



Vol. 15

October – December 2010

Issue. 4

Oil Palm Sector Scenario

Import of palm oil has increased considerably during the last decade. India imported 6.49 million tonnes of palm oil during 2009-10 constituting 74% of total import of vegetable oils in the country.

Concurrently, in India, the area under oil palm cultivation has been steadily increasing in the last two decades. In 1980s, oil palm area which was less than 10,000 ha progressed to about 78,000 hectares during 2004-05 and further increased to 1.57 lakh hectares during 2008-09. The net area under oil palm available during 2009-10 is 1.64 lakh hectares. Production of Fresh Fruit Bunches (FFB) also increased from 1.45 lakh tones during 2004-05 to 2.91 lakh tonnes during 2008-09.

From the Director's Desk

Dear Readers,

Harvesting in oil palm is a skilled job. At present, manual methods are being followed for which special training is required. Harvesting of young palms of less height is comparatively easy. As the palm grows, sickle attached to aluminium poles are used. Climbing on the tree with a ladder or using a rope and employing sickle or chisel to cut the fronds and bunches is also practiced. Climbing becomes difficult after certain height, mainly due to the hindrance of frond base in the trunk. Long aluminium poles attached with sickles are used in tall palms. Balancing the lengthy poles, hooking bunches and fronds, pulling and cutting consume time and cause physical stress to the labour and result in reducing the overall efficiency.

Taller trees are often left un-harvested due to the lack of suitable methods and devices for harvesting. Hence replanting is followed after the trees attain a height of 10-15 metres at the age of 30-35 years even if the palm gives steady yields. However, under irrigated conditions, tree growth is faster and hence harvesting is proving to be a greater problem at younger stage itself. While efforts have been initiated to mechanize the operation, a well accepted and economically viable mechanized harvesting system is yet to be developed.

Under the guidance of Director General, ICAR and with the encouragement of Deputy Director General (Hort.), ICAR, an inter-institutional research

project 'Development of Harvesting tools for oil palm' was initiated by Directorate of Oil Palm Research and Central Institute of Agricultural Engineering, Bhopal. A Scientist from DOPR visited CIAE, Bhopal and made a presentation on the subject. Following this, Director, CIAE formed a Team of Scientists to work on this priority problem. The Team visited oil palm plantations in Kerala and Andhra Pradesh States and also participated in a Brain Storming Session on 'Development of harvesting tools for oil palm' held at DOPR. Based on the discussions in the Brain Storming Session, the following decisions were made:

- * Initial efforts shall concentrate on developing harvesting tools for oil palm trees of 5 to 35 years old, planted in plain terrain (without much undulation) & grown as a monocrop. Variations in the developed tools could be attempted at a later stage for location-specific problems.
- * Development of a self propelled hydraulically operated high raise platform for harvesting oil palm bunches in tall trees - to be carried out by DOPR.
- * Development of an improvised sickle with light weight & high strength poles - to be taken up by CIAE, Bhopal. DOPR would provide the required logistic assistance.
- * Development of a motorized sickle for use in medium tall palms and also for use in combination with high rise platforms - to be taken up by CIAE-IEP Centre, Coimbatore.
- * Testing, evaluation and demonstration of the improved tools and equipments - to be accomplished by DOPR, CIAE and AICRP on FIM Scheme Centre, Maruteru, A.P.
- * Safety to the operator and ergonomics need to be taken care while developing the tools.

Both DOPR and CIAE have already initiated action on the respective activities assigned to them and it is expected that the first set of improved harvesting tools would be promoted for bulk demonstrations by December, 2011.

BEST WISHES FOR A HAPPY & PROSPEROUS NEW YEAR

S. Arulraj
Director

Research achievements / New findings

Studies on oil loss and moisture loss

Preliminary studies on estimation of mill oil loss by using Costa Rican material collected from farmer's field showed that the average mill oil loss was 5.44 % in adult palms and 8.46 % in juvenile palms. Experiment on storage of FFB after harvest at ambient conditions indicated that the extent of moisture loss was more in over-ripe fruits (10.47%) than in ripe fruits (7.88%) over a period of seven days.

