt.) for identification of farmers in "Management of chilli wilt" on 05-07-2013 and distributed *Trichoderma viride* and Imidachloprid for seed treatment and conducted field visit on turmeric.

F. Group Discussions:

Medicinal and Aromatic Plants Research Station, Rajendranagar

- Dr G. Satyanarayana Reddy Principal Scientist & Head and Dr. T. Susila, Senior Scientist (Hort.) participated in stake holders meet with CEO, NMPB organized by A.P. State Medicinal plants Board on 23-10-2013 at Hotel Golconda, Hyderabad.

G. Exposure Visits :

KVK, Venkataramannagudem:

- Nine groups of farmers visited KVK during 2013-14 as a part of Exposure visit arranged by DAATTC & ATMA of Guntur, Krishna, West Godavari, East Godavari, and Visakhapatnam as detailed below:
- On 16.04.2013 Dr.E.Karunasree, Programme Co-ordinator, Sri N.Veerabhadra Rao, SMS (Fisheries) and Dr.K.Vijay Prakash, SMS (Vety.Sci.) interacted with farmers during exposure visit to KVK, Venkataramannagudem under ATMA, Narsaraopeta division, Guntur.

Farmers from Narsaraopet division of Guntur District & Vijayawada Division of Krishna District

- An exposure visit to Dr.YSR Horticultural University "Rythula Avagahana Sadassu" with collaboration of ATMA was conducted by Dr.E.Karunasree, Programme Co-ordinator and the team of scientists, Krishi Vigyan Kendra, Venkataramannagudem.
- On 10.01.2014 foreigner visit to KVK Instructional farm. In this programme Dr.M.B.N.Rao, Director of Industrial and International Programmes, Dr.YSRHU, Kum.S.Vishala, RA (Hort.) were participated.
- On 04.02.2014 farmers from Tiruvuru division of Krishna District visited Dr.YSRHU & KVK, Venkataramannagudem and learned about various technologies of Horticulture and allied aspects.



Dr. M.B.N. Rao, Dir. Of Extension in Farmers interaction at KVK, V.R.Gudem

- On 11.02.2014, Prakash degree college students, koyyalagudem visited KVK, Dr.YSRHU, Venkataramannagudem. In this programme Dr.E.Karunasree, Programme Co-ordinator, Sri Ch.Kiran Kumar, SMS (SSAC) and Kum. S.Vishala, RA (Hort.) have explained about organic manures and bio-fertilizers production and application.
- Seventy Volunters of Nehru Yuvakendra Sanghathan, West Godavari, East Godavari and Yanam visited KVK, Venkataramannagudem and learned about latest technologies in Floriculture, Improved backyard poultry, Nursery management, Vermi composting, Azolla cultivation and Medicinal plants uses on 14th February, 2014.
- On 12.03.2014, farmers from Krishna district visited Dr.YSRHU & KVK, Venkataramannagudem and learned about various technologies of Horticulture and allied aspects.



Volunters of Nehru Yuvakendra Sangathan, West Godavari, East Godavari and Yanam visited KVK

- On 13.03.2014, farmers from Nuzvid division under ATMA visited Dr.YSRHU & KVK, Venkataramannagudem and learned about various technologies of Horticulture and allied aspects.
- On 20.03.2014, farmers from Vishakapatnam division under ATMA visited Dr.YSRHU & KVK, Venkataramannagudem and learned about about various technologies of Horticulture and allied fields.

H. Field Days :

Horticultural Research Station, Ambajipeta

Field day was organized on organic composting using coir pith waste and vermi compost using coconut leaf on 19th March, 2014 to 20 nos. of Visakapatnam district farmers. Field day was organized on integrated farming system model in coconut on 23rd March, 2014.

Organic composting of coir pith

Integrated farming sytem model in coconut

Horticultural Research Station, Anantharajupeta

- Farmers of Gajwel division, Medak (dt.) visited the research station and the scientists explained about the production technologies of horticultural crops and protected cultivation of vegetables on 06.2.2014.
- A group of 30 Farmers of Mydukuru, Duvvuru, chapadu & Rajampet visited the station under ATMA, YSR district on 24.2.2014; one day training was given on production technology of vegetables and mango.

Horticultural Research Station, Kovvur

- Dr.B.V.K.Bhagavan, PS (Hort), Dr.M.M.Naidu, Senior Scientist (Hort.) and Dr T. Rajashekharam, Scientist (Pl. Path) have attended the field day organized by RAWEP students at Kalavalapalli village on 17th December,2013

Krishi Vigyan Kendra, Venkataramannagudem

- On 12.04.2013, scientists of KVK conducted field day on OFT-soil test based fertilizer application in rabi Maize along with department of Agriculture and shown the result demonstrations in farmers field followed by group discussion with farmers regarding various production aspects of rabi Maize.
- On 08.11.2013 Sri Ch.Kiran Kumar, SMS (SS&AC), Kum. S.Vishala, RA (Horticulture) conducted Field day on "Integrated Nutrient Management in Paddy" at Chodavaram.

Krishi Vigyan Kendra, Pandirimamidi

Sl.No	Date	Title of the Programme	Place	Total Participants
01	18.11.2013	Field day on Paddy Variety- JGL-17004	Pedageddada	50
02	20.11.2013	Field day on Paddy Variety- MTU-1075	I.Polavaram	50
03	20.11.2013	Field day on Paddy Hybrid Rice- DRRH-3	I.Polavaram	50
04	13.12.2013	Field day on Blackgram Variety- PU-31	I.Polavaram	30
05	14.03.2014	Field day on Maize	Rajampalem	50

I. Mass Communication:

With a view to reach a large number of farmers with the latest technologies and methods, scientists of the university are regularly giving radio talks, TV programmes and literature & publications through print media in local language, Kisan melas, guest lectures through various line departments, institutions and NGOs etc. The programmes given by the scientists during the year 2013-14 are:

a. Radio Programmes:

Date	Topic	Name of the Scientist
28-06-2013	Tholakarilo mamidilo chepattavalasina komma kathirimpulu	Smt. D.Aparna, Scientist (Hort.)
06-03-2014	Mango pest disease management and bye products preparation	Smt. D.Aparna, Scientist (Hort.)
18-06-2013	Oushadha pantala saagu	Dr T. Susila, Scientist (Hort.)
18-06-2014	Sugandha Pantala Saagu	Dr T. Susila, Scientist (Hort.)
18-04-2013	Post Harvest Management of Mango	Dr. A. Kiran Kumar, Senior Scientist (H)
25-10-2013	Present condition of mango and management to be taken up during November and December for better flowering.	Dr.A.Kiran Kumar, Senior Scientist (H)
25-10-2013	Management of diseases in ginger	Dr. K. Jyothirmai Madhavi Scientist (Pl.Path)
17-02-2014	Mamidi thotala yajamanyam	Dr. M. Raj KumarPrincipal Scientist (H) & Head
26-07-2013	Vulli pantalo adhika digubadiki patinchavalasina Yajamanya padhathulu	Smt K.Mamatha,Scientist (Hort)
11-04-2013	Kobbarilo Nilakadaga Adhika Digubadulu Sadhinchandanki Yajamanya charyalu	Dr. G. Ramanandam, Principal Scientist (Hort.)
15-06-2013	Kobbarilo Nilakadaga Adhika Digubadulu	Dr.N.B.V.Chalapathi Rao,
19-06-2013	Sadhichadanki charyalu Kobbarilo Anthara Pantaga Cocoa Saagu	Senior Scientist (Ent.) Smt. E. Padma, Scientist (Hort.)
08-04-2013	Mirapalo egumathiki anuvyna nanyatha pramanalu	Dr. L.Naram Naidu, Principal Scientist (Hort.),
06-06-2013	Mirapa rakalu – Narumadi yajamanyam	Dr.C.Venkata Ramana, Scientist (Hort.)
06-08-2013	Narumallalo sasya rakshana	T.Viaya Lakshmi, Scientist (Pathology)
22-08-2013	Mirapalo saalu thotala yajamanyam	Dr.L.Naram Naidu,
20-09-2013	Mirapalo eruvula yajamanyam	Principal Scientist (Hort.) Smt.A.Rajani, Scientist (Hort.)
25-03-2014	Vesavilo kuragayala saagu	Dr.C.Sarada, Senior Scientist (Hort.)
27-03-2014	Mirapalo aflotoxinlu- Nivarana	T.Vijaya Lakshmi,
27-03-2014	Seed production in chillies	Scientist (Path) Smt.A.Rajani, Scientist (Hort.)
	Mirapalo purugulu – Yajamanyam	T.Vijaya Lakshmi, Scientist (Path)
	Mirapalo tegullu - Yajamanyam	T.Vijaya Lakshmi, Scientist (Path)
06-02-2014	Mirapalo kalupu nivarana mariyu eruvula yajamanyam	Dr.C.Sarada, Senior Scientist(Hort.)

	Fertilizer management in chilli	Dr.C.Venkat Ramana, Scientist (Hort.)
	Post harvest technology and seed production in chillies	Smt.A.Rajani, Scientist (Hort.)
	Pasupu tavvakam, kotha anantara parignanam	Dr.S.Surya Kumari,
	Vaamu saagulo melakuvalu	Principal Scientist (Hort.) Sri.K.Giridhar, Scientist (Hort.)
29-10-2013	Cultivation of vegetable crops (Carrot), Spices (Coriander, Aizwan)	Dr.Ch.Ruth, Scientist (Pl.path) & Head
01-11-2013	Pasupu sagulo sasyarakshana	Dr.Ch.Ruth, Scientist (Pl.path) & Head
13-04-2013	Ulli saguSukshma neeti paddatilo udyana pantala sagu	Smt.G. Jyothi, Asst. Professor
23-09-2013	Vyavasaya patasala "Banthi and lilly saagulo melakuvulu"	Dr.A.Girwani, Assoc. Professor
21.07.2014	"Vyavasaya patasala – vividha cut flower rakaala saagu vivaralu-marketing avakasalu"	Smt. C. Madhumathi, Scientist (Hort.)
20-09-2013	Cultivation of flower crops in rabi season	Dr. K. Dhanumjaya Rao, PS (Hort.) & Head
03-12-2013	Improved package of practices for tuberose cultivation	Dr. P. LalithaKameswari, Scientist (Hort.)
05-12-2013	Improved package of practices for marigold cultivation	Dr. P. LalithaKameswari, Scientist (Hort.)
24-03-2014.	Jasmine cultivation- pruning and training techniques	Dr. P. LalithaKameswari, Scientist (Hort.)
02-09-2013	Pest and disease management in fruit gardens	Dr. B. Srinivasulu, Senior Scientist (Hort.),
23.09.2013	Pest, disease and nutrient management in fruit, vegetable and flower crops	Dr. K. Subramanyam, Principal Scientist & Head
25-11-2013	Rabi Horticultural Crops – Problems and their Management	Dr. B. Srinivasulu, Senior Scientist (Hort.)

b. Television Programmes:

Date	Topic	Name of the Scientistr	Recorded by
30.01.14	Mango pest and disease management	Smt. D.Aparna, S cientist (Hort.)	Doordarshan
26.03.14	Mango pest, disease management, water and fertilizer management and harvesting procedure to be followed during harvesting for mango expert	Smt. D.Aparna, Scientist (Hort.)	Doordarshan
10.05.13	Sugandha Thaila Pantalu	Dr.G.S.N.Reddy Prl. Scientist (Hort.)	Sapthagiri

