

STRATEGIES FOR SELF SUFFICIENCY IN INDIGENOUS OIL PALM SEED PRODUCTION

K.U.K. NAMPOOTHIRI, R.S.N. PILLAI and P.S. RAVINDRAN

Central Plantation Crops Research Institute, Research Centre, Palode 695 562, Trivandrum, Kerala

INTRODUCTION

The oil palm seed requirement in India by the turn of this century is estimated to be 56 million. This is based on the assumption that 50% of the 0.575 million hectares of area, identified as suitable for oil palm cultivation, will be covered by 2000 A. D (Anonymous, 1988). While we have to depend on imported seed material for some more time in view of the limited capacity of seed production in the country, it is imperative to adopt strategies which will make India self-sufficient in production of planting material. Some of the problems in this regard are pointed out and ways and means to overcome these are discussed in this article.

Genetic nature of the planting material

The original wild populations of oil palm were *duras* which produce fruits with thick shell. Consequently mutants called *pisiferas*, which are shell less originated. The hybrid between them called *tenera* has thinner hybrids are planted today for commercial purposes all over the world.

Shell thickness is monogenic, *duras* being homozygous for the dominant gene (Sh+ Sh+) and *pisiferas* for the recessive (Sh- Sh-) gene. Therefore *tenera* seeds cannot be used for raising planting material, necessitating hybrid production for every planting.

Significant difference are also noticed in the performance between various *dura x pisifera* combinations. It therefore means that careful selection of mother palms as well as pollen parents is necessary before embarking on a commercial seed production programme. This obviously demands high resources input and involves many years of experimentation. The refusal to supply proven parental material by other leading oil palm producing countries coupled with the limited availability of genetic stocks in India greatly reduce the scope of increasing the production of planting material without sacrificing the quality.

Present status of seed production

Though indigenous production of *tenera* hybrids was initiated in the country by 1974 for experimental purposes, commercial production was started only 1982 (Pillai and Nampoothiri, 1982). These were produced using 40 *dura* mother palms of Malaysian origin planted in 1961, at the Oil Palm Station, Thodupuzha, Kerala. *Pisifera* palms were identified from a *tenera x tenera* population. The promising performance of indigenous hybrids using some of the *dura* palms in the above said garden and pollen imported from the Nigerian Institute for Oil Palm Research prompted production and distribution of similar *tenera* material to various oil palm growing localities in India (Nampoothiri et al., 1992). The research centre of Central Plantation Crops Research Institute at Palode (Kerala) is the only Centre from where *tenera* seeds are produced now. So far 0.78 million seed materials have been distributed and about 500 hectares have been planted with these in Andhra Pradesh, Karnataka, Kerala, Andaman and Nicobar Islands, Maharashtra, Tamil Naud, Gujarat, Tripura, Assam, West Bengal, Arunachal Pradesh, Orissa, Meghalaya and Bihar. However the present capacity is only 0.4 million seeds annually. It is not possible to increase the production mainly due to non-availability of suitable mother palms.

Alternatives

Since production falls short of demand, measures are to be taken to make available sufficient planting material for envisaged planting in various states. Due to reasons already enumerated, increase in indigenous production will be a long term process which is to be supplemented with short term measures to cope up with the immediate requirements.

i) Import of seeds

There are countries which have been engaged in oil palm breeding for the past many years, and have promising seed material. We have been importing seeds from Malaysia, Ivory

