

IIOPR News



ICAR- Indian Institute of Oil Palm Research, Pedavegi - 534 450, Andhra Pradesh

What's INSIDE... Research Update, Transfer of Technology, Publications etc.

From Director's Desk



It gives me immense joy and pride to share with all my peers and well-wishers that I have taken over as the new Director of this prestigious Institute, ICAR-Indian Institute of Oil Palm Research, Pedavegi on 30th September 2015. As you all know the role of this premier institute is very important in the emerging vegetable oil scenario in

India. To enable the Institute to remain competitive and relevant, research programmes are being fine tuned and planned with continuous monitoring of progress for on-course corrections, if any, by focusing attention on the development of cutting edge technologies. An interdisciplinary mode of research would be encouraged for achieving the above targets.

Though the present yield levels in progressive districts like West Godavari in Andhra Pradesh is about 4.00 tonnes of oil per ha (on par with Indonesia and Malaysia), other districts in Andhra Pradesh as well as remaining oil palm growing states continue to record low productivity levels around 2.00 tonnes per ha which needs to be improved so that the oil yield from the available area under oil palm could be enhanced significantly. Thus, the productivity improvement through improved planting materials and increased resource use efficiency of water, nutrients and labour would be of crucial importance in achieving the higher productivity targets on one hand and profitability of the system on the other side. It will also insure against the fluctuations in prices of FFB and will help in reducing panic among farmers in this matter. The challenge is therefore to narrow the gap between the national average/commercial yield and the yield potential, both through crop improvement and management.

In this regard, research activities at IIOPR, need to be strengthened and hastened up to meet the productivity targets. The primary breeding objectives for oil palm would be to achieve higher oil yield coupled with slow vertical growth. There is a need to increase the oil to bunch ratio to 27 per cent that would ensure high Oil Extraction Rate in the Processing Mills.

Breeding in oil palm should aim at development of new planting materials that have the capability for better oil yields with high quality, slow vertical growth and better adaptability in diverse agro climatic conditions prevailing in India. These traits could be improved through integrated approach of traditional breeding

and biotechnology. Shell thickness marker used to identify the fruit type at an earlier stage, gene for increasing the mono unsaturated fatty acids for edible purpose, introduction of dwarfing gene into oil palm are some of the important areas of oil palm genomics research needs to be looked into.

The success in oil palm genetic improvement programmes depends on the large number of Progeny Evaluation Trials to be conducted with the selected cross combinations and selection of promising combinations and utilization of results for establishment of new seed gardens on Public-Private Partnership mode.

The results obtained from the proposed breeding and biotechnological programmes are expected to play a crucial role in overall improvement of oil palm production in the country.

R.K. Mathur, Director

Sectoral News

The two important antioxidants having very good therapeutic benefits are carotenoids and phenolics. Phenolics are very important for fighting chronic diseases. Oil palm fruit contains phytochemicals such as vitamin E (tocopherols, tocotrienols), carotenoids and phytosterols. During the process of oil extraction the liquid waste emanated from oil mills contain a very good amounts of phenolics which are proved to have good therapeutic properties. The caffeoylshikimic acids, which are rare in nature, are the major components of oil palm phenolics. The lipid soluble tocotrienols have shown anti-tumour effects on prostate, breast, colon, melanoma and lung cancers. Now the water soluble components called palm juice had shown potential nutraceutical properties due to the presence of phenolic acids. Due to hydrogen or electron donating mechanism, the palm fruit extracts of water or ethanol were able to scavenge the free radicals. A study funded by Malaysian Palm Oil Board revealed that the oil palm phenolics are capable of acting against pancreatic cancer proliferation by arresting cell growth at S-stage through down regulation of NF-kB activity. In another study it was also found that OPP has a role to play in prevention and treatment of neurodegenerative diseases such as Alzheimer's and Parkinson's. Besides the sludge, even empty fruit bunches do contain certain phenolics which exhibit radical scavenging activities.

Forth coming events

Training programme on "Plant Protection in Oil Palm" from October 14-16, 2015

Training programme on "Nursery Management in Oil Palm" from November 18-20, 2015

Research update - Achievements/ Methodologies / Innovative Technologies / Genetic stock

Chemicals for the management of leaf webworm, *Acrida meyricki*

(Saravanan L and Kalidas P)

Pesticides viz., triazophos 40% EC (0.05%), cypermethrin 10% EC (0.005%) and profenophos 50% EC (0.05%) effectively controlled the leaf webworm within five days after spraying. Hence, these chemicals could be used in the management of leaf web worm as alternative to lambda cyhalothrin which is being commonly used in oil palm. These pesticides should be used in rotation, so as to disturb the development of insect resistance of this pest over a period.

