Quality planting material - a crucial input in coconut farming

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The most important criteria for getting sustainable and profitable yield from any crop depend on the quality of the planting material. The production and management of planting material in the nursery decides the performance of coconut in the field and ultimately the quality of the produce. The expectations of each farmer while selecting seedlings for planting will be that it should be early bearing, high yielding, give high copra content and oil, it should be of short stature etc. If poor quality planting materials are used for planting, the performance of the palm will not satisfy the expectation of the farmer causing considerable loss of time and money to the farmer. In the absence of commercially viable vegetative propagation techniques, only seed propagation is possible in coconut. The desirable qualities are controlled by the genes present in 32 chromosomes in each cell of coconut palm which is transferred from generation to generation through seeds. The quality of coconut seedlings, (i.e. the ratio of the performance of seedling in the field and the expectation of farmers) is highly correlated with adult palm characters. Further, as coconut is cross pollinated, the palms do not breed true making the selection of seed nut and seedling more difficult and important. The desirable qualities are transferred to generations through the genes present in these chromosomes. Therefore, for production of seedlings with good qualities, the selection of seed garden, good mother palms and seed nuts assume great importance.

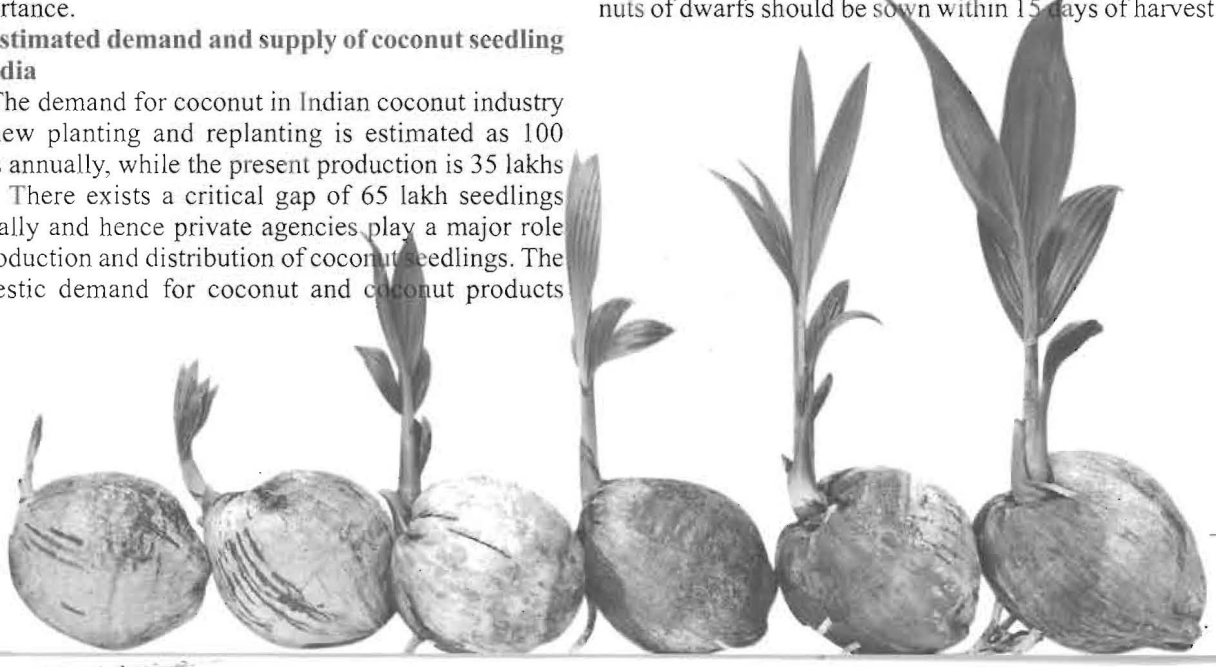
Estimated demand and supply of coconut seedling in India

The demand for coconut in Indian coconut industry for new planting and replanting is estimated as 100 lakhs annually, while the present production is 35 lakhs only. There exists a critical gap of 65 lakh seedlings annually and hence private agencies play a major role in production and distribution of coconut seedlings. The domestic demand for coconut and coconut products is also increasing. Besides, the export of coconut and its products shows tremendous increase. To meet the increasing future demand production and productivity should be increased. This is only possible though increasing the productivity of existing gardens through regular replanting and by adopting better management practices.