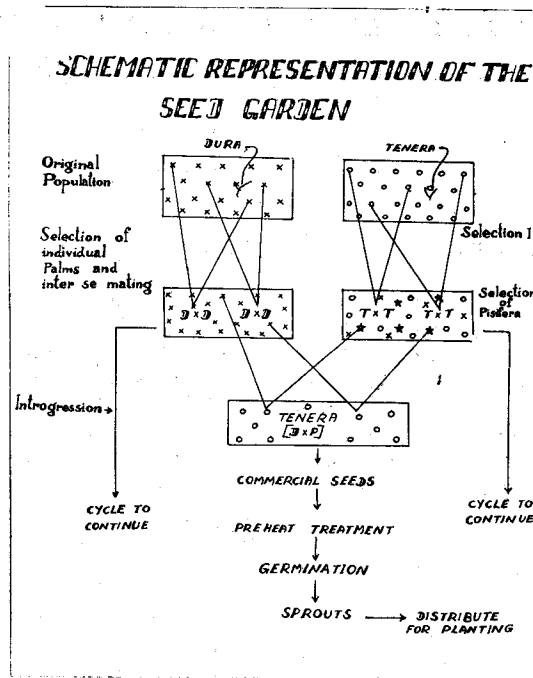


Fig. 1 Schematic representation of the seed garden

Coast, Nigeria, Papua New Guinea, Republic of the Zaire/ and Costa Rica since 1962. Though Malaysia has banned supply of seeds, the other sources are still available for import. Due to the liberalised policies of seed import, larger quantities are being imported by various Government and Private agencies. The cost is generally 0.40 to 0.45 US \$ per sprout. High yielding clonal progenies are also available from TROPICLONE, Montpellier, France at a cost of US \$ 4.5

ii) Identification of more mother palms

A critical examination of material available at CPCRI Plantations has yielded 15 mother palms which can be immediately used. With this, a marginal increase of 0.15 million seeds can be expected. A total of 252 high yielding *dura* x *dura* belonging to seven combinations have been planted in 1989. This will yield seeds from 1995 thus increasing production to one million. More *D* x *D*s are being planted.

iii) Establishment of seed gardens

A permanent solution, though long term, is the establishment of seed gardens. The seed gardens will consist of 75% *dura* palms and 25%

tenera x *tenera* palms. To improve the potential of *duras*, the presently identified high yielding *duras* can be *inter se* mated and *D* x *D* population raised. High yielding mother palms will have to be selected from this population. Similarly *t* x *t* population will be raised by *inter se* mating high yielding *teneras*.

Shell thickness being monogenic, the resultant progeny will consist of 25% *duras*, 50% *teneras* and 25% *pisiferas*. The *pisifera* required will be identified from this segregating population. Sterile *pisiferas*, i.e., those with no shell and embryo will be preferred for pollen collection. Only a few palms will be required as pollen parents since each inflorescence can produce upto 50-100g pollen. The pollinated one *dura* inflorescence only 0.5g pollen is required. By judicious mixing with talc powder the quantity of pollen can be increased to such an extent that pollen from one inflorescence can be used to produce enough seeds to plant 4000 hectares (Hartely 1988). All unselected palms can be cut and removed so that maintenance cost will be restricted to parental palms only. It is possible to enrich the seed garden by including very high yielding palms imported/ identified from time to time (Fig. 1). The details

of a ten hectare seed garden are given below:

Total area of seed garden	10 a
Area to be covered by <i>pisifera</i>	2 ha
No. of T x T plams @140/ha	280 nos
No. of <i>pisiferas</i> obtainable @25%	70 nos
Sterile <i>pisiferas</i>	7 nos
Area covered by <i>duras</i>	8 ha
No. of <i>Dura</i> palms @140/ha	1120 nos
No. of <i>dura</i> mother palms which can be selected	11s nos @10%
No. of bunches obtainable/palm	5 nos
Total no. of d x p bunches obtainable	56 nos
No. of seeds expected per bunch	2500 nos
Total no. of seeds expected	1.4 million
Area which can be covered/annum	7,000 ha
Proportion of seed garden : annual area covered	1: 700

Seed gardes (20 ha each) are being established by the Department of Horticulture, Andhra pradesh and Karnataka. A ten hectare garden is planned by the Plantation Corporation of Kerala. Nurseries to produce *dura* x *dura* and *tenera* x *tenera* seedlings have been raised in the respective states. With these the annual seed production will increase to 70 million.

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DISCUSSION

P. RETHINAM: Whether it will be possible to produce 0.5 million seeds annually? If so from which year.

K.U.K. NAMPOOTHIRI: Yes, from 1994.

K.K.N. NAMBIAR: Oil palm seeds have now been introduced from Costa Rica where fatal yellowing is present. Are we justified in introducing seeds from such countries? Experience in Malaysia is that where ever oil palm is planted in old coconut area, *Ganoderma* problem is on the increase. Now we have *Ganoderma* problem both in Karnataka and A.P. where oil palm is to be planted in large scale. Are you justified in this programme?

K.U.K. NAMPOOTHIRI: The seed gardens and plantations of ASD Costa Rica were found to be disease free when the visits were made. Moreover the disease is not seed borne. The species of *Ganoderma* affecting oil palm and coconut are different. So far there is no incidence of the disease in Andhra Pradesh and Karnataka. We have to keep a constant vigil.