10.05.13	Sugandha Thaila Pantalu	Dr.G.S.N.Reddy Prl. Scientist (Hort.)	Sapthagiri
05.07.13	Oshadha Sugandha Pantala Saagu	Dr.G.S.N.Reddy Prl. Scientist (Hort.)	Sapthagiri
07.04.13	PHT of mango and benefits of pre harvest sprays of fungicide before one month of harvest.	Dr. M. Raghava Rao, Principal Scientist (H)	Gemini TV
21.04.13	Mango crop management at the time of harvest.	Dr. M. Raghava Rao, Principal Scientist (H)	ETV
24.04.2013	Top working in mango crop	Dr. M. Raghava Rao, Principal Scientist (H)	ETV
24.04.2013	Udyana pantalalo yantrikaranam Mamidilo Kota samayamlo Teesulovasasina JagrathaluKothaga Totalu vesukunetappudu Tesukovalasina jagrathalu	Dr. A. Kiran Kumar, Scientist (H).	Doordarshan Kendra, Hyd
05.05.2013	Mamidilo prastuta samayamlo teeskovalasina samagra sasyrakshana charyalu	Dr. K.Jyothimai Madhavi Scientist (Pl.Path)	ETVAnnadatha
26.06.2013	Danimma kaya toluchu purugu nivarana	Dr. M. Raghava RaoPrincipal Scientist (H)	CVR TV
26.06.2013	Mamidi kotha anantharam jagratalu Mamidilo eruvula yajamanyam Bopiayi narumadi pempakamJamalo adhika sandrata paddathi.Jamalo pepatu eruvulu.	Dr. A. Kiran Kumar, Senior Scientist (H)	CVR TV
26.06.2013	Jamalo pandu eega nivarana Maamidilo aaku goodu purugu nivarana.	Dr. K. Jyothirmai Madhavi, Scientist (PP)	CVR TV
16.08.2013	Metta prantalalo udyana pantala sagu	Dr. A. Kiran Kumar, Senior Scientist (H)	Doordarshan
27.12.2013	Mamidilo pootaku mundu, tarvatha theesukovalasina charyalu.	Dr. M. Raj Kumar, Principal Scientist (Hort.) & Head.	Doordarshan
21.02.2014	Post harvest management for export Mango	Dr.A.Kiran Kumar, Senior Scientist (H)	Doordarshan
17.02.2014	Mamidi thotala yajamanyam	Dr.M.Raj Kumar PS (H) & Head	Doordarshan
12.03.2014	Maamidilopinde raaludu - nivaaranopaayalu	Dr.A.Bhagwan, Senior Scientist (H)	Doordarshan
26.04.13	Irrigation management and moisture conservation methods in coconut cultivation	Dr. G. Ramanandam, Principal Scientist (Hort.)	Dooradarshan Saptagiri, Hyderabad

07.05.13	Irrigation management and moisture conservation methods in coconut cultivation	Dr. G. Ramanandam, Principal Scientist (Hort.)	CVR TV
10.06.13	Coconut varieties suitable for Andhra Pradesh	Dr. G. Ramanandam, Principal Scientist (Hort.)	CVR TV
19.06.13	Selection of coconut seedlings and method of planting	Dr. G. Ramanandam, Principal Scientist (Hort.)	Dooradarshan Saptagiri, Hyderabad
12.07.13	Kobbarilo Antara Pantala Saagu	Dr. G. Ramanandam, Principal Scientist (Hort.)	Doordarshan kendra, Hyderabad
23.10.13	cocoa cultivation practices	Dr. G. Ramanandam, Principal Scientist (Hort.)	Dooradarshan Saptagiri, Hyderabad
28.10.13	Measures to be taken for coconut, Banana, and vegetables as affected by cyclones/heavy rains	Dr. G. Ramanandam, Principal Scientist (Hort.)	Dooradarshan Saptagiri, Hyderabad
12.10.13	Kobbarilo Movvukullu tegulu, Cocoalo kayakullu tegulu mariyu kandam macha – teeskovalsina charyalu	Dr.A.Snehalatha Rani, Scientist (Pl.Path.)	ETV, Annadata
29.10.13	Pineapple as an intercrop in coconut gardens	Sri. K. Ravindra Kumar, Scientist (Hort.)	ETV, Annadata
28.10.13	Kobbarilo Movvukullu tegulu, Cocoalo kayakullu tegulu mariyu kandam macha – teeskovalsina charyalu	Dr.A.Snehalatha Rani, Scientist (Pl.Path.)	Dooradarshan Saptagiri, Hyderabad
4.11.13	Black pepper intercropping in coconut.	Sri. K. Ravindra Kumar, Scientist (Hort.)	ETV Annadata
23.11.13	Precautions to be taken for the revival of coconut palms affected by Helen cyclone	Dr. G. Ramanandam, Principal Scientist (Hort.)	Doora Darshan, Hyderabad & ETV, Annadata
25.11.13	Precautions to be taken for the revival of coconut and banana affected by Helen cyclone	Dr. G. Ramanandam, Principal Scientist (Hort.)	NTV & Raj News
27.11.13	Precautions to be taken for revival of coconut palms as affected by Helen cyclone	Dr. G. Ramanandam, Principal Scientist (Hort.)	I NEWS channel
17.12.13	Kobbarilo Pinde raludu samasya nivarana paddathulu	Sri. K. Ravindra Kumar, Scientist (Hort.)	ETV, Annadata
15.12.13	Post cyclonic measures to be taken for speedy recovery of coconut gardens	Dr. G. Ramanandam, Principal Scientist (Hort.)	ETV, Annadata
09.01.14	Reasons for button dropping in coconut and remedial measures	Dr. G. Ramanandam, Principal Scientist (Hort.)	ETV
20.01.14	"Use of different moisture conservation practices in coconut	Dr. G. Ramanandam, Principal Scientist (Hort.)	ETV

28.02.14	Kobbarilo Sasyarakshana	Dr. N.B.V. Chalapathi Rao, Sr. Scientist (Ent.)	Doora Darshan, Hyderabad
22.03.14	Suitable green manure crops in coconut orchards	Sri. K. Ravindra Kumar, Scientist (Hort.)	ETV, Annadata
21.03.14	Preparation of vermicompost from coconut leaf	Sri. K. Ravindra Kumar, Scientist (Hort.)	Dooradarshan Saptagiri, Hyderabad
27.03.14	Irrigation management and soil moisture conservation practices in coconut	Dr. G. Ramanandam, Principal Scientist (Hort.)	Dooradarshan Saptagiri,Hyderabad
17-06-2013	Seasonal measures in cultivation of turmeric	Sri. K. Giridhar, Scientist (Hort)	CVR TV
04-07-2013	Mirapa rakalu and nursery management	Dr.L.Naram Naidu, Principal Scientist (Hort.)	CVR TV
30-07-2013	Nursery management and precautions at the time of chilli transplanting	Dr.C.Venkata Ramana, Scientist (Hort)	DD-1
01-10-2013	Insect pests of chilli and their management	Smt.T.Vijaya Lakshmi, Scientist (Path)	DD-1
01-10-2013	Diseases of chilli and their management	Smt.T.Vijaya Lakshmi, Scientist (Path)	DD-1
01-10-2013	Seed Production	Smt. A. Rajani, Scientist (Hort)	DD-1
05-10-13	Precautions to be taken up at the time chilli transplanting	Dr. C.Venkata Ramana, Scientist (Hort)	DD-1
10-10-2013	Pasupu-Prasthutha Paristhithilo patinchavalasina melakuvalu	Dr. S. Surya Kumari, Principal Scientist (Hort.)	E-TV
29-10-13	Immediate measures to be taken up to recoup the flood affected chilli	Dr. C.Venkata Ramana, Scientist (Hort)	TV-5
30-01-2014	Mirapalo virus tegullu – nivarana	Smt.T.Vijaya Lakshmi, Scientist (Path)	DD-1
24-04-13	Protected cultivation of flower crops	Dr. K.Dhanumjaya Rao, PS (H) & Head	T news channel
12-08-2013	Improved cultivation practices for aster	Dr. P. Lalitha Kameswari, Scientist (Hort.)	Saptagiri T.V.
05-10-2013	Cultivation of cut and loose flowers in A.P.	Dr. K.Dhanumjaya Rao, PS (H) & Head	T news channel
25-10-2013	Cultivation of rabi flower crops	Dr. P. Lalithakameswari, Scientist (Hort.)	Saptagiri T.V
28-12-2013	Gerbera and carnation cultivation in polyhouses	Dr. K.Dhanumjaya Rao, PS (H) & Head	T news channel
12-03-2014	Improved cultivation practices of loose flowers in A.P.	Dr. K.Dhanumjaya Rao, PS (H) & Head	T news channel

10-01-2014	Improved horticultural techniques for jasmine cultivation	Dr. P.Lalithakameswari Scientist (Hort.)	Sapthagiri TV
27-03-2014.	Improved cultivation practices of cut flowers in A.P	Dr. K.Dhanumjaya Rao, PS (H) & Head	V6 channel
24-04-2013	Protected cultivation of flower crops	Dr. K.Dhanumjaya Rao, PS(H) & Head	T news channel
12-08-2013	Improved cultivation practices for aster	Dr. P.Lalithakameswari Scientist (Hort.)	Saptagiri T.V.
05-10-2013	Cultivation of cut and loose flowers in A.P.	Dr. K.Dhanumjaya Rao, PS (H) & Head	T news channel
19-4-2013	Vesavi lo metta pandla thotala yajamanyam	Dr. B. Srinivasulu, Senior Scientist (Hort.)	Doordarshan

J. Guest Lectures:

HRS, Ananthapur:

- Dr. K. Subramanyam, Principal Scientist &Head and Dr. B. Srinivasulu, Senior Scientist (Hort.), HRS, Anantapuramu attended RCY Programme from 22-4-2013 to 8-5-2013.
- Dr. B. Srinivasulu, Senior Scientist (Hort.), HRS, Anantapuram attended Farmers training programme on Vegetable production technologies – RHTI, Anantapuram –23-4-2013.
- Dr. B. Srinivasulu, Senior Scientist (Hort.), HRS, Anantapuram attended Farmers training programme on Mango production technologies – Kalyanadugam – 3-6-2013.
- Dr. K. Subramanyam, Principal Scientist & Head, HRS, Anantapuram attended Farmers training programme on Pomegranate production technologies-RHTI, Anantapuram on 21.6.2013.
- Dr. B. Srinivasulu, Senior Scientist (Hort.), HRS, Anantapuram attended Farmers training programme on Mango production technologies - RHTI, Anantapuram - 3-7-2013.
- Dr. B. Srinivasulu, Senior Scientist (Hort.), HRS, Anantapuram attended Farmers training programme on Papaya production technologies – RHTI, Anantapuram –18-7-2013.
- Dr. B. Srinivasulu, Senior Scientist (Hort.), HRS, Anantapuram attended "Awareness Programme on Renewal energy utilization in farming systems "at ARS, Rekulakunta organized jointly by KVK, Reddipalli and ARS, Rekulakunta on 23-9-2013.
- Dr. B. Srinivasulu, Senior Scientist (Hort.) attended Farmers training programme on "Vegetable Cultivation" at Regional Horticultural Training Institute, Anantapuram on 08-11-2013.
- Dr. B. Srinivasulu, Senior Scientist (Hort.) attended farmers training programme on Mango organized by Rural Development Trust, Anantapuram.

- Dr. B. Srinivasulu, Senior Scientist (Hort.), HRS, Anantapuram attended Farmers training programme on Farmer – Scientist interaction programme at Agricultural Research Station, Anantapuram on 18-01-2014.
- Dr. B. Srinivasulu, Senior Scientist (Hort.), HRS, Anantapuram attended Farmers training programme on Vegetable Production Technology conducted by Rural Development Trust, Anantapuram at Raptadu on 24-01-2014.
- Dr. B. Srinivasulu, Senior Scientist (Hort.), HRS, Anantapuram attended Farmers training programme on Mango Production Technology conducted by Rural Development Trust, Anantapuram at Anantapuram on 27-01-2014.
- Dr. B. Srinivasulu, Senior Scientist (Hort.), HRS, Anantapuram attended Farmers training programme on Papaya Production Technology conducted by Department of Horticulture at RHTI, Anantapuram on 22-02-2014.
- Dr. B. Srinivasulu, Senior Scientist (Hort.), HRS, Anantapuram attended Farmers training programmes on Chilli & Vegetable Production Technology conducted by Department of Horticulture at RHTI, Anantapuram on 21st and 22nd March, 2014.

Horticultural Research Station, Darsi

- S.Narasimha Rao, Scientist, (Pl. Path) participated in the technology week organized by KVK, Darsi from 10.12.2013 to 12.12.2013.
- S.Narasimha Rao, Scientist, (Pl. Path) attend a training programme on production practices of turmeric at Ayyaluriparipalem on 18.12.13 as resource person.



