SOME FACTS ABOUT ARECANUT

By

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INTRODUCTION. Arecanut is grown in India, under varied conditions of soil, climate and altitude and it is needless to say that its agriculture is also carried out in diversified methods and practices. Hence it is difficult to generalise the method of cultivation of the crop. But it is the duty of scientific workers, especially at this hour, when maximum production per unit of labour and soil is aimed at, to find out the best and most economic method of cultivation of this crop. The attempts made at the Arecanut Research Station at Vittal of South Kanara on the above lines are described in this paper. The Arecanut Research Station at Vittal comprises 4·75 acres of garden taken on lease and has the conditions of semi-malnad parts of South Kanara. The main work of the station is primarily on the pathological aspects of the areca palms but work was also carried out, side by side, on other lines such as agronomical and certain fundamental facts also. The age of the garden is about 34 years.

DETAILS OF WORK. The cultivation practices that are followed at this station are described below :—

1. *Seeds and sowing.* With a view to select trees of very high performance, the yields obtained from all the palms in the garden are recorded separately with full details of number of bunches harvested, number of nuts per bunch, weight, size, shape and colour of nuts etc. Seednuts are selected from trees which are high yielders and healthy. Care is also taken to follow the methods of selecting seednuts that are locally adopted, such as harvesting middle bunches, selecting nuts from middle portions of bunches, nuts which are medium sized etc. The methods of raising seedlings are also those followed locally, viz. dibbling small sprouts which were allowed to germinate in baskets or straw bundles. Seedlings of 1½ to 2½ years of age are used for planting in the main field. The cost of raising such seedlings comes to about 9 pies to an anna per seedling

2. *Planting.* At the Arecanut Research Station, the seedlings are planted wherever gaps are formed by the mortality of the palms due to various causes. The stumps of dead areca trees are dug out and pits 3' x 3' x 3' are formed. The pits are refilled to a height of about one foot from their bottom level. Care is taken to see that refilling is done in such a manner as to form a cone of earth at the centre of the pit. Then the seedling which is removed from the nursery whith a ball of earth is placed over the cone so formed and some more earth is added and the plant is firmly fixed to the soil by pressing the sides of the cone. The formation of cone and planting the seedlings prevents stagnation of water at the collar region of the plant facilitating its early establishment. No manure is added while planting except spreading some green leaf round the base of the seedling to prevent the soil splashing to the tender spindle during heavy rains. About a fortnight after planting, they are manured with cattle manure or compost and ash. Planting is usually done either in the beginning or end of August. But it has been the experience that they can be planted during other months also if good irrigation and drainage facilities are available.

3, *Leaf-fall and flowering.* Under best conditions, the palm is said to flower in about 4 to 5 years after planting, though normally it takes about 6 to 8 years. Flowering is seen throughout the year but the peak period is between the months of November and April which is evidenced by the following table:—

I. Table showing the number of spadices produced during 1953-54 and 1954-55 at the Research Station, Vittal.

Month	Number of inflorescences developed in 1953-1954.	Number of inflorescences developed in 1954-1955.	Average	% of the total production in the month.
July	52	150	101·0	1 5
August	36	137	86 5	1·3
September	83	154	118·5	1 9
October	182	390	286·0	4·4
November	342	763	552·5	8·3
December	533	824	678·5	10·3
January	646	1451	1048·5	16·0
February	816	1310	1063·0	16·2
March	948	1301	1124·5	17·1
April	854	878	866·0	13·2
May	685	298	491·5	7·5
June	228	68	148 0	2 3
Total.	5405	7724	6564·5	100·0

II. Table showidg the average number of leaves shed and the number of inflorescences developed during the years 1953–1954 & 1954–1955.

S. No.	Month	Average No. of leaves shed from 1575 trees	Average No. of inflorescences developed in 1575 trees.	% of inflorescences to the leaf-fall.
1.	July	549·5	101·0	18·5
2.	August	543·5	86·5	15·9
3.	September	541·5	118·5	21·9
4.	October	871·5	286·0	32 8
5.	November	1014·0	552·5	54·5
6.	December	891 5	678 5	76·1
7.	January	1205·5	1048·5	87·0
8.	February	1208·5	1063·0	88·0
9.	March	1206·5	1124·5	93 2
10.	April	1006·0	866·0	86·1
11.	May	851·0	491·5	57 8
12.	June	611·5	148·0	24·2
	Total.	10500·5	6564·5	62·5

Even though the leaf-fall is seen during all the months of the year, yet the percentage of inflorescences to the leaf-fall is observed to be more during the months of October to May than in other months (as evidenced in table II above) and more than 80% of the inflorescences is developed during the months of November to April (as is evidenced in table I). The average number of leaves shed per palm per year was recorded to be 6·7 and the number of inflorescences produced was only 4·2.