Mapping spatial variability of leaf nutrient status of oil palm plantations in India

(Behera S K, Rao B N, Suresh K, Manorama K and Ramachandrudu K)

Spatial variability of leaf nutrients in oil palm plantations located in Goa, Karnataka, Mizoram and Gujarat states of India were examined for implementation of site-specific fertilization programme. Geo-referenced leaf samples were collected randomly and the leaf nutrients concentration was assessed and analyzed statistically and geostatistically. The concentration of leaf nutrients like N, P, K, Ca, Mg, S and B in oil palm plantations varied widely at different locations. Leaf P concentration was positively and significantly correlated with S concentration at Goa, Karnataka and Gujarat. Positive and significant correlation between leaf Ca and Mg concentration was recorded at Mizoram and Gujarat. Geostatistical analysis of leaf nutrients exhibited different distribution pattern at different locations. This study revealed the necessity of determining spatial variability of nutrient status of oil palm plantations before planning a differential fertilizer programme. Thus, saving of nutrients could be achieved by adopting site-specific nutrient management strategy.

Bunch parameters of elite Dura mother palms

(Sunilkumar K, Naveenkumar P, Murugesan P, Mathur R K and Ramajayam D)

Bunch analysis of 34 Dura palms selected for high yield showed a mean weight range of 14.38 to 35.45 kg per bunch. Fruit to

bunch percent ranged from 53.26 to 74.50 and oil to bunch percent was more than 20 % for 14 palms.

Development of quality standards for planting material in oil palm nursery

(Sunilkumar K and Mathur R K)

The overall performance of seedlings raised from sprout types such as triplet, both plumule and radicle underdeveloped and rudimentary plumule etc were poor at six months age. There was no significant difference in mean height, stem length, no of leaves, third leaf area as well as total leaf area of different sprout categories. Whereas stem girth, dry weight of stem, leaf, total dry weight, no of roots, length of primary roots and root density differed significantly. Seedlings raised from underdeveloped radicle and plumule, triplets, double radicle and rudimentary plumule were having lesser girth. Root dry weight was less in case of triplet, underdeveloped radicle and plumule rudimentary radicle and double radicle. Root density was significantly low for triplets, rudimentary radicle and underdeveloped plumule and radicle. Shoot dry weight was significantly low in triplet, followed by both plumule and radicle underdeveloped and rudimentary plumule.

Establishment of new germplasm block-VI at IOPR, Pedavegi

(Ramajayam D, Murugesan P, Mathur RK, Naveen Kumar P, Ravichandran G, Sunil Kumar K)

A new germplasm block-VI with 23 accessions has been established in a randomized complete block design (RCBD) and with 32 accessions in a observational trial at ICAR-IOPR, Pedavegi.

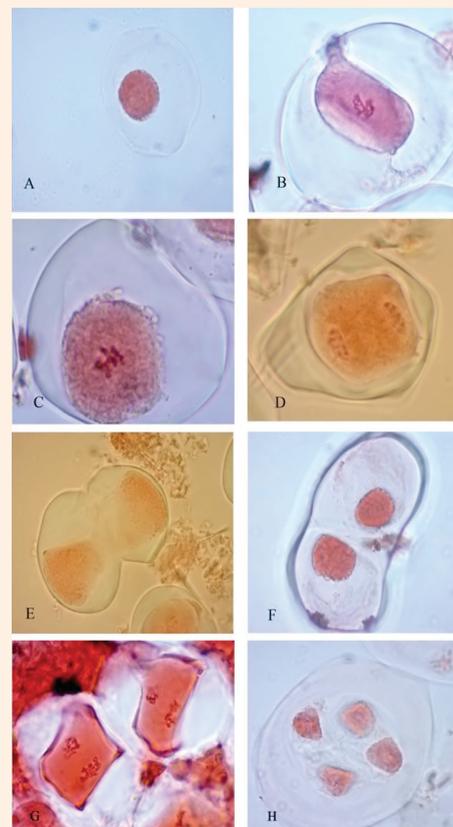


Ceremonial planting of germplasm by DDG (Horticulture Science) at IOPR, Pedavegi

Studies on oil palm Pollen

(Sunilkumar K, Mathur R K and Rahana S N)

The stage of inflorescence and sample preparation method standardised for Microsporogenesis study and stages from pollen mother cell to tetrad was recorded. Inflorescence from 7th to 12th leaf axil were found to be correct stages for the study.



