PRODUCTION OF COCONUT HYBRIDS – PRESENT AND FUTURE

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Abstract: Inspite of the fact that the coconut area in India has increased from 5,96,000 ha in 1949-50 to 12,29,800 ha in 1986-87 the area covered by hybrids is negligible. The main constraint for the low coverage of hybrids is the non-availability of dwarf palms on the one hand and finance on the other. The centrally sponsored scheme for production of T x D seednuts could make only a marginal impact because of the limited target due to the difficulty in crossing.

Out of the present annual production of 100 lakhs coconut seedlings in the country the contribution of T x D is only about 7.0 lakhs. While the Coconut Development Council/Board could sponsor the production of 34 lakh seednuts of T x D in the states of Kerala, Tamil Nadu, Andhra Pradesh, Karnataka and Orissa since 1980, Tamil Nadu alone could produce additional 39 lakhs of T x D seednuts during the same period. At the same time, the production of D x T hybrids is only meagre. Out of the 10 seed gardens which have been established in the country for the production of D x T hybrids (Chandrasankara) only four seed gardens have started production in a very limited scale inspite of the fact that it is possible to produce over a lakh of seednuts as on today.

In addition to D x T, there is a need to produce planting material of the four Tall x Dwarf hybrids viz. LO x CDO (Chandralakhsa), LO x GB (Lakshaganga), ECT x DG (VHC 1) and ECT x MDY (VHC 2) recommended for large scale cultivation in the states of Kerala and Tamil Nadu. Utilizing the existing mother palms and by establishing additional Laccadive Ordinary sources it will be possible to produce about 10 lakhs T x D hybrid nuts annually. This can be further augmented provided the tissue culture technique in coconut is perfected and commercialised. If this is achieved, the country's requirement of hybrid seedlings will be met. Moreover, the planting of tall seedlings cannot be replaced by hybrids because of the limitations in the infrastructural facilities available and also the existing conditions under which coconut is being cultivated.

INTRODUCTION

In india the coconut area has increased from 0.59 million ha in 1949-50 to 1.23 million ha in 1986-87. The production has increased from 3448 million nuts to 6485 million nuts during the above period. Inspite of the fact that India being the first to produce hybrid as early as in 1932 and to plant in 1934 at Nileswar of Kerala, the major production of planting material to a tune of 10 million every year is only from tall cultivars, viz., West Coast Tall, East Coast Tall, Orissa Tall, Tiptur Tall, Gujarat, Zanzibar Tall and Benaulim. Hybrid seed production did not make any impact in the country for the simple reason that adequate and organized seed gardens with dwarf and tall mother palms are not available.

DEVELOPING HYBRIDS

With a view to increase the production and productivity of coconut, the coconut breeding was reoriented to produce hybrid coconut. India is the first to produce coconut hybrid right in 1932. The first T x D planting was done at Nileswar in 1934. Likewise the seedling possessing a good vigour with changed petioles, colour of Chowghat Orange Dwarf (COD) later named as natural cross dwarf (D x T) was planted at Kasaragod in 1939. Patel (1937) was

the first to report on the manifestation of hybrid vigour in coconut a finding which opened a new vista in coconut improvement. Subsequently the performance of the hybrid seedlings planted in 1934 was compared with those of selfed progenies of parent when they were 63 month old by John and Venkatanarayana (1943) who found that the vigour comprised early flowering and consequently shorter pre-bearing period, increased rate of leaf production and number of leaves, greater rate of growth of stem, increased girth of trunk at base, larger number of female flower, higher number of nuts, economic nut characters of the tall parent, and higher initial setting percentage resulting in the production of more nuts. Study of morphological characters and yield for 35 years of a T x D plantation (Satyabalan, 1983) revealed that the hybrids are early bearing (within four and half years), high yielding (75-85 nuts) and of high copra content (187 g/nut) while the yield of talls is 55-60 nuts with a copra content of 175 g/nut. Similarly, in the east coast also the superiority of Tall x Dwarf was reported. Studies on the performance of four hybrids, namely, East Coast Tall (ECT) x Dwarf Green, ECT x Ayiramkachi, ECT x Malayan Dwarf Yellow (MDY) and MDY x ECT resulted in the release of Veppankulam Hybrid Coconut (VHC 1) which is a cross between ECT x DG and VHC 2 a hybrid of ECT x MDY (Anon., 1987). The cross combination studies at Kasaragod and Pilicode resulted in identification and release of three hybrids viz., Chandrasankara (COD x WCT) and Chandralaksha (LO x COD) from Kasaragod and Lakshaganga (LO x GB) from Pilicode. Thus we have at present five released hybrids and a few pre-released hybrids with higher yield potential. However, the long time taken (nearly 50 years) for the release of hybrids resulted in considerable delay in planning for the large scale hybrid production. Besides these hybrids, some of the indigenous and exotic cultivars are also identified for different regions based on the studies carried out at CPCRI, Agricultural Universities and All India Co-ordinated Research Project on Palms.

AVAILABILITY OF D x T SEED GARDENS IN THE COUNTRY

The concept of establishing seed gardens was thought of during early seventies and the centrally sponsored schemes were sanctioned for different states on 50:50 basis. At present Kerala, Karnataka, Tamil Nadu and Orissa have seed gardens of 963 ha as shown in Table 1. Another four seed gardens of 20 ha each are proposed for the states of Assam, Bihar, Madhya Pradesh and Orissa/Andhra Pradesh by the Coconut Development Board. Besides, Tamil Nadu has established two tall seed gardens (Puttur and Neyveli) and dwarf and tall seed garden at Vellalaviduthi.

