

# 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



**P**alm oil is the world's largest consumed vegetable oil. To make oil palm industry more sustainable, it is necessary to strike a holistic balance among social, environmental and economic needs of the country and people by addressing

the need for social development of the people, conservation and management of the environment, and ensuring progress of the nation as a whole via economic development. Unsustainable practices like deforestation, causing damage to wild life, unprecedented use of pesticides and fertilizers cause environmental damage in terms of increased carbon emission and thereby global warming, disturbance to biodiversity with a severe impact on planet Earth. To produce this crop in a sustainable manner, a Round table on Sustainable Palm Oil (RSPO) was formed with all the stakeholders viz., oil palm producers, palm oil processors or traders, consumer goods manufacturers, retailers, banks and investors, environmental and nature conservation NGOs and social or developmental NGOs as members to develop and implement global standards for sustainable palm oil. These include non-conversion of primary forest or socially or ecologically valuable areas for plantations, protection of endangered animals and plants, protection of water, soil and air (including a ban on the use of fire for clearing land), no child labour and the creation of educational opportunities for children living in the plantations, inclusion and support of smallholders, regular assessment of plantations by independent accredited certifiers.

India is the largest importer of palm oil followed by China and European Union (EU). To mitigate the gap between demand and supply in vegetable oil production and to reduce the exhaustive imports, the country is gearing up with a big plan of oil palm cultivation in nearly 2.0 million hectares of identified potential areas. The major advantage of Indian oil palm being non-cultivation on deforested land and following all the sustainable practices referred in the RSPO, though it is not a signatory. The crops replaced with oil palm are only non remunerative cultivable ones but not forest plants. Oil palm cultivation practices are not responsible in enhancing the Green

House Gases and hence there is no threat to the environment. The cultivation of oil palm by giving irrigation is unique to India. The industry follows sustainable practices in the form of micro irrigation thereby conserving water. Though all the above practices are leading to sustainable cultivation, economical sustainability to the Indian oil palm farmers is not occurring due to importation of unsustainable palm oil from other countries at cheaper rates, which needs to be addressed on priority. Efforts should be made to get the share from Green fund being maintained for sustainable practices in Netherlands. This is possible through collective efforts of all the stakeholders of the Indian oil palm Industry.

**P. Kalidas, Director (Actg.)**

## Sectoral News

The cumulative rainfall received in the Indian sub-continent since the onset of south west monsoon, 2015 had been 6% lower than its long term average. Whereas, the central and southern parts of India reported to have received 13 and 12% deficit rain respectively during this period. This resulted in increase in temperatures by about 4 to 6° C over the normal averages. This may lead to lower sex ratio especially where the oil palm gardens are affected by westerly winds. Under these conditions, oil palm requires a judicious management of water and nutrients. Hence farmers are advised to irrigate the palms appropriately. Mulching the basins with available biomass can avoid loss of water through evaporation. Application of green leaf manure @ 100 kg or FYM @ 50 – 100 kg per palm is also recommended. In juvenile gardens practicing ablation to remove male and female inflorescences will enhance the water and nutrient use efficiency. Making long trenches of 1 foot width and 2 feet depth across the slope at every 3-4 palm rows intervals can conserve rain water. Palms should also be provided with proper nutrition, especially potassium if enough rainfall is received.

## Forth Coming Events

**Training programme on "Oil Palm Production Technology" from August 18-25, 2015.**

**Training programme on "Oil Palm Hybrid Seed Production" from September 8-10, 2015.**

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

### Distribution variability of soil properties and leaf nutrient concentrations in Karnataka assessed

(Sanjib Kumar Behera, Suresh K, Rao BN, Manorama K and Ramachandrudu K)

The values of soil properties in both surface (0 to 20 cm) and sub-surface (20-40 cm) soil layers varied widely. About 55, 83, 82 and 14 % of leaf samples were found to be deficient in N, P, K and B respectively. Correlations between soil pH and exchangeable Ca and Mg, between soil pH and soil EC in both the soil layers, between leaf N, P and K concentration and leaf S concentration and between leaf Mg and B concentration were found to be positive and significant. Geostatistical analysis revealed that surface soil properties had circular, Gaussian, spherical, and exponential best fit models and were influenced by intrinsic, extrinsic and both intrinsic and extrinsic factors.