- S.Narasimha Rao, Scientist, (Pl. Path) as resource person attended a training programme on "Disease management in mango" at Sivarajanagar on 2-12-2013.
- S.Narasimha Rao, Scientist, (Pl. Path) attended a training programme on "Agronomic management in chillies for improving the water productivity" at Ongole on 13-3-2014 at Darsi on 26-3-2014 as a resource person.
- Dr.M.M.Naidu, SS (Hort), attended as resource person for the training programme on "Production technology of banana and papaya" to the farmers of Nalgonda district at Horticulture training institute, Hyderabad from 5th to 6th July 2013 as resource person.
- Dr.B.V.K. Bhagavan, PS (Hort) delivered a lecture on "Production technology of banana and papaya" at Horticulture training institute, Hyderabad from 16th to 17th July 2013.
- Dr.T. Rajashekharam, Scientist (PP), attended as resource person for the training programme on "Production technology on banana" to the farmers of Nalgonda district at Horticulture training institute, Hyderabad from 12th to 13th August 2013.

- Dr.B.V.K.Bhagavan, PS (Hort) attended the training programme organized by NESTAM, NGO as resource person and delivered a lecture on banana cultivation on 9.12.13 at Chagantipadu village of Krishna District.

Horticultural Research Station, Mahanandi:

- Dr.Ch.Ruth, Scientist (Pl.Path) & Head participated in "Arati Avagahana Sadassu" in Gajulapalli village dt: 18-09-13 and delivered a lecture on package of practices in Banana crop.
- Dr.Ch.Ruth, Scientist (Pl.Path) visited Joharapurum, Aspari and Molagavelli, Aluru Mandals dt: 05-09-13 & 07-09-13 and conducted group discussion about Ajwain cultivation and introduced the variety LTA-26.
- NCIPM - Synthesis, validation and promotion of IPM in chilli - Dr.Ch.Ruth, Scientist (Pl.path) & Head observed chilli fields in Regadaguduru village dt: 24-09-13 and observed thrips damage in Chillies and discussed with selected farmers under NCIPM project.
- Dr.Ch.Ruth, Scientist (Pl.Path) & Head observed flood damage in Banana, Turmeric, Onion and Tomato crops in Nandipalli, Gopavarum, Mahanandi and Atmakur villages, dt: 28-10-13.
- Dr.Ch.Ruth, Scientist (Pl.Path) & Head participated in the training programme on "Banana cultivation" conducted by Jai Kisan Zoovari Agro Chemicals Pvt.Ltd. at Thimmapuram, dt:19-12-13 and delivered a lecture on package and practices of Banana crop.
- Dr.Ch.Ruth, Scientist (Pl.Path) & Head participated Training programme on "Pest and disease management in Mango at flowering stage" in Rudravaram village, dt:31-12-13 along with Horticultural officer, Allagadda and observed mango orchards and identified hoppers, mealy bugs, leaf webber and sooty mould incidence.
- Dr.Ch.Ruth, Scientist (Pl.Path) & Head observed chilli fields in Pandu Rangapuram village along with Principal Scientist (Pl.Path), IIHR, Banglore and Board member, ANGRAU, dt: 05-02-14.
- Dr.Ch.Ruth, Scientist (Pl.Path) & Head participated in the Kisan mela and arranged a stall, dt: 22-01-14 conducted by RARS, Nandyal.
- Dr.Ch.Ruth, Scientist (Pl.Path) & Head participated as resource person in the training programme "Pandlathotallo Avagahana Sadassu - Sweet orange and Tissue culture Banana" in Komarolu, Orvakallu and Panyam mandal along with Horticulture officers Panyam and Orvakallu mandals, dt: 01-02-14
- Dr.Ch.Ruth, Scientist (Pl.path) & Head participated as resource person in the training programme on Acidlime and Sweet orange in Marripalli Village Allagadda Mandal and ADH-2, Nandyal and Acidlime farmers participated, dt: 12-03-14.
- Dr.Ch.Ruth, Scientist (Pl.Path) & Head participated in the training programme on vegetables in Kothapalli village of Chagalamarri Mandal, dt: 13-03-14.
- Dr.Ch.Ruth, Scientist (Pl.Path) & Head participated in the training programme on Mango and Acidlime in Atmakur, dt:18-03-14.

- Dr.Ch.Ruth, Scientist (Pl.Path) & Head participated in the training programme at LK Thanda on tomato dt:22-03-14 and Gani (Gadivemula Mandal) on Mango. dt:23-03-14.

Mango Research Station, Nuzvid:

- Smt. D.Aparna, Scientist (Hort.) & Head participated as resource person in training program on mango organized by Department of Agriculture under NSP at Aarugolanupeta (Chaatrai) and Telladevarapalli (Vissannapeta) mandals on 7-11-2013.
- Smt. D.Aparna, Scientist (Hort.) & Head participated as resource person in training programme on mango organized by Dept. of Horticulture at Kalaturu (Agiripalli) and Bapulapadu (Bapulapadu) on 3-3-2014.
- Smt. D.Aparna, Scientist (Hort.) & Head participated as resource person in training programme on mango organized by Dept. of Horticulture at Morsumilli, and Chandragudem (Mylavaram) mandals on 14-3-2014.
- Smt. D.Aparna, Scientist (Hort.) & Head participated as resource person in training programme on mango organized by Dept. of Horticulture at Ganginenipalem, Chowturu and Gurrajupalem (G.Konduru) mandals on 12-3-2014.
- Smt. D.Aparna, Scientist (Hort.) & Head participated as resource person in training programme on mango organized by Dept. of Agriculture under AP Tankfed management at Narasingaraopalem, Agiripalli on 20-3-2014.

Horticultural Research Station, Pandirimamidi

- Dr.K.Rajendra Prasad, Scientist (Hort.) participated in training and farmers' discussion along with Hon'ble minister for stamps and registration Sri.T.Narasimham at Krishnunipalem in Gokavaram revenue division on 22.4.2013.
- Dr.K.Rajendra Prasad, Scientist (Hort) participated in farmers' discussion along with Project Officer, ITDA at Peda gaddada, Rampachodavaram revenue division on 23.4.2013.
- Dr.K.Rajendra Prasad, Scientist (Hort.) attended a training programme on "Cashew pest and disease management" in RAWEP village, Kothapalli on 16.12.2013 as resource person.

- G.Narasimha Murthy, Scientist (Hort.) conducted a rythu sadassu in Gadarada village and training given to farmers on the production aspects cashew, mango and vegetable crops on 19.12.2013.
- Dr.K.Rajendra Prasad, Scientist (Hort.) attended a training programme as resource person on "Mango production technology" along with department officials at Narasapuram on 24.1.2014.

- Dr.K.Rajendra Prasad, Scientist (Hort.) attended a training programme on "Cashew production technology" along with department officials at Madhurapudi on 30.1.2014 as resource person.

Fruit Research Station, Sangareddy

- Dr.K.Prabhavathi, Scientist (SS&AC), participated in the training programme on "Creating awareness for increasing the area under Horticultural crops" organized by ATMA at Kalivemula village, Sangareddy mandal on 4-9-2013
- Dr.A.Bhagwan, Senior Scientist (H) participated in a training programme on "Off season production of mango" at Chittoor on 30-11-2013.
- Dr.K.Jyothirmai Madhavi, Scientist (Pl.Path) delivered a lecture on "Integrated pest and disease management in mango" at AP Horticultural Training Institute (APHTI), Hyderabad on 4-10-2013.
- Dr.A.Bhagwan, Senior Scientist (H) delivered a lecture on "INM fruit crops" at AP Horticultural Training Institute (APHTI), Hyderabad on 7-12-2013.
- Dr.K.Prabhavathi, Scientist (SS & AC) delivered a lecture on "Organic farming in fruit crops" at AP Horticultural Training Institute (APHTI), Hyderabad.

Post Harvest Technology Reseaech Station, Venkataramannagudem

- Dr.B.Prasanna Kumar, Principal Scientist (Hort.) attended to the District Level Seminar on Cashew at Narsipatnam, Visakhapatnam district and covered a topic on Cashew production technology as resource person.

K. Kisan Mela & Horticulture Shows:

HORTI - EXPO 2014:

Scientists of Fruit Research Station, Sangareddy were involved in organizing the stall of Dr. YSRHU at HORTI-EXPO 2014 at Nizam College Grounds, Hyderabad from 14-2-2014 to 17-02-2014.

L. Rythu Sadassus :

Horticultural Research Station, Ambajipeta

Date	Topic	Village	Scientist participated
20.04.13	Coconut Production Technology	Siripalli Village of East Godavari District	Dr. N. B. V. Chalapathi Rao
27.04.13	Organic farming	Amalapuram East Godavari District	Dr. N. B. V. Chalapathi Rao
12.05.13	Package of practices for coconut and cocoa.	Ravulapalem, East Godavari district	Dr. G. Ramanandam, Principal Scientist (Hort.) & Dr.N.B.V.Chalapathi Rao, Senior Scientist (Ent.)

Cashew Research Station, Bapatla

K.Umamaheswara Rao, Scientist (Hort) & Head, participated in Rythusadassu at Tadepalligudem on 1.5.2013

K.Umamaheswara Rao, Scientist (Hort) & Head participated in Rythusadassu at Kandukur, Prakasam District and delivered a lecture on sweet orange and mango cultivation aspects on 13.05.2013.

Horticultural Research Station, Lam

Date	Village	Topics covered	Resource person
6-4-2013	Guntur organized by Dept of Hort.	Chilli production technology	Dr.C.Venkata Ramana, Scientist (Hort.)
9-5-2013	Guntur organised by Govt of Andhra Pradesh	Chilli production technology	All the scientists of HRS, Lam
8-10-2013	Dachepalli and Karampudi organised by ATMA and Ambhuja cements ltd.	Chilli production technology	Dr.C.Sarada, Senior Scientist (Hort.)
26-12-2013	Tullur organized by RAWEP students	Chilli, banana and turmeric management	Dr.L.Naram Naidu, Principal Scietist (Hort.) & Sri.K.Giridhar, Scientist (Hort.)
4-1-2014	Garapadu organized by Karshak crop sciences	chilli production technology	Dr. L.Naram Naidu, Principal Scientist (Hort.) & T.Vijaya Lakshmi, Scientist (Path)
6-1-2014	Tenali market Yard compound conducted by Central Government	Management and production of Turmeric	Sri K.Giridhar, Scientist (Hort.)
15-2-2014	Mangalagiri	Chilli, banana and turmeric management	Dr.C.Sarada, Senior Scientist(Hort)
21-2-2014	Kachavaram village, Dachepalli mandal organized by Dept of Hort.	Chilli production technology	Smt.A.Rajani, Scientist (Hort)
22-2-2014	RARS, Lam organized by DAATTC, Guntur	Chilli production technology	T.Vijaya Lakshmi, Scientist (Path)
24-2-2014	Gundavaram, Chebrolu mandal	Vegetable production	Dr.C.Sarada, Senior Scientist (Hort.)
24-2-2014	Narakoduru, Chebrolu mandal	Vegetable production	Dr.C.Sarada, Senior Scientist (Hort.)
1-3-2014	Kottapalem, Ganapavaram mandal	Chilli production technology	T.Vijaya Lakshmi, Scientist (Path)
7-3-2014	75 Tallur, Pedakurapadu mandal	Chilli production technology	Dr.C.Sarada, Senior Scientist (Hort)

Mango Research Station, Nuzvid

- Smt. D.Aparna, Scientist (Hort.) & Head participated in rythusadassu organized by Department of Agriculture at Dr.YSRHU, V.R.Gudem on 10-5-2013.
- Smt. D.Aparna, Scientist (Hort.) & Head participated in rythusadassu organized by Department of Agriculture at Layola college auditorium, Vijayawada on 16-5-2013.

Krishi Vigyan Kendra, Venkataramannagudem

- On 06.04.2013, Dr.M.B.Nageswara Rao, Director of Extension, Dr.YSRHU, V.R.Gudem, Dr.E.Karunasree, Programme Co-ordinator, Sri Ch.Kiran Kumar, SMS (SS&AC) and the staff of Krishi Vigyan Kendra, Venkataramannagudem participated and arranged photo exhibition on flood affected crops in KVK adopted villages and operational areas along with the contingency measures suggested by way of placing flexi posters and method demonstrations on the occasion of the visit of Hon'ble Chief Minister, Govt. of Andhra Pradesh at Tadepalligudem.

