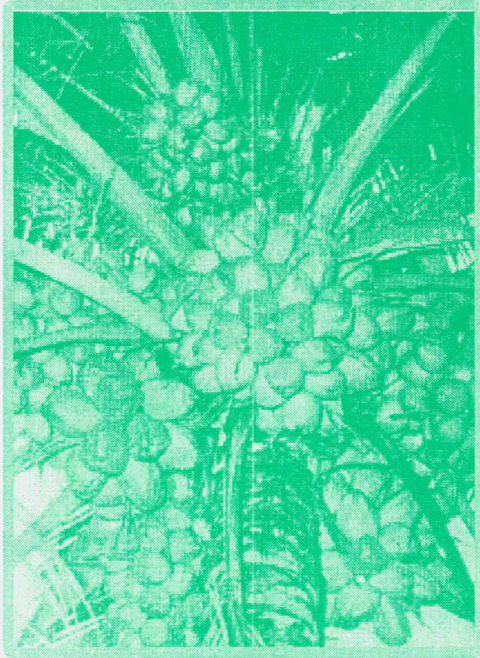


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IMPROVED CULTURAL PRACTICES FOR COCONUT IN GOA



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INTRODUCTION :

Coconut is an important horticultural crop of Goa which is grown in an area of about 24,000 ha, with an annual production of 110 million nuts. The average nut production per palm/yr. is only 23, which is very low. The main reason for low productivity is that, the cultivators do not pay much attention to its culture. One can obtain/achieve the yield of 100 nuts per palm per year, by following the scientific cultural practices in coconut. Some of the important practices are described below.

SELECTION OF VARIETIES :

a) Tall varieties : Benaulim variety is recommended for commercial cultivation in Goa State for its good yield, hardy too and has no buckling habit. Under good management practices, this variety can yield upto 100 nuts/palm/year. Pratap is a selection of Benaulim variety giving 150 nuts/tree/annum. Under good management practices these varieties start yielding from 6th year onwards. These varieties have life span of 80-100 years.

b) Dwarf varieties : These varieties are more suitable for home gardens and small scale plantation. In this regard, Malayan yellow dwarf, Malayan orange dwarf, Malayan green dwarf and Chaughat orange dwarf are some of the popular dwarf varieties. These varieties give about 160-170 nuts/tree/year. Dwarf varieties are characterized by short stature, and earliness in bearing. The palm commence bearing in about 3-4 years after planting and are short lived with life span of 45-50 years. These varieties with buckling habit character, are more prone to pests and diseases.

c) Hybrid Varieties : These varieties are evolved by crossing tall x dwarf varieties (T x D) and also dwarf x tall (D x T). Hybrid varieties show vigor for growth and nut yield. They start bearing at the age of 4.5 years and yields about 125 nuts/tree/yr. Chandrasankara, Chandralaksha, Kerashankara, Lakshaganga, Anandganga are some of the popular hybrid varieties of coconut.

Therefore the general recommendation is that, for commercial cultivation farmers may go for Benaulim and Pratap varieties. However they may grow dwarf and hybrid varieties for house compounds or small scale cultivation.

SELECTION OF SEEDLINGS :

The selection of seedlings is of utmost importance in coconut, as it is a cross pollinated crop and does not breed true to type. Seedlings should be healthy and vigorous. One year old seedling should have minimum 5-6 leaves and 10 cm girth at Collar. Stunted, thin and lanky seedlings should always be discarded.

PLANTING :

Coconut seedlings can be planted in any month except, June and July due to heavy rains during these months. However, the ideal time for planting coconut is March - May. Planting should be done before 15th May so that it can withstand heavy rains. For planting, dig the pits of 1x1x1 mt. size at the distance of 8 x 8 mt. If the planting is to be done on bund in one line, the spacing of 6 mt may be maintained between two seedlings.

Fill the pit with 1 kg of sterameal, 1 kg of mussorie phosphate, 1 kg of neem cake, two baskets of compost and top soil. The pit should be filled upto 75 cm. Plant the seedling in the centre of the pit.

AFTER CARE :

Sufficient attention should be paid to the young seedlings. During rainy season, care should be taken that the water does not stagnate in the pit. If the water stagnate in pit, the water and soil may enter into the growing point, which will result in damage to the growing point and ultimately the death of the young seedling. Provision of proper drainage is important in the areas which are prone to water logging. Seedlings should be protected from hot sun during March to May, by making small pendal over each seedling. Seedlings should be irrigated during summer months, 45 lit. of water, once in 4 days is sufficient. In case of sandy soils the watering frequency period may be reduced to 2 days. Seedlings should be protected from the stray cattles wherever such menace exists.