Onset of seed germination and maturity of developing bunch in *Elaeis oleifera*

Developing fruits and seeds were collected on various days after anthesis (DAA) to fruit shedding from *Elaeis oleifera* palms planted in 1994 at DOPR Research Centre, Palode to study "on-set of germination" in developing and matured seeds. Amount of moisture content in fruit, seed and embryo and seed germinability % (when formed) were determined during different developmental stages from the representative fruit samples extracted from developing bunches. The *oleifera* seeds extracted at 144 DAA showed 16.7 % of germination and highest germination (90%) was recorded both in 180 DAA and 188-192 DAA. However, high survival rate of deperculated- germinated seeds was obtained from 188-192 DAA than previous stages (180DAA and 165DAA). Complete fruit shedding was observed after 192 DAA. Sudden decrease in moisture content was recorded from 165 DAA onwards in both sterile and fertile fruits in developing bunches. Highest mesocarp oil content was recorded during 188-190 DAA.

E.oleifera and *E. guineensis* specific DNA markers

Markers were identified which could distinguish the *E.oleifera* palms from *E.guineensis* palms. Two random primers OPM-06 and OPP-08 could amplify

an unique fragment specific to *E.oleifera*. Similarly, three SSR primers SSR-44, SSR-132 and SSR-204 could distinguish *E.oleifera* from *E.guineensis*. *Eg* and *Eo* specific bands were amplified by SSR-44 primers, where as *Eg* specific band was amplified by SSR-132 and *Eo* specific band could be amplified by SSR-204 (Fig. 1). These could effectively be used in MAS of interspecific hybrids.

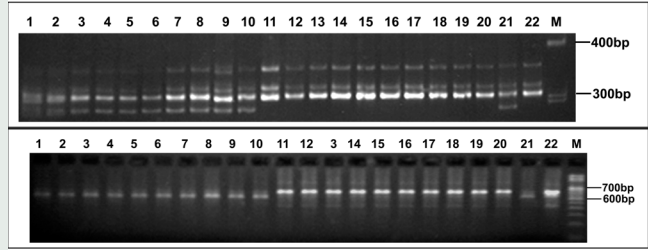


Fig.1 : SSR-132 (top) and OOP-08 (bottom) could distinguish *Eo* from *Eg*. (Lane 1-10 *Eo* palms, 11-20: *Eg* palms; 21: *Eo* Bulk; 22: *Eg* bulk; M: Marker)

Metroglyph and Index Score Analysis of morphological variations in high yielding *dura* palms

High yielding *dura* palms were characterized morphologically for palm height, girth at 25cm, sex ratio, number of developing fruit bunches, number of leaves, petiole width, petiole depth, number of leaflets, rachis length, leaflet length. Metroglyph and index score analyses were carried out for all these characters. All the palms were grouped into 9 clusters based on low, medium and high value of palm height and rachis length. The cluster V consists of nine palms, out of which six palms were close proximity to each other. Palms in other eight clusters showed scatterings, which indicated existence of morphological variation within clusters. In other analysis, character wise index score was assigned and total index score for each genotype was calculated. All genotypes were grouped into three Groups based on Mean \pm SD values of Index scores. Inclusion of the two divergent groups of palms, based on any one or combination of analysis in future hybridization programme would possibly yield fruitful results.

CAMPUS NEWS

Deputy Director General (Hort.), ICAR, New Delhi visits DOPR Dr. H.P.Singh, Deputy Director General (Horticulture), ICAR visited Directorate of Oil Palm Research during December 27-28, 2010. The programme included a visit to the experimental plots and laboratories at Pedavegi Campus. Ongoing research programmes of the Institute were reviewed and suggestions for improving the output were



DDG visits experimental fields

offered. The occasion was also utilized to formally inaugurate the "Tissue Culture Laboratory", a facility developed at the Campus as a part of the XI Five Year Plan item of activity.

Dr. H. P. Singh, Deputy Director General (Hort.) addressed the scientists and staff of DOPR. He emphasized the importance of oil palm for national economy and the significant role expected from DOPR for enhancing oil palm production in the country by improving the production potentials. He further assured that the Council would provide all the required support to the Institute to maximize its output. Suggestions for overall maintenance and improvement of the campus were also offered.



Inauguration of Tissue Culture Lab



DDG addressing DOPR Staff

Transfer of Technology

Officers Trained: DOPR organized Officers' training programmes on "Plant Protection in Oil Palm" to 3 officers; "Oil Palm cultivation" to 46 officers of Department of Agriculture, Mizoram; "Nursery Management in Oil Palm" to 4 officers and "Soil and Leaf Nutrient Analysis in Oil Palm" to 3 officers. Participants in these training programmes were from Mizoram, Tamil Nadu, Karnataka, Kerala and Andhra Pradesh. In addition, a contractual training programme on "Oil Palm Production" was also organized to 35 staff of M/s. MAC Oil Palm Ltd.