Exhibition Stall at Kisan mela, RARS Maruteru, West Godavari

Photo Exhibition on Phailin Cyclone at Tadepalligudem during CM Visit

SKPP Horticultural Polytechnic, Ramachandrapuram

- Sri M. Satti Raju, Vice-Principal has participated in Rythu Sadassu at Rampachodavaram on 14-5-2013.

M. Rythu Chaitanya Yatras:

Cashew Research Station, Bapatla

Date	Name of the village	Name of the Scientist	Topics covered
22.04.2013	Nandirajuthota, Bapatla	K. Umamaheswara Rao, Scientist (Hort.) & Head	Cultivation of Horticultural crops
02.05.2013	Pittalavanipalem, Bapatla	K. Umamaheswara Rao, Scientist (Hort.) & Head	Cultivation practices of flower crops
03.05.2013	Muthayapalem, Bapatla	K. Umamaheswara Rao, Scientist (Hort.) & Head	Cashew production technology
06.05.2013	Pyarli, Bapatla	K.Umamaheswara Rao, Scientist (Hort.) & Head	Cashew production technology

Horticultural Research Station, Lam

Date	Name of the village	Name of the Scientist	Topics covered
22-4-2013	Jonnalagadda	Smt.T.Vijaya Lakshmi, Scientist (Path)	Chilli production technology
22.4.2013	Kammavarialem & Govindapuram	Sri. K. Giridhar, Scientist (Hort.)	Production technology of different horticultural crops
23-4-2013	Changiskhanpet & Gopalpuram	Sri. K. Giridhar, Scientist (Hort.)	Production technology of different horticultural crops
23-4-2013	Gorantla	Smt.T.Vijaya Lakshmi Scientist (Path)	Package of practices of important vegetables viz tomato, cucurbits and bhendi
24-4-2013	Srungarapuram	Smt. A.Rajani, Scientist (Hort.)	Production technology of turmeric
25-4-2013	Narakoduru	Smt. A.Rajani, Scientist (Hort.)	Production technology of vegetables
25-4-2013	Tokavaram & Mallavaram	Smt.T.Vijaya Lakshmi Scientist (Path)	Management practices to be taken for the quality chilli
25-4-2013	Endrai & Lemellapudi	Dr.C.Sarada, Senior Scientist (Hort.)	Package of practices of chilli
26-4-2013	Pedapalakaluru	Smt.T.Vijaya Lakshmi Scientist (Path)	Chilli production technology
26-4-2013	Lakshmana-gudipudi	Dr.C.Sarada, Senior Scientist (Hort)	Package of practices of chilli
29-4-2013	Nallapadu & Turakapalem	Smt.T.Vijaya Lakshmi Scientist (Path)	Chilli production technology
30-4-2013	Ankireddypalem, Challavaripalem	Smt.T.Vijaya Lakshmi Scientist (Path)	Pest and disease management of different vegetable crops
9-5-2013	Guntur	All the scientists of HRS, Lam	Important horticultural crops of the district
1-5-2013	Vengalayapalem	Smt.T.Vijaya Lakshmi Scientist (Path)	Chilli production technology
2-5-2013	Lalpuram & Lingayapalem	Smt.T.Vijaya Lakshmi Scientist (Path)	Management practices to be taken for the quality chilli
3-5-2013	Pothuru & Obulanaidupalem	Smt.T.Vijaya Lakshmi Scientist (Path)	Pest and disease management of different vegetable crops
7-5-2013	Khambhampadu and Parsha	Dr.C.Venkata Ramana, Scientist (Hort.)	Chilli production technology
8-5-2013	Lingapuram and Bholusupadu	Dr.C.Venkata Ramana, Scientist (Hort.)	Chilli production technology

Horticultural Research Station, Pandirimamidi

Place	Date	Participant & Designation	Particulars
Busigudem	25.04. 13	Dr.K.Rajendra Prasad Scientist (Hort.)	Cashew & Vegetables
Bandapalli and Tativada	27.04. 13	Dr.K.Rajendra Prasad Scientist (Hort.)	Oil palm & Mango
I.Polavaram	03.05.13	Dr.K.Rajendra Prasad Scientist (Hort.)	Cashew, Mango & Vegetables
Tamarapalli	04.05.13	Dr.K.Rajendra Prasad Scientist (Hort.),	Cashew, Brinjal, & Mango
Ootla	07.05.13	Dr.K.Rajendra Prasad Scientist (Hort.)	Oil palm& Vegetables
Folkspeta	08.05.13	Dr.K.Rajendra Prasad Scientist (Hort.)	Cashew & Mango & Marigold

Floriculture Research Station, Rajendranagar

- Dr. P. Lalitha Kameswari, Sci(H) attended Rythu Chaintanya Yatra on 25th at Kothvalguda and Shamshabad villages and on 29th May, at Hamidullanagar and Gollapalli villages, Shamshabad mandal.

Medicinal & Aromatic Plants Research Station, Rajendranagar

- Dr.G.Sathyanarayana Reddy, Principal Scientist & Head has participated in RCY in Hamidullahpur and Gollapalli villages on 27-4-2014 and Pedashapur and Jukal villages of Shamshabad mandal of Rangareddy district on 29-4-2014.
- Dr T. Susila, Scientist (Hort.) has participated in RCY in the following villages of Shamshabad Mandal from 23rd April 2013 to 8th May 2013 in Rangareddy district.

Date	Village	No.of farmers participated
23-04-2013	Malkaram	45
24-04-2013	Nanajipur	52
25-04-2013	KothwalgudaShamshabad	4439
26-04-2013	ThondupalliUtpalli	3617
04-05- 2013	Pedda GolcondaChina Golconda	7933
06-05-2013	Palmakula	45
08-05-2013	Muchintal	33

SKPP Horticultural Polytechnic, Ramachandrapuram

- Sri M. Satti Raju, Vice-Principal has participated in Rythu Chaitanya Yatra at Pedakothuru, and discussed about the pre seasonal/seasonal operations in horticultural crops. The programme was chaired by the Agriculture minister on 3-5-2013 and at Jonnada village on 4-5-2013.
- Sri M. Satti Raju, Vice-Principal has participated as resource person in three days District level training on Cocoa at Tuni on 27-6-2013.

Krishi Vigyan Kendra, Pandirimamidi

S.No.	Date	Scientist participated	Village/Mandal	Topics covered
1	22-04-2013	Dr.A.Srinivas Sri V.Govardhana Rao	Koyyalagudem village, RakotaRampachodavaram mandal	Kitchen gardeningSRI cultivation, Pest and disease management in Paddy, high yielding varieties in Paddy
2	23-04-2013	Dr.A.Srinivas	Peda Geddada village Rampachodavaram mandal	Backyard poultry, high yielding varieties of Paddy , Turmeric, Cashew grafts, women empowerment & Maize cultivations & activities of KVK
3	23-04-2013	Sri V.GovardhanaRao	Indukuru, M.Ravilanka, Lothupalem, Pedhabheempalli villages Devipatnam mandal	Package of practices in Maize, Pest & disease management in Paddy, high yielding varieties in Paddy
4	24-04-2013	Dr.A.Srinivas	Busigudem village Rampachodavaram mandal	Backyard poultry, high yielding varieties of Paddy , Turmeric, Cashew grafts, women empowerment & Maize cultivations & activities of KVK
5	24-04-2013	Sri V.GovardhanaRao	Devaram, Pothavaram villages Devipatnam mandal	Package of practices in Maize, Pest & disease management in Paddy, high yielding varieties in Paddy
6	25-04-2013	Sri V.GovardhanaRao	Sarbhavaram, Uppayyapalem, Kambalapalem villages Devipatnam mandal	Package of practices in Maize, Pest & disease management in Paddy, high yielding varieties in Paddy
7	26-04-2013	Sri V.GovardhanaRao	Pudipalli, Gonduluru, Anguluru, Nelakota	Package of practices in Maize, Pest & disease management in Paddy, high yielding varieties in Paddy
8	27-04-2013	Sri V.GovardhanaRao	Bandapalli, Tatiwada villages Rampachodavaram mandal	Package of practices in Maize, Pest & disease management in Paddy, high yielding varieties in Paddy
9	29-04-2013	Dr.A.Srinivas	Marriwada village Rampachodavaram mandal	Backyard poultry, high yielding varieties of Paddy, Turmeric, Cashew grafts, women empowerment & Maize cultivations & activities of KVK
10	29-04-2013	Sri V.GovardhanaRao	Devipatnam, toyyuru, Ganugulagondi, Agrahram, Yenugulagudem villages Devipatnam mandal	Package of practices in Maize, Pest & disease management in Paddy, high yielding varieties in Paddy

N. Village Adoption Programme :

Horticultural Research Station, Ambajipeta

Eighteen RAWEP students (Girls) from College of Horticulture, Venkataramannagudem were trained at HRS, Ambajipeta regarding production and protection technologies of coconut and its inter crops under the guidance of Dr.G. Ramanandam Principal Scientist (Hort.) & Head, Dr.N.B.V. Chalapathi Rao, Senior Scientist (Ento.), Sri K. Ravindra kumar, Scientist (Hort.), Dr.A.Snehalatha Rani, Scientist (Pl.Path.). The students were positioned in two different villages (Gangalakurru & Mukkamala) for learning field experiences on local horticultural crops.

VI. PUBLICATIONS

Books, Laboratory manuals, Technical bulletins, Research papers etc.

A. Research papers

Dr.B.Prasanna Kumar, Principal Scientist (Hort.), Studies on the effect of Integrated nutrient management practices on growth and leaf yield of Palak (Beta vulgaris var. bengalensis L) – Andhra Agricultural Journal, Bapatla.

Dr.B.Prasanna Kumar, Principal Scientist (Hort.), Studies on the effect of Integrated nutrient management practices on quality parameters and economics of Palak (Beta Vulgaris var. bengalensis L) – Green Farming (An International Journal of Applied Agricultural and Horticultural Science) – Jodhpur.

Dr.B.Prasanna Kumar, Principal Scientist (Hort.), Studies on the effect of chemicals and growth regulators on post harvest shelf life of cv. Red Lady of papaya – Journal of Horticultural Science: Bangalore.

Dr.B.Prasanna Kumar, Principal Scientist (Hort.), Effect of Auxins and type of cutting on propagation of phalsa (Grewia subinequalis DC.) under shade net conditions – Green Farming (An International Journal of Applied Agricultural and Horticultural Science), Jodhpur.

Dr.B.Prasanna Kumar, Principal Scientist (Hort.), Utilization of Cashew apple (Anacardium occidentale L.) for preparing cashew apple syrup by using different cultivars – Green Farming (An International Journal of Applied Agricultural and Horticultural Science) Jodhpur.

Dr.B.Prasanna Kumar, Principal Scientist (Hort.), Effect of time and level of pruning on growth of Cashew (Anacardium occidentale L.) Journal of Plantation Crops, Kasargod, Kerala.

Dr.B.Prasanna Kumar, Principal Scientist (Hort.), Performance of different genotypes of Guar (Cymopsis tetragonalaba L Taub) under agro-climatic conditions of North Coastal Zone of Andhra Pradesh-Andhra Agricultural Journal, Bapatla.

Dr.B.Prasanna Kumar, Principal Scientist (Hort.), Correlation coefficients of growth and seed quality of Guar (Cymopsis tetragonalaba L Taub) under agro-climatic conditions of North Coastal Zone of Andhra Pradesh – Andhra Agricultural Journal, Bapatla.

Dr.T.Padmalatha, Dr.G.S.N.Reddy, R.Chandrasekhar, A.Shivashankar and Anurag Chaturvedi. (2013). Effect of foliar sprays of bioregulators on growth and flowering in gladiolus. Indian Journal of Agriculture Research 47(3):192-199,

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T. Susila, G. Satyanarayana Reddy and D. Jyothsna. 2013. Standardization of protocol for in vitro propagation of an endangered medicinal plant Rauvolfia serpentina Benth. Journal of Medicinal Plants Research. 7(29): 2150-2153.

T. Susila, 2013. Performance of tuberose cultivars under north coastal Andhra Pradesh, India. Agricultural Science Digest. 33 (2): 161-162.

