

Existing State of Arecanut Gardens and

the Possible Ways of Their Rejuvenation.

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I INTRODUCTION

India imports about one third - about 11 lakh maunds - of her total annual requirement of arecanut from various countries particularly from Malaya and Ceylon. This regular import burdens the national foreign exchange to the extent of about five crores of rupees every year. It is, therefore, necessary to attain self-sufficiency by increasing the production of arecanut. This can be achieved by extending the area under the crop and by increasing the yield of existing gardens. The extension of area is a long range proposition since the palms from their time of transplanting take about five to ten years to come to bearing. Besides, the availability of fresh lands fit for arecanut cultivation being rather limited, the extension of area under this crop is possible mainly by converting the land which are under food crops. Adequate attention to revive the existing gardens to increase the yield can, therefore, contribute substantially with immediate effect to make good the deficit.

II. EXISTING STATE OF ARECANUT GARDENS

The methods of cultivation and cropping practices now in vogue in different parts of the country are so varied and in many tracts even quite primitive that it affords considerable scope for improvement. An examination of the areca gardens in different tracts will reveal that palms bearing no fruit whatsoever to high yield are seen randomly distributed in the gardens even though all the palms receive more or less identical

treatment and that many of these palms are below the economic level of production. Even the very old palms which have outlived their utility and which are incapable of giving any more economic return are found to be retained. The gaps that occur in the gardens due to the death of old and diseased palms are being found to be replaced with poor quality seedlings raised from un-elected seednuts. The palms are also found to be planted haphazardly without maintaining any spacing and at places too close and shallow.

Many of the existing gardens in Mysore and Kerala are situated on uneven slopy lands and as such



Fig. 1. Neglected Garden.

particularly in places of heavy rainfall there is severe surface erosion. A good many of the gardens in these parts are full of haphazardly growing banana clumps which may in some cases even outnumber the areca trees and thus compete with the main crop for manurial and water requirements besides in certain areas attracting pests such as monkeys which does great damage not only to bananas but also to areca. Usually the gardens in West Bengal and also in certain parts of other arecanut growing States are even left for cattle grazing. In some tracts of Kerala, West Bengal, Assam and Tripura, the crop is never irrigated and is purely rainfed. In months of heavy rainfall the palms particularly in low lying areas suffer very badly due to want of enough deep drains to drain the sub-soil water. Intercultivation is done once in many years or never at all. The palms are also not adequately and systematically manured. In some places, manuring is done once in three or four years and in certain others it is very rare. Control measures to combat the various pests and diseases are also not invariably taken up in time. Such gardens require adequate attention from the point of view of cultivation practices, manuring, replanting with fresh seedlings and protecting the crop against pests and diseases so as to revive them and improve the yield.

III IMPROVEMENTS SUGGESTED

(a) Production of quality seedlings for replanting or underplanting.

The question of seed selection is of utmost importance in any crop more so in the case of perennial crops

like arecanut which live for over 60 years. Any neglect in seednut selection would adversely affect the yield for a considerable number of years since such a situation cannot be easily remedied as in the case of annual crops. It is, therefore, essential that only selected nuts gathered from pre-marked mother palms are used and quality seedlings raised.

Mother palms have to be marked out in reputed gardens having a large percentage of high yielding middle aged palms of about twentyfive to forty years old. It will be advantageous to mark out mother palms in such a garden since in the natural process of crosspollination there is a greater chance for the high yielding mother palms to interbreed among themselves. The wide variation in the yielding capacity of the palms under more or less uniform conditions is very likely due to their differential genetic constitution. Since scientific knowledge on the correlation of morphological characters with high productivity is lacking at present, selection of mother palms on the basis of general vigour and yield of the palm has to be followed. Before the commencement of the harvest season, all the trees in the garden are to be observed for their vigour and yielding characters. All the diseased, less vigorous and poor yielding trees, i. e. trees having



Fig. 2. Marked Palms.