4. *After-cultivation.* This consists of weeding whenever found necessary, digging to about 6 to 8 inches deep with mammuti fork .during the month of November and attending to the general cleanliness of the farm by picking 'sogais' (dry leaves) and removing dead inflorescences etc. Another important operation that is included under after cultivation is the spraying of areca bunches against fruit-rot or Koleroga with 1% Bordeaux mixture twice during an year, once towards end of May or early June and for a second time during the middle of July. The tender palms are protected by tying areca leafsheaths or leaves over them which helps to minimise the sun scorch of stems. The life of older trees with cavities or fissures can be prolonged by tying split pieces of areca stems over such portions.

5. *Manurial practices.* The method of manuring adopted at the station was slighly different from that which is generally practised by local growers. The manure is applied in a circular trench 1 foot wide and 9"-10" inches deep, dug 2 feet away from the base of the tree. Half a pound of Superphosphate per tree is spread at the bottom and over this 20 Lbs. each of green leaf and 20 Lbs. of cattle manure or compost is spread and 1½ Lbs. of wood ash is also applied at the top layer and the manures are finally covered up with earth. Manuring is usually taken up during August of every year. Compost required for the farm was prepared from materials available in the farm itself such as dry leaves of areca, banana and other farm rubbish.

Attempts were also made to make the farm self-sufficient with respect to its green manure requirements. For this purpose plants of *Gliricidia maculata* and *Indigofera teysmunii* were planted in the marginal areas of the garden. Gliricidia was also planted as a hedge crop on the fence line of the garden which gave a good portion of the green leaf requirement of the station. Besides these, cover crops such as *Peuraria javanica*, *Centrosema pubescens* and *Calapogonium muconoides* were tried with success. Seeds of the above cover crops are sown in between rows of areca trees during the month of January. The advantages of sowing the seeds during January are as follows;—

(1) The crop gets itself well established before the beating South-West monsoon rains commence in June or July; (2) the crop gives good protection to the surface of the ground from the direct rays of sun during the summer months. (3) the crop prevents the surface erosion of manurial ingredients during the rainy season. (4) it improves the texture of the soil and finally a good green manure crop becomes available at the month of August for manuring.

6. *Irrigation.* The garden needs to be irrigated from the middle of November to the end of May or till the onset of South west monsoon rains. The tanks and irrigation channels are to be rectified during October and November. Water is let in through the channels from the middle of November or early December and splashed to the surface of the garden by using a small bucket made out of the leaf sheath of areca. Irrigation is given once in 5 or 6 days.

7. *Harvesting and curing.* (a) Nuts are harvested when they are fully mature, i. e. when they change to orange red or yellow or crimson in colour. The bunch becomes ready for harvest on an average, after eleven months of the leaf-fall and appearance of inflorescence, though the period varies from 9⅓ months to 13 months (as is evidenced in table III given below).

III. Table showing the dates of appearance of inflorescence and harvesting of bunch.

Tree No.	Date of leaf-fall or appearance of spadix.	Date of harvest of ripe bunches.	Period taken for maturity in months and days.
1.	14-4-1954	10-3-1955	10 months and 27 days
	28-5-1954	1-4-1955	10 months and 3 days
2.	13-1-1954	21-12-1954	11 ,, 15 days
	3-3 1954	18-1-1955	10 ,, 15 ,,
	4-4-1954	17-2-1955	10 ,, 13 ,,
	1-5-1954	10-3-1955	10 ,, 2 ,,
3.	18-1-1954	17-11-1954	10 ,, 4 ,,
	8-3-1954	19-1-1955	10 ,, 11 ,,
	30-3-1954	18-2-1955	10 ,, 16 ,,
	10-5-1954	10-3-1955	10 ,, 0 ,,
4.	22-9-1953	18-11-1954	13 ,, 26 ,,
	22-10-1953	18-11-1954	12 ,, 26 ,,
	27-12-1953	22-12-1954	11 ,, 26 ,,
	7-2-1954	20-1-1955	11 ,, 13 ,,
	14-3-1954	18-2-1955	11 ,, 4 ,,
5.	17-11-1953	18-11-1954	12 ,, 1 ,,
	25-12-1953	23-12-1954	11 ,, 29 ,,
	6-3-1954	20-1-1955	10 ,, 14 ,,
	10-5-1954	19-2-1955	9 ,, 9 ,,

Average 11 months 0 days

(b) *Size and shape of nuts.* The size and shape of nuts are found to vary within the same bunch and in different bunches of the same tree. The length of nuts vary from 3·2 cms. to 6·8 cms. and breadth (at the widest point) from 2·9 cms. to 5·3 cms. Different shapes, viz. oval, oblong, spherical and pyriform are also seen, but colour is a more or less consistent factor for fruits of individual tree.