T. Susila, 2013. Evaluation of Gladiolus varieties for Visakhapatnam district of Andhra Pradesh, India. Agricultural Science Digest. 33 (3): 237-238.

T. Susila and G. Satyanarayana Reddy 2013. Markets for Medicinal Plants an Over view. Souvenir of National Seminar on Current Status and Recent Advances in Medicinal Plants Research. Oushadhi 2013 pp: 173-177

G. Satyanarayana Reddy and T. Susila (2013). Some important medicinal plants in India – importance and conservation" Abstract published in proceedings of 2nd International Symposium on Minor Fruits and Medicinal Plants held at University of Ruhuna, Mapalana, Kamburupitiya, Srilanka on 20th December 2013. pp: 20

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"Genetic diversity revealed in commercial varieties of Chrysanthemum (Dendranthema grandiflora) using RAPD markers" authored by P.Lalitha Kameswari, G.Anuradha , M. Pratap and Hameedunnisabegum published in Electronic Journal of Plant Breeding, 5(1): 45-51 (Mar 2014).

"Genetic diversity in tuberose (Polianthes tuberose L.) using morphological and ISSR markers" authored by P.Lalitha Kameswari, A. Girwani and K.RadhaRani published in Electronic Journal of Plant Breeding, 5(1): 52-57 (Mar 2014)

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C.Narendra Reddy, D.Anitha Kumari BKM Lakshmi, D.Jagdishwar Reddy 2013, Residue dynamics of Imidacloprid and Hexaconazole in mango. International journal of bioresource and stress management 4(2)263-265.

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Subba Reddy G.V, Nageswara Rao M.B, Uma Jyothi K and Sasikala K, 2013 studies on the effect of plant Growth Regulators on flowering, Corns, Cormel production in Gladiolus J.Res.,APAU, 41 (2): 11-16.

Madhavi K, Umajyothi K and Nageswara Rao M.B, 2014 Evaluation of vegetable cowpea for high yields A.A.J. 61 (2).

B. Books/ Book Chapters

Dr.G.Sathyanarayana Reddy, Principal Scientist & Head and Dr.T.Susila, Senior Scientist (Hort.), MAPRS, Rajendranagar Published booklet on "Cultivation of Aromatic crops" (English).

K. Jyothirmai Madhavi and P. Kishore Varma published book chapter on "Role of antiviral principles in the management of plant viruses" In: Organic Farming and Management of Biotic Stresses. (eds) Samir Kumar Biswas & Samir Pal, Published by Biotech. Books, New Delhi, 2014, pp. 491-506.

P. Kishore Varma and K. Jyothirmai Madhavi book chapter on "Plant growth promoting rhizobacteria and its role in crop protection" In: Organic Farming and Management of Biotic Stresses. (eds) Samir Kumar Biswas & Samir Pal, Published by Biotech. Books, New Delhi, 2014, pp. 491-506.

Dr.C.V.S.K.Sarma, IAS, Additional Chief Secretary & Vice-Chancellor i/c, Dr.YSRHU released Telephone Directory of Dr.YSRHU for 2013, edited & compiled by Dr.M.B.N.Rao, DE on 04th July, 2013 at Secretariat Hyderabad.

Udyana Panchangam-2013 of Dr YSRHU published and released on Telugu New Year day , 11-04-2013 by Dr.M.B.N.RAO, DE, through Hon'ble CM & other Cabinet Ministers at Ravindra Bharathi, Hyderabad.

Release of Udyana Panchangam and other university publications

Publications explaining the cultivation and management practices of various horticultural crops were brought out as detailed below by Dr.M.B.N.Rao, Director of Extension,Dr.YSRHU

- Flowering creepers
- Production Technology for Aagakara
- Tapioca Cultivation
- Restoration of Cyclone affected coconut garden
- Rejuvenation of old Mango gardens by Top working
- Cashew Production Technology
- Flowering Shrubs & Herbs
- Flowering Trees & Palms
- Medicinal & Aromatic Plants
- Micro-Irrigation Management

C. Technical Bulletins/Folders/Pamphlets

- Dr.B.Prasanna Kumar, Principal Scientist (Hort.), Integrated Pack House cum Cold Storage Unit (Bilingual Telugu and English)
- Smt. D.Aparna, published Technical Bulletin on "Mamidi poothaku mundhu chepattavalasina sasya rakshna charyalu".
- Smt. D.Aparna, published Technical Bulletin on "Mamidi lo sakaalam lo poothaku mariyu adhika digubadulaku cheyyavalasina yaajamaanya mariyu sasya rakshna paddathulu".
- Smt. D.Aparna, published Technical Bulletin on "Mamidi pootha samayalo purugu thegulla nivarana".
- MAPRS, Rajendranagar, technical bulletin on Important Medicinal plants cultivation (in Telugu) (Mukhyamaina oushadha pantala sagu) .

D. Popular Articles:

- Mamidi lo vividha rakalaina antu kattu padhathulu – by Smt. D.Aparna, Scientist (Hort.) in Rythulokam agriculture magazine March, 2013 (P.No.7-8)
- Chalapathi Rao, N.B.V., Ravindra Kumar, K. & Ramanandam, G. "Kobbarini Aasinche Nallamutte purugu –Nivarana charyalu" Agri clinic February' 2014 (P.7-8).

Title of the article	Magazine in which Published	Authors	Month /year
Mamidi Thotalalo Panta kotha tadhupari charyalu	Rythu Nestham	Dr. A. Kiran Kumar, Dr.A.Bhagwan and Dr.M.Raj Kumar	May, 2013, P.No.37
Mamidi kaya kotha samayam Gurthinchadam & Market ku tharalinche samayam lo jagrathalu.	Rythu Nestham	Dr. A. Kiran Kumar, Dr.A.Bhagwan and Dr.M.Raj Kumar	May, 2013, P.No.38
Punasa Mamidi Rakala Sagu.	Rythu Nestham	Dr. M. Raj Kumar, Dr. A. Bhagwa, Dr. A. Kiran Kumar, Sri H.B. Charles and C.H. Sadaiah	July, 2013 P.No.31-33
Allam lo Adhika digubadula Kosam	Rythu Nestham	Dr. A. Bhagwa, Dr. A. Kiran Kumar, Dr. M. Raj Kumar and Sri C.H. Sadaiah	July, 2013-08-03 P.Np.48-50
Allam lo anu-uthaptulu.	Rythu Nestham	Dr. M. RajKumar, Principal Scientist (H), Dr.A.Bhagwan, Senior Scientist (H), Dr.A.Kiran Kumar, Scientist (H)	August, 2013
Mamidilo komma kathirimpulu	Rythu Nestham	A. Bhagwan, A. Kiran Kumar and M. Raj Kumar.	September, 2013, P.No.30-3
Mamidi Sagulo melaina padhathulu	Rythu Nestham	M. Raj Kumar, A. Bhagwan, A. Kiran Kumar and Ch. Sadaiah.	September, 2013, P.No.14-15
Nurserylalo pandla mokkala utpathi – Gurthunchuko-valasina amshaalu	Rythu Nestham	r. A. Kiran Kumar, Dr. A. Bhagwan, Dr. M. Raj kumar, Sri Ch. Sadaiah	Nov, 2013, P.No.19-20
Egumatiki anuvaina jaama saagulo melaina yaajamaanya paddhatulu	Rythu Nestham	Rythu nestam Dr. M. Raj Kumar, Principal Scientist (Hort.) & Head.	December, 2013
Mamidi lo poota mariyu pinde dasalo teesukovalasina jagrathalu	Rythu Nestham	M. Raj Kumar, A. Bhagwan, A. Kiran Kumar, Ch. Sadaiah and T. Sandeep Reddy.	January, 2014
Mamidi thotallo prasthutam teesukovalasina jagrathalu	Rythu Nestham	M. Raj Kumar, A. Bhagawan, A. Kiran Kumar, Ch. Sadaiah and T. Sandeep	February, 2014 P, no. 45-47.
Mamidi lo pinde, kaya dasalo cheyalsina panulu	Rythu Nestham	M. Rajkumar, Principal Scientist (H), A. Bhagwan, Senior Scientist (H), A. Kiran Kumar, Senior Scientist (H), K. Jyothirmai Madhavi, Scientist (Pl. Patho) and Ch. Sadhaiah.	March, 2014
Mamidi kotha ananthara sankethika parignanam	Rythulokam	A. Kiran Kumar, Senior Scientist (H), M. Rajkumar, Principal Scientist (H), A. Bhagwan, Senior Scientist (H) and Ch. Sadhaiah.	March, 2014

Name of the Scientist	Designation	Particulars	Name of the Magazine
Cultivation of Gaillardia in summer season.	Vyavasayam	Dr P. Lalitha Kameswari, Scientist (Hort)	April 2013
Alstroemeria – An eco-friendly flower crops	Floriculture Today	Dr P. Lalitha Kameswari, Scientist (Hort)	August 2013
Cultivation of China Aster	Annadata	Dr P. Lalitha Kameswari, Scientist (Hort)	September 2013
Tuberose cultivation - Improved practices	Annadata	Dr P. Lalitha Kameswari, Scientist (Hort)	September 2013
Gardenia – A Fragrant plant landscape gardening	Floriculture Today	Dr P. Lalitha Kameswari, Scientist (Hort)	September 2013
Ornamental chilies – Anew trend in ornamental gardening	Floriculture Today	Dr P. Lalitha Kameswari, Scientist (Hort)	October 2013
Bathukamma – A uniq festival of flower decoration	Floriculture Today	Dr P. Lalitha Kameswari, Scientist (Hort)	November 2013
Marigold cultivation- Improved practices	Vyavasaya padipantalu	Dr P. Lalitha Kameswari, Scientist (Hort)	January 2014
Vitini Penchadam Chala Telika (Linoxium)	Sakshi	Dr. R. Chandra Sekhar Dr. P. Prasanth	14.02.2014
Alankarana andhu Asparagas	Sakshi	Dr. R. Chandra Sekhar Dr. P. Prasanth	21.02.2014
Chamanthiki Shithakalame Anukulam	Sakshi	Dr. R. Chandra Sekhar Dr. P. Prasanth	01.11.2013
Kommalu Natadame melu	Sakshi	Dr. R. Chandra Sekhar Dr. P. Prasanth	01.11.2013
Pulu Twaraga Pusela Cheyochu	Sakshi	Dr. R. Chandra Sekhar Dr. P. Prasanth	08.11.2013
Ila chesthe Mokantha Pule	Sakshi	Dr. R. Chandra Sekhar Dr. P. Prasanth	22.11.2013
Chamanthilo Idhela? Adhela?	Sakshi	Dr. R. Chandra Sekhar Dr. P. Prasanth	15.11.2013
Ivi Pula Nanyathanu debathisthayi	Sakshi	Dr. R. Chandra Sekhar Dr. P. Prasanth	29.11.2013
Dumpala Empikane kilakam	Sakshi	Dr. R. Chandra Sekhar Dr. P. Prasanth	11.10.2013
Kanakabharaniki Kashtalu	Sakshi	Dr. R. Chandra Sekhar Dr. P. Prasanth	13.12.2013

Mallela nilva kalani Penchochu.	Sakshi	Dr. R. Chandra Sekhar Dr. P. Prasanth	20.12.2013
Kommalu yenduku katharinchali?	Sakshi	Dr. R. Chandra Sekhar Dr. P. Prasanth	04.01.2014
Arliki yenda dhandiga Undali	Sakshi	Dr. R. Chandra Sekhar Dr. P. Prasanth	17.01.2014
Ivi mallela sogusunu chidimesthayi	Sakshi	Dr. R. Chandra Sekhar Dr. P. Prasanth	17.01.2014
Thadi yekuvaina thakuvaina nashtame	Sakshi	Dr. R. Chandra Sekhar Dr. P. Prasanth	24.01.2014
Bangaru kaddilanu pandinchochu	Sakshi	Dr. R. Chandra Sekhar Dr. P. Prasanth	01.02.2014
Viti sagu chala telika	Sakshi	Dr. R. Chandra Sekhar Dr. P. Prasanth	07.02.2014
Chala kalam pulu pusthayi	Sakshi	Dr. R. Chandra Sekhar Dr. P. Prasanth	28.02.2014
E mokka Chala mondidhi	Sakshi	Dr. R. Chandra Sekhar Dr. P. Prasanth	07.03.2014

Dr. Saidaiah Pidigam published an article on “Biofuels on degraded lands” on 26.9.13 – Eenadu (state) main paper editorial column page 4.

