

Oil Palm *in* FOCUS



An e-Newsletter from the Society for Promotion of Oil Palm Research and Development (SOPOPRAD)

President Speaks



Indian Oil Palm towards 2030 & 2050

I am very happy to bring out this third issue of the News Letter, Volume 1, *Oil palm in focus*, of the Society for Promotion of Oil Palm Research and Development (SOPOPRAD). The year 2020 have come to an end. We hope for the best in the New Year 2021. We have talked about attaining self-sufficiency in many things of which increasing vegetable oil production is one of the very important one. Oil palm is the one crop, which has not suffered much during the pandemic Covid-19. Now it is time for us to formulate and implement various programmes to take Indian oil palm towards 2030 and 2050 aimed at Swadeshi palm oil production to augment the edible oil pool of our country and to reach near self-sufficiency by 2030 and sufficiency by 2050. Many may ask whether it is possible and my answer would be yes, it is possible with a determined political will and concerted efforts to implement the programmes in letter and spirit.

Oil palm, in general, is facing criticism from many corners of the world especially from environmental angles and health. In spite of all the criticism, the fact is that area under oil palm cultivation has increased considerably and its production increase has made tremendous impact from mere 1.264 million tons in 1960 to 72.835 million tons in 2018, over shadowing all other oils and thus, occupying the first place in global vegetable oil production. A group of people are going on criticizing that it is not good for health and other groups, the 'so-called environmentalists' continuously criticizing for its harmful impact on the environment, particularly by causing deforestation in the tropics and reducing biodiversity, and also saying that the rivers will dry etc. It is also a fact that the highest consumption of edible oil as well as industrial uses is of palm oil. Hundred years of success story in global palm oil production (and still gaining popularity in terms of area expansion in many countries and production) and also projecting palm oil as the major vegetable oil in meeting the global demand of vegetable oil pool is an answer to these criticisms. It is also a fact that oil palm, with its high productivity level (5 to 8 tons of CPO/ha/year with the latest high yielding hybrids), is the choice of high value crop since arable land availability is reducing every year due to massive diversification to non-agricultural uses.

Though we formulated the 'Technology Mission on Oilseeds (TMO)' in the year 1986, the Oil Palm Development Project (OPDP) as small holders' irrigated crop was taken up in the identified potential states during 1990 starting from four states to 13 states out of 18 identified. The OPDP became RKVY, NMOOP and now is under the NFSM-Micro Mission on Oil Palm.

The farmers of erstwhile Andhra Pradesh, Karnataka, Tamil Nadu who took up oil palm cultivation following the technologies advocated have got 4 to 6 tons of CPO/ha/year and their socio-economic condition had increased and many of them have increased the area under oil palm. The highest yield obtained by a small farmer in Karnataka was 50 t FFB/ha or 10 t CPO/ha. This is an encouraging real story which we should take it for moving forward. The otheside of the sad story is that most of the famers realize very low average yield due to many reasons, non-adoption of scientific package of cultivation, being the most important one. If only a real MISSION MODE approach like WHITE REVOLUTION through NDDB has been taken up we would have really made success.

Honorable Prime Minister Shri Narendra Modi appealed on 23 July 2020 to the farmers in the North-East States to take up oil palm cultivation in a big way. It is a step to support the 'Atmanirbhar Bharat' initiative and to reduce the imports of palm oil and make India self-sufficient in edible oils too. This will also provide stable income to the people in the North- East Region of India which incidentally will help to reduce shifting cultivation and provide stable and sustainable income to tribal and save the denudation of forest for the shake of shifting cultivation besides producing Palm oil to increase the vegetable oil pool.

The domestic consumption of edible oils in India has been outstripping the production and the gap between the two is quite significant which is being met by imports. India imports nearly 15 million tons annually (or nearly 68 per cent) of edible oils to meet the country's annual consumption demand of about 22 million tons. The bulk of these imports are palm oil. Of the total imports of edible oil, palm oil accounts for 60 per cent or about 9 million tons.

With the rich experience gained in cultivating oil palm as small holders' crop for the last three decades we now have to move fast towards smart **Oil Palm Development towards 2030** to produce 3 to 4 million tons of CPO and 0.3 to 0.4 million tons of palm kernel oil. By 2050 this is to be doubled by bringing out 2.0 million ha to yielding level. Besides small farmers, we have to encourage big farmers also with the same financial assistance and oil palm should be declared as plantation crop .

I wish all the oil palm growers a very happy, bright, healthy and prosperous New Year, 2021.



Dr. P. Rethinam
President, SOPOP RAD

SEMI CLONAL SEEDS INTRODUCED

Godrej Agrovet introduced semi clonal oil palm seeds in Andhra Pradesh.