### Standardised and developed sieves for different seed sizes

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

Three different sized sieves were fabricated to uniformly grade the oil palm seeds into four categories (<10mm = very small, 10-15mm = small, 15-20mm = medium and >20mm = big).



Small size Medium size Big size  
Different sieve sizes for oil palm hybrid seeds

### Breeding for high yield in oil palm

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

Out of seven Dura crosses evaluated for growth in the nursery three performed better.

### Flowering in tissue culture plants

(Naveen kumar P, Ravichandran G and Ramajayam D)

Oil palm plantlets from tissue culture which were field planted in January 2014 have initiated flowering in November 2014 and since then there is regular normal flowering in these palms

### Oil quality in oleifera germplasm accessions

(Murugesan P)

Oleifera palm oils had more oleic and linoleic acid with some exceptions in the progeny palms. Palm no 14 of Malaysian accession had

highest (55.22) oleic acid (C18:1). A known selected Interspecific hybrid planted during 1998 had highest (61.91) palmitic acid and Chithera 2 had the lowest (23.77). Oil quality parameters will be taken into account while making interspecific hybrids and back crossing programme in *E.oleifera*.

### Oil palm leaf webworm named as *Acria meyricki* Shashank and Ramamurthy

(Saravanan L, Kalidas P and Phani Kumar T)

Incidence of leaf webworm, *Acria* sp. on oil palm, that was first recorded during the winter months of 1995-96 is now identified as *Acria meyricki* Shashank and Ramamurthy (Lepidoptera: Depressariidae: Acriinae). The pest has become endemic in Krishna, West Godavari and East Godavari districts of Andhra Pradesh causing severe damage to the foliage. The larvae scrap the leaves initially, by staying inside silken web on the undersurface of leaves causing defoliation subsequently. During severe infestation, the leaflets dry and give burnt up appearance. The pest is active during October to March.



Leaf webworm larva Damaged leaf

### Type of sprouts used and their performance in primary nursery

(Sunil Kumar K and Mathur RK)

The mean performance of all abnormal sprout types used was inferior to the average performance of normal sprouts in nursery. Among various types of abnormal sprouts used, those with leafy growth were closer to normal sprouts.

### Inter specific hybrids

(Sunilkumar K, Murugesan P, Mathur RK and Naveenkumar P)

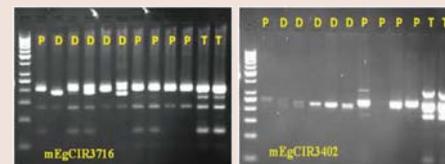
Out of 33 palms evaluated, 15 palms of EOxEG cross, 1 EGxEO palm and 4 EO open pollinated were having height increment below 25 cm. One EOxEG palm recorded sex ratio of 0.64 during 2014-15.

### Identification of polymorphic microsatellite markers in oil palm

(Ramajayam D, Naveen kumar P, Mathur RK and Ravichandran G)

This study assessed 52 SSRs in eight oil palm germplasm representing dura, tenera and pisifera in order to find polymorphic SSRs which could possibly be used for ascertaining the genetic differences and /or similarities

among them. The following 11 SSRs namely mEgCIR3750, mEgCIR0905, mEgCIR3260, mEgCIR3301, mEgCIR3698, mEgCIR3439, mEgCIR3716, mEgCIR3788, mEgCIR1713, mEgCIR2380 and mEgCIR3402 were found to be polymorphic which will be very useful in various applications of oil palm breeding



programmes like genetic diversity studies, linkage map and QTL analysis.

### A method to store germinated seeds in oil palm

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

Oil palm seeds showing embryo protrusion can be stored by coating them with 2.5% sodium alginate followed by 2.5% CaCl<sub>2</sub> with a slow shaking at 70-80 rpm for 15 minutes. These coated seeds could be stored at 27°C and 80-85% RH for 30 days without affecting the sprouts.



Coated seeds

### Thodupuzha dura Germplasm regenerated

(Murugesan P)

During the month of May-June 2015, out of thirty one germplasm samples collected from Thodupuzha old germplasm block (1960 planted) one palm (Palm No 322) was reported to have high kernel size was regenerated at RC, Palode.