Dr. Saidaiah Pidigam published an article on “Cultivate GM crops for losses” on 10.8.13-Eenadu (state) main paper editorial column page 4.

Dr. Saidaiah Pidigam published an article on “Utilization of agricultural wastes for future” on 5.8.13 - Eenadu(state) main paper editorial column page

Dr.Ch.Ruth, Scientist (Pl.path) & Head published an article in Padi panta - Sakshi Daily Newspaper on “Vesavi Ullisaguku Samayamidee” dt:26-02-2013.

Dr.L.Mukunda Lakshmi, Dr. K. Gopal, Smt G. Sarada, Smt T. Naga Lakshmi & Dr. K. M. Yuvaraj “Cheeni Nimma Thotallo Rabi Antharapantagas Anapa Saagu” Sedya Phalam, February, 2013; 42-43

Dr.L.Mukunda Lakshmi, Dr. K. Gopal, Smt G. Sarada, Dr. K. T. Venkata Ramana & Smt T. Naga Lakshmi , “Pachi Rotta Pyrla Saagutho Prayojanalu” Rythunestham, March, 2013; 59.

K. Gopal, K.T.V. Ramana, L. Mukunda Lakshmi, T. Naga Lakshmi and G. Sarada (2013), Citrus Production and Protection Technology .

Dry root rot in citrus and its management (Cheeni, Nimma thotalaku vachu verukullu thegulu – Nivarana) (2013). K. Gopal, T. Naga Lakshmi, K.T.V. Ramana, L. Mukunda Lakshmi, G. Sarada, V. Gopi and T. Gouri Sankar.

K. Gopal, G. Sarada, K.T.V. Ramana, T. Naga Lakshmi and L. Mukunda Lakshmi.(2013), Snow scales in citrus and its management (Cheeni, Nimmalo polusu purugulu – Yajamanyam.

G. Sarada, K. Gopal, L. Mukunda Lakshmi, T. Naga Lakshmi and K.T.V. Ramana., (2013). Management of citrus mangu (Cheenilo mangunali – Nivarana)

L.Mukunda Lakshmi, K. Gopal, K.T.V. Ramana, G. Sarada and T. Naga Lakshmi.(2013)Precautionary measures to be taken at the time of citrus planting (Cheeni antu mokalu natetapudu thisukovalsina jagrathalu) .

Dr. D. Srinivas Reddy et al., (2013), Indigenous Mango Varieties of Chittoor (Technical bulletin), Published by IIHR, Bangalore.

Dr.M.Kavitha, Scientist (PP), Dr.B.Govinda Rajulu, Principal Scientist (PP) & D.Sreedhar, Scientist (H) – Kanakambram mariyu chamanthitho sasyarakshana – sedyapalam.

Dr.M.Kavitha, Scientist (PP), Dr.P.T.Srinivas, Senior Scientist (PP), D.Sreedhar, Scientist (H), A.Ramanjaneya Reddy, Scientist (SS) & Dr.B.Prathap, Scientist (Agronomy) – Aaratilo nulipurugulu – samagrayajamanyam – sedyapalam.

Veena Joshi, B.Srinivas Rao, D.Vijaya, G.Ram Reddy, D.Anitha Kumari, Drakhsa lo seethakalapu kathirimpulato nanyamina digubadulu", November 2013, Rytunesham, page no 47-48.

D.Vijaya, B.Srinivas Rao, G.Ram Reddy, D.Anitha Kumari and Veena Joshi Vividha udyana pandlapantala lo pempakam lo nealala empika, Sedyaphalam,Vol.1 no:7Pg 22

B.Srinivas Rao, G.Ram Reddy D.Vijaya, D.Anitha Kumari and Veena Joshi, "Endudraksha" Agriclinic-April 2013.

E. Participation of Teachers / Scientists in International and National conferences/ symposiums / workshops.

Dr.T.Susila, Sr. Scientist(Hort) participated in sensitization workshop on biotechnologies for upliftment of SC, ST and Rural population organized by Agri Biotech Foundation, ANGRAU Campus on 17-5-2013 and 18-5-2013.

Dr. G.Sathyanarayana Reddy Pr. Scientist (Hort.) participated in Round table conference of GM crops organized Farmers Association of Andhra Pradesh on 09-10-2013.

Dr G. Satyanarayana Reddy Principal Scientist (Hort.) and Dr T. Susila Senior Scientist (Hort.) participated in World Agricultural Forum Congress from 4-7th November, 2013 at HICC, Hyderabad.

Dr G. Satyanarayana Reddy Principal Scientist (Hort.) presented oral paper entitled " Some important medicinal plants in India – importance and conservation" at 2nd International Symposium on Minor Fruits and Medicinal Plants held at University of Ruhuna, Mapalana, Kamburupitiya, Srilanka on 20th December 2013.

Dr G. Satyanarayana Reddy Principal Scientist (Hort.) presented oral paper on "Conservation strategies of medicinal plants" in the National Seminar on current status and recent advances in Medicinal plant Research organized by A.P. Medicinal and aromatic Plants Board on 30-12-2013 at Central Research Institute of Unani Medicine, Yerragadda, Hyderabad.

Dr G. Satyanarayana Reddy Principal Scientist (Hort.) presented oral paper on Effect of date of sowing and nitrogen on growth and yield of Isabgol (Plantago ovata) at 2nd International Conference on Agricultural & Horticultural Sciences 2014 held from February 3-5th 2014 ,Radisson Blu Plaza Hotel, Hyderabad organized by OMICS publishing group USA.

Dr T. Susila, Senior Scientist (Hort.) attended Awareness Workshop in issues related to genetically modified crops at ANGRAU organized by Biotech Consortium India Ltd (BCIL) New Delhi on 28-11- 2013.

Dr T. Susila Senior Scientist presented oral paper entitled "Effects of Plant Growth Regulators and Time of Application on Growth and Tuber Yield of Coleus forskohlii" at 2nd International Symposium on Minor Fruits and Medicinal Plants held at University of Ruhuna, Mapalana, Kamburupitiya, Srilanka on 20th December 2013.

Dr.T.Susila, Sr. Scientist (Hort.) participated in the National Seminar on current status and recent advances in Medicinal plant Research organized by A.P. Medicinal and aromatic Plants Board held on 30-12-2013 at Central Research Institute of Unani Medicine, Yerragadda, Hyderabad.

Dr T. Susila Senior Scientist (Hort.) presented oral paper entitled Effect of different plant densities on leaf and gel yield of Aloe barbadensis. 2nd International Conference on Agricultural & Horticultural Sciences 2014 held from February 3-5th 2014, Radisson Blu Plaza Hotel Hyderabad organized by OMICS publishing group USA.

Prasad K R, K U Kumari, G N Murthy,Vengaiah, P C 2014. Studies on the performance of improved varieties of turmeric in the agency area of east Godavari district on 27-18th January 2014 at department of botany, Andhra Loyola college, Vijayawada, Andhra Pradesh, India.

Prasad K R, K U Kumari, G N Murthy,Vengaiah, P C 2014. Studies on performance of varieties of ginger in the agency area of east Godavari district on 27-18th January 2014 at department of botany, Andhra Loyola college, Vijayawada, Andhra pradesh, india.

Kumari, K U, K R Prasad, G N Murthy,Vengaiah, P C 2014. Identification of cinnamon varieties suitable for rainfed conditions of at high altitude region of east Godavari district on 27-18th January 2014 at department of botany, Andhra Loyola college, Vijayawada, Andhra Pradesh, India.

Kumari, K U, K R Prasad, G N Murthy,Vengaiah, P C 2014. Collection, maintenance, evaluation of germplasm lines of minor forest produce spices for growth and economic yields at high altitude region of east Godavari district on 23rd January 2014 at ISPP south zonal seminar on physiological and molecular interventions for improving crop productivity at agricultural college Bapatla, Andhra Pradesh, India.

Prasad K R, K U Kumari, G N Murthy,Vengaiah, P C 2013. Studies on production of capsicum under polyhouse conditions during 29-30 November 2013 at national seminar on protected cultivation of horticultural crops and value addition at sam higgimbatham institute of agriculture and science, Allahabad, India.

Kumari, K U, K R Prasad, G N Murthy, Vengaiah, P C 2013. Studies on performance of gerbera cultivars under polyhouse conditions at high altitude region of Andhra Pradesh during 29-30 November 2013 at national seminar on protected cultivation of horticultural crops and value addition at sam higgimbatham institute of agriculture and science, Allahabad, India.

Vengaiah, P C, R Nagalakshmi and BVK Bhagavan, 2013.Physio-chemical and functional characteristics of flour produced from yam tuber (Dioscorea alata L) International Conference on Tropical Roots and Tubers for Sustainable Livelihood under changing Agro-Climate during 09-12 July 2013 at Hotel Mascot, Thiruvananthapuram.

Vengaiah, P C, G N Murthy, K R Prasad, H P Maheswarappa, 2013. Nutrient composition in Palmyrah tubers (Borassus flabellifer, L). International Conference on Tropical Roots and Tubers for Sustainable Livelihood under changing Agro-Climate during 09-12 July 2013 at Hotel Mascot, Thiruvananthapuram.

Dr.S.S.Vijaya Padma attended the seminar on "Physiological and Molecular Interventions for Improving Crop Productivity" organized by ISPP SOUTH ZONAL SEMINAR at college of Agriculture, Bapatla on 23-01-2014.

Dr. K. Radha Rani, presented poster on "Evaluation of bitter gourd genotypes for growth and yield characters" in the ISPP South zonal seminar on physiological and molecular interventions in crop productivity conducted by Dept of Crop Physiology at College of Agriculture, Bapatla on 23-01-2014.

Dr. K. Radha Rani, presented paper on "Genetic Variability, character association and pethanalysis in early segregating population of bitter Gourd (Momordica charantia L.) from 03-02-2014 to 05-02-2014 in 2nd International conference on Agricultural and horticultural sciences conducted by Omics Group at Hyderabad.

Dr. K. Radha Rani, presented poster on "A study on Heterosis and combining ability for quantitative traits in Bittergourd (Momordica charantia L.) from 20-02-2014 to 25-02-2014 in International conference on bitter gourd conducted by AVRDC at ICRISAT, Hyderabad

Dr.A.Girwani presented poster on 'Studies on growth and flowering of gladiolus as influenced by organic manures' in the ISPP South zonal seminar on physiological and molecular interventions in crop productivity conducted by Dept of Crop Physiology at College of Agriculture, Bapatla on 23-01-2014.

Dr.A.Girwani attended the seminar on "Physiological and Molecular Interventions for Improving Crop Productivity" organized by ISPP SOUTH ZONAL SEMINAR at college of Agriculture, Bapatla on 23-01-2014.

Dr. P.Lalitha Kameswari, Scientist(Hort) have attended the "International conference on Landscape and Urban Horticulture" from 12th to 14th, September, 2013 organized by ISHS at Science City, Kolkatta and gave an oral presentation on "A Comparative analysis of genetic diversity in chrysanthemum (Dendranthema grandiflorum) cultivars based on RAPD and ISSR markers ."

Dr. P.Lalitha Kameswari, Scientist(Hort) attended the ISPP South Zonal seminar on 23/01/2014 and presented the poster on "Genetic relatedness among Chrysanthemum genotypes using ISSR markers for which best poster was awarded.

Dr. P.Lalitha Kameswari, Scientist(Hort) attended the 2nd International conference on Agricultural and Horticultural sciences from 3rd – 5th February, 2014 at Radisson plaza, Hyderabad and gave the oral presentation on "Morphological characterization of chrysanthemum based on qualitative traits."

Dr. A.L.N.Prasad, Sr. Scientist (Pl.Phy.) acted as convener for the technical session IV (Post harvest technology and value addition) of Annual Group Meeting of AICRP on Floriculture organized by DFR at Ludhinana, Punjab.