Shri Nasim Ali, CEO of Godrej Agrovet, introduced *Semi Clonal Seeds* sourced from AAR, Malaysia for cultivation in Andhra Pradesh. **Superior high yielding oil palm saplings raised out of semi clonal seeds were distributed exclusively for the farmers of Godrej Agrovet Limited factory zone in West Godavari District of Andhra Pradesh.** He also said that *they are expecting to bring around 160 to 170 ha under the new variety of the oil palm during October and November 2020 in Andhra Pradesh. Mr. Chiranjiv Chaudhary, IFS, Commissioner*

of Horticulture, Government of Andhra Pradesh, Dr. R.K. Mathur, Director, ICAR- IOPR (Indian Institute of Oil Palm Research), congratulated Godrej Agrovet on the occasion of release of semi clonal high yielding variety seedlings of Oil Palm. It would be immensely useful to boost the income of farmers of Andhra Pradesh, being the largest producer of Oil palm. The need for close monitoring of the establishment and further growth of such seedlings planted in the farmers' field by M/S. Godrej agrovet was highlighted. Saplings of the new high yielding variety of oil palm will eventually be made available to farmers pan India, with special focus on Andhra Pradesh, Telangana, Tamil Nadu, Odisha, Gujarat, Mizoram and Goa.



SOPOP RAD congratulates the efforts made by M/S Godrej Agrovet Limited in introducing new variety.

KNOW ABOUT SEMI CLONAL SEEDS

Over a period of time, oil palm had undergone tremendous progress in Fresh Fruit Bunch (FFB) and palm oil yield and productivity due to the efforts and intensive research and development carried out by public and private research organizations. Before the invention of single gene discovery by Beirnaert and Vanderweyen (1941), dura type of planting materials has been utilized for commercial cultivation. Subsequently, the type of material progressed from Dura × Pisifera seeds, tissue culture plantlets, inter specific hybrids and clonal/ semi clonal seeds/genomic selection provides wide choice of planting materials available now with high yield and quality as well as resistant to biotic and abiotic stresses. The semi clonal seeds are produced from progeny tested best parents with the object to increase FFB yield and per ha oil yield. In the semi clonal seed production, the following steps are followed. 1. Progeny testing of different combinations of dura and pisifera. 2. From the best combining parents, dura is cloned and progenies raised as seed garden. 3. Best performing pisifera and best performing progenies of duras (Cloned progenies) will be utilized for hybrid seed production through conventional method of hybrid seed production (Fig1). The end result is an oil palm variety with 22% more oil yield.

The characteristics features reported in semi clonal palms are: slow height increment for longer economic life, high bunch numbers as buffer against environmental stress; high FFB & oil yield per ha in favorable environments with capacity to produce 7 tons oil /ha; high uniformity in all aspects; small frond petioles for easy harvesting and compactness for high palm stands (i.e. 148 seedlings against 143 palms/ha of usual tenera variety).

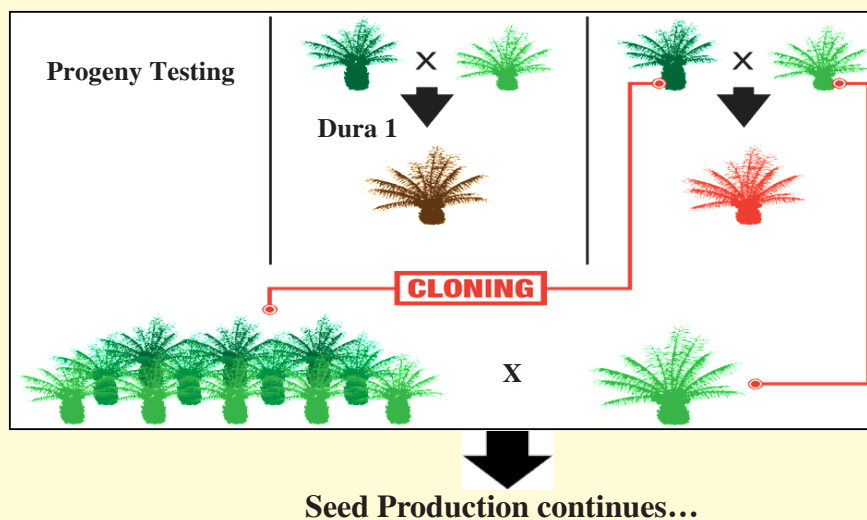


Fig .1: Semi clonal Hybrid Seed Production

Benefits of Semi clonal seed over conventional hybrid seeds

Characters	Semi clonal seed	Conventional hybrid
Height of 11 years old palm	325cm	390cm
Bunch Numbers	High	Low
FFB yield and palm oil yield	FFB yield: 38 t/ha Crude palm oil yield: 9t/ha	FFB yield: 34-35 t/ha Crude Palm oil yield: 7t/ha
Genetic purity and uniformity	100 % genetic purity and high uniformity in all respects	Difficult to ensure and get 100% genetic purity and uniformity of the palms
Dwarf petiole and rachis	Small frond petioles for easy harvesting and short rachis	
Palm population	148 palms/ha	143 palms/ha