MANURING :

Manuring is required for good and healthy growth during juvenile and reproductive stages, which will result in higher nut yields. Manuring should be done twice in a year (i.e. April and August), in the places where irrigation facility is available, and once i.e. in August in rainfed gardens. Split application helps in minimizing the

losses due to leaching and plants are assured of continuous availability of nutrients.

Fertilizers should be applied only when there is sufficient moisture in the soil and when there is no possibility of applied nutrients being washed out. In the period of heavy rains, soil conditions are not suitable for application of fertilizers. Bulky organic manures should be applied in monsoon to facilitate decomposition. For efficient utilization of nutrients, the fertilisers should be applied to the palm in the entire area upto distance of 1 to 2 mt. depending on the age of the palm. Basins should be opened to a depth of 20 cm upto a distance of 1-2 mt. from the trunk. Green leaves should be filled in the basins, and should be closed after application of fertilizers. Details of requirement of fertilizers and manures is given in table - I

Table - I
Application of fertilizers, and green leavest at different age.

Age of tree (yr.)	Fertilizers kg/palm/yr.		Green leaves (kg/palm/yr.)
	19:19:19	Muriate of Potash	
1	0.6	0.2	10
2	1.2	0.4	20
3	1.8	0.6	30
4	2.4	0.8	40
5 and above	3.0	1.0	50

The adult palm require 500 gm of N_2 500 gm of P_2O_5 and 1.2 kg of K_2O . These nutrients can be supplied to palm in the form of other fertilizers also. It is better to supply these nutrients in organic form. The requirement of fertilizer is given in Table 1, is for one year. If two split doses are given, half the quantity is to be given in August and another half in April.

IRRIGATION AND DRAINAGE :

Though coconut palm survives and yields under rainfed conditions, irrigation during dry period is necessary for achieving substantial improvement in the productivity of palms. The common method of irrigation adopted in coconut garden is flood irrigation and basin irrigation. When irrigation is given by basin method, one

productive palm may be given 200 litres of water once in 8 days. In case of sandy soils same quantity of water may be given once in 4 days. Drip irrigation is another effective method adopted by many of the farmers in Goa. 30 litres of water need to be released per palm per day, when irrigation is given by this method. Water is saved to the extent of forty to sixty percent by adopting this method, cost of labour is also reduced. As the coconut palm gets optimum water by this method. The productivity is also increased.

It is also important to facilitate the drainage in the coconut gardens. Gardens having poor natural drainage, it is essential that artificial drainage facility is provided by cutting deep and wide drains between the rows of palms and by raising the level of ground around the individual palms.

INTER AND MIXED CROPPING :

Variety of useful crops can be grown in coconut gardens, as well spaced coconut garden provides adequate interspaces. When annuals and seasonals are grown in coconut gardens, they are called intercrops. Whereas when perennials are grown, they are called mixed crops. It is advisable to grow banana as intercrop during first five years, as it helps in providing shade to young palms, and also it generates income. Pepper, nutmeg, cloves, and pineapple are found to be profitable. In case of rainfed gardens intercrops like, vegetables, pulses, groundnut and fodder crops can be grown in rainy season.

UNDER PLANTING :

The yield of tall variety palms tends to decline after the age of about 60-70 years, due to onset of senility. In case of dwarf palms the senility will be comparatively earlier. Planting of new coconut saplings therefore becomes, imperative at this stage, in order to maintain productivity. While doing this operation, the newly planted seedlings should be planted sufficiently away from the older palms. In such gardens the old palms should be removed in stages, so that the garden becomes free of the old palms in about 6-10, years after initiating this operation.

HARVESTING, YIELD AND ECONOMICS :

In general coconuts are harvested once in 3-4 months. However, in well maintained gardens, coconuts are harvested once in two months. The coconuts normally

takes 10 to 12 months to mature from the flowering stage. The fully matured nut contains little quantity of water inside and when tapped it gives metallic sound. Usually 11-12 months old nuts are harvested. In places where tender nuts are in demand, the best stage to harvest is when coconut bunches are about 7 months old. When nuts are harvested for seed purpose, they need to be stored in sand for retaining the nut water for long time.

Though the average yield in Goa is 23 nuts/tree/year, one can achieve, the yield of 100 nuts/tree/yr from a well maintained irrigated coconut garden, by adopting improved management practices. One can get income of Rs. 64,000/- from 1 ha area having 160 paims. For maintaining 1 ha area an amount of Rs. 20,000/- it is required. Therefore, there is a net profit of Rs. 44,000/- from 1 ha area. If intercrops like pepper, nutmeg are grown the net profit may go up to the tune of Rs. 80,000/- per ha.

For further details farmers may write to, The Director, ICAR Research Complex for Goa, Ela, Old Goa or to the Training Organiser, Krishi Vigyan Kendra, Ela, Old Goa.

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