Dr. Ravi Chandrasekhar, Associate Dean attended World Agricultural Forum Congress and Agri-Tech Trade Fair "Reshaping Agriculture for a sustainable future: Focus on small Farmholders" in Hyderabad during November 4-7, 2013.

Place	Date	Participant & Designation	Particulars
South kannda district Karnataka	21.04.13 to 27.04.13	G.Narasimha Murthy Scientist (Hort.)	Germplas survey and collection for AICRP palms at
AndhraLyola College, Vijayawada.	27.1.14 to 28.01.14 C	Dr.K.Rajendra Prasad Scientist (Hort.)	National conference on "Modern approaches to the conservation of medicinal plants"
IGKV, Raipur	27.1.14 to 28.01.14 C	G.Narasimha Murthy Scientist (Hort.) & Sri P.C VengaiahScientist (FST)	Participated in Annual workshop AICRP on Palms held at IGKV Raipur and presented the work done report.
Sam Higgin bottom Institute of Agriculture, Technology and Sciencies , Allahabad	29.11.13 to 30.11.14	Dr.K.Rajendra Prasad Scientist (Hort.)	National seminar on "Protected cultivation of horticultural crops and value addition"
Mahatma Phule Krishi Vidyapheet, Rahuri, Maharastra.	17.9.2013 to 7.10.2013	Dr.K.Rajendra Prasad Scientist (Hort.)	Participated 21 days training programme on "Exploitation of underutilized fruits"
NAU Guajarat	02.12.13 to 05.12.13	G.Narasimha Murthy Scientist (Hort.)& Sri P.C VengaiahScientist (FST)	Participated in Germplasm survey and visited NAU university
CIPHET Ludhiana	21.11.13 to 23.11.13	Sri P.C Vengaiah Scientist (FST)	Training on application of micro encapsulation techniques in food industry
World agri cultural fair	02.07.13 to 06.07.13	Sri P.C VengaiahScientist (FST)	Participated world agricultural fair at HICC Hydrabad
IARI New Delhi	31.05.13 to 20.06.13	Sri P.C VengaiahScientist (FST)	21 days training on Recent Advances in Statistical Modelling Techniques

21-01-2014 to 27-01-2014: Dr.M.Raj Kumar, Principal Scientist (H) & Head Dr. A. Bhagwan, Senior Scientist (H), Dr. A. Kiran Kumar, Senior Scientist (H), Dr. K. Jyothirmai Madhavi, Scientist (Pl.Path) and Dr. K.Prabhavathi, Scientist (SS&AC) have attended the Biennial workshop of AICRP (Fruits) organized at Dapoli, vide memo no:13776/Res-III/Seminars/2013 of the Director of Research, Dr.Y.S.R.H.U.

25-02-2014 to 26-02-2014: Dr. A. Bhagwan, Senior Scientist (H) attended the Annual workshop on "Understanding the changes in host pest interactions and dynamics in mango under climate change scenario" at RECA-ICAR- Ranchi.

07-01-2014 to 10-01-2014: Dr. A. Bhagwan, Senior Scientist (H) and Dr. A. Kiran Kumar, Senior Scientist (H) attended the CIC&CAC, meeting on "A value chain on Mango & Guava for Domestic and Export Markets" at Trichy, Tamil Nadu.

11.03.2014: Dr.K.Prabhavathi, Scientist (SS & AC) attended one day workshop on Agri-clinics and Agri-business centres scheme organized by NABARD at Sangareddy.

Dr.B.V.K.Bhagavan, Principal Scientist (Hort) & Head and Smt R.Nagalakshmi, Scientist (Hort) participated in the Global conference on Tuber crops at CTCRI,Trivendrum from 9th to 12th July 2013 and gave poster presentations.

Dr B V K Bhagavan, PS (Hort) and Dr.M.M.Naidu, Senior Scientist (Hort) proceeded to Mapalana, Srilanka (19th to 23rd December) and presented the research paper on banana and fenugreek respectively in 2nd international symposium on minor fruits and Medicinal plants organized by University of Ruhuna, Malapana.

Dr.B.V.K.Bhagavan, PS (Hort) and Dr T. Rajashekharam, Scientist (Pl Path) attended 19th Group meeting on fruits organized at Konkan Krishi Vidya Peeth, Dapoli from 20th to 27th January and presented the experiment results.

Dr.B.V.K.Bhagavan, PS (Hort) proceeded to Hyderabad to participate in World Agricultural forum congress and Agri –Tech Trade fair, 2013 at HICC, Hyderabad from 4-11-13 to 6-11-13.

Smt.K.Mamatha, Scientist (Hort) participated in 14th Annual Group Meeting of AICRP on Tuber crops at BAU Ranchi from 19th to 22nd March 2014 and presented the work done during the year 2013-14.

S.Narasimha Rao, Scientist (Pl Path) participate the Symposium on Spices Medicinal and Aromatic crops , SYMSAC-VII from 27-29th November-2013 and presented the poster presentation abstract papers on

a. "Evaluation of turmeric *(Curcuma longa L.)* germplasm of different duration groups against major diseases in Andhra Pradesh"

b. "Performance of different turmeric (*Curcuma longa L.,*) cultivars for yield and quality in the agency areas of North coastal Andhra Pradesh"

S.Narasimha Rao, Scientist (Pl Path) attended the 21 days training programme on "Plant disease management approaches using microbial and plant genomic resources." from 24th January 2014 to 13th February 2014 at Department of Biotechnology, UAS, Dharwad, Karnataka.

Chalapathi Rao, N.B.V., Emmanuel, N. and Snehalatharani, A. 2013. Emerging pest and disease problems of cocoa in Godavari districts of Andhra Pradesh: In Abstracts of National seminar on Cocoa Development in India-Issues and strategies. T.N.A.U., Coimbatore, Tamilnadu, 15th – 16th April, 2013.

Ravindra kumar, K., Narasimha Rao, S., Ramanandam, G., Chalapathi Rao, N.B.V. and Snehalatha Rani, A. 2013. Performance of different turmeric (*curcuma longa L.*) cultivars for field and quality in the agency area of North coastal Andhra Pradesh. Abstract in SYMSAC – VII from 27th – 29th November, 2013 held at Madurai, (Coorg), Karnataka.

Ramanandam, G., Ravindra Kumar K., Padma, E., Kalpana, M. and Snehalatharani, A.2014. Influence of organic manures on yield and copra content of coconut (*Cocos nucifera L.*) in East Godavari district of Andhra Pradesh : In Abstracts of National Seminar on Green chemistry – its impact on environmental protection (GCIED). Sir CR Reddy Autonomous College, Eluru, Andhra Pradesh, 6th February, 2014. P.51.

Ravindra Kumar K. Ramanandam G. Chalapathi Rao, N.B.V. & Snehalatharani, A. 2014. Evaluation of different organic and synthetic sources of nitrogen on growth, yield and economic parameters of turmeric *(Curcuma longa* L.) : In Abstracts of National Seminar on Green chemistry – its impact on environmental protection (GCIED). Sir CR Reddy Autonomous College, Eluru, Andhra Pradesh, 6th February, 2014. P.51.

Chalapathi Rao, N.B.V., Snehalatharani, A., & Emmanuel. N. 2014. Validation of eco friendly IPM technology for Rhinoceros beetle, *Oryctes rhinoceros* management : In Abstracts of National Seminar on Green chemistry – its impact on environmental protection (GCIED). Sir CR Reddy Autonomous College, Eluru, Andhra Pradesh, 6th February, 2014. P.55.

Snehalatharani, A., Chalapathi Rao, N.B.V., Ravindra Kumar K. and Ramanandam G. 2014. Bio control based eco friendly management of stem bleeding disease of coconut in Andhra Pradesh : In Abstracts of National Seminar on "Green chemistry – its impact on environmental protection (GCIED). Sir CR Reddy Autonomous College, Eluru, Andhra Pradesh, 6th February, 2014. P.61.

Dr. L.Naram Naidu, Principal Scientist(Hort), Dr.C.Sarada, Senior Scientist (Hort) and Smt.A.Rajani, Scientist (Hort) attended XXXI Group meeting of AICRP on Vegetable Crops at CCK HRKV Palampur, H.P on 2-5, May,2013

Dr. L.Naram Naidu, Principal Scientist(Hort) attended CSS Review meeting at CRSS, Jagudan, Gujarat on 19th to 20th June, 2013.

Dr. S. Surya Kumari, Principal Scientist (H) and Sri K. Giridhar, Scientist (H) attended XXIVth workshop of AICRP on Spices held at Jagudan, Gujarat on 23-26th Oct, 2013.

Dr.C.Sarada, Senior Scientist (Hort) attended "III international seminar on extension educational strategies for sustainable agricultural development – A global perspective "– held at UAS, Bangalore to present a paper on 5-8th Dec, 2013.

Dr. L.Naram Naidu, Principal Scientist(Hort) attended training programme on "Scientific report writing and presentation" at NAARM, Hyderabad on 6-1-2014 to 9-1-2014

All the scientists of HRS, Lam attended National seminar on "Development of vegetable varieties for round the year cultivation" held at Guntur organized by NRI Agritech Pvt. Ltd. Guntur on 11-1-2014

Dr. S.Surya Kumari, Principal Scientist(Hort) attended training programme on management development workshop on technology management for researchers at NAARM, Hyderabad on 27-1-2014 to 31-1-2014.

Dr.S.Surya Kumari PS(H) & Sri K.Giridhar, Scientist(Hort.) Participated and presented lectures on Pests and Diseases in Turmeric, Production of quality planting material in Turmeric at the National seminar on *Harvest Festival & production:,* at Swarna Palace, Vijayawada organized by IISR, Calicut under NHM on 21-1-2014.

Dr. S. Surya Kumari, PS (H), Dr.C.Sarada, Senior Scientist(Hort), Sri K. Giridhar, Scientist (H) ISPP South Zonal Seminar on *Physiological and Molecular interventions for improving Crop productivity* jointly organized by ANGRAU and ISPP,New Delhi at College of Agriculture, Bapatla on 23-1-2014.

Dr.L.Naram Naidu, Principal Scientist(Hort) attended training programme on Science Administration and Research Management at Administrative Staff College of India, Hyderabad on 10th to 21st Feb,2014.

Nabi Rasool Shaik, Syam sundar Reddy.P and Amarnathreddy.M (2013). Marker assisted selection (MAS): for Rapid improvement of quality protein in maize (QPM). Paper presented in National seminar on molecular markers in crop improvement. Agriculture College, Bapatla. ANGRAU on 20-03-2013.

Sudhavani V, Rajya Lakshmi R, Syam sundar Reddy P, Umajyothi K and Tanuja Priya B (2013). Effect of pre harvest spray of growth regulators on the post harvest quality and shelf life of baby corn during storage at room temperature. Abstract presented in national seminar on "Protected cultivation of horticultural crops and value addition"-29th to 30th November-2013, Department of Horticulture, Allahabad school of Agriculture, Sam Higginbottom Institute of Agriculture, Technology and Sciences, Allahabad-211007, U.P., INDIA

Rajkumar M., Nagesh, A. Raghavendra & Srinivas Reddy D (2013), Distribution and Infestation rate of Root Knot Nematode in Crossandra in Rayalaseema of Andhra Pradesh , National

Symposium-Nematode A friend and Foe of Agri Horticultural Crops: 21-23 rd November, 2013 at Dr. Y. S. Parmar University of Horticulture and Forestry, Solan. HP

Ramana KTV, L. Mukunda Lakshmi, K. Gopal, V.N.P. Sivarama Krishna, T. Naga Lakshmi and G. Sarada. 2013. Nitrogen and potassium based fertigation response on plant growth, yield and quality of sweet orange (*Citrus sinensis* Linn. Osbeck) cv. Sathgudi. National Citrus Meet on August 12-13th 2013 at National Research Center for Citrus, Nagpur, pp:143.

Mukunda Lakshmi M, K.T.Venkata Ramana, V.N.P. Sivarama Krishna, K.M. Yuvaraj, T. Naga Lakshmi, G. Sarada and K. Gopal. 2013. Effect of growth regulators and chemicals on growth, fruit yield and quality of hasta bahar flowering in acid lime (*Citrus aurantifolia* Swingle) cv. Balaji. National Citrus Meet on August 12-13th 2013 at National Research Center for Citrus, Nagpur, pp:147.