Quality at Mother palms level

Coconut seedlings quality should start with the mother palm. It should be regular bearers with annual yield of greater than 80 nuts and copra content of not less than 150g/nut under rain fed condition. Palms should have reached full bearing stages and should have consistently high yields for at least four years. Avoid very old palms of above 60 years . Palms which produce barren nuts or those shedding large number of immature nuts should be discarded.

Mature nuts should be harvested when at least one nut in the oldest bunch starts to dry. In Talls, it takes 11-12 months to become a mature seed nut whereas in dwarfs, nuts will mature in 10-11 months after pollination. Seed nuts are preferably selected from the center of the bunch, as development of nuts at top and bottom may not be uniform leading to poor germination or poor quality of seedlings. Harvested seed nuts are stored in shade to prevent drying of nut water, till their husks become completely dry. Seed nuts of the tall variety can be stored for two months after harvest whereas the seed nuts of dwarfs should be sown within 15 days of harvest.



Recommended Coconut varieties released for different region				
Sl No	**Variety**	**Parentage**	**Released agency**	**Recommended area**
	Hybrids			
1	Chandra Sankara	COD x WCT	CPCRI	Kerala, Karnataka, TN
2	Kera Sankara	WCT x COD	CPCRI	Kerala, Karnataka
3	Chandra Laksha	LCT x COD	CPCRI	Kerala, Karnataka
4	Laksha Ganga	LCT x GBGD	KAU	Kerala
5	Kera Ganga	WCT x GBGD	KAU	Kerala
6	Kera Sree	WCT x MYD	KAU	Kerala
7	Kera Sowbhagya	WCT x SSAT	KAU	Kerala
8	Ananda Ganga	ADOT x GBGD	KAU	Kerala
9	Godavari Ganga	ECT x GBGD	APAU	AP
10	VHC-1	ECT x GD	TNAU	TN
11	VHC-2	ECT x MYD	TNAU	TN
12	VHC-3	ECT x OD	TNAU	TN
13	Konkan Bhatye CH-1	GBGD x ECT	RCRS, Bhatye	Konkan
14	Kalpa Sankara	CGD x WCT	CPCRI	Kerala
15	Kalpa Samrudhi	MYD x WCT	CPCRI	Kerala, Assam
16	Kalpa Shresta	MYD X TT	CPCRI	Kerala, Coastal Karnataka, TN
	Tall	Agency released	Qualities	Area recommended
1	Prathap	KKV, Dapoli	High Yield	Konkan region, Kerala
2	Veppankulam-3 (VPM-3)	TNAU	High yield, Drought tolerant	TN
3	Aliyar Nagar -1 (ALR 1)	TNAU	High yield	TN
4	Kamrupa	AAU	High yield	NE region- Assam
5	Kera Sagara	KAU	High yield	Kerala
6	Kera Bastar	AICRP Palms	High yield	Chattisgarh
7	Kera Keralam	AICRP Palms	High yield	TN, Kerala
8	Kalyani Coconut	BCKV	High yield	WB
9	Kalpatharu	AICRP Palms	Drought tolerant, ball copra, high yield	Kerala, Karnataka, TN
10	Chandrakalpa	CPCRI	Drought tolerant, high oil content- 72%	Lakshadweep, Kerala, Tamil Nadu
11	Kerachandra	CPCRI	High yield	All regions
12	Kalpa Pratibha	CPCRI	High nut, oil yield, tender nut, Drought tolerant	Kerala, Tamil Nadu
13	Kalpa Mitra	CPCRI	High nut, oil yield, Drought tolerant	Kerala, WB, AP
14	Kalpa Dhenu	CPCRI	High nut, oil yield, Drought tolerant	Andaman, Kerala, TN
	Dwarf	Agency released	Qualities	Area recommended
1	Chowghat Orange Dwarf	CPCRI	Dwarf, Tender nut	All regions
2	Goutami Ganga	APHU	Dwarf, High yield, tender nut	AP, TN
3	Kalparaksha	CPCRI	High nut, oil yield in RWD prevalent areas	Kerala
4	Kalpa Jyothi	CPCRI	Dwarf, Yellow nuts, Tender nut variety.	Kerala, Karnataka
5	Kalpa Surya	CPCRI	Dwarf, Orange nuts, Tender nut variety.	Kerala, Karnataka & Tamil Nadu
6	Kalpasree	CPCRI	Dwarf, superior oil, high yield in RWD prevalent areas	Kerala

