

DOPR News

DIRECTORATE OF OIL PALM RESEARCH

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From the Director's Desk

Dear Readers,

Directorate of Oil Palm Research took initiative for dissemination of technology through mobiles with budget support from Department of Agriculture & Cooperation, Govt. of India initiated a project on "Oil Palm Kisan Mobile Message Services" during 2012-13, with an objective to disseminate oil palm technology through mobile message services to the stakeholders.

Mobile numbers were collected from five states viz., Andhra Pradesh, Goa, Gujarat, Karnataka, Maharashtra and Mizoram. A total of 13,834 unique mobile numbers were identified. Two types of messages were published to mobile numbers viz., i. Message through Short Message Service (SMS) in text form. A total of 54 text contents were prepared in vernacular languages and sent to 3.12 lakh mobile numbers as SMS with a delivery percentage of 81% and ii. Message in the form of Voice call. A total of 41 contents were pre-recorded and sent to 3.61 lakh mobile & landline numbers and delivery percentage was 42.9 %.

Feedback collected on published SMS and voice messages revealed that majority of the respondents are receiving the messages (94%); regular in reading / listening the messages (88%). They have indicated that the messages are audible (88%); language is understandable (86%); message is useful (80%); relevant to their crop growth (69%); messages are being discussed/spread (80%); 33% of them are adopting the practices disseminated through SMS/Voice messages; indicated to have follow up visit of officials (14%) and scientists (12%). Farmers would like to consult through phone (78%) for follow up action (78%); opined to have toll free facility (80%); preferred mode of mobile service was through voice (49%); SMS (10%) or both (31%); would like to have weekly messages (71%); indicated that messages are accurate (75%), brief (75%) and clear (78%); Usefulness of specific subjects are as follows viz., irrigation (16%), fertilizer application (14%), disease management (8%) and weed control (4%).

We invite all the oil palm growers and development managers to register with us for utilizing this facility and get benefitted from this unique service from DOPR.

S. ARULRAJ
DIRECTOR

Research Findings

Seasonal changes in oil formation and fatty acid composition

Oil content and fatty acid composition in three oil palm hybrids viz., Malaysia, Deli x Ghana and Deli x Nigeria were analyzed in two seasons, rainy and summer. Seasonal variation in fruit weights (4.9 – 13.6 g), oil content (69.3 – 81 %) and moisture (30.2 – 43.9 %) were observed. Saturated fatty acids like myristic (0.67 – 1.32 %) and palmitic (41.9 – 49.6 %) showed high levels during summer season, while stearic (3.67 – 4.86 %) increased during rainy season. Unsaturated fatty acids like oleic (36.5 – 44.1 %), linoleic (5.58 – 8.57 %) and linolenic (0.22 – 0.56 %) were also increased during summer season and decreased during rainy season. The study confirms that oil content and fatty acid composition is strongly influenced by temperature and rainfall during rainy and summer seasons.

Effect of fruit ripening on fatty acid composition

Changes in fatty acid composition, oil content and moisture content were analyzed in four adult oil palm tenera hybrids viz., Malaysia, Palode, Deli x Ghana and Deli x Nigeria grown under irrigated conditions. During different developmental stages from anthesis to maturity during the 12, 14, 16, 18, 20 weeks after anthesis (WAA) analysis was carried out. Fruit weight increased from 12th to 20th week (5.1-10.6 g) in all the hybrids. Oil content increased from 22 to 79 oil/dry mesocarp % while moisture content decreased (34.3%) from 12th to 20th week. Six fatty acid profiles viz., myristic (0.5-4.3 %), palmitic (34.1-50.9 %), stearic (2.8-6.4 %), oleic (3.0-6.4 %), linoleic (7.8-11.5 %) and linolenic (0.3-3.3 %) identified by standardizing the GC parameters. The method standardized was rapid with a total analysis time of 7 minutes and environmentally friendly, and accuracy was good for raw-material quality control.