Table 1. Available D x T seed gardens in India

Centre	Area ha
CDB, Mandya (seed-cum-demonstration)	20
CPCRI, Kidu	43
Central State Farm, Aralam	250
Dharmaveera, Karnataka	200
Nilambur, Kerala 200	
Biswanagakani, Orissa	50
Navlok & Ettankulam, Tamil Nadu	200
Total	963

PRESENT POSITION OF PLANTING MATERIAL

The total production of planting material in the country is estimated to be 10.0 million seedlings every year of which 6.0 million seedlings are

produced by various state government nurseries from the seednuts of selected mother palms from farmers' fields and the balance of 4.0 million by private nurseries and coconut growers (Anon., 1988). Out of the 10.0 million seedlings the annual production of T x D hybrid is only about 0.70 million most of which are produced mainly in the farmers' field.

Though large scale production of T x D was initiated right in 1960s only 0.34 million seedlings could be produced annually through the centrally sponsored scheme in the states of Kerala, Karnataka, Tamil Nadu, Andhra Pradesh and Orissa. In addition, the state sector scheme of Tamil Nadu produced about 3.5 lakhs T x D seedling annually, and the target for the current year is seven lakhs. From this it is evident that there is an increased awareness in Tamil Nadu for T x D hybrid seedlings. The production of D x T hybrid is about 15,000 to 20,000 from the various available sources in Tamil Nadu and Kerala.

PRESENT AND FUTURE PRODUCTION POTENTIAL OF D x T HYBRIDS

Even though from the existing seed gardens it is possible to produce about 88,000 D x T hybrid seeds as on date the actual production is far below this figure. This can be definitely further augmented to 0.6 million by the end of VIII Plan and 0.94 million by the turn of this century if all the impediments are removed and more infrastructural facilities are provided (Table 2).

When the proposed seed gardens as well as the seed gardens established by Tamil Nadu under the state sector come to full bearing, the production figure of D x T will further go up to 1.5 million seednuts annually.

Table 2. India's production potential of D x T coconut hybrids through seed gardens

	Seednuts ('000)	
	Present	Future
Kerala		
Nileswar	5	60
Aralam	12	75
CPCRI, Kasaragod	6	6
Chowghat Taluk	20	20
Karnataka		
Dharmaveera	5	90
CPCRI, Kidu	20	60
Mandya (CDB)	..	..
Tamil Nadu		
Ranipet	20	300
Ettankulam	..	120
Orissa		
Biswanagakani	..	180
Konark	0.5	30
Total	88.5	941

REQUIREMENT OF PLANTING MATERIALS FOR THE FUTURE

The requirement based on (1) area expansion in traditional and non-traditional areas, (2) regular under-planting and replanting in traditional states, and (3) rehabilitation of root (wilt) disease affected areas in Kerala; will be 15 million seedlings (Table 3) as estimated during the Group Meeting on Strategy for Production of Planting Materials in Coconut held at Kasaragod (Anon., 1988). While the existing seed gardens including the four new seed gardens of 80 ha can produe about 1.5 million Dwarf x Tall seedlings, it is necessary to further augment the production of released T x D hybrid planting materials. This requires setting up of seed gardens with West Coast Tall, Laccadive Ordinary, Andaman Ordinary and East Coast Tall as tall parents and Chowghat Orange Dwarf, Malayan Yellow Dwarf and Gangabondam as dwarf parents.

Table 3. Annual planting material required in the country

Requirement	In lakhs
The seedling requirement for 30,000 ha new planting annually	60
Replanting, underplanting, rehabilitation in root (wilt) affected areas and other areas in Kerala	60
Replanting, underplanting at 2% area in other states	30
Total	150

Strategies for increasing the production of coconut hybrids planting materials

There is urgent need for increasing the production and productivity of coconut in the country in view of edible oil shortage and big drain in foreign exchange for the import of vegetable oils. The availability of quality planting materials is the prime requisite for increasing the production and productivity. Hence short and long term strategies are to be adopted for generating the hybrid planting materials.

Short-term strategy

The target of T x D hybrid production can be increased utilizing the selected tall mother palms available in the farmers field in different states. The existing seed gardens for production of D x T hybrid in Kerala, Tamil Nadu and Karnataka may be rejuvenated by providing funds for building up of the required infrastructural and other basic facilities. Since the palms in most of the gardens are in yielding stage it will be possible to augment D x T hybrid seed production from these gardens within the next plan period itself. In addition to government owned seed gardens it may also be considered to recognise some of the farmers/private coconut gardens for hybrid seed production. In this case strict identification of selected mother palms, quality control and pricing of seedlings are to be imposed.

Long-term strategy

In view of the huge need for planting material (15 million annually) no time should be spared in establishing the additional seed gardens in the country with the talls and dwarfs mentioned earlier for facilitating the production of released hybrids. Tissue culture technique for large scale commercial production of elite plantlets has to be standardized. Private entrepreneurs must be encouraged to establish the certified seed gardens with recommended tall and dwarf mother palms for which the planting materials will have to be supplied from the known source by competent authorities. Technical guidance has also to be provided to them for the proper maintenance of the garden and the selection of the planting materials.

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