

DOPR News

DIRECTORATE OF OIL PALM RESEARCH

(Indian Council of Agricultural Research)

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From the Director's Desk

Dear Readers,

India is one of the major producers and consumers of vegetable oils, accounting for 12 to 15 percent of the area under oilseeds and 6 to 7 percent of the production of vegetable oils in the world. Despite production of over 9.65 million tonnes of vegetable oils during 2011-12 in the country, the domestic availability of edible oil continues to remain grossly inadequate to meet the demand. The gap between demand and availability of edible oils are met by imports and palm oil constitutes bulk of these imports. During 2011-12, India has imported 10.20 million tonnes of edible oils valued at US \$ 7.58 billion. In terms of volume, it was 52.98 percent of domestic availability of edible oils. The quantum of import is likely to go up with increase in per capita consumption and population pressure resulting in higher future demand.

The Govt. of India and National Agricultural Research System are giving adequate emphasis for improving productivity of oilseed crops through release of high yielding varieties and adoption of technology. During the last two decades, efforts have also been made to introduce and exploit a number of new oil bearing crops. However, among the recently introduced crops, only oil palm has shown promise for commercial cultivation under Indian conditions.

Expert Committee constituted by Ministry of Agriculture, Government of India has identified a total of 1.93 million hectares in 18 states of the country as suitable for oil palm cultivation. So far, an area of 2.20 lakh ha has been covered under oil palm. Production of palm oil in India continues to be at a meagre level with respect to its requirement. The FFB yields obtained by progressive farmers of Andhra Pradesh and Karnataka, under optimum cultural and irrigated conditions, are between 20 and 25 tonnes of FFB per ha per annum i.e. 4-5 tonnes of oil per ha per annum from fourth year onwards. The highest yield of 30-35

tonnes FFB /ha/yr during the seventh year was also recorded in many plantations. One of the farmers in Karnataka could achieve a record yield of 52.3 FFB / ha/ yr from a 15 year old garden.

To remain competitive in the emerging global scenario, a four-fold increase in land productivity, three-fold increase in water productivity, doubling of energy use efficiency and a six fold increase in labour productivity are to be envisaged for the future. With the present level of technology available in India, it is possible to produce 8.00 million tonnes of palm oil and 0.8 million tonnes of palm kernel oil from an area of 2.0 million ha which is much higher than the vegetable oils produced from nine annual oilseeds with an area of 26.11 million ha.

In India, for a population of 1200 million during 2011, 19.25 million tonnes of vegetable oil was utilized. However, the current per capita consumption of 14.8 kg is lower than nutritional needs as defined by FAO. In the years to come, oil palm is likely to play a major role in augmenting the supply of vegetable oil in the country. As against the potential area of 1.93 million hectares spread over 18 states in the country, hardly 2.20 lakh ha was planted so far. Among the major tree crops, oil palm forms the high potential prospective and long-term source of edible oil, which is expected to contribute significantly towards meeting the growing edible oil demand in the country.

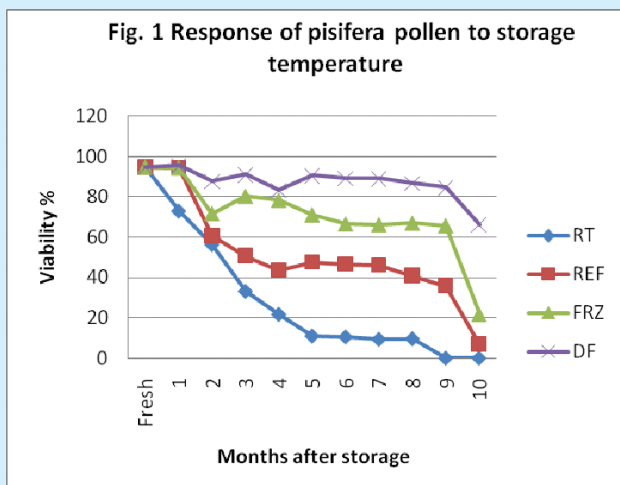
By 2050, even if an area of 2.00 million ha is covered under oil palm, the country must be able to produce about 14 million tonnes of oil from oil palm @ 7.00 tonnes of oil per ha. There is a need for proper policy back-up for sustaining the long-term commitment of the farmers, researchers, development managers and policy makers to oil palm.