Stages of Microsporogenesis in Oil Palm: A. Pollen mother cell, B & C stages of Prophase, D. First Anaphase, E. First Telophase F. First Cytokinesis, G. Second Anaphase, H. Tetrad stage

Establishment of New dura block at RC, Palode

(Murugesan P, Sunilkumar K and Rahana SN)

A new Dura block has been planted with eight cross combinations (D20 × D23, D20 × D35, D36 × D36, D48 × D48, D48 × D61, D47 × D61, D80 × D85 and D84 × D61) in RBD with 15 seedlings per treatment replicated five times.

New Projects Sanctioned

Under AICRP on Palms, a new project has been sanctioned on "Plant Geometry and Optimization of nutrients in Oil palm" at IOPR, Pedavegi

Transfer of Technology

Officers trained

Organised three training programmes to 67 officers of State Department of Agriculture / Horticulture and Entrepreneurs belonging to Andhra Pradesh, Karnataka, Goa, Mizoram.

Training Programme	Date	Participants from	No. of Participants
State Level Training on oil palm production Technology	August 5-6, 2015	Wyra, Khammam, Telangana	22
State Level Training on oil palm production Technology	August 6-7, 2015	Mysore, Karnataka	24
Oil palm Production technology	August 18-25, 2015	Mizoram, Goa, Andhra Pradesh, Telangana	16
Oil Palm Hybrid Seed Production	September 8-10, 2015	Andhra Pradesh	5
Total			67



Officers undergoing hands on experience on bunch analysis during a training programme on Oil Palm Production Technology

Farmers trained

Organised four training programmes of one day duration on "Oil Palm Cultivation" to 169 farmers of Andhra Pradesh at IOPR, Pedavegi and three programmes for 58 farmers at RC, Palode .

Sl. No	Date	Participants from	No. of Participants
PEDAVERGI			
1	10.06.2015	Srikakulam Dist., A.P.	62
2	19.06.2015	East Godavari Dist. A. P.	35
3	22.06.2015	Visakhapatnam Dist. A. P.	34
4	29.06.2015	Srikakulam Dist., A.P.	38
PALODE			
5	28.07.2015	Alangulam, TN	25
6	14.09.2015	Kadayam and Mukkadu Blocks, Tirunelveli TN	17
7	28.09.2015	Valiyoor and Naguneri Blocks, Tirunelveli TN.	16
Total			227

Farmers Field Schools organised

Two farmers field schools were organised on Pest management on oil palm and Disease management in oil palm to 94 farmers of Telikicherla, West Godavari Dist. A.P.



Field school on Pest management



Field school on Disease management

Mobile Messages

Oil palm technologies published as 97 text SMS to 0.97 lakh numbers and 117 voice messages to 1.33 lakh numbers in four languages to oil palm growers of 13 states.

Video Conferences

Three video conference sessions conducted to KVK staff of seven locations in Mizoram simultaneously on aspects of irrigation management, pest management and disease management in oil palm.

Exhibition

Dr.P.Naveen Kumar and Dr.D.Ramajayam participated and put up exhibition stall displaying oil palm exhibits on 15.09.2015 in 'Rythukosam Chandranna' programme at Agrl. Market Yard, Tadepalligudem organized by Horticulture Department, West Godavari, A.P.

Radio Talk

Dr.K.Ramachandrudu had given a radio talk on growing of flower crops in bearing oil palm gardens at AIR, Vijayawada on 27.8.2015.

Diagnostic field visits

Dr.K.Manorama and Dr.L.Saravanan visited Farmers' plantations in Nellore District during 13th and 14th of July, 2015, to identify the probable reasons for bunch failure in the district

Dr.K.Ramachandrudu, Dr.P.Naveen Kumar, Dr.Sanjib Kumar Behera, Dr.L.Saravanan, Dr.Praveena Deepthi and Dr.K.Manorama visited a village called Makkinavari gudem in West Godavari District on 9.7.2014 to observe the organically grown oil palm plantations using Jeevamrutham, a cow based organic manure.