Farmers trained: Nine training programmes on "Oil Palm cultivation" of one day duration were organized to 347 farmers belonging to Mizoram, Gujarat, and Andhra Pradesh States. Farmers were explained about oil palm package of practices. Literature on oil palm

cultivation practices was provided. Video film on recommended practices of oil palm was shown. Visits to Oil palm gardens and a processing unit were also organized.

Extension activities

- * A digital video film on achievements and ongoing activities of DOPR was brought out with the title "DOPR Marching ahead" in English, Hindi and Telugu.
- * DOPR organized a "District Level Seminar on Cocoa" on 21.12.2010. Lectures were delivered on recommended practices of cocoa as intercrop in coconut and oil palm plantations. Coconut and oil palm growers, staff from Department of Horticulture, oil palm and cocoa processing units attended the Seminar. The Seminar was sponsored by Directorate of Cashew and Cocoa Development, Govt. of India.

Research Publications

Jayanthi, M. and Mandal P. K. (2010) "In vitro propagation and clonal abnormality studies in oil palm – A review" *Advances in Horticulture Biotechnology - Vol 1 - Regeneration systems – Fruit Crops, Plantation Crops and Spices*. (Eds: Singh H.P., V. Parthasarathy and K. Nirmal Babu) Westville Publishing House, New Delhi, 319-341.

Kalidas P. (2010). Effect of new methods of insecticides application on the management of psysids of oil palm. 4th Indian Horticulture Congress held during 18-21 November, 2010.

Mandal P. K. and Jayanthi, M. (2010) "Molecular marker and Marker assisted selection in oil palm – present status and future strategies" *Advances in Horticulture Biotechnology - Vol 3 - Molecular Markers and Marker Assisted Selection – Fruit Crops, Plantation Crops and Spices*, (Eds: Singh H.P., V. Parthasarathy and K. Nirmal Babu) Westville Publishing House, New Delhi, 197-223

Rajasekhar Pinnamaneni, Kalidas, P. and Sambasiva Rao, K R S. (2010). Studies on the effect of varied physico-chemical parameters on the growth of *Beauveria bassiana*. *Research Journal of Biological Sciences*, 2(1): 20-29.

Sunil Kumar, Shinoj Subramannian and Sparjan Babu D. S. (2010). Prediction of oil content based on the biological variance in color of oil palm fresh fruit bunches. Paper presented in 4th Indian Horticulture Congress held at New Delhi during November 18-21, 2010.

Sunita S and Varghese, P. T. (2010). Bio engineering and agronomic measures for soil and water conservation in oil palm plantations. 4th Indian Horticulture Congress held during 18-21 November, 2010.

Technical publications

Prasad M V, Reddy V M, Kalidas. P. and Suresh K. Book and folder on Teltad ki kheti (Oil Palm cultivation-English).

Prasad M V and Reddy V M. Folder on Importance of leaf nutrient analysis in oil palm and method of leaf sampling.

PERSONALIA (during 2010)

Awards

Dr. K. Praveendeepti, Scientist (Plant Pathology) received Sri G. Sri. Ramulu memorial Gold medal for getting overall university highest OGPA in the faculty of agriculture, Acharya N. G. Ranga Agricultural university, Hyderabad in 43 convocation of university from Dr. M. S. Swaminathan on 29-12-2010.



Degree awarded

Dr. K. L. Mary Rani, Scientist (SS) was awarded Ph. D in Computer Science from Padmavati University, Tirupati, A.P. during April, 2010.

Promotion

Dr. R. K. Mathur, Sr. Scientist promoted to Principal Scientist w.e.f 18.9.2008.

Newly appointed

Dr. Goutam Mandal joined as Sr. Scientist (Horticulture) on 15.1.2010.

Dr. K. Praveena Deepthi joined as Scientist (Pl. Pathology) on 5.3.2010.

Dr. A. Gopala Krishna Reddy, joined as Scientist (Horticulture) on 7.5.2010.

Transferred

Dr. L. Saravanan, Scientist (Ag. Entomology) transferred from Directorate of Medicinal and Aromatic Plants Research, Boriavi, Gujarat to DOPR, Pedavegi on 3.3.2010.

Dr. G. C. Satisha, Sr. Scientist (Soil Science) transferred to IIHR, Bangalore, Karnataka on 22.4.2010.

Dr. Ananta Sarkar, Scientist (Ag. Statistics) transferred to NAARM, Hyderabad, A.P. on 27.4.2010.

Retired

Sri. K. Dharmaraju, Upper Division Clerk on 31.1.2010

Edited by :

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Published by :

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Printed at

M/s ELURU OFFSET PRINTERS
R R Pet ELURU - 534 002
☎ 244543 # 9848234567