S. ARULRAJ
DIRECTOR

RESEARCH ACHIEVEMENTS / NEW FINDINGS

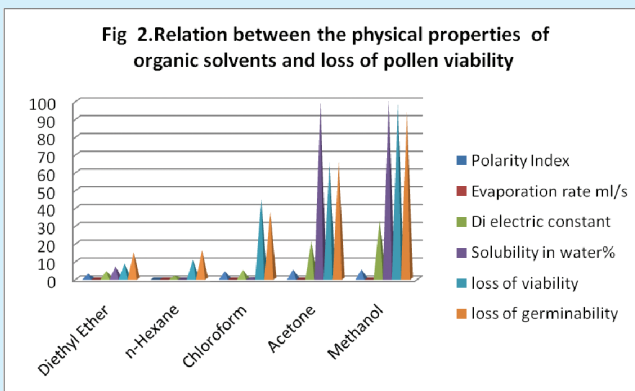
Standardization of oil palm pollen storage technique

Study conducted at Directorate of Oil Palm Research on storage of pollen at low temperature regimes indicated that with respect to storage under varying temperatures, it was -20°C storage in deep freezer (fig. 1) that retained maximum viability as well as germination. This trend was same for Dura and Pisifera pollen although the loss was relatively faster with respect to the former.



Pollen Storage in organic solvents

Study was conducted to identify the better organic solvent to store pollen without considerable loss of viability and as well as germinability. It was evaluated for viability during storage at intervals of one month by employing the same tests and conditions as for the pollen sample prior to storage. There was a distinct correlation between pollen viability retention and physical properties of solvents like polarity, polarity index, evaporation rate, dielectric constant and solubility in water. Dielectric constant and solubility % in water are more in polar solvents (both aprotic and protic) when compared to non polar solvents. Pollen grains stored in non polar organic solvents (n-Hexane and Di ethyl ether) retained maximum viability whereas those stored in polar solvents, lost viability and germination very fast, the trend was shown in Fig 2. Thus, present method indicated that it is feasible to store oil palm pollen in Diethyl ether or n-hexane at -5°C temperature (refrigerator) up to 200 days without considerable loss of viability or germination and polar solvents (both the aprotic and protic) solvents are not suitable for pollen storage even for short term due to its high dielectric constant and high solubility in water.



Oil palm FFB harvesting tools

Designed and developed two sickles with light weight high strength poles, DOPR-1 and DOPR-5, for harvesting of oil palm fresh fruit bunches (FFB) from tall palms. These sickles were intensively tested at DOPR and in oil palm plantations of Andhra Pradesh and Kerala.



Developed height (4.5m) adjustable hydraulically operated high rise platform for harvesting of oil palm bunches from tall palms. Harvesting of bunches can be done from this platform by using sickles attached to aluminum poles (6.1 m), there by one can harvest bunches from the tall palms up to a height of 10.6 m.



Developed a back pack mounted motorized sickle for harvesting oil palm bunches from medium tall palms and also for use in combination with high raise platforms. The machine can be used by carrying it on the back of the operator (in the backpack model) or on the platform.



Research articles

- ♦ Azadvar Mehdi, Virendra Kumar Baranwal, Madhavan Kochu Babu and Deepthi Praveena. 2012. Sequence Analysis of 16S rRNA and secA Genes Confirm the Association of 16Srl-B Subgroup Phytoplasma with Oil Palm (*Elaeis guineensis* Jacq.) Stunting Disease in India. *J Phytopathology* 160:6-12
- ♦ Behera, S.K., Shukla, A. K. and Singh, M. V. 2012. Distribution variability of total and extractable copper in cultivated acid soils of India and their relationship with some selected soil properties. *Agrochimica (Italy) LVI* (1): 28-41
- ♦ Jayanthi M. 2012. Population ecology, threats, status and conservation of natural populations of *Crotalaria longipes* - an endangered plant. *J. of Biodiversity and Environ. Sci.*2(4):1-9
- ♦ Jayanthi, M., Kamala, A.V.R., Tamil Selvan C and Mandal P.K. 2012. DNA markers for varietal identification of oil palm. *J. of Plantation Crops* 40(3): 208-211
- ♦ Mandal, G., Dhaliwal, H.S and Mahajan B.V.C. 2012. Effect of pre-harvest application of NAA and potassium nitrate on storage quality of winter guava (*Psidium guajava*). *Indian J. of Agric. Sci.* 82 (11): 985-9
- ♦ Mandal G., Mathur, R.K., Sunil Kumar, K., Murugesan, P., Meena Kumari, K., Balaji, B and Nagaraju, A. 2012. Collection of elite oil palms from exotic commercial plantations in India. *Agrotechnology*1(2): 50

- ♦ Singh, M. V. and Behera, S. K. 2013. Strategies and issues in developing customized fertilizers in India. *Indian J. of Fertilizer* 9(2): 52-59
- ♦ Sunilkumar, K. and Sparjanbabu, D.S. 2013. Surface color based prediction of oil content in oil palm (*Elaeis guineensis* Jacq.) fresh fruit bunch. *African J. of Agric. Res.*, 8(6): 564-569.
- ♦ Suresh, K., Prasanna lakshmi, R., Kiran kumar, M. and Lakshmi kantha, D. 2013. Growing degree days and reproductive phenology of four oil palm hybrids in India under irrigated conditions *J. Agrometeorology* 15(Spl.Issue1): 1-4.