(c) *Period of harvest.* Harvesting of ripe arecanuts is done in almost all the months, but the bulk or major harvests are made between October and March, During other months, only stray bunches become available for harvest. The percentage of the number of nuts harvested at each month to the total harvest of the year at the Research Station, Vittal, is given below:—

TABLE IV.

PERCENTAGE OF TOTAL FOR THE YEAR.

S No.	Month.	1953-54.	1954-55.	1955-56.
1.	July	0·10	0 04	0·07
2.	August	0·65	0·30	0·48
3,	September	1 35	1·25	1·30
4.	October	9·52	1·87	5·70
5.	November	12·94	16·20	14·57
6.	December	20·06	34·79	27·42
7.	January	35·10	24·83	29·97
8.	February	15·10	15·42	15·26
9	March	4 90	4 01	4·45
10.	April	0·19	1·16	0·67
11.	May	—	0·13	0·06
12.	June	0·09	—	0·05
	Total	100·00	100·00	100·00

From the above table, it is also gathered that more than 87% of total produce is harvested between November and February.

(d) *Curing of arecanuts.* The ripe arecanuts are harvested from the trees by using bamboo poles. After harvest the nuts are spread in the sun for drying in the specially prepared curing yards. They are allowed to dry in the sun for about 35 to 40 days. To ensure uniform drying and easy seperation of kernel from kusk, the fruits are turned upside down once in 3 days. They are then husked by using special knives called "Mettukaties" and sorted. The superior nuts form the 'Biligotu' portion and the inferior ones are separated as 'Koka'. The relation between the nuts at different stages of curing is furnished in table V.

TABLE V.

S. No.	Partculars.	1952–53.	1953–54.	1954–55.	Average.
1.	Average number of fruits (wet) for Lb.	14	14	13	13·7 or 14·0
2.	Average number of dry nuts (with husk) per Lb.	35·5	35·2	34·2	25 0
3.	Percentage of drying (after 40 days of drying)	59·7	59·9	62·2	60·6
4.	Average number of cured and husked nuts per Lb.	59·0	57·7	57·2	58·0
5.	Percentage of Koka in husked nuts by weight.	3·7	4·5	3·2	3·8
6.	Percentage of husked nuts over total wet weight of nuts.	23·5	24·4	22·5	23·5
7.	Percentage of husked nuts over dry weight (nuts with husk).	58·3	60·9	59·7	60·0

From the above table, it is estimated that on an average 100 pounds of fruits give, after drying, 39·4 Lb. of dried areca, which, after dehusking, gives 15·9 Lbs. of husk and 23·5 Lb. of husked nuts of which 0·9 Lb. will be 'Koka' and 22·6 Lb. will be 'Biligotu'.

(e) *Yield.* The average yield per acre of the garden (with only 338 bering trees per acre) was 1,132 pounds of cured and husked nuts. The details regarding the yields per tree of bearing age recorded at the Research Station during the last three years is given below :—

TABLE VI.

AVERAGE YIELD PER TREE.

S. No.	Particulars.	1952–53.	1953–54.	1954–55.	Average.
1.	Average number of bunches per palm.	2·2	2·4	2·9	2·5
2.	Average number of fruits per bunch.	96·0	68·7	72·5	79·0
3.	Average yield of areca-nuts with husk per palm (nos.) ..	208·0	164·9	210·0	194 0
4.	Average yield (cured and husked nuts) per palm by weight (Lbs.)	3·5	2·8	3·6	3·3

From the foregoing figures it is gathered that only 2·5 bunches per palm is available for harvest even though the spadices produced is 4·2 and the average number of leaves shed is 6·7 per palm per year. Hence, it is evident that 37·3% of the leaves that shed are barren without spadices and out of the 62·7% which produce spadices, 25·4% are infertile spadices and get dried up and only 37·3% of the spadices get fertilised and develop into good bunches.