The characteristics features reported in semi clonal palms are 1. Slow height increment for longer economic life, high bunch numbers buffer against environmental stress, high FFB & oil yield per ha in favorable environments with capacity to produce 7 tons oil /ha .High uniformity in all aspects. Small frond petioles for easy harvesting and Compactness for high palm stands per ha, i.e. 148 seedlings per ha. can be planted against 143 palms of usual Tenera variety planted.

About 6 million plantlets are being produced through micro propagation (Malaysia: 5 million, Indonesia: 0.5 million and Costa Rica: 0.5 million) at the global level. A total of 11 companies (Clonal palm, FELDA, AAR, Sime Darby, IOI, Bornea Samudra and others) are reported to achieve commercial scale clonal palm production in Malaysia. (Information by Dr. P.Murugesan, Principal Scientist, Horticulture).

WEBINARS ORGANIZED BY ICAR –IIOPR, PEDAVEGI

1. Webinar on ‘Oil Palm genetic resources; present status and future needs in India’

Webinar on ‘Oil Palm genetic resources; present status and future needs in India’ was held on 07.10.2020. The webinar was started with the welcome address and introduction of guests of honour, panellists and the speakers by Dr.R.K. Mathur, Director, IIOPR. There were three presentations viz., 1. Historic perspective and future requirements of oil palm PGR in India by Dr.P.Rethinam 2.Oil palm genetic stocks with important traits – status and future for India by Dr.P.Murugesan and 3. Oil palm genetic resources; present status and future requirements in India by Dr.H.P. Bhagya, Dr.Kuldeep Singh, Dr.N. Krishna Kumar and Dr.K.U.K. Nampoothiri participated as guests of honour.

The recommendations emerged from the webinar are as follows

1. Collaborative project for clonal conservation by refinement of protocol for clonal propagation to be taken up in future with ICAR-NBPGR.
2. Collection of trait specific germplasm from primary centres of origin should be taken up.
3. Cryopreservation should be further strengthened in collaboration with NBPGR.
4. Screening for salinity and drought tolerance for expansion of area in drought and salinity prone areas.

2. Brain storming on Management options for achieving higher water productivity in Oil Palm

Brainstorming webinar was organised on 29.10.2020 aimed to prepare the roadmap for research on water management in Oil Palm. Dr.R. K.Mathur. Director, ICAR-IIOPR welcomed the experts and introduced the topic. Dr.K.Manorama, Principal Scientist (Agronomy) made a presentation on details of the crop and work done so far in India and abroad. The following experts from all over India participated in the programme.

Dr(s). V.Praveen Rao, P.K.Ghosh, S.Bhaskar, P. Rethinam, Man Singh, H.P.Maheswarappa, S.Rami Reddy,

P.M.Govinda Krishnan, Ravi Bhat, T.Vidan Singh, P. Subramanian, B.L.Manjunath, M.Patidar, SS.Rao and Ravindra Singh.

The following recommendations emerged out of the webinar.

1. Take up a comparative study having treatments with land based and crop-based water requirements.
2. Water requirement is to be estimated through lysimeter studies or by following different ET under shaded and non-shaded areas.
3. As majority of oil palm in India is grown under irrigation, water foot print needs to be estimated.
4. Studies are to be taken up to understand the impact of Oil Palm on environment
5. To reduce the effect of vapour pressure deficit, anti-transpirants can be tried along with potassium polyacrylate, a super absorbent for water retention.
6. Adopt ‘Sensor Based Automation’ for enhancing water productivity.

(Source: www.iiopr.gov.in)

Webinars attended by our Society Members

Dr. KUK.Nampoothiri

1. Climate technologies for carbon-neutral agriculture: 11/8; 14/8; 21/8;25/11/2020
2. Oil palm genetic resources – present status and future needs: 7/10/2020
3. Coconut based high-density multispecies cropping system: 29/10/2020

Dr. P. Rethinam

1. Oil palm genetic resources - present status and future needs: 7/10/2020
2. Brain storming on Management options for achieving higher water productivity in oil palm: 29.10.2020
3. Inaugurated International Colloquium on Crop Physiology in commemoration with International Year of Plant Health 2020 at Tamil Nadu Agricultural University, Coimbatore on 26 November 2020.



EC Meeting of SOPOPRAD held on 30th December, 2020

The Executive Committee meeting of the Society for Promotion of Oil Palm Research and Development was held at the ICAR-Indian Institute of Oil Palm Research, Pedavegi on 30th Dec., 2020 at 11.30 am.