A diagnostic field visit was made by Dr G Ravichandran, Dr K Ramachandrudu, Dr D Ramajayam and Dr L Saravanan on 07.08.2015 to Kabini and Taraka seed gardens and Farmers' fields in Mysore and Mandya districts of Karnataka.

Publications

Research articles

- Behera SK, Suresh K, Narasimha Rao B, Manoja K, Manorama K, Ramachandrudu K. (2015). Estimation of potassium concentration in oil palm (*Elaeis guineensis* Jacq.) leaf tissue by simple and inexpensive water extraction method. *Journal of Plant Nutrition*. DOI: 10.1080/01904167.2015.1084007.
- Behera SK, Rao BN, Suresh K, Manorama K, Ramachandrudu K and Manoja K. (2015). Distribution variability of soil properties of oil palm (*Elaeis guineensis* Jacq.) plantations in southern plateau of India. *Indian Journal of Agricultural Sciences* 85(9): 1170-1174.
- Mathur RK and Sunilkumar K. 2015. Selection of *pisifera* parents based on progeny performance of D x P oil palm hybrids. *Indian Journal of Horticulture*. 72 (2):278-281
- Murugesan P, Mary Rani KL, Ramajayam D, Sunilkumar K, Mathur RK, Ravichandran G, Naveen Kumar P and Arunachalam V. 2015. Genetic diversity of vegetative and bunch traits of African oil palm (*Elaeis guineensis* Jacq.) germplasm in India, *Indian Journal of Agricultural Sciences*. 85 (7):892-895
- Murugesan P and Anitha P (2015) Plant genetic resources conservation in Agricultural crops. In training manual of training course on Forest Genetic resource management for Indian Forest Genetic Resource Management for IFS officers (10-14th Aug, 2015) (Editors K.Palanisamy et al) IFGTB, Coimbatore-2. pp 218-233.
- Mary Rani K L, Prasad M V and Narsimha Rao B (2015). Varshabhava paristhithullo oil palm saagu-raitulu tarachuga adige prasnalaku javabulu. *Rytu Nestam*. 10(11):29-30.

Technical publications (Books, book chapters, Technical or extension bulletins, e-publicatons, popular articles etc)

- Kalyan Babu B published two partial cds

Participation in Seminars/ Symposia/Workshops/ Conferences etc.

- Dr. P. Kalidas, Acting Director participated in the group discussion on "Digital and Sensor Based Agriculture" at Indian Institute of Oilseeds Research on 31.07.2015.
- Dr. P. Kalidas, Dr.K Ramachandrudu, Dr.L.Saravanan participated in the District Level Oil Palm Farmers Meet and delivered talks on Oil Palm Production Technologies held on 26th September 2015 at Parvathipuram, Vizianagaram Dt., organized by the Dept of Horticulture, Govt of Andhra Pradesh.
- Dr.B.N.Rao attended the Executive Committee meeting of National Mission on Oilseeds and Oil Palm at Krishi Bhawan, New Delhi on 26.08.2015.
- Dr.B.Kalyana Babu participated and presented an oral paper in 2nd International conference on Biotechnology, at Hyderabad from 3rd to 4th Aug 2015. ()
- Dr.K.Ramachandrudu participated in Horticulture Department-NMOOP-MM-II (OIL PALM) 2015-16 Workshop held on 23.09.2015,Rajahmundry,organized by the Dept of Horticulture, Govt. of Andhra Pradesh.
- All the scientists of IIOPR participated in the State Level Launching of the project "Farmers Participatory Research Demonstration Plot on Cocoa for enhancing Productivity and Profitability" organised by ICAR-CPCRI and Directorate of Cashew and Cocoa Development Board on 21.8..2015 at IIOPR, Pedavegi.

Training courses attended

- Dr.K.Manorama participated in 10 day training programme on "Geospatial Analysis of Natural Resources Management using Statistical Tools" during 2-11 September,2015 at NAARM, Hyderabad
- Dr.M.V.Prasad & Dr.K.L.Mary Rani participated in one day training programme on "Development of Mobile Applications" on September 14, 2015 at C-DAC, Hyderabad.
- Ms.H.P.Bhagya has undergone professional attachment training at CPCRI, Kasaragod from 11.05.2015 to 10.08.2015.