Table 1 Source: CPCRI Kasaragod

Seed nuts of tall varieties begin germination within 60-130 days after sowing and seed nuts of dwarf varieties germinate 30-95 days after sowing in the nursery. Generally, germination is recorded till the fifth month of sowing and a good seed lot will give more than 80% germination. Seed nuts that do not germinate within 6 months after sowing can be removed from the nursery.

Gardens should have palms with a high proportion of heavy bearers but it should not be from very favorable conditions. Garden should be free from the incidence of diseases and not prone to severe attacks of pests

Collect seed nuts from January to April in the West Coast region. Only fully matured nuts i.e. about 12 months old should be harvested. Nuts should not be damaged while harvesting. Discard nuts having irregular shape and size

Quality Standards of Tall Mother Palms
Regular bearing and yielding 100 nuts.
Age - 15 to 50 years
Steady bearing palms irrespective of age
Palms with more than 30 fully opened leaves with short strong petioles and wide leaf base firmly attached to the stem.
Bearing at least 12 bunches of nuts with strong bunch stalks.

Table : 2

Recommended Varieties

The tall varieties are extensively grown throughout India while dwarf is grown mainly for parent material in hybrid seed production and for tender coconuts. The tall varieties generally grown along the west coast is called West Coast Tall and along the east coast is called East Coast Tall. Benaulim is the tall variety grown in Goa and coastal Maharashtra. Laccadive Ordinary, Laccadive

Quality Standards of Dwarf Mother Palms
Regular bearing yielding 100 nuts.
Age - 8 to 30 years
Steady bearing palms irrespective of age
Palms of more than 30 fully opened leaves with short strong petioles and wide leaf base firmly attached to the stem.
Bearing at least 12 bunches of nuts with strong bunch stalks
Palms with all typical characters of dwarf with regard to stem, crown, nut and inflorescence.

Table : 3

Micro, Tiptur Tall, Kappadam, Komadan and Andaman Ordinary are some of the tall varieties. Chowghat Dwarf Orange, Chowghat Dwarf Yellow, Chowghat Dwarf Green, Malayan Yellow Dwarf and Malayan Orange Dwarf are some of the dwarf varieties grown in India. Gangabondam is a semi tall type grown in certain tracts of Andhra Pradesh. Some of the coconut varieties and hybrids released for cultivation in India are given in Table 1.