Important issues brought out by EC Members which needed attention of the SOPOPRAD to be taken up with the Government authorities and Research organization.

1. Implementation of CACP report, which is long pending: If this issue is decided the problem of OER will also get settled. Support price based on cost of cultivation should be taken up with Govt.
2. Import duty on oil palm seed material: In the recent years the import duty on seed has been increased from 5% to 30% thinking that the seeds which are being imported are for oil extraction. We need to bring to the notice of the concerned authorities stating that the oil palm seeds import is not for oil extraction and it is

only for raising seedlings/ planting material for Oil Palm cultivation by farmers.

3. Oil palm growers are of the view that the import duty reduction should be carefully done not to affect the interest of Indian Vegetable oil production.
4. Barbadoes nesting fly is creating problem in the recent times. Awareness among the Oil Palm growers need to be created to control/manage this fly.
5. The information on the newly identified lines of Oil Palm by 3F need to be communicated for the benefit of growers.

News Letters from M/S. 3F OIL PALM and Ruchi Soya Industries Ltd with lot of information to the farmers, success stories. Tips for better cultivations, new activities initiated and training programmes conducted for farmers.

SOPOPRAD appreciate the efforts made by the Processors and wish such information may regularly brought to the stakeholders.

INFORMATION ON THE NEWLY IMPORTED HYBRIDS OF OIL PALM BY 3F OIL PALM

ASD – THEMBA (HIGH DENSITY VARIETY):

- Advanced generation variety from Costa Rica
- Crossing Details: Deli X Ghana
- Mother palm (4th Generation) X Father palm (2nd Generation)
- Vertical stem growth rate- Medium (58 cm / year)
- Leaves length - 1 feet shorter than normal leaves
- Planting can be done @ 160 plants per Ha
- Withstand water deficit of up to 300 mm
- Yields begin within 22 months from date of plantation
- Under good management and favorable weather conditions yields up to 35 MT/Ha



FELDA -ML 161:

- Advanced generation variety from Malaysia
- Crossing Details - Deli x Yangambi
- Medium sized bunches produced in large number
- Less spiky bunches
- Under good management and favorable weather conditions yields up to 33 MT/Ha Yields
- Planting @ 143 plants per hectare
- Vertical stem growth rate of 55 cm / year



FELDA -3 WAY CROSS:

- Advanced generation variety from Malaysia
- Crossing details - (Deli x Nigeria) x Yangambi
- 148 plants per hectare can be planted - Leaves are short
- Medium size bunches in large number
- Vertical stem growth rate of 55 cm / year
- Under good management and favorable weather conditions yields up to 33 MT/Ha Yields.



CIRAD – 3 WAY CROSS VARIETY:

- Advanced Generation Variety from Thailand
- Crossing Details = Deli X (Lame X Yangambi)
- A combination of good qualities from both Lame and Yangambi
- Dwarf variety-Reduced vertical stem growth rate - 50 cm / year
- Can withstand water shortage up to certain level
- Planting @143 plants per hectare
- Yields starts by 20 months from date of plantation
- Due to its shorter palms, easy to harvest and can extend working life of plantations to few more years



CIRAD – STANDARD VARIETY:

- Advanced Generation Variety from Thailand
- Crossing Details: Deli X Lame
- Dwarf variety - grows only about 50 CM per year
- Can withstand water shortage up to certain level
- Due to its shorter palms, easy to harvest and can extend working life of plantations to few more years
- Planting @143 plants per hectare
- Yields begin in 24 months from date of plantation
- Under good management and favorable weather conditions yields up to 35MT/Ha
- The number of bunches will be higher than the usual variety with medium size bunches.



ASD-SPRING (PREMIUM VARIETY):

- Advanced generation Variety from Costa Rica
- Crossing Details: Deli X Nigeria
- Mother palm (fourth generation) X father palm (second generation)
- Moderate vertical stem growth rate - Medium (58 cm / year)
- Planting @143 plants per hectare
- Produce Big size Bunches.
- 50% of plants give virescens (virescens –Fruits are in green color while in unripe stage and turns brightorange when fruitsripe)
- It's easy to know the maturity of the Bunch
- Under good management and favorable weather conditions yields up to 36 MT/Ha Yields
- Yields begin at 24 months from date of plantation



(Source: 3F Oil Palm Newsletter, 2019)

FELICITATION TO SOCIETY LIFE MEMBERS WHO RETIRED FROM SERVICE

SOPOPRAD felicitated the three Life Members of the Society who retired from the service.

