

THE CASHEW NUT INDUSTRY OF SOUTH INDIA

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THE cashew tree is a native of Central and South America as well as of the West Indies. It was introduced into India by the Portuguese for the main purpose of checking erosion on the west coast of the Peninsula and on the sandy dunes of the east coast. It now grows wild, chiefly along the west coast as far as Bombay but also in parts of the east coast such as the Guntur, Godaveri and Vizagapatam districts. The tree is capable of thriving under widely different conditions of soil and climate. In South Kanara, it grows on red laterite soils under a rainfall of about 150 inches per annum though over 90 per cent. of this is distributed during the south-west monsoon from May-October while on the east coast, it is found on sandy tracts with a rainfall of less than about 40 inches per annum.

In all parts of South Kanara which is the largest producing and exporting district of kernels in India the tree grows wild. Along the coast, it occurs mixed with other shrubs on the hill slopes and develops a somewhat spreading habit owing to the poor soil and exposed position. But on a sandy soil and in a sheltered situation it grows more erect and does best.

PRODUCTS OF THE CASHEW

There are several economic products of the cashew but with the exception of the kernels these have not yet been made commercially successful. The present importance of the cashew in India lies in the value of its kernels for which there is a large market in New York and to a lesser extent in London where these are used in confectionery. It is reported that owing to the bland taste of these kernels and their similarity to almonds and walnuts they have gained much popularity. An industry for the export of the kernels has rapidly developed along several centres of the west coast of India, of which

Mangalore is the chief. In 1924, the export of kernels from India amounted to about 300,000 lb. while in 1934 it totalled 9 million pounds and from South Kanara alone $6\frac{3}{4}$ million pounds.

There are about six cashew factories located in Mangalore, employing about 15,000 workers, mostly women, for the extraction and export of the kernels. The fresh nuts are purchased from the ryots but as the supplies from South Kanara are insufficient for the factories in Mangalore, nuts are also obtained from Goa, Malabar, Cochin, Travancore and even Portuguese East Africa. The total production of nuts from South Kanara is about 120,000 bags of 130 lb. each but from Malabar about 30,000 bags and from East Africa 140,000 bags are obtained for extraction of the kernels in the factories of South Kanara.

On the west coast, the nuts are available from February-April and even up to the end of May each year from Goa and Malvan districts in the Bombay Presidency. The East African cashews have a different season and the nuts are imported from October-December thus enabling the factories to be kept engaged throughout the year. In Ceylon, the cashew nut season is usually from April-July.

The kernel is also esteemed in India and there is a small market as well for raw kernels and the "brokens" extracted from the roasted nuts as these are unsalable in the overseas market. The kernels from tender nuts are used in South India for curries, *payasams* and *bhaji*. They are usually sold at Re. 0-1-6 per 100 kernels. The kernels of mature nuts are sold only after roasting and are used in the preparation of different Indian sweets. They are also eaten with jaggery and coconut, being fried in oil or ghee and mixed with Bengal gram powder. Reference to the other products of the cashew may be made to a note on this subject in *The Tropical Agriculturist* for July, 1936.

VARIETIES

There are several varieties of cashew showing differences in the colour of the fruit (red, yellow or intermediate), the shape of the fruit, the size and shape of the nut, the size and shape of the kernels, the season of bearing (early, main or late) and the tendency to shedding of the flowers. Work on the selection

of suitable varieties for yield, season and quality of the kernel has only just commenced on some of the agricultural research stations on the west coast.

Until recently, the yield has not been regarded as an important factor because the tree was allowed to grow without any attention but with the present importance attached to the cashew tree on account of the value of its kernels an interest is being shown in the cultivation of this crop and new areas are being planted up. With the increased attention now being paid to this crop growers are becoming concerned with the question of yield.

Quality of the kernel is of great importance and determines the price and the demand. Good quality kernels should be white, bold and hard. Sweetness is desirable though it alone does not commend a higher price. The best quality kernels come from Travancore while those from North Kanara are the worst being too hard and fibrous. The East African kernels are smaller but give a higher percentage of kernels from the nuts. This is an important consideration with the factories which pay a higher price for varieties which give this higher percentage. While the South Kanara nuts result in about 28 per cent. of kernels on shelling, the East African nuts give about 30 per cent.

