

# Productivity improvement in coconut: Role of right varieties and selection of quality planting materials

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Coconut, the kalpavriksha exhibits wide variability in its yield potential, copra and oil output. Even though India ranks first in coconut production, the productivity realized in India is as low as 36 nuts/ palm/ year and 7034 nuts/ ha/ year. Through the selection of right varieties, good planting materials and adopting right management practices, productivity could be enhanced to an average of 120 nuts/ palm/ year and 20,000 nuts/ ha/ year.

By the research efforts of State Agricultural Universities and Central Institutes, 25 improved varieties of coconut were released (Table 1). Even though the research institutes and various developmental agencies produce quality planting material every year, the production meets only a part of the requirement for replanting and new planting. In such situation of dearth of planting materials, farmer can select good mother palms from his own garden and produce quality seedlings. The techniques for mother palm selection, seednut selection and seedling selection were perfected and were used effectively for commercial production of good

quality seedlings by various institutes and agencies.

A farmer can select good mother palms from his own garden by observing plant morphological and yield contributing characters. Selection of high yielding mother palms and selecting seed nuts from selected mother palms have proved to be a very reliable and scientific approach for production of good quality seedlings in coconut.

High yielding (>80 nuts/palm/year), regular bearing palms of age 20 years or more with more than 30 fully opened leaves with strong petioles and wide leaf base firmly attached to the stem, bearing at least 12 bunches of medium sized oblong nuts with strong bunch stalks, husked nuts weighing at least 600g with mean copra content of 150g/ nut serve as good mother palms.

All high yielding palms may not necessarily produce high yielding progenies. Mother palms selected should maintain consistency in high progeny performance. Mother palms capable of producing best progenies are thus prepotent palms with high breeding values. The superior progenies could be selected even at

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**Judicious selection of mother palms for production of quality seedlings, production of NCDs, situation specific selection of varieties are some of the approaches for improving production and productivity of coconut apart from adopting good management practices.**

Table 1. Improved varieties of coconut

Sl. No.	Name	Parentage	Nutyield /palm /year	Institute responsible for release
<b>Selections</b>				
1.	ChandraKalpa	Laccadive Ordinary	97	CPCRI
2.	Pratap	Benawali Green Round	151	KKVP,Dapoli
3.	ChandraTara	Philippines Ordinary	110	CPCRI
4.	Chowghat Orange Dwarf	Chowghat Orange Dwarf	65	CPCRI
5.	Kalpasree	Chowghat Green Dwarf	66	CPCRI
6.	Kalpatharu	Tiptur Tall	116	CPCRI
7.	Kerasagara	Seychellis	99	KAU
8.	Kalparaksha	Malayan Green Dwarf	65	CPCRI
9.	KalpaPrathiba	-	15874*	CPCRI
10.	KalpaDhenu	-	15012*	CPCRI
11.	KalpaMitra	-	13973*	CPCRI
<b>Hybrids</b>				
1.	ChandraSankara	COD × WCT	116	CPCRI
2.	LakshaGanga	LO × GB	108	KAU
3.	KeraGanga	WCT × GB	100	KAU
4.	AnandaGanga	AO × GB	95	KAU
5.	ChandraLaksha	LO × COD	109	CPCRI
6.	KeraSankara	WCT × COD	108	CPCRI
7.	KeraSree	WCT × MYD	130	KAU
8.	KeraSowbhagya	WCT × SSA	130	KAU
9.	VHC-1	ECT × MDG	98	TNAU
10.	VHC-2	ECT × MYD	107	TNAU
11.	VHC-3	ECT × MOD	127	TNAU
12.	GodavariGanga	ECT × GB	140	APAU
13.	KalpaSamrudhi	MYD × WCT	117	CPCRI
14.	KalpaSankara	CGD × WCT	84	CPCRI

\*Nut yield/ hectare /year

nursery stage by observing certain seedling characters. Early germination of seednuts and high seedling vigour are the selection criteria for superior progenies. Seedlings with collar girth of 10- 12 cm with six to eight leaves for 10- 12 month old seedlings, showing early splitting of leaves are regarded as quality seedlings. If rigorous selection procedures are adopted, the recovery of quality seedlings from a nursery will be approximately 60 - 65 percent.

Another approach to get highly productive planting material in

coconut is the use of Natural Cross Dwarf hybrids. A farmer can either select NCDs from the nursery of dwarfs or produce NCDs by controlled pollination of dwarf cultivars grown in his garden.

The manifestation of heterosis or hybrid vigour in coconut was first reported from India as early as 1932 and the heterosis is effectively utilized in the commercial production of hybrid seed nuts.

Chowghat Orange Dwarf ( COD) and Chowghat Green Dwarf ( CGD) are the most popular dwarf cultivars

grown in Kerala. Dwarfs are usually self pollinated with high degree of uniformity. When nurseries of dwarf cultivars are raised, farmers often observe natural cross dwarf hybrids to the extent of three to five per cent in CGD and up to 20 percent in COD. Such hybrid seedlings can be detected in the nursery with their petiole colour, increased vigour of seedlings and increased length and width of leaves. These hybrids are popular among farmers because of their high yield, good copra and oil out turn. More over, these hybrids could be produced in their own garden without much difficulty.

For the production of NCDs in farmer's plots, high yielding regular bearing dwarf palms surrounded by healthy high yielding regular bearing tall palms are marked. Emasculation of dwarf palms by removing all male flowers and allowing natural cross pollination from tallers are adopted for increased recovery of hybrid seed nuts. The hybrids from the nursery could be identified by noting the petiole colour. When Dwarf Orange is used as female parent, the hybrid seedling will have green/ bronze petiole colour depending upon the type of WCT ( pollen parent) grown in the garden. When Chowghat Dwarf Green is used as female parent, both the hybrids and inbreds will have green petiole. Such hybrids in the nursery could be identified by the increased vigour of hybrid seedlings.

The improved varieties released from research stations are recommended for various situations. The selection of varieties suitable for the location/ condition is another

strategy to improve the production and productivity of the garden.

Among the selections released from various research stations, Chandra kalpa, a selection from Laccadive Ordinary is recommended for drought prone areas of all coconut growing regions of the country. The varieties Kalpa Prathibha, Kalpa Dhenu and Kalpa Mitra are also reported as drought tolerant. Kalparaksha, a selection from Malayan Green Dwarf and Kalpasree, a selection from Chowghat Green Dwarf show field tolerance to root (wilt) disease and hence recommended for root (wilt) affected areas. Kalpatharu, a selection from Tiptur Tall is suitable for production of ball copra and is

suitable for cultivation in rainfed areas. Chowghat Orange Dwarf is recommended for tender nut purpose due to high quality nut water in large quantities in the nut.

The fourteen hybrids released from various research institutes are high yielders with 100-140 nuts/palm/ year and copra content 150-215g/nut. The hybrids AnandaGanga, KeraGanga and KeraSree are recommended for general cultivation both under rainfed and irrigated conditions. Chandra Sankara, a cross between COD  $\times$  WCT is recommended for ideal situations under good management. Hybrids with Laccadive Ordinary as one of the parents are found tolerant to drought

and hence the hybrids LakshaGanga and Chandra Laksha are recommended for drought prone areas. KalpaSamrudhi, a cross between MYD  $\times$  WCT is recommended for cultivation in Kerala and Assam under rainfed condition. The hybrid KalpaSankara (CGD  $\times$  WCT) also is suitable for cultivation in the root (wilt) disease prevalent tracts.

Judicious selection of mother palms for production of quality seedlings, production of NCDs, situation specific selection of varieties are some of the approaches for improving production and productivity of coconut apart from adopting good management practices.