Dr.B.N.Rao, Secretary, SOPOPRAD and Principal Scientist (Horticulture), ICAR-IIOPR, Pedavegi superannuated from ICAR service on 31st January, 2020

Dr. P. Kalidas, A senior Founder member of the Society and Principal Scientist (Entomology), ICAR-IIOPR Pedavegi superannuated retired from IACR service on 31st May, 2020.

Sri Nasim Ali: Founder Life Member of the Society and Senior Vice-President, Godrej Agrovet and also Executive Member of the Society on 31st December, 2020 .

Recognising their services rendered to the Society, to the oil palm development in the country in general and to the Oil Palm Growers, in particular, the Society felicitated them in the EC Meeting held on 30th December, 2020.

The Society wishes them very happy, healthy, peaceful and active retired life.

OIL PALM IN NORTH EASTERN REGION

Prime Minister Narendra Modi appealed to the farmers in North-East States to take up oil palm cultivation with an aim to make India self-sufficient in edible oils. The Prime Minister recommended the State governments of N-E region to set up Oil Palm Missions in their respective States to promote cultivation of the oilseed.

“Agri-scientists and agro economists are saying that North-East farmers have a potential to take up oil palm cultivation. If they actually take it up, it will be a big help to the country, the North-East region and the farming community here. (Because), India is an assured market for palm oils. If the N-E farmers do it along with the organic farming, imagine how big the service to the nation that would be and a boost for our economy” Prime Minister Shri. Modi said in his address. This was well received by the Oil Palm Processors and farmers.

Early Introduction of oil palm in NEH Region

Several Missions and Committees have been set up over a period of time from 1959 to till date to identify the potential areas for Oil Palm cultivation. All the earlier committees had identified the areas in forest lands. The very first committee headed by Mr. D.H. Urquhart, Former Director of Agriculture, Gold Coast in 1959 identified 8,000 ha in South India and Tripura forest lands suitable for Oil Palm.

In Assam stray oil palm trees are there at Assam Agriculture University, Jorhat, HRS, Kahikuchiand CPCRI Research Centre, At Tripura Horticulture Station, Nagicheera, 295 tenera oil palm seedlings obtained from Oil Palm India, Kerala were planted during 1983 and about 260 palms have come to flowering within 3 years of which 189 palms were having female flowers and 826 bunches of

3.0 kg were harvested during 1987. These were raised under natural rain fed conditions and no management / inputs were given.

At Bio –Complex of Sipahijala , there were 24 Tenera palms planted during 1975 along the lake side and the growth performance was good . If all these palms were given inputs regularly the performance would have been much more encouraging.

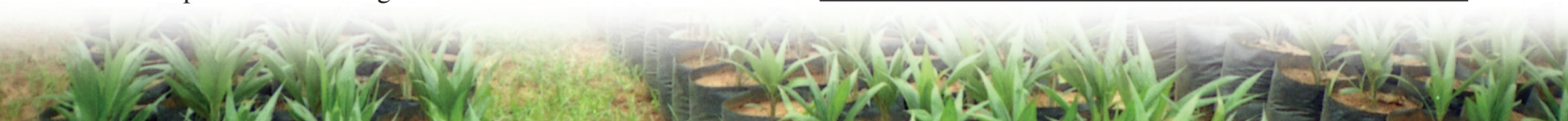
Potential areas identified in NEH Region for oil palm

The Committees/Working Groups constituted by DOAC & FW, Ministry of Agriculture & Farmers Welfare, GoI in 1986 to identified the potential areas for growing oil palm under irrigation, headed by Dr. K.L.Chadha, the then Horticulture Commissioner, later in 2006 to review and suggest measures for improvement and additional areas headed by Dr. K.L. Chadha, Former Dy. Director General Horticulture, ICAR, New Delhi and in 2012 by Dr P. Rethinam, formerly Director, NRC for Oil Palm, Asst. Director General Plantation Crops, ICAR; to identify additional Potential areas.

The Potential Areas for oil palm cultivation are indicated in the state maps Still there may be scope for increasing the potential areas .

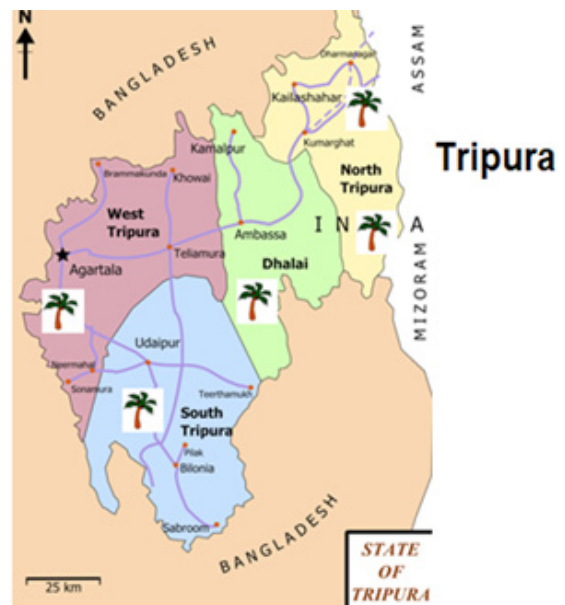
Potential areas identified for Oil Palm Cultivation

Sl.No.	State	Area in ha
1	Assam	25,000
2	Arunachal Pradesh	25,000
3	Mizoram	1,33,000
4	Manipur	60,000
5	Nagaland	50,000
6	Tripura	7,000
	Total	3,00,000



It is also understood that the recent committee had identified more areas in this region.