Phenological growth stages

The different phenological stages of Oil Palm hybrids were coded using the Biologische Bundesantalt, Bundessortenamt and Chemische Industrie General Scale. The duration between unfolding of 70 per cent spear leaf to bunch maturity in the hybrids ranged from 447.9 to 485.2 days

and the duration from anthesis to maturity ranged from 145.8 to 153.7 days. Wide variation in the degree days from spear leaf development to bunch maturity were also observed among the hybrids ranging from 6320.2 to 6937.3. Among the hybrids, United plantations hybrid possessed the shortest duration and lowest degree days from spear development to bunch maturity. The study would help in estimating thermal time required for the completion of different phenological stages, which could be used for yield forecasting models and studying climatic analogues in oil palm.

Water imbibition behavior in oil palm hybrid seed

The water imbibition behaviour was investigated in dormant and heat treated hybrid seeds of Oil palm (DxP). Results indicated that a duration of 40 days for the heating treatment intended breaking oil palm seed dormancy is as good as 50 or 60 days duration in softening of dormancy barrier (which is responsible for water entry into embryo) as per seed weight gains of treated seeds (Fig – 1).

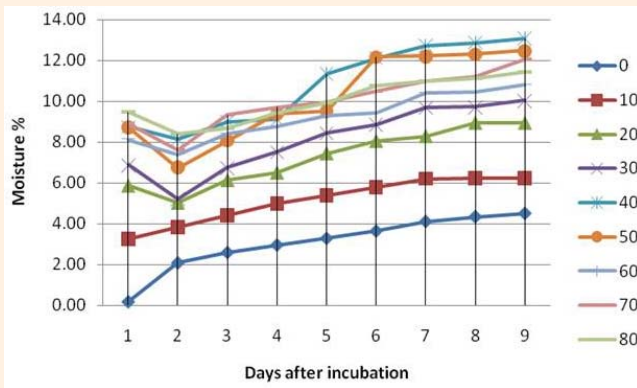
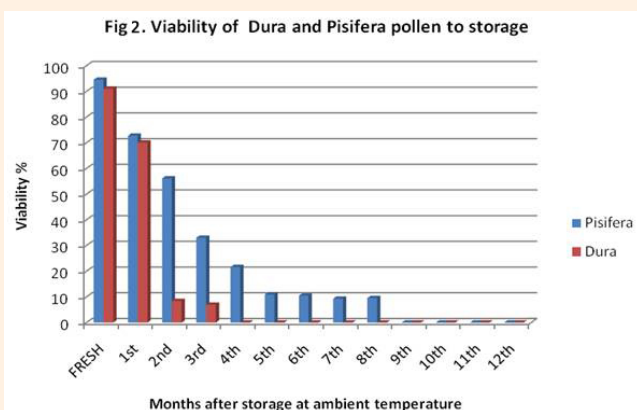


Fig. 1 Rate of water imbibition (%) in oil palm hybrid (D X P) seed as influenced by the duration (days) of heating treatment.

Differential response of Dura and pisifera pollen to storage

Pollen from Dura palms was found to be viable at room temperature (RT) for one month and in second month the viability percent dropped drastically reaching zero by fifth month. Pisifera, on the other hand, could retain good viability for two months at RT and then declined to lose viability completely after 9 months of storage (Fig. 2).



Effect of chipping and de-operculum dormancy breaking technique

Seeds of *E.oleifera* were subjected to various treatments to find a substitute for heating treatment which is routinely employed for dormancy breaking. The results revealed that mechanical chipping and de-operculum registered high germination and showed early and uniform germination.

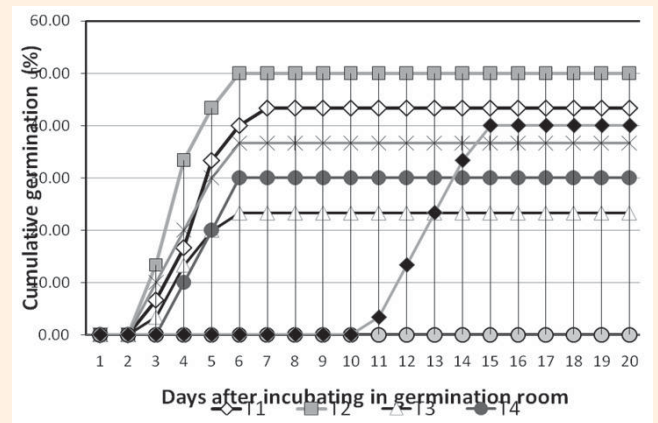


Fig. 3. Effect of chipping and de-operculum dormancy breaking technique in *Elaeis oleifera* seeds