It is possible to improve the quality of the planting materials through a series of selections at the various levels of seedling production. Through a series of selections made at different stages, it is possible to obtain quality seed nuts and seedlings. For production of quality coconut planting material it is essential to have good seed gardens quality mother palms of the desired varieties. The seed gardens selected for procuring seed nuts should have palms with a high proportion of heavy bearers. Garden should be free from the incidence of diseases and not prone to severe attacks of pests. Mother palm selection is a key factor in planting material production of coconut. The important features of superior mother palms are given in Table 2 and 3

Standards of quality seed for sale:	
Parameter	Standards
Germination	>80%
Purity	>98%
Fruit weight (g)	>400g – Dwarfs / >600g – Talls
Nut water	Present
Pest and disease incidence	Nil
Maturity	10-11 months-dwarf / 11-12 months-Tall

Table : 4

Selection of seedlings from the nursery is an important step for ensuring high yield. Only seedlings with good quality should be selected through a rigorous selection based on characteristics viz: early germination, rapid growth and seedling vigour; six to eight leaves; collar girth of 8-10 cm; early splitting of leaves. The colour of the petiole of the seedling leaf can also be used as a selection criterion for dwarfs and hybrids. The Dwarfs should exhibit the petiole colour of the mother palm while the petiole colour of hybrid seedlings may range from green/brown/intermediate shades of the parents. More vigorous seedlings can be obtained by poly bag nursery. The advantage of polybag seedlings is that there is no transplanting shock and the seedlings are with better vigour and the seedling bear early. Select seedlings, based on the above characteristics. The recovery of good seedlings will be 60 to 65% of total seed nuts sown. There are no serious pest and diseases in coconut nurseries. However, bud rot affected seedlings are to be avoided for planting. The symptoms are yellowing and withering of the spindle leaf followed by drying and death of seedlings. The spindle of the affected seedlings will easily come out with a gentle pull and rotting can be seen in the lower end of the detached seedling. Quality standards for good seedling are shown in table 5.

Standards of quality seedling for sale		
Sl No.	Characters	Standards
1	Age of the seedling	8 to 9 months
2	No of leaves	6 & above
3	Girth at collar region	Dwarfs- >8 cm; Hybrids/ Talls- >10 cm
4	Height	Dwarf- >80 cm; Hybrids / Talls->100 cm
5	Petiole Color	Dwarf should exhibit petiole color of parent; Hybrids green/brown/ intermediate shades of parents.
6	Disease /pest Incidence	Absent

Table : 5

Selection of right variety and quality of seed material is important as the quality of planting material has got a direct bearing on production and productivity of coconut. It is therefore, necessary to select a consistently yielding elite variety of coconut seeds for plantation. Select high yielding DxT (Dwraf x Tall) and elite tall varieties recommended to each state for commercial cultivation for production of raw nuts, copra and neera. For tender nut purpose select dwarf varieties, Chavghat Dwarf varieties, COD (Orange) CDG (green) and Malayan varieties, MYD (yellow), MDG (green). The Malayan varieties are good for neera production also.

Conclusion

Today we have a number of high yielding coconut varities suitable for specific regions in our country. We also have the production technologies defined for each varieties/regions. Considerable efforts have been made by both research and development departments in establishing seed gardens and planting material sources to cater to the demand of quality planting materials. However there are several limitations for this conventional method of production of planting materials from seed. One seedling can be produced from one nut that too with a gestation period of 20-24 months. Hybrid seedling productions also have limitations. In India 98% of the existing plant population is tall and only limited number of dwarf palms are available. Hence hybrid seedling production is less than 3.5% of total planting material production. Increasing demand for hybrids lead to sale of uncertified planting materials by private nurseries at higher price. Even reputed nurseries levy high price varying from Rs.250-500/- for a single seedling that too after a long waiting period. If quality is assured, farmers show willingness to pay higher price. There is a limit for producing hybrid seedlings from a single mother palm. At present hybridization is carried out in the ten DSP farms of CDB, CPCRI and Farmers gardens. Annual production of hybrids hardly touches 50,000 per annum. Hybrid seedling production is time consuming. As such there is an overall limit for hybrid production. Increasing production in the existing seed gardens and establishment of more dwarf mother gardens is essential to enhance hybrid seedling production. Besides, there should be greater emphasis in popularizing the importance of using quality planting material in coconut production and quality parameters for selection of mother gardens, seed nuts and seedlings. ■