## New Projects Sanctioned

1. Seasonal changes in bunch components and oil composition in oil palm under irrigated conditions (DAC sponsored project under NMOOP)  
(Suresh K and Mathur RK)
2. Recycling of oil palm waste through cost effective and innovative techniques (DAC sponsored project under NMOOP)  
(Ramachandrudu K, Manorama K, Behera SK and Rosaiah G)
3. Consortium Research Project on Agrobiodiversity (ICAR-Network project)  
(Murugesan P)

## Transfer of Technology

### Video Conference on oil palm

(Mary Rani K L and Prasad MV)

One video conference session was organised on oil palm cultivation practices with stakeholders of oil palm, Mizoram. Two sessions were organised with KVK staff of Mizoram on planting and cultural practices in oil palm and fertilizer management in oil palm.

### Farmers training programme

(Prasad MV, Manorama K, Naveen Kumar P and Mary Rani KL)

Organised seven training programmes of one day duration on "oil palm cultivation" to 255 farmers from Chhattishgarh and Andhra Pradesh. Organised one day on farm farmers training programme on oil palm cultivation to 50 oil palm farmers in Nellore district, A. P.

### SMS on oil palm sent through Farmers Portal

(Mary Rani KL and Prasad MV)

Oil Palm cultivation technologies were disseminated in four languages through 206 text and 188 voice SMS to 3.62 lakh and 3.88 lakh mobile numbers of oil palm growers of Andhra Pradesh, Telangana,

Karnataka, Goa, Arunachal Pradesh, Assam, Mizoram, Meghalaya, Nagaland, Odisha, Chattisgarh, Maharashtra and Gujarat.

### Demonstration of harvesting from tall oil palm

(Prasad MV and Vidhan Singh)

Fourteen training cum demonstrations on harvesting of oil palm bunches from tall palms were conducted in West Godavari and Krishna districts of Andhra Pradesh, where in 347 farmers participated.

### Diagnostic field visit

A diagnostic field visit was made by Ravichandran G, Ramajayam R, Naveen kumar P and Kalyan Babu B to Rajahmundry seed garden, Government of Andhra Pradesh, on 25.06.15 to investigate the performance of mother palms.

### Farmers Field School

(Prasad MV, Behera SK and Mathur RK)

Organised four one day farmers' field schools on Fertilizer Management in oil palm and Supplementary Pollination in oil palm to 134 farmers of Mizoram.

Sl. No	Topic of Field School	Date	Participants Address	No. of Participants
1	Fertilizer Management on oil palm	24.04.2015	Darlok, Mamit, Mizoram	40
2	Supplementary Pollination in oil palm	24.04.2015	Darlok, Mamit, Mizoram	40
3	Supplementary Pollination in oil palm	27.04.2015	Buchangphai, Kolasib, Mizoram	21
4	Supplementary Pollination in oil palm	29.04.2015	Khamarang, Kolasib, Mizoram	33
	<b>Total</b>			<b>134</b>

## Publications

### Research Articles

1. Behera SK, Rao BN, Suresh K and Manoja K. (2015). Soil nutrient status and leaf nutrient norms in oil palm (*Elaeis guineensis* Jacq.) plantations grown on southern plateau of India. *Proceedings of the National Academy of Sciences, India Section B: Biological Sciences*. DOI: 10.1007/s40011-015-0508-y.
2. Behera SK and Shukla A. K. (2015). Spatial distribution of surface soil acidity, electrical conductivity, soil organic carbon content and exchangeable potassium, calcium and magnesium in some cropped acid soils of India. *Land Degradation and Development* 26(1):71-79. DOI: 10.1002/ldr.2306.