The nuts show considerable variation in size but in the case of the large nuts, the kernels are not necessarily large in comparison with those from medium size nuts. Selection of varieties for yield and quality should not, therefore, be based on size of nuts without considering the size of the kernel. Small, round nuts have generally well-filled kernels which are termed bold in the trade. The nuts on the west coast vary from about 60 to 150 per pound while in Ceylon the range of variation is from about 30 to 125 nuts per pound. The East African nuts are smaller than the west coast nuts of India. Variety also differ in the degree of whiteness and hardness of the kernels.

At present, on the west coast the nuts are available during February-April but there are varieties which bear in January and even later in the season during May-June. If early or late bearing varieties can also be produced better prices will be realised as the factories will then have their supplies spread over a greater part of the year.

Premature shedding of the flowers is common in the cashew and usually only a small proportion of the flowers produced develops into fruits. There are varieties which show a comparatively small percentage of shedding. The setting of the flowers is controlled by light and humidity and it is well known that in cloudy weather setting of the flowers is poor.

FIELD CULTIVATION

(1) PLANTING

In South Kanara, the ryots generally scrape the soil in the middle of some bush growing on the hill slopes and plant after the first few rains two or three nuts so that after germination the fleshy cotyledons or seed leaves are hid from the view of the cowboys who devour them if they are discovered. By planting the nuts deep—about 5 inches in the soil—the cotyledons remain below the surface and the seedlings develop undisturbed. The most vigorous seedling is then retained and the others removed but the percentage of seedlings that subsequently develops is small owing to the absence of sufficient care and attention in raising these plants.

Nurseries are not usually sown as the tap root becomes easily damaged when the seedlings are removed from the beds. They do not stand transplanting well. But in other parts of the west coast nurseries are opened and in the course of a week to ten days the seedlings are transferred to baskets which are placed in pits filled with good soil. It is the custom in some parts of Ceylon as at Mannar to place the nuts in palmyra baskets and after about a month the seedlings with the baskets intact are planted out and good results are obtained.

The plants are usually spaced at about 30 to 40 feet apart but closer spacing is advisable in the earlier stage of growth and if the plants are set at about 20 feet apart they can later be thinned out to 40 feet apart. In more sheltered areas the planting may be somewhat closer.

(2) INTERCULTIVATION

No attention was formerly paid to the cultivation of the cashew but some ryots hoe their land every year towards the close of the south-west monsoon. During the months of July and August when there are heavy rains on the west coast of India any cultivation is inadvisable owing to soil erosion which results thereby.

Manuring is not practised though the tree responds readily to it, not only in an increased yield but also in earlier bearing.

(3) HARVESTING

The fruits with the nuts attached are harvested by means of a long stick with a curved knife at its end. This is usually done before the fruits are fully mature, because of the anxiety of the ryots to sell their nuts as early as possible. Tender nuts are sometimes removed and sold in the local markets at $1\frac{1}{2}$ to 2 annas per 100. The disadvantage in harvesting the fruits off the trees lies in the removal of the immature fruits and nuts as well as of the flowers. In East Africa, the nuts are allowed to drop and are picked off the ground.

(4) YIELDS

The cashew tree is quick growing and is capable of bearing within about 18 months, though it is not until the tree reaches its fifth or sixth year that it commences to give economic yields. It comes into full bearing by about its tenth year.

In South Kanara, the flowers appear from December-February and the nuts are ready for picking between February-April. The average yield is reported to be about 20 lb. nuts per tree but this would be much more if not for the heavy loss of flowers and tender nuts occasioned during harvesting. There are, however, some trees which give as much as 100 lb. per tree.

On shelling, about 25-30 per cent. of kernels are obtained and these after removal of the thin skin covering them yield about 80-90 per cent. of peeled kernels. Shelling usually results in about 75-89 per cent. of wholes and 11-26 per cent. of broken. In the extraction of the pericarp oil about $1\frac{1}{2}$ modas ($27\frac{1}{2}$ lb.) of nuts give about 2 bottles of oil.

A. PREPARATION OF THE KERNELS FOR EXPORT

For the overseas market, the kernels are extracted by first roasting the nuts. They are then shelled, peeled, graded and packed for export. No machinery is used in the extraction of the kernels, the whole process being quite simple. Roasting is carried out in open pans, about 6 lb. nuts being placed at a time in each pan. They are kept for about one minute, stirring

continuously to prevent charring. About three bags of 140 lb.* nuts each can be roasted per hour at a cost of six annas.