Rubber Board had introduced Rubber as a crop in this non traditional area successfully, Bamboo Mission had introduced Bamboo in this region. Oil Palm with inter, mixed, multi specis/ multi stoyed crop and mixed farming system will provide a sustainable venture .



Progress of OPDP in NEH Region

The oil palm cultivation was started first in Mizoram state and subsequently in other states. Tripura is yet to take up cultivation.

Entrepreneur wise area covered in different NE States Four entrepreneurs are involved in OPDP in North Eastern states as on 2019 is shown in table 1.

Field performance of oil palm at Research Centre, Pasighat, Arunachal Pradesh. Demonstration on oil palm production potential in North East Region table 2 (Pasighat, Arunachal Pradesh)

Crop management practices

29 Oil Palm seedlings were planted at 9m x 9m during 2006 to demonstrate its cultivation in North Eastern region with application of recommended dose of fertilizers (900:450:900g NPK/palm/year) and water management practices.

The number of bunches, bunch eight and FFB yield level are similar to the conventional Oil Palm growing countries. With care and management it should be possible to get similar yields in farmers' field.

Processing facility established in Mizoram

M/s Godrej Agrovet Ltd. had established a Mill at Bukvannei, Kolasib Dist. in Mizoram during 2014 with a capacity of 5 mt/h. The mill is running with very low capacity due to insufficient fruit arrival. Normally 1000 ha oil palm is required for 5 t/hr capacity.

Reasons for low arrival of FFB: -

- i) **Low price of FFB:** FFB price was Rs 5.5 per kg and the Government of Mizoram support by Rs 1 per kg of FFB.
- ii) **FFB could not be collected/ purchased** from some villages during peak period of June to September as vehicle movements are restricted due to poor Village roads, connectivity.
- iii) No fertilizer application due to non-availability at the specific period of requirement and also very expensive.
- iv) **No irrigation.** Oil palm is being cultivated entirely under rain fed condition. Adequate moisture levels could not be maintained throughout the year.
- v) **Some farmers are not aware** of selling FFB due to poor link road to their garden/compact area hence FFB were simply wasted.

Table 1: Area covered, yield and inter crops raised during juvenile phase of Oil Palm in different NE states

NE oil palm status					
Sl. No.	Name of State	Name of Company	Area Coverage (Ha)	Yield/ha	Intercrops
1	Arunachal Pradesh	Ruchi Soya Ind. Ltd	1072	Yet to get	Maize, Vegetables, Mustard, Banana, Papaya, Pine apple
		3F oil Palm	1119	Yet to get	
		Shiva Sai Oil Palm	660	Yet to get	
2	Mizoram	Ruchi Soya Ind. Ltd	5571	1.5 - 2 MT	Banana, Pine apple
		3F oil Palm	2419	1.5 - 2 MT	
		Godrej Agrovet	12400	1.5 - 2 MT	
3	Assam	Shiva Sai Oil Palm	2000	Yet to get	Veg, Banana, Pine apple
4	Nagaland	Shiva Sai Oil Palm	2500	Yet to get	Soya bean, Mustard, Vegetables

Table 2: Growth characters and yield data of Pasighat, NE state

Year	Growth characters			Yield attributes		
	Plant height (cm)	Collar girth (cm)	No. of leaves /palm	No. of FFB	Average bunch weight (kg)	Yield (t/ha)
2015-16	113.1	249.3	21.8	9.1	13.6	17.7
2016-17	207.1	258.1	22.0	10.7	17.9	27.4
2017-18	275.0	249	22.0	9.21	19.6	25.8
2018-19	370.0	250	22.0	8.4	18.7	22.8
2019-20	398.0	267	22.8	9.2	18.5	24.3



VII) **Farmers have not understood the right method of cultivation** and possibilities of raising inter/ mixed crops.

Constraints

1. Concerted efforts were not adequately taken at all levels.
2. Inadequate training for all levels of people right from farmers to officers as well as field level officers of processing factories.
3. Inadequate transfer of technology by visiting the farmers' fields at regular intervals due to remoteness.
4. Timely supply of inputs was not given to promote the crop growth and vigour
5. Very poor approach to the farmers' fields which stood in the way of transport of inputs to the field and transport of FFB from field to collection centre / processing mill.