3. Behera SK, Shukla AK, Singh MV, Wanjari RH and Singh Pooja (2015). Yield and zinc, copper, manganese and iron concentration in maize (*Zea mays* L.) grown on Vertisol as influenced by zinc application from various zinc fertilizers. *Journal of Plant Nutrition* DOI: 10.1080/01904167.2014.992537.
4. Biswajit Mondal, Adhikari RN, Patil SL, Raizada A, Prabhavathi M, Ramajayam D and Loganandhan N (2014). Assessment of on-farm employment generation through natural resource conservation activities in the semi-arid region. *The Andhra Agric. J.*, 61(4):921-926.
5. Murugesan P, Mary Rani K L, Ramajayam D,

Sunil Kumar K, Mathur R K, Ravichandran G, Naveen Kumar P and Arunachalam V (2015). Genetic diversity of vegetative and bunch traits of African oil palm (*Elaeis guineensis*) germplasm in India. *Indian Journal of Agricultural Sciences* 85 (7): 32-35

6. Naveen Kumar P, Sparjanbabu, DS, Ravichandran G, Anitha M, Satyanarayana G, Mandal Goutam and Ramajayam D (2015). Effect of low temperature storage on oil palm (*Elaeis guineensis* Jacq) seed viability, *International Journal of Tropical Agriculture*, 33(1): 155-159.

7. Prasad MV, Mary Rani KL, Arulraj S and Krishna Hemanth G (2015). Oil Palm Kisan Mobile Message Services – A New Paradigm in Technology Dissemination. *Indian Research Journal of Extension Education*. 15(2) : 100-104.

8. Ravichandran G, Venkatasalam EP and Manorama K (2015). Role of bioactive polymer coating on potato (*Solanum tuberosum* L) microtuber storage and field performance. *Indian Journal of Horticulture*, 72(1):107-113.

9. Shashank PR, Saravanan L, Kalidas P, Phanikumar T, Ramamurthy VV and Chandra Bose NS (2015). A new species of the genus *Acria* Stephens, 1834 (Lepidoptera: Depressariidae: Acriinae) from India. *Zootaxa* 3957(2): 226-230.

10. Shukla AK, Malik RS, Tiwari PK, Prakash C, Behera SK, Yadav H and Narwal RP (2015). Status of micronutrient deficiencies in soils of Haryana-Impact on crop productivity and human health. *Indian Journal of Fertilizers* 11(5): 16-27.

11. Yadav, Soobedar, Naveen Kumar P, Arora A and Singoda A (2015). Effect of protease inhibitors on physiological and biochemical changes influencing keeping quality in gladiolus. *Indian J. Hort.* 72(1):92-99

### Technical Publications

1. Behera SK, Narsimharao BN, Suresh K, Prasad MV, Mathur RK and Manorama K (2015). *Tel tad me adhikutpadan ke lia poshak tatwan ka uचित prabandhan. Khad Patrika* (January): 13-17.
2. Manorama K, Behera SK, Narsimharao BN, Suresh K and Prasad MV (2015). Oil Palm totalto rasayanika yeruvula viniyogam. *Annadata*: 54-55.
3. Mary Rani KL, Prasad MV and Narsimha Rao B (2015). Oil palm saagulo neeti yajamanyamu – raitulu tarachuga adige prasnalu – javabulu. *Rytu Nestam*. 10(9) : 45-46.

## Participation in Seminars/ Symposia/Workshops/ Conferences etc.

### Dr.P.Kalidas, Director (Actg.)

- Participated in Round table discussion on sustainable palm oil on 5<sup>th</sup> June, 2015 at New Delhi between leading Indian and Dutch businessmen, research institutes and civil society organizations.



- Attended meeting at New Delhi on 8<sup>th</sup> May, 2015 regarding exploring the possibilities of cultivation of oil palm in the islands of East Coast under the Sagarmala project.
- Attended Annual Conference of Directors of ICAR Institutes during 15<sup>th</sup> to 16<sup>th</sup> May, 2015.
- Participated in regional committee meeting of Zone III held at ICAR Research Complex for NEH Region, Agartala, Tripura on 22<sup>nd</sup> and 23<sup>rd</sup> of May, 2015.

Dr.P.Kalidas, Dr.R.K.Mathur and Dr.B.N.Rao attended the 24<sup>th</sup> Annual Group Meeting of AICRP on Palms (26-05-2015 to 28-05-2015) held at ICAR Research Complex for Goa, Goa. Dr.P.Kalidas and Dr.K.Suresh participated in the meeting of the Task force on agriculture development with special reference to innovation and successes carried out on oilseeds in country (NITI Aayog) at IIOR, Hyderabad.