Ms Bhagya HP and Dr Preethi P

- Participated in "Oil Palm production System management" training at IIOPR, Pedavegi from 18.08.2015 to 25.08.2015.
- Participated in Oil Palm Hybrid seed production training programme at IIOPR, Pedavegi from 08.09.2015 to 10.09.2015.

Lectures delivered

- Ms.S.N.Rahana delivered lecture on "Importance of Oil Palm cultivation" and "Oil Palm Nursery Management", in the training programme organised by Plantation Corporation of Kerala Ltd., Athirappally, Kerala.

- Dr.B.N.Rao gave a lecture on Consultancy Services during Consultancy Management Training at NAARM, Hyderabad on 06.08.2015.
- Dr.P.Murugesan delivered lecture on "Plant genetic resources conservation in Agricultural crops" on 14.08.2015 in the training course on forest Genetic Resources Management for the officers of Indian Forest Service at IFGTB, Coimbatore.
- Dr.P.Naveen kumar delivered lecture on 'Regulation of phenylpropanoid biosynthetic pathway for enhanced fragrance' at Bio-Trendz 2015: DST sponsored National Level Technical Seminar organized at K L University, Vaddeswaram on 27.08.2015.

Visits

- Dr.P.Kalidas and Dr.K.Suresh visited NRSA, Hyderabad Centre for discussions on use of Remote Sensing facility in identification of Sagarmala Islands for feasibility of oil palm cultivation on 13.08.2015.
- Dr. G. Ravichandran and Dr. D. Ramajayam visited Sristi Agro Biotech Private Limited, Kolkata to monitor the progress of tissue culture technology.

Memberships in committees / expert teams

- Dr R.K.Mathur and Dr B.N.Rao acted as a members in Committee to finalise land and technical programme for AICRP on Palms Centre, Bavikere, UAHS, Shivamogga, Karnataka

Personalia (New appointments / Transfers / Promotions)

- Dr.R.K.Mathur, Principal Scientist (Plant Breeding) has taken over the charge of Director, ICAR-IIOPR, w.e.f. 30.09.2015.
- Dr.P.Preethi, Scientist (Fruit Science) joined ICAR-IIOPR w.e.f. 13.08.2015 after completion of three months professional training at IHR, Bengaluru.
- Mr.Muralidharan Pillai has been promoted from Technician to Senior Technician (Fitter) in Category-I w.e.f. 18.09.2007.

Others

- Drs Mathur R K and Rao B N conducted a feasibility study in Agricultural and Horticulture Research Station, Bavikere of University of Agricultural and Horticultural Sciences, Shivamogga, Karnataka for taking up AICRP trials on oil palm
- Dr B N Rao acted as external expert for Evaluation of Ph.D thesis of the UHS, Bagalkot, Karnataka and for Thesis Viva Voce Examination on 29th July, 2015.
- ICAR-IIOPR introduced Aadhar Enabled Biometric Attendance System (AEBAS) of attendance with effect from 1.7.2015.

Awards/Honours/Recognition

- Mr.A.Dhanaraju, SSS has been awarded cash prize in "Cash Award Scheme for Supporting Category Employees of ICAR" in the ICAR's 87th Foundation Day Ceremony held at Patna on 25.07.2015



- Dr B Kalyan Babu received Best Speaker award at 2nd International conference on Biotechnology, held at Hyderabad during 3rd and 4th Aug 2015.

Events

ICAR-IIOPR conducted two Swachha Bharat campaigns on 4.7.2015 and 7.8.2015.

Hindi Fortnight Celebrations (14.9.2015 to 28.9.2015). हिन्दी पखवाडा मनाया



Mr Vishwanathachari (BSNL), Secretary, TOLIC distributing the prizes for the winners of hindi competitions

Distinguished visitors

Mr Sanjay Lohiya, Joint Secretary (NMOOP), DAC visited ICAR-IIOPR, Pedavegi, on 3.7.2015 and had discussions with the scientists.



Dr.K.Krishna Kumar, DDG (Horticulture Science) and Dr.P.Chowdappa, Director, CPCRI visited ICAR-IIOPR on 21.8.2015 on the occasion of State Level Launching of the project "Farmers Participatory Research Demonstration Plot on Cocoa for enhancing Productivity and Profitability" organised by ICAR-CPCRI and Directorate of Cashew and Cocoa Development Board.

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