Fig. 3. Mother palm.

less than 10 open leaves, trees with less than four bunches and trees with poor set are to be rejected. Since the production of inflorescence in arecanut is limited to the leaf axile, a palm with large number of leaves can generally be expected to produce more number of bunches than a tree with less number of leaves under identical conditions. Number of bunches and nut set being the main quantitative characters that contribute to the yield of a palm, due attention has to be bestowed on these points. Further, the palms having seednuts of desirable shape and thin husk are also to be preferred. The selected trees are marked out and serially numbered. The morphological features of the mother palms (inter-nodal distance, girth, number of leaves, crown habit, number of bunches, nut-set, colour of nut, shape of nut, size of nut, number of nuts per lb. etc.) may be recorded and maintained in the form of a parent palm register. This will enable to study the performance of the progenies with reference to each of the parent palm characters noted. During the succeeding years the irregularly yielding trees out of the above are to be noted and marked out as 'R' in the first year, 'R₁' in the second year and 'R₂' in the third year so that at the end of three years most of the undesirable trees, i. e. less vigorous, vigorous and less yielding and irregularly yielding get grouped under R, R₁ or R₂ (rejects). The above observations and method of elimination can be continued even beyond third year till the parent palm finally selected show consistency in high yield.



Fig. 4. Selected Nuts.

From the marked out mother palms right from the first year of marking, fully tree ripe nuts are gathered from the middle bunches, i. e., second and third. The bunches when ready for harvest have to be lowered by means of a rope. All under-sized and malformed nuts and nuts having less weight must be rejected since heavy nuts have been found to give both higher percentage of germination and seedlings of better vigour than the nuts with less weight. The selected seednuts may be sown preferably soon after harvest. If required to be stored, they may be kept under shade and have to be sown within a week.



Fig. 5. Pit with sown nuts.

The nuts are sown for germination in small shallow pits of convenient size, the soil of which is dug and loosened to a depth of one foot and filled with sand to a depth of three to four inches. The nuts are to be arranged over the sand bed vertically with their calyx end pointing upwards or horizontally on their sides at a distance of one inch in and between the rows. It has been found that there is practically no difference between these two positions of nuts in sowing from the point of view of both germination and vigour of seedlings. Seednuts collected from different mother palms may be sown separately. The nuts are then to be just covered with sand. Sowing at lower depths has been found to adversely affect the germination. The nuts are to be watered daily. Some shade should be provided to the seed beds if natural shade does not exist. Usually, the nuts start germination in about 40 days after sowing and may continue up to about 100

days. Germination of the nuts from each mother palm may be noted separately at weekly intervals from commencement to completion. The data pertaining to nursery (data of sowing, number of nuts sown, germination at weekly intervals, percentage of germination, sprouts selected, seedlings selected, percentage of selected seedlings to nuts sown etc.) can be recorded in the form of a nursery register. From the data so gathered, it will be possible to further reject such of the mother palms whose nuts have germinated late and which have given a low percentage of quality seedlings. The average germination of seed arecanut has been found to be around 94.0 per cent. After about three months of sowing, the sprouts are to be planted in the nursery beds. The area required for the nursery is to be well dug or ploughed and shade crop of banana to be planted at nine feet apart in rows of twelve feet apart in

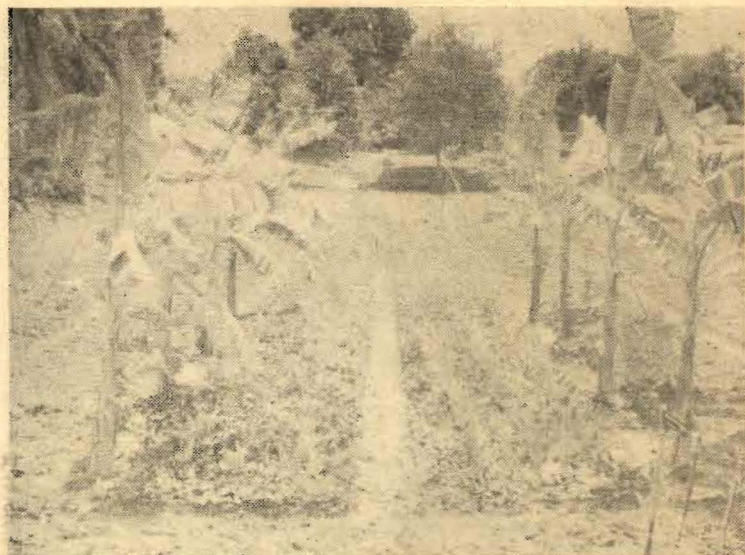


Fig. 7. Transplanted Sprouts in the nursery beds.