Nut chipping machine

Designed and fabricated nut chipping machine (lab scale) to facilitate the chipping of physical barriers/ structures responsible for dormancy in oil palm. Chipping (opening) the seed without damaging the embryo was successfully demonstrated in D×P hybrid seeds and obtained maximum germination while adopting 'chipping and de-operculum dormancy breaking' protocol developed recently.



TRANSFER OF TECHNOLOGY

Training programmes organised

Three training programmes were organised on different aspects of oil palm production to 21 officers. Five training programmes were offered on Oil Palm cultivation to 235 farmers.

Title of the programme	Date	Number of participants	Officers / Farmers represented from
Officers Training			
Soil and Leaf Nutrient Analysis in Oil Palm	January 22-24, 2014.	4	Chhattisgarh, Kerala and Odisha
Oil Palm cultivation and the prospects of Oil Palm Industry	February 18-20, 2014.	13	Nagaland
Orientation on Oil Palm cultivation	February 21, 2014.	4	Chattisgarh, Karnataka & Andhra Pradesh
Farmers Training			
Oil Palm cultivation	February 22, 2014	22	Andhra Pradesh
Oil Palm cultivation	March 11, 2014	89	Karnataka
Oil Palm cultivation	March 21, 2014	73	Karnataka
Oil Palm cultivation	March 22, 2014	29	Andhra Pradesh
Oil Palm cultivation	March 25-27, 2014	22	Odisha

Oil Palm Innovators Meet

Oil Palm Farm Innovators meet was organised at Lachapuram, Khammam District, Andhra Pradesh on 11.03.2014, where in 160 participants consisting of oil palm growers, staff of Department of Horticulture, Oil Palm processors and scientists participated. Deliberations were held for sustainable oil palm production. On this occasion tools developed by DOPR were demonstrated *i.e.* Ablation tool for ablation of inflorescences during juvenile period and sickle attached aluminium pole for harvesting of bunches from tall palms. Few innovative farmers have adopted micro-irrigation, split (4 nos.) application of fertilizers and obtained about 25 tonnes of FFB/ha during the 8th year of the plantation.



National Oil Palm Seed Meet Organized

The National Oil Palm Seed Meet 2014 was organized on 07.01.2014 at DOR, Hyderabad to assess the demand and supply of oil palm seed sprouts for the year 2013 and to finalize the requirements in the year 2014. Representatives of six oil



Dr. Anupam Barik (in the centre), Addl. Commissioner (TMOP), Dr. S. Arulraj (on right side), Director, DOPR and Dr.K. S. Varaparasad, Director, DOR during the National Oil Palm Seed Meet on 07.01.2014

palm seed gardens, staff of Dept of Hort, Govt. of A. P., Oil Palm Processors and scientists from DOPR participated in this event. Dr. Anupam Barik, Addl. Commissioner (TMOP) presided over the function and in his presidential address emphasized the importance of oil palm in fulfilling the consumption needs of the population for edible oils in coming years. Dr. S. Arulraj, Director, DOPR welcomed the guests and made a presentation about the Oil Palm Planting material in the technical session. Dr. R. K. Mathur, Principal Scientist & Nodal Officer (Seeds) gave an overview of the demand and supply of oil palm germinated seeds in the last five years from all the oil palm seed gardens.

RESEARCH PUBLICATIONS

Anitha Pedapati, Vandana Tyagi, Yadav, S.K., Pratibha Brahma and Murugesan, P. (2013). Present status and future priorities for introduction of Oil Palm in India. *The Ecoscan* 7(3&4): 139-144.