Book chapters

- ♦ B. Narsimha Rao, K.Suresh and S.Sunitha. 2013. Nutrient Use Efficiency in Oil Palm Plantations Under Indian Conditions. In: *Precision Farming in Horticulture* (Ed by Jitendra Singh, S.K.Jain, L.K.Dashora and B.S.Chundawat, New India Publishing Agency, New Delhi, India). Pp 155-160.
- ♦ Kancherla Suresh. 2013. Adaptation and mitigation strategies for climate resilient oil palm. In: *Climate-Resilient Horticulture - Adaption and Mitigation Strategies* by H.P.Singh, N.K.S.Rao and K.S.Shivashankara, (eds.). Pp. 199-212, Springer, India, DOI 10.1007/978-81-322-0974-4.
- ♦ Praveena Deepthi, K and Narayan Reddy, P. 2012. 'Head smut of sorghum' in Seed borne diseases of field crops and their management. In: *Agrobios* (ed by Mohan S. Bhale and Ashok Gour). Pp 165-182.
- ♦ Praveena Deepthi, K and Narayan Reddy, P. 2012. 'Grain smut of sorghum' in Seed borne diseases of field crops and their management. In: *Agrobios* (ed by Mohan S. Bhale and Ashok Gour). Pp 155-164.
- ♦ Sudhakar, R., Narayan Reddy, P and Praveena Deepthi, K. 2012. 'Ergot of sorghum' in Seed borne diseases of field crops and their management. In: *Agrobios* (ed by Mohan S. Bhale and Ashok Gour). Pp183-196.
- ♦ Murugesan, P., Mandal, G. and Shareef, M. 2013. Seed Quality Assessment in plantation Crops. Published in compendium of NSRTC sponsored training programme on "Seed Quality Assurance" held during 19- 23 Feb 2013 at KAU, Thrissur, Kerala. Pp. 127-135.
- ♦ Prasad, M.V., Sunitha, S., Jayanthi, M and Kochu Babu M. 2012. Participation of women in oil palm production and processing. In: *Women in Horticulture and women-friendly technologies* (Eds. Tripathi PC, Srinath K., Shukla AK., Kishore K and Naresh Babu) Published by Directorate of Research on Women in Agriculture. pp. 48-50.

Popular articles

Vijayabhaskar, V. and Narsimha Rao, B. 2013. Water management in oil palm cultivation. 2013. *Annadata*. January Pp 60-61.

Technical publications

Prasad, M. V., Madhav Reddy, V., Sampath Kumar, P., Rayapa Raju, D. G. S. and Jameema, J. 2012. Frequently asked questions - answers in oil palm (Telugu). Directorate of Oil Palm Research, Pedavegi, P-28.

TRANSFER OF TECHNOLOGY

Training courses organised / lectures delivered

Organized officers training on "Soil and leaf nutrient analysis in Oil Palm" to 9 officers belonging to State Department of Horticulture/Agriculture and oil palm processors of Andhra Pradesh, Odisha and Tamil Nadu.

Organized nine training programmes of one day duration on "Oil Palm cultivation" to 198 farmers from Chattisgarh, Karnataka, Mizoram, Odisha and Tamil Nadu.

Mobile messages on oil palm

Eleven contents on oil palm cultivation were developed and delivered as SMS and fourteen contents were developed and sent as voice messages to 13,834 mobile / land phone number of oil palm growers of Goa, Gujarat, Karnataka, Mizoram, Odisha and Andhra Pradesh through Oil Palm Kisan Mobile Message Services.

Exhibition

Dr. Goutam Mandal participated in the ICAR exhibition stall during the 100th Indian Science Congress- 2013 organized by Indian Science Congress Association held at Kolkata during January 3-7, 2013.

Campus News

Visit of Dr. N. K. Krishna Kumar, Deputy Director General (Horticulture), ICAR

Dr. N. K. Krishna Kumar, Deputy Director General (Horticulture), ICAR, New Delhi visited DOPR, Pedavegi during February, 2013. He inaugurated the Training Hall on February 7, 2013 and addressed the staff.



He reviewed the progress of fund utilization with the administration & accounts staff. Scientists' meeting was organized to review the institute research projects and finalized the topic for Institute flagship programme.