7. Suggestion for increasing FFB Production:

- A). Improve road connectivity for collection of FFB from those villages which could not be harvested and transported during rainy season. The prime importance to be given is for making motorable roads
- b). Arrange timely availability of fertilizers to the farmers of North East States to increase production of FFB per ha.
- c). Construct more water harvesting structures to ensure irrigation during dry period which will enhance productivity there by income of farmer.
- d). Make all agriculture link roads as all- weather motorable road, stone pavement road etc.
- e). Convince the farmers about the profitability of the crop.
- f). Organising lot of frontline demonstrations

Research and Development available in NEH Region

a) Research Infra structure available in NEH
The following research set up are available for Assam and NEH Region:

1. Assam Agricultural University-Jorhat- Having Colleges and Research stations.
2. Central University.
3. ICAR –NEH Research Complex with Regional stations in every state.
4. All India Coordinated Research Project on Palms for Oil Palm at Pasighat.

5. Krishi Vigyan Kendras in each state.

But Oil Palm research is being taken up only at AICRP Centre, Pasighat.

b) Development Departments

The respective Department of Agri/ Horticulture are promoting oil palm cultivation in their states with the association of selected entrepreneurs for the past 10 years. But concerted efforts are needed at all levels to promote oil palm development.

c) Entrepreneurs for Oil Palm Development and Processing

Four Entrepreneurs viz . 3F OIL PALM P LTD, GODREJ AGRO VET LTD, RUCHI SOYA and SHIV SAI OIL PALM are involved in Oil Palm development and processing in this region. A close tie up is needed between the three, i.e Farmer –Entrepreneur-Govt. Dept.

These companies have entered into Agreement with State Governments, raise Oil Palm nurseries getting sprouts from indigenous or import , select farmers, provide technical help from time to time, set up centers at convenient intervals to collect the harvested FFB; make payment to the farmers in their bank account, and process by setting up of processing units.

- d) M/S. Godrej Agro vet has set up one processing unit of 5 t /hour capacity
- e) Oil Palm hybrid seed garden in Mizoram has been set up jointly by IIOPR and State dept.

One seed garden was set up with the parental planting materials obtained from ICAR –IIOPR , Pedavegi during 2014-15 and the Dept. of Horticulture is maintaining the same. Complete revitalization is required to make it fruitful.

What are the Positive Lesions learnt from the Existing Oil Palm Cultivation?

1. Oil Palm cultivation, though started late, has given the hope that the yields similar to South India could be achieved under prevailing agro climatic , ecological and environment conditions, **provided proper care and input managements are given.** Yield levels up to 20 t FFB/ha /year could be realized in some palm in the Research Centre as well as in farmers' fields.
2. Very low yields of less than one-ton FFB /ha/year also seen in many of the farmers' fields indicating that many of the farmers are still not aware of the



technologies to be adopted and non-availability of inorganic fertilizers, moisture stress in some areas and the existing mechanism of implementing the development programme and monitoring need greater tuning up at all levels .

3. Require more training and guidance to farmers to convince them to take up Oil Palm cultivation.

Strategies suggested

A. Technology Mission on Organic Oil Palm Development Project in NEH (TMOOPDP –NEH)

1. Setting up of Technology Mission for Organic Oil Palm (TMOOPDP) for NEH Region including Assam exclusively to promote organic Oil Palm cultivation. This should be exclusive to Oil Palm and not merged with any existing project. Merging may dilute the implementation as we have already experienced
2. This Mission should be headed by highly Competent Person having adequate experience in Oil Palm Research and Development as well as having commitment. The person can be an even recently retired person to start with. He can be located in Guwahati or Aizawl with a functional office and mobility.
3. In the Development Departments of Agri/Horti., a special cell is to be created at the State Headquarters and exclusive technical staff at the level of Assistant Director to be posted for implementation of the project in the identified districts as was done during the commencement of OPDP in 1990. This team and the MISSION will closely work together.
4. A highly competent Technical Advisory Committee is to be set to periodically monitor the project and suggest midterm corrections needed, if any.

B. Implementation of Project

1. The available ICAR Research in NEH Region will have to be entrusted with oil Palm as one of the mandatory crops for research.
2. Location specific evaluation of available advanced tenera hybrid combinations having cold and drought tolerance with IOPR, Pedavegi and imported advanced planting material from other countries can be taken up by the ICAR –NEH Research set up by taking the help and collaboration of ICAR-IOPR.
3. All KVKS in this region will have to be involved in taking up the Front-Line Demonstrations on Oil Palm

as well as inter/ mixed cropping suitable for the region and training programs. Trainers Training should get priority to train technical people.