Fig. 6. Sprouts in Pits.

North-south direction. Planting of banana suckers may be taken up at least six months prior to the planting of sprouts so that they may get well established and give sufficient shade to the young sprouts. The interspace between the banana rows is to be applied with a basal dose of five tons of well decomposed cattle manure and then laid out into raised beds of four feet width and six inches height and of convenient length in North-South direction with a central drainage-cum-irrigation channel of one and half feet width. The young sprouts are to be transplanted in these beds at a distance of one foot X one foot after rejecting the late germinated and weak sprouts. Earlier germinated nuts have been found

to produce significantly more vigorous seedlings than the late germinated ones. The percentage of good sprouts to the nuts sown is about 91.0. In each bed three rows of sprouts can be planted leaving one foot margin all round. After planting the beds are to be mulched with green or dry leaf to avoid the deposition of soil on the growing points of the sprouts during heavy rains and also to check surface erosion. Care is to be taken to drain the nursery beds during rainy months and they are to be well irrigated during other months. In cases, where the seedlings are to be retained in the nursery for more than one year, a wider spacing of two to three feet has to be given. They are also to be manured with about five tons of well decomposed cattle manure annually. Only vigorous seedlings (which have produced five or more leaves at the end of one year, seven, eight or more leaves at the end of two or three years and having good girth) are to be selected for planting. The percentage of quality seedlings to the nuts sown is about 72.

The bearing palms of the garden should be watched year after year to find out their yielding capacity and such of the palms which yield below the economic level persistently under the best of attention should be marked out and these as well as other gaps which occur due to the death of old and diseased palms should be replaced with quality seedlings. While planting these seedlings, care has to be taken to plant them at regular distance and in lines so that in course of time the garden will have uniformly spaced trees. Underplanting



(a) Selected (b) Rejected
Fig. 8. Seedlings

has to be taken up particularly in those gardens, where the palms have been originally planted at a wider spacing. The seedlings have to be under-planted at regular distance when the palms are about forty years old.

(b) Improved cultivation practices

Gardens which are on uneven and slopy lands should be levelled to form terraces and this will prevent soil erosion to a great extent. The large number of banana clumps in the gardens should be thinned out so as to minimize the competition of these plants with the main crop for the plant nutrients and water. Subsequently, the banana should be kept under check by desuckering whenever found necessary. Gardens should be intercultivated after clearing the weeds by hoeing and digging. Fresh earth is to be applied wherever

necessary towards the end of North-East monsoon, i.e. in October or November. The palms have to be irrigated in summer months at regular intervals ranging from four to fifteen days depending upon the method of irrigation and types of land. Drainage of sub-soil water in the month of heavy rainfall is very important and therefore adequate and sufficiently deep channels should be dug in between rows of palms for drainage. With the onset of summer showers, seeds of suitable cover crops like *Pueraria Javanica*, *Calopogonium muconoides*, *Centrosema pubescens*, *Crotalaria* species etc., may be sown which in addition to preventing soil erosion and smothering weed growth add organic matter to the soil.

(c) Manuring

Areca palms have to be judiciously manured every year preferably after the end of heavy rains. Twenty to thirty pounds each of green leaf and farm yard manure or compost, one pound of ground-nut cake, half pound of super phosphate and one and half pounds of either wood ash or quarter pound of muriate of potash per tree can be used with advantage. These may be applied preferably in trenches of one foot width and depth dug about two feet away from the base of the palms all round. Quick growing leguminous plants like *Gliricidia muculata*, *Indigofera teysmenii* etc., can be grown along the border of the garden for getting a steady supply of leaves.

(d) Pests and diseases

Heavy crop losses occur due to pests and diseases. Proper control measure to check even the most ravaging disease like 'Koleroga' is not taken up in time. Neutral Bordeaux mixture (5 Lb. lime and 5 Lb. Copper Sulphate in 50 gallons of water) has to be sprayed before the outbreak of the 'Koleroga' disease.

Timely control and prophylactic measures against other diseases and also pests have to be taken to ensure good yield.