Kalidas, P. and Sravanti, A. (2014). Decomposition of oil palm bio-waste using microbes. *Current trends in Biotechnology and pharmacy*,8(1):45-54

Kiran Kumar, M., Suresh, K., Prasanna Lakshmi, R., Lakshmi Kantha, D. and Mathur, R.K. (2011). Carbon Sequestration of Eleven Oil Palm Hybrids under Irrigated Conditions. *Int. J. Oil palm*, 8 (1&2): 27-30.

Manoja, K., Suresh, K. and Behera, S. K., (2011). Dynamics of Soil Organic Carbon and Microbial Activity in Oil Palm Growing Soils of Andhra Pradesh. *Int. J. Oil palm*, 8 (1&2): 17-22.

Manoja, K., Suresh, K. and Behera, S. K., (2011). Relationship between Dehydrogenase Activity and Physico-chemical Properties in Oil Palm Growing Soils of Andhra Pradesh. *Int. J. Oil palm*, 8 (1&2): 35-38.

Mary Rani, K.L., Narsimha Rao, B., Rambabu, M. and Anil Kumar (2014). Application of Database Technologies for Monitoring the Performance of Nutrient Uptake and Irrigation Levels in Oil Palm. *Agrotechnol.*, 2(4):169.

Murugesan, P., Shareef, M., Haseela, H. and Mathur, R. K. (2013). Seed Quality and germination in selected hybrids of Oil Palm (*Elaeis guineensis*, Jacq). *J. of Plantation Crops*, 41(2):172-176.

Narasimha Rao, B., Suresh, K., Ramachandrudu, K. and Mary Rani, K.L. (2011). Influence of fertigation on growth and yield of oil palm. *Int. J. Oil palm*, 8 (1&2): 13-16.

Saravanan, L., Kalidas, P., Ravi Babu, K. and Phanikumar, T. (2014). Factors affecting the activity of pollinating weevil, *Elaeiodobius kamerunicus* Faust in Irrigated Oil Palm plantations. *Agrotechnol.*, 2(4):143

Saravanan, L., Kalidas, P., Phanikumar, T., Praveena Deepthi, K. and Ravi Babu, K. (2014). *In vitro* compatibility of *Trichoderma viride* with agrochemicals. *Ann. Pl. Protect. Sci.* 22(1)190-239: 224-226

Suresh, K., Kiran Kumar, M., Lakshmi Kantha, D., Prasanna Lakshmi, R., Manoja, K., Raj Kumar, P., Narsimha Rao, B. and Behera, S.K. (2011). Effect of different irrigation methods and levels on nitrate reductase activity in Oil Palm. *Int. J. oil palm*, 8(1&2): 5-8.

Technical publications

Behera, S. K., Suresh, K., Prasad, M. V., Rao, B. N. and Ramachandrudu, K. (2013). Soil Sampling in Oil Palm Plantations. Extension folder published by DOPR, Pedavegi, P-4.

Kalidas, P. (2014). Biodiversity and its role in agriculture development. Souvenir, National seminar on "Biodiversity conservation- present status", held at Tenali, Andhra Pradesh on 23-24 January 2014, p14.

Manorama, K., Sanjib Kumar Behera, Suresh, K., Prasad, M. V., Ramachandrudu, K. and Rao, B. N. (2014). Palm oil totallo Matti Namuna (Telugu) (Soil sampling in oil palm plantations). *Annadata*, Telugu Agricultural Journal, Feb 2014. p40.

Murugesan, P. (2014). Breaking Seed dormancy in oil palm, India-ASEAN News on Agriculture and Forestry, 2 (2): 7-8.

Murugesan, P., Sunil Kumar, K., Sujathakumari, N., Naveen Kumar, P., Ravichandran, G. and Mathur, R.K. (2014). DOPR Research Centre in a nut shell, Published by Director, DOPR, Pedavegi, Andhra Pradesh, p8

Murugesan, P. and Shareef, M. (2013). Status of crop improvement and conservation strategies in oil palm. In: Recent advances in conservation of genetic resources of plantation crops (eds. Anitha Karun, M. K. Rajesh, B.A. Jerard, C.H. Amarnath and K. Samsudeen) pp 59-72.