Sarada G, K. Gopal, T. Naga Lakshmi, K.T.Venkata Ramana and L. Mukunda Lakshmi. 2013. Management of citrus psylla (*Diaphorina Citri* Kuwayama) using bio-rational insecticides. National Citrus Meet on August 12-13th 2013 at National Research Center for Citrus, Nagpur, pp:215.

Sridevi Ch, Syam sundar Reddy P and Madhu Kiran Tumma (2014)- Evaluation of effects of different levels of nitrogen and phosphorous on yield and yield components of Coriander cv. Sudha. Abstract accepted for poster presentation in ISPP South Zonal Seminar on Physiological and molecular interventions for improving crop productivity-23rd January-2014 at Agricultural college , Bapatla.

Harshavardhan A, Rajasekhar M, P.S.S.Reddy, and Umakrishna.K, (2014) Effect of pre sowing seed treatments on germination and growth of Jackfruit (*Artocarpus heterophyllus* LAM.) seedlings. Abstract accepted for poster presentation in ISPP South Zonal Seminar on Physiological and molecular interventions for improving crop productivity-23rd January-2014 at Agricultural College , Bapatla.Pp: 144

Swamy sekhar R, Kuldeep Mehta and Syam sundar Reddy P (2014)- Influence of plant growth regulators on growth, flowering and yield attributes of straw berry (*Fragaria x ananassa* Duch.)cv. Chandler. Abstract accepted for poster presentation in ISPP South Zonal Seminar on Physiological and molecular interventions for improving crop productivity-23rd January-2014 at Agricultural College , Bapatla. Pp: 148.

Srividya S, Syam Sundar Reddy P, Umajyothi K, Sudhavani V and Ramanjaneya Reddy A (2014) Effect of different types of packaging material on shelf life and quality of tomato cv. Lakshmi under ambient conditions. Abstract published in 2 days National conference on "Pre-/post harvest losses and value addition in Vegetables from 12th-13th July 2014 at IIVR, Varanasi, U.P., INDIA. Pp: 142-143

Srividya S, Syam Sundar Reddy P, Umajyothi K, Sudhavani V and Ramanjaneya Reddy A (2014) Effect of different gauges of LDPE packaging material on shelf life and nutrition quality of tomato cv. Lakshmi under ambient conditions. Abstract published in UGC sponsored 2 days national conference on "Emerging trends in value addition to plants and plant products" (ETVAPP-2014)

from 24th-25th July 2014 at St. Josephs College for Women (Autonomous), Visakhapatnam, A. P., INDIA. Pp: 63

Syam Sundar Reddy P (2014) Value added processing of fruits for nutritional security. Abstract published in UGC sponsored national conference on "Emerging trends in value addition to plants and plant products" (ETVAPP-2014) from 24th-25th July 2014 at St. Josephs College for Women (Autonomous), Visakhapatnam, A. P., INDIA.Pp: 64

Sri K. Uma Maheswara Rao Scientist (Hort) & Head, Cashew Research Station, Bapatla, attended the national sysmposium on cashew at University of Agriculture and Horticultural Sciences (UAHS), Shimoga Karnataka from 29th – 30th, October 2013 and presented the paper entitled with "Performance of high yielding selections and hybrids of cashew (Anacardium Occidentale.L) under multi location trail –II"

Sri K. Uma Maheswara Rao Scientist (Hort) & Head, Cashew Research Station, Bapatla attended the Annual Group Meeting of Scientist of AICRP on cashew held at BCKV, Kalyani, West Bengal from 5-7th January 2014 and presented the research results with respect to crop improvement, crop management and crop protection for the year 2012-13.

D.Vijaya and B.Srinivas Rao and Veena Joshi 2013, Influence of different rootstocks on petiole nutrient content of commercial grape varieties (Oral presentation) at National Seminar on Developments in Soil Science- 78rd Annual Convention of ISSS Oct 23rd -26th , 2013 **.** CAZRI, Jodhpur pg 9.

B.Srinivas Rao,G.Ram Reddy,D.Vijaya, D.Anitha Kumari and Veena Joshi 2013. Strategies for promoting wine grape cultivation in Andhra Pradesh National Seminar on Futuristic Agricultural Extension for livelihood Improvement and Sustainable Development Jan 19-21, 2013 CompendiumANGRAU, EEI, ISEE, SEP

G. Ram Reddy, B. Srinivas Rao and D. Anitha Kumari 2014 Effect of Abiotic Factors on Downy Mildew in Grape. National Seminar of plant physiology on "Physiological and Molecular Interventions for Improving Crop Productivity,2014 Department of Crop Physiology, Agriculture College Bapatla, and ISPP,New Delhi, Hyd

Veena Joshi , B Srinivas Rao D.Vishnu Vardhan Reddy and R Subhash Reddy Blended Wine Propeties Prepared From White and Red Grape (*VitisVinifera* L.) Varieties from India National Seminar of plant physiology on "Physiological and Molecular Interventions for Improving Crop Productivity, Department of Crop Physiology, Agriculture College Bapatla, and ISPP,New Delhi, Hyd

D.Vijaya, B.Srinivas rao and Veena Joshi 2014 Effect of stage wise irrigation in cv Thompson Seedless grape grown on Dogridge rootstock on yield and petiole nutrient content, National Seminar of plant physiology on "Physiological and Molecular Interventions for Improving Crop Productivity, Department of Crop Physiology, Agriculture College Bapatla, and ISPP,New Delhi, Hyd

D.Anitha Kumari, V.Anitha, BKM. Lakshmi, 2014 Evaluation of insecticides for the management scale insect in mango *(mangifera indica)* National Seminar of plant physiology on "Physiological and Molecular Interventions for Improving Crop Productivity, Department of Crop Physiology,Agriculture College Bapatla, and ISPP,New Delhi, Hyd

D.Anitha Kumari, G.Ram Reddy, B.Srinivas Rao 2013,Efficacy Of Biopesticides, for management of mealy bug, *Maconellicoccus Hirsutus* In grape (Poster presentation) in National Seminar on botanicals in IPM, present status and future strategies Bapatla

D.Anitha Kumari, G.Ram Reddy, D.Vijaya B.Srinivas Rao 2014 Management of stem borer in grape National conference n recent trends in applied entomology,Organised by Department of zoology and environmental sciences,Lachoo memorial college of science and technology, Jodhpur,Rajasthan

Dr.E.Karunasree, Programme Co-ordinator, Krishi Vigyan Kendra, Venkataramannagudem participated in the training programme on "Advanced Techniques and Professional Management of Research in Home Science" from 21.11.2013 to 10.12.2013 at Hyderabad.

Dr.E.Karunasree, Programme Co-ordinator, Krishi Vigyan Kendra, Venkataramannagudem participated in one day training programme on "Mushroom cultivation" at pranthiya udyana sikshana kendram at Eluru.

Dr.E.Karunasree, Programme Co-ordinator, Krishi Vigyan Kendra, Venkataramannagudem participated in a training programme on "Friends of Coconut Tree(FoCT)" and trained on waste management in Coconut gardens through Vermicomposting.

Dr.E.Karunasree, Programme Co-ordinator, Krishi Vigyan Kendra, Venkataramannagudem participated in "Millet Fest" from 25th – 26th January, 2014 at Guntur organized by ANGRAU & Department of Agriculture.

On 12.02.2014 Dr.E.Karunasree, Programme Co-ordinator, Krishi Vigyan Kendra, Venkataramannagudem participated in the training programme on "QRT Reviewing of ACRIP on palms" at Directorate of Oil palm Research, Pedavegi and learned about various convergence programmes at KVK, for large scale adoption of the proven technologies in Coconut, Oil palm and Palmyrah from AICRP on Palms.

VII.FINANCE AND BUDGET

The major financial grants to Dr.Y.S.R Horticultural University comes from the A.P. Government under Plan by way of grants-in-aid for running the institution. The bulk grants approved in the budget for the year 2013-14 was Rs.51.00 crores, including salaries grant of Rs.41.00 crores and other grants-in-aid of Rs.10.00 crores.

The ICAR assistance was Rs.5,10,05,000/- (including NAIP) and the Govt. of India assistance was Rs.19,67,000/- while the amount received from other agencies was Rs.89,20,000/- and Departmental sponsored schemes Rs.2.40 crores.

Thus, the total budget of the University for the year 2013-14 was Rs.59,58,92,000/-

VIII. AWARDS AND HONOURS

Dr. M. Raj Kumar, Principal Scientist (H) & Head received Dr. I.V.Subbarao Memorial Award for Best Scientist from Rythu Nestham magazine on 26-09-2013.

Dr.M.B.N.RAO (DE) received the Ugadi Puraskarams for 2013 from Hon'ble CM & other Cabinet Ministers at Ravindra Bharathi, Hyderabad on Telugu New Year Day, 11-04-2013.

Dr.M.B.N. Rao (DE) received The Best University Teacher Award of, Government of Andhra Pradesh for 2013 on 05th September, 2013 from Sri K.Parthasarathi, Hon'ble Minister for Secondary Education, and Govt, Examinations A.P. at Ravindra Bharathi, Hyderabad.

IX. BUILDING AND CONSTRUCTION PROGRAMMES

Horticultural Research Station, Anantharajupeta

Erection of Shadenet house along with drip installation under RKVY funds for vegetable cultivation was takenup




Horticultural Research Station, Aswaraopet

Established of Bio- Control Laboratory building under State Horticulture Mission Scheme, which was inaugurated by Hon'ble Horticulture Ministry Sri Ram Reddy Venkata Reddy garu on 08.10.2013.

View of Bio-Control Laboratory Building, HRS, Aswaraopet

Polyhouse constructed under RKVY

Krishi Vigyan Kendra, Venkataramannagudem

Dr.S.Ayyappan, Hon'ble Director General, ICAR, New Delhi and Sri Eli Venkata Madhusudhana Rao, MLA, Tadepalligudem Inaugurated the KVK administrative building and farmers Hostel. During this programme the guests and the University Officers of Dr.YSRHU visited the exhibition arranged on technological interventions of KVK for Farm and Home Development and appreciated the KVK Team


College of Horticulture, Mojerla

During this year, for value addition of fruits and vegetables a post harvest processing laboratory was constructed with an estimated cost of Rs.20.00 lakhs. The laboratory was fully equipped with different processing & packing equipment.

X. OTHER SIGNIFICANT EVENTS

Dr. J. Dilip Babu, Director of Research interacting with Dr Rajendran, Team leader, QRT on AICRP (Palms), HRS, Vijayarai

Dr. B. Prasanna Kumar, P.S (Hort) explaining processing of cashew apple fruit syrup and RTS beverage preparation to the farmers of the Krishna district

Dr. B. Prasanna Kumar, P.S (Hort) explaining about pre cooling chamber in integrated pack house to the students of Andhra Layola college, vijayawada

Training programme conducted on "Production Technology in Guava" at Zaheerabad

University stall at World Agricultural Forum Congress and Agri-tech Trade Fair 2013

Exhibition stall arranged at KVK, V.R. Gudem visited by honourable Dr. S. Ayyappan, D.G., ICAR

Cashew grafts produced under regional nursery scheme at cashew research station, Bapatla

Students of agricultural Polytechnic, Maruteru visited cashew research station, Bapatla

Training programme on production technology in mango and guava in Khammam district

Training programme on production technology in mango and guava in Mahaboobnagar district

Training programme in mango and guava production technology in nalgonda district

Training programme on production technology in mango and guava in Warangal district

Inauguration of computer laboratory and planting of sapling by Dr. A. Padmaraju Hon'ble Vice-chancellor at college of horticulture, Mojerla on 7-10-2013

Dr. B.M.C. Reddy, Hon'ble Vice-chancellor Inspected HRS and HC & RI Anantharajupeta on 8-2-2014

Dr. J. Dilip Babu, Director of Research planting coconeu plant at HRS Anantharajupeta on 18-3-2014

Dr. B. Srinivasulu, Director of Research visited HRS Mahanandi on 5-5-2013

Dr. K. Gopal, Zonal Research Head, Rayalaseema Zone visited sweet orange Buddling unit at HRS, Mahanandi on 4-1-2014