DDG visited the laboratories and experimental fields on February 9, 2013 and suggested researchable issues in irrigation and nutrient management and physiological



studies. Measures for strengthening the crop improvement programme in DOPR were discussed and suggestions were offered.

Institute-Industry Interface Programme

Institute – Industry Interface Programme on Scope for Commercialization of Tissue Culture Technology in Oil Palm was held at DOPR, Pedavegi on January 3, 2013 under the Chairmanship of Dr. Ajay Parida, Executive Director, M.S.Swaminathan Research Foundation and Dr. K.U.K. Nampoothiri, Former Director, CPCRI. Director, DOPR and all the scientists participated in the programme. The commercialization process for the tissue culture technology including callus induction, somatic embryogenesis and plant regeneration from inflorescence has been initiated. The developed technology was presented to the entrepreneurs from private firms and the external experts. It was concluded that the Tissue Culture Technology developed at DOPR is good and quite promising. The possibility of involving Small Business Groups for refining the technology for large scale commercial production is being explored.

Interaction meeting on 'Refinement of methodologies for conducting crop improvement trials in Oil palm' was also held on January 2-3, 2013, wherein all the scientists of crop improvement division participated.

Interactive Meeting of AICRP Oil Palm

Interactive meeting of AICRP oil palm scientists was organized at DOPR, Pedavegi on January 10, 2013 to review the location specific research on oil palm being conducted at the AICRP oil palm centres. Scientists from the six AICRP oil palm centres and Director and scientists of DOPR participated in the meeting.

National Oil palm Seed Meet

National Oil palm Seed Meet - 2013 was organized at DOPR, Pedavegi on January 31, 2013 to finalize the oil palm hybrid seed production targets for all the seed gardens in the country and sprouts distribution schedule for the year 2013-14. Seed garden personnel from the six seed gardens and Director and scientists of DOPR participated in the meeting.

Oil Palm Stakeholders' meeting in Mizoram.

Directorate of Oil Palm Research organized stakeholders meeting on February 28, 2013 at Aizawl. Members representing oil palm growers, officials of state department of Agriculture, Oil Palm processing units and Scientists from DOPR attended the meet. Dr. C. L. Lalzarliana, Director of Agriculture, Mizoram chaired and Dr. S. Arulraj, Director, DOPR presided the meeting. The progress made in oil palm development was reviewed and strategies for enhancing oil palm productivity and area expansion in Mizoram were suggested. As a part of the programme DOPR conducted a training course on "Oil Palm Production Technology" to officials of State Department of Agriculture, oil palm processors and oil palm growers.

Interface Meeting of Oil Palm Stakeholders held in Karnataka.

Interface Meet with stakeholders viz., oil palm growers, officials of State Department of Horticulture, oil palm processors and Scientists from DOPR was held on March 2, 2013 at Directorate of Horticulture, Bangalore, Karnataka. The meeting was chaired by Dr. N. K. Krishna Kumar, Deputy Director General (Horticulture), ICAR, New Delhi. Present status of oil palm development in Karnataka was reviewed and issues in oil palm industry, R&D Plans and approaches for increasing area under oil palm and productivity in Karnataka were discussed. Dr. Krishna Kumar launched SMS services of DOPR in Kannada language and felicitated Mr. Purushottam Nadgowda, a progressive oil palm grower for achieving highest oil palm yield from young oil palm plantation. An Interactive session was held, where in scientists from DOPR presented technologies to improve oil palm productivity and replied the queries raised by oil palm growers, officials of Department of Horticulture and oil palm processors.

Memberships in committees / expert teams

- ♦ Committee consisting of scientists viz., Dr. M. V. Prasad, Dr. K. Ramachandrudu, Dr. K. Sunilkumar, Dr. Goutam Mandal and Dr. P. Naveen Kumar surveyed 208 oil palm plantations having different sources of planting material and submitted report for their performance.
- ♦ Committee consisting of scientists viz., Dr. P. Kalidas, R. K. Mathur and B.N. Rao conducted feasibility studies in association with State Department of Horticulture, Karnataka and submitted the feasibility reports to identify suitable farm for oil palm progeny evaluation trial in Karnataka

Transfers / New appointments

Smt. B. Swarna Kumari, A. O. transferred to Central Tobacco Research Institute on 11.03.2013.

Dr. M. Jayanthi, Senior Scientist transferred to IARI, Pusa, New Delhi on 28.03.2013.

Recognition / Awards

Dr. Goutam Mandal became elected member from South India in Agriculture and Forestry Sciences section of Indian Science Congress Association, Kolkata.

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