Narsimha Rao, B., Suresh, K. and Arulraj, S. (2014). Present Status of Oil Palm Development in India. *Plant Horti Tech.* 13(5): 15-17

Narsimha Rao, B., Suresh, K., Behera, S. K., Ramachandrudu, K. and Manorama, K. (2014). Nutrient management in oil palm. Technical Bulletin, published by DOPR, Pedavegi, P-24.

Narsimha Rao, B., Suresh, K., Behera, S. K., Ramachandrudu, K. and Manorama, K. (2013). Irrigation management in oil palm. Technical Bulletin, published by DOPR, Pedavegi, P-19.

Prasad, M. V., Arulraj, S and Mounika, B. (2014). Oil Palm Cultivation Practices. Extension folder published by Directorate of Oil Palm Research, Pedavegi, Andhra Pradesh. P-6.

Prasad, M. V., Kalidas, P., Narsimha Rao, B., Suresh, K., Ramachandrudu, K., Praveena Deepthi, K. and Srinu, B. (2013). Oil Palm Sagu (Telugu) (Oil Palm Cultivation-English). Technical Bulletin published by Directorate of Oil Palm Research, Pedavegi, P-66.

Prasad, M. V., Mounika, B., Ravi Kumar Mathur and Arulraj, S. (2014). Tel Tad kheti karne ki tarike-Hindi (Oil Palm Cultivation Practices - English). Extension folder published by Directorate of Oil Palm Research, Pedavegi, Andhra Pradesh. P-6.

Ramachandrudu, K., Arulraj, S. and Rao, B. N. (2014). Heliconia-A potential inter crop in bearing oil palm gardens. *Plant Horti Tech*, 13(4): 36-38.

Training courses attended:

Mr. Nasir Hussain and Ms. Ramya Menon, Assistants, attended Special Training Programme for newly recruited Assistants (DR) of ICAR conducted by ISTM, New Delhi during 30.12.2013 to 10.1.2014

Foreign Deputation

Dr. D. Ramajayam, Senior Scientist, attended NAIP sponsored training in the area of Marker Assisted Selection (NRM) at West Virginia State University, USA during 03.01.2014 to 15.03.2014

Dr. R. K. Mathur, Principal Scientist, attended a Study Visit to Palm Elit Seed Garden in Krabi, Thailand on 25-27 February 2014

Extension activities

Dr. B. Narasimha Rao delivered a Radio talk on "Vesavilo Oil Palm thotalalo neeti yajamanyam" AIR, Vijayawada on 25th March, 2014.

Dr. K. L. Mary Rani delivered a Radio talk on "Mobile Message Services on Oil Palm Cultivation", AIR, Vijayawada on 26th March, 2014

Dr. P. Kalidas delivered a Radio talk on 'Recent out breaks of Pest problems in oil palm and their management', All India Radio (AIR), Vijayawada on 18th March, 2014

Dr. P. Murugesan Organised and participated in video documentary of oil palm cultivation programme – Njattuvula and covered R & D activities of DOPR RC Palode on 7th March 2014 and programme telecasted on 22nd and 23rd March 2014 in Media One Channel for the benefit of farmers.

Dr. P. Murugesan participated in an exhibition in connection with the Agricultural Mela held at TRRI, Aduthurai, Trichi on 10th January, 2014.

Participation in Exhibitions

DOPR has put up a stall in the agricultural exhibition "Krishi Vasant" organized at CICR, Nagpur on February 9-13, 2014. Live exhibits, posters on oil palm production technologies were arranged in the stall. On 9.2.2014, Dr. S. Ayyappan, Secretary DARE and DG, ICAR visited the stall. Farmers'/visitors' belong to Maharashtra, Karnataka, Tamil Nadu, Andhra Pradesh, Jammu & Kashmir, Uttar Pradesh, Madhya Pradesh, Chhattisgarh, Jharkhand and Punjab visited the stall. Queries raised by the visitors were clarified regarding palm oil and oil palm cultivation practices. Nearly 2.0 lakh people visited the stall during the five days of exhibition.



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