Shelling is performed by hand labour, mostly by women and about 30-50 lb. of nuts can be shelled a day by a woman. The cost of shelling is about Re. 0-0-4 per lb. of shelled kernels. For roasting and shelling a bag of nuts the cost is about Re. 1-0-0.

Peeling of the thin pink seed coat is carried out after oven drying and this is again done by women who are paid in contract at the rate of Re. 0-0-4 per lb. for wholes and Re. 0-0-2 per lb. for brokens. About 12-16 lb. of wholes and 10 lb. of brokens can be peeled a day by a woman.

Further details on the curing processes are given in a note which appeared in *The Tropical Agriculturist* and referred to above.

B. PREPARATION OF THE FRESH KERNELS

This process is only carried out in small factories as at Kasaragad for the sale of fresh kernels in India. As soon as the nuts are purchased from the ryots they are spread out in the sun for about four days. They are then stored in bags for use as required.

Before shelling, the nuts are again kept in the sun and shelled while warm. The kernels are sold with the seed coat. About 14-21 pounds of nuts can be shelled by a woman at a cost of Re. 0-2-3.

PRICES

The prices paid by the factories for the nuts are liable to a certain amount of fluctuation. A bag of 130 pounds of the best Travancore and Goa nuts as also for the East African nuts is about Rs. 9-0-0, *i.e.*, nearly 7 cts. per pound. South Kanara nuts fetch about Rs. 8-8-0 per bag or about 6½ cts. per pound.

The kernels sell locally at about 5 annas for wholes and about three annas per pound for brokens.

A bottle of pericarp oil fetches about 1½ annas in Mangalore.

*A bag contains 130 lb. of nuts but for roasting and shelling a bag of 140 lb. of nuts is used.

CONCLUSION

The cashew tree is capable of growing without any attention under widely different conditions of soil and rainfall. In South Kanara, it thrives on a poor laterite soil and a rainfall of about 150 inches per annum with a marked dry season from November-April while on the east coast of Madras Presidency it is found on sandy soils with a rainfall of less than about 40 inches per annum. In Ceylon, too, the tree flourishes under varying soil and rainfall conditions. In the Western Province, it is seen both on laterite and white quartz sand under a rainfall of about 80 inches distributed during two monsoons, while near Mannar it grows on a coastal sand with a north-east monsoon during which most of the rainfall of about 40 inches is received. Near Batticaloa it is also found on sandy soils with a rainfall of about 60 inches the greater portion of which is distributed during the north-east monsoon.

The tree is thus able to grow on the poorest soil unsuited to most other crops and withstands drought well. It has come to be regarded as a waste land crop and is, therefore, one which can well be extended in most parts of the dry zone and may solve the problem for a perennial crop which can thrive in the dry zone, without irrigation.

The present importance of the cashew tree lies in its kernels for which there is a large demand in the United States of America and in Europe where about 10 million pounds are being annually purchased at present though there is a demand for greater quantities. But the Indian crop is insufficient to meet this demand and the west coast factories have to resort to the importation of African nuts and are even willing to purchase whatever quantities Ceylon can supply.

In Ceylon, cashew nuts of good quality are produced but the kernels are not subject to the same roasting process as in India. Roasted as well as fresh kernels are, however, produced and sold locally. The trade is in the hands of small dealers and the nuts find a ready sale. With the present output the prices realised are somewhat better than those prevailing in India but with an increase in the extent under cultivation the local markets are not capable of absorbing much more than at present.

If Ceylon can participate in an export trade it should prove profitable but the quantities produced must be greatly increased for working even a single factory. As the crop requires the minimum of care and attention the cost of production should be low in comparison with other crops. The extraction of the kernels and the grading and packing of these for export cannot be undertaken, as at present, as a cottage industry for great care is needed in the standardisation of this product and in ensuring its arrival overseas, free from insect attack.

It is essential if Ceylon is to enter the export trade in this commodity that a factory with equipment in packing the kernels in hermetically sealed and standard cases be established. But in the meantime it should prove profitable to export the surplus nuts from Ceylon to factories on the west coast of India as in the case of East Africa.

The possibilities of developing a cashew nut industry in Ceylon are, therefore, considerable and deserve full attention.