4. Since Organic Farming is envisaged, it would be advisable to provide one milking animal (cow or buffalo) so that the dung and urine can be utilized in making vermi compost.
5. Special subsidy norms can be fixed so that the farmer will not have initial financial problem to take up Organic Oil Palm cultivation.
6. Cluster/Group farming approach may be promoted for better adoption of technologies and machineries, field level monitoring, forming roads to connect the main road for setting up of FFB collection centers and also easy transport of produce and marketing of inter crops.
7. Organising Training Programmes at all levels on all aspects of organic production of Oil Palm.
8. Working out annual target for area expansion two years before so that planting materials can be ready by the time to achieve the annual target.
9. All natural water harvesting structures available in all states need to be deepened to store more water which could be used during dry period.

C. Working out an Annual Planting Schedule

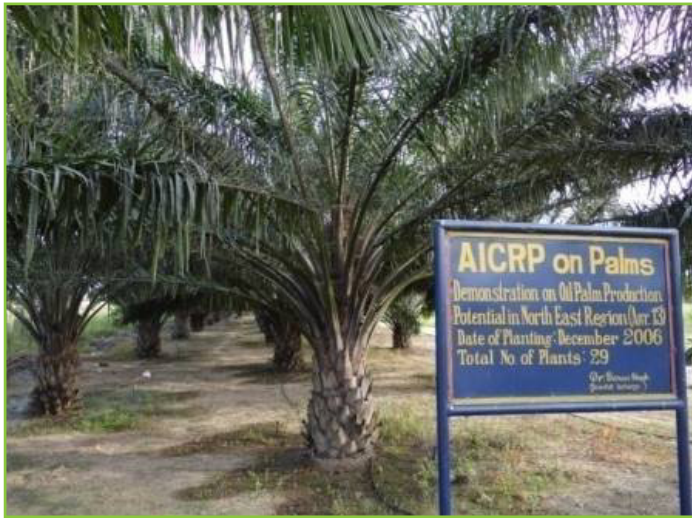
An annual planting schedule is to be formulated to achieve the targeted area of 3.0 lakh ha in about 10 years from 2022-23 to 2032-33 to cover 30,000 ha annually totally in all six states i.e. approximately 5000 ha in each state . States having lesser potential have less area annually and others will have higher target.

Expected outcome of the Mission

At the end of 2035 -36 it is likely to produce 2.0 to 3.0 tons of CPO, 0.2 -0.3 t Palm Kernel Oil (PKO), 0.5 t Palm Kernel Cake (PKC) ha /year and in addition bio mass, Palm Oil Mill Effluent (POME) etc will be available. **So from 3 lakh ha, 6.0 to 9.0 lakh tons of Crude Palm Oil; 0.6 to 0.9 lakh Tons of Palm Kernel Oil ; 1.5 lakh tons of Palm Kernel Cake can be obtained every year.** Kernel cake can be used for cattle feed and bio mass can be used for conversion of compost and recycled to Oil Palm fields. Biomass and POME can be used to prepare organic manure and used in the plantation. Bio mass can be used to produce bio energy.



Performance of Oil Palm in the field-Photos



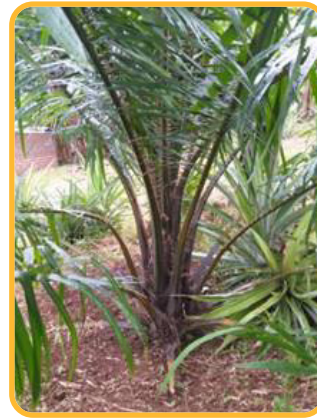
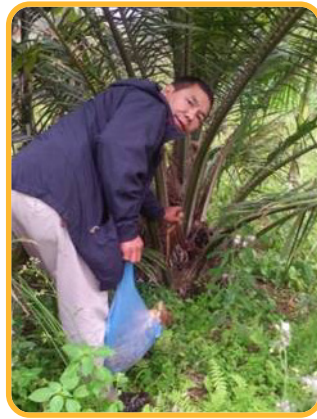
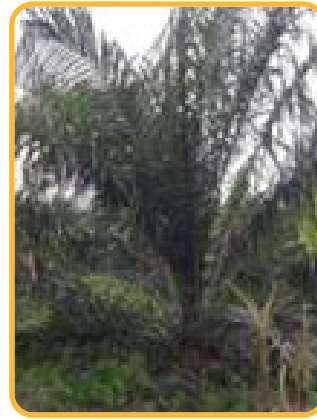
Oil palm in Pasighat



Oil Palm with inter crops in Mizoram

OIL PALM PHOTOS OF FARMERS FIELDS IN NEH REGION





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