8. *Subsidiary crops* Several subsidiary crops like coconuts, banana, pine apples, pepper vines etc. are grown primarily with the object of shade to the garden and also to increase the revenue.

9. *Cost of maintenance and Balance Sheet.* An effort is made to arrive at the cost of cultivation and to fix up the balance sheet for maintaining an acre of the existing garden. The economics are as follows :—

TABLE VII.

BALANCE SHEET.

S. No.	Cost of cultivation	1953–54 Rs. A. P.	1954–55 Rs. A. P.	Average Rs. A. P.
1.	Preparatory cultivation–digging pits (3'x3'x3') for filling up gaps. ..	4–11–10	3—6—0	4—0–11
2.	Manures and manuring — including cost of manures...	161—6—8	164–15—9	163—3—3
3.	Seeds and sowing – cost of areca seedlings utilised for planting and also labour. ..	8–14—3	4–14—1	6–14—2
4.	After cultivation – weeding, digging, repairing fence and drainage channels, picking dry leaves, spraying twice with Bordeaux mixture etc.	57—7—1	78–11—1	68—1—1
5.	Irrigation – rectifying irrigation channels and irrigating the garden. ..	78—9—4	64—2–11	71—6—1
6.	Harvesting, curing, husking etc. including proportionate cost of construction of yard.	48—6—4	51—2—4	48–12—4
7.	Cost of cultivation and harvesting charges of subsidiary crops. ..	27–12—9	27—2—5	27—7—7
	Total..	385—4—3	394—6—7	389–13—5

RECEIPTS.

Produce	1953–54 Yield per acre. Lb.	1953–54 Value Rs.	1954–55 Yield per acre. Lb.	1954–55 Value Rs.	Average Rs.
1. Husked areca.	925·5 (Nos.)	1344–12—8	1216·5 (Nos.)	1655–10—0	1500—3—4
2. Ripe arecanuts sold.	717	10–12—0	757	13—6–11	12—1—5
3. Miscellaneous receipts coconuts, banana, jack etc.	—	106—9—2	—	200–14—7	153–11–11
	Total.	1462—1–10	—	1869–15—6	1666—0—8

The average annual cost of cultivation per acre. ..Rs. 389-13—5

The average annual receipt per acre. 1666—0—8

Gross profit. .. 1276—3—3

The net profit of the garden is arrived at after making allowances for the following items :—

S. No.	Particulars	Amount Rs. As. Ps.
1.	Interest at 5½% on Rs. 12,000 (which is the market rate of an acre of the garden).	660—0—0
2.	Proportionate watchman charges (actuals).	114—0—0
3.	Land assessment.	8—0—0
4.	Supervision charges (actuals). ..	161—0—0
5.	1/10 expenditure (of Rs. $\frac{943-11-0}{4\cdot75}$ on dead stock. (actuals). ..	19-14—0
	Total..	962-14—0
	Gross profit...	1276—3—3
	Less allowances to be made on other items as shown above. ..	962-14—0
	Net profit..	313—5—3

SUMMARY. The method of raising arecanut varies from tract to tract. One such method as followed at the Arecanut Research Station, Vittal, is explained in detail. The economics of maintaining an areca garden also is given. An attempt has also been made in this paper to record the various fundamental facts and figures gathered at the above mentioned Station during its 3 years of existance.

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Extension Training Programme *

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The backbone of the whole programme of intensive rural development envisaged under the First and Second Five Year Plans of the Government of India is the village worker. As the strategic and vital link between all the rest of the development programme organisation and the village people, he is the solid nucleus around which the whole extension programme is built. The task of training these village workers, which is vested in the Directors of Extension and Training, Ministry of Food & Agriculture, is, therefore, one of almost frightening responsibility – but also a stimulating challenge. For how well *Gram Sevaks* succeed in their careers depends to a marked extent upon the training which they have received.

The history of the training institutions working under the guidance of Directors of Extension and Training is well-known. It was in 1952 that five Extension Training Centres were established at Mandya (Mysore), Sindewahi (M. P.), Burdwan (W. B.), Bakshi-ka-talab (U. P.) and Anand (Bombay). In October of that year, the Community Projects Programme envisaged the establishment of 1,200 blocks, which needed 12,000 trained extension workers at the village level, in addition to the various supervisory personnel at the block level. To meet this urgent need the Ministry of Food and Agriculture immediately took in hand the establishment of 29 more Extension Trainig Centres, in co-operation with the State Governments.

To-day, there are 43 Extension Training Centres in the country and 54 Basic Agricultural Schools for