### Training courses attended

Dr.B.N.Rao attended training programme on "Stress Management" at NAARM, Hyderabad from 16.6.2015 to 19.6.2015.

Sri Asif Mohammed, AF&AO attended a training programme on "Public procurement" at NIFM, Faridabad from 01.06.2015 to 06.06.2015

Manorama K successfully completed the Online course on "ICT basics" offered by IIT Kanpur in collaboration with Commonwealth of Learning

### Consultancy services

Drs.P.Naveen Kumar, R. K. Mathur, G. Ravichandran, D.Ramajayam and S.K.Behera completed a consultancy project on 'Feasibility study and DPR preparation for establishment of Oil Palm seed garden in Odisha' funded by Govt. of Odisha and submitted the report.

## Personalia

### New appointments / Transfers

Dr.P.Kalidas, Principal Scientist (Entomology) assumed the charge of Director (Acting), IIOPR on 1<sup>st</sup> of April, 2015

Ms.H.P.Bhagya, Scientist (Spices and Plantation crops) joined IIOPR on 09.04.2015

Sri A.S.Sabu joined IIOPR RC, Palode as Chief Technical Officer on 01.04.2015

Smt N.Sujatha Kumari, Assistant Chief Technical Officer, IIOPR RC, Palode has been transferred to ICAR-CTCRI, Trivandrum

Shri.P.Anil Kumar, T1 joined duty at IIOPR-RC, Palode on 01.04.2015 after transfer from IIOPR, Pedavegi

### Promotions

Dr K.Ramachandrudu, Sr Scientist (Horticulture) has been promoted from Senior Scientist to Principal Scientist (Horticulture) w.e.f 17.07.2013

### Superannuation / Retirement

Sri S.John, SSS, IIOPR Pedavegi and Smt.P.Thankamma, SSS, IIOPR RC, Palode attained superannuation on 31.5.2015

## Awards/Honours/ Recognition

Dr.B.Kalyan Babu, Scientist (Agricultural Biotechnology) received the Prof. G.Rangaswami Memorial Award, 2014 for Best Research Paper of National Academy of Biological Sciences, Bangalore

Dr.M.V.Prasad and Dr.K.Manorama have been nominated as Members of Technical Support Group (TSG) 2015-16 of ISOPOM, Government of Andhra Pradesh

Dr.P.Murugesan, is nominated as member, IMC, Member ITMU of CTCRI, Trivandrum and Executive Member of ISPC, CPCRI, Kasaragod

Dr.D.Ramajayam has been nominated as one of the members for the Advisory Committee of B.Babu Rao, Ph.D Scholar and H.S. Prasanna, M.Sc. student at Dr.Y.S.R.H.U, HC & RI, Venkataramannagudem, A.P.

Dr.P.Murugesan has acted as external examiner for M.Sc (Ag.) Seed Technology student of Agricultural College and Research Institute, TNAU Madurai during the month of June 2015

Dr K.Suresh mentored Ms. Sk. Aaisha, UG student from St. Theresa's College of Women, under INSPIRE SHE funded by DST on "Physiological and Biochemical basis for tolerance in African oil palm crosses"

## Events

An interface meeting was organized with farmers, processors and scientists of IIOPR on 25.4.2015 to discuss various issues related to the crop under the chairmanship of DDG (Horticulture Science) at IIOPR, Pedavegi.



IIOPR has signed an MOU with Acharya Nagarjuna University, Guntur on 12<sup>th</sup> May, 2015 to guide M.Sc and Ph D students at our Institute.



### IIOPR participated in ICAR Zonal Sports Meet (South Zone)

IIOPR Sports Contingent comprising 23 participants actively participated in seven different events in the ICAR Zonal Sports Meet (South Zone) for the year 2015 held at CIFT, Cochin during 25<sup>th</sup> – 29<sup>th</sup> May, 2015 under the Chief-de-mission of Dr.G.Ravichandran.

## Distinguished Visitors

Mr.Francois Balumuene, Ambassador of Democratic Republic of Congo and Mr. Kasongo Musenga, Second Councillor visited IIOPR on 17<sup>th</sup> June, 2015



Ms Usha Rani, IAS, Commissioner, Dept. of Horticulture, Govt of AP visited IIOPR on 19.6.2015

