

A Note on Camphor Industry in Madras State

(Received from the Director of Agriculture, Madras)

There are two sources of obtaining camphor. One is from the leaves, twigs and stems of the Camphor tree (*Cinnamomum camphora*) and the other is from the leaves of the camphor plant (*Ocimum Kilimajarieum*) (syn. *Ocimum camphora*).

Cinnamom camphora or tree camphor: Rao, et al (1925) state that though the tree can be cultivated in all parts of India with an annual rainfall of 40" and over, its cultivation as a commercial enterprise is not profitable. Deo (1949) states that India has failed to produce camphor from *Cinnamomum camphora* (tree camphor) though it has been successfully cultivated in Dehra Dun, Saharanpur, Nilgiris, Mysore etc.

On the Nilgiris, about 40 acres were put under the tree-camphor between 1937 and 1945 in Halacarai Estate near Coonoor belonging to Messrs. T. Stanes & Co., Coimbatore. The yield per acre worked out to 60 lb. of camphor and 10 lb. of camphor oil per year whereas in U. S. A. and Ceylon the average yield is 125 to 150 lb. of camphor.

There are about 25 large sized camphor trees of about 75 years of age in Mangalam Camp Estate (near Sultan's Battery) in Wynad, belonging to Messrs. Techno Chemical Industries Ltd., Calicut. During the past three years, they have also planted about 150 seedlings (rooted shoots separated from the old stumps) in the same Estate and all these plants are reported to be growing vigorously. They have also planted a few grafts of camphor obtained on *Cinnamom* seedling root-stock, but the growth of these grafts is reported to be poor.

Camphor trees exist now in the following Agricultural Research Stations:

Government Botanical Gardens, Ootacamund: Two large sized trees, and also a plantation of 100 trees above the Mazdoor lines.

Sim's Park, Coonoor: One large sized camphor tree.

Fruit Station, Burliar: One large sized and one small sized tree.

Agricultural Research Station, Taliparamba: 21 small sized trees of about 35 years of age but with stunted growth. Camphor extraction was attempted for the first time in December 1952.

Agricultural Research Station, Ambalavayal, Wynad: Six seedlings were planted in 1951 and those are coming up well.

The camphor tree has not been found to develop viable seeds in any of the places where it is grown in this State, though the tree has been found to flower at Coonoor and Burliar. It is, however, reported that the tree develops seed at Dehra Dun. The Forest Research Institute, Dehra Dun supply fair quantities of seed to indenters. Messrs. Techno Chemical Industries Ltd., got supply of seed regularly for the past 3 years from the Forest Research Institute, Dehra Dun.

It is also reported that the Silviculturist, Ootacamund has a few hundred well-grown seedlings for distribution. Cuttings of young leaves as well as mature leaves and twigs from the camphor tree can be taken for extraction of camphor, only when the tree is about 15 years of age and over. The percentage of crystalline camphor obtained is reported to be 1.5% of the fresh leaves and twigs. The camphor and camphor oil is obtained mixed together, and the oil portion is

separated by pressing in hand press and fractional distillation and fractional crystallisation. From a recent trial distillation at Agricultural Research Station Taliparamba by an improvised method, about 2% of crystallised camphor and camphor oil was obtained. The percentage of camphor and oil obtained at Halacarai Estate in Nilgiris and in the Mangalam Camp Estate in Wynad is reported to be 3%.

In this State, the Wynad, the Nilgiris, Kodaikanal hills and the Shevroys are the most suitable places for growing camphor trees, since this species grows well in hills rather than in the plains. At Arakku, the camphor trees are coming up well and these trees are noted in Anantagiri on the way to Arakku. From 15 year old trees about 50 lbs. of camphor and about 25 lbs. of oil may be obtained annually per acre. Therefore, unless the price of camphor is about Rs. 5/- per pound, it may not be worth-while to grow camphor trees on a commercial scale. The price of Japan camphor came in the Madras city down from Rs. 3-8-0 to Rs. 3-0-0 per pound 1952. The comparatively low yield, a period of 15 years and over to become fit for cuttings of leaves, uneconomic price level of camphor—all these lead to the conclusion that the cultivation of the tree-camphor does not hold out much promise in this State.

Ocimum Kilimanjaricum (Syn: Ocimum Camphora): Dec. (1949) has recorded that this new plant begins to yield camphor after about 4 to 6 months of its introduction and that 3 to 4 cuttings can be taken per year easily. The plant is not grazed or browsed by animals. The leaf yields camphor. After harvest, the leaves can be cut, dried and stored without loss of camphor. It is an additional point in its favour that dried leaves can be sent to distilling centres for extraction of camphor. This plant develops such a good root system that the hill slopes can be protected from soil erosion by the growing of this species of plant. It is understood that the Forest Department has already introduced this plant in "Top Slips" (Nilgiris) for preventing soil erosion.

In the Mangalam Camp Estate in Wynad, Messrs. Techno Chemical Industries Ltd., have planted about 1,000 seedlings and it is reported that these plants have made excellent growth. The firm has also extracted camphor from the leaves of this plant. A few thousand seedlings are also raised by them for planting in the next monsoon season. This plant is also reported to be grown on a small scale on the Shevroys (Salem district) by one individual planter. In northern India, particularly near Dehra Dun, this plant is reported to be growing semi-wild and also as a cultivated crop.

Ocimum camphora: Has been introduced for trial in the Agricultural Research Stations in Taliparamba and in Wynad and a short account of work done is given below.

At Agri. Res. Station, Ambalavayal in Wynad: In 1950, a few seedlings were raised with seed obtained from Messrs. Techno Chemical Industries, Ltd., and planted out on the station. In 1951, some seed was obtained from the 1950 crop with which seedlings were raised and there at present 200 seedlings grow on the farm.

About 12 Ozs. of seed collected in this station were sent to the Government Lecturing and Systematic Botanist Coimbatore in 1952 for distribution to various Agricultural Research Stations for trial.

Six pounds of air-dried leaf were sent to the Curator, Ooty in 1952 for extraction of camphor and it is reported that camptor was extracted from it.

Agri. Res. Station Taliparamba: 236 seedlings were planted in August 1952 but the plants have not made very satisfactory growth, probably due to failure of

monsoon during the year. Recently 5 lb. of leaves were collected from these plants and camphor was extracted.

The seeds of *Ocimum camphora* can be had from (i) the Forest Research Institute, Dehra Dun, (ii) the Secretary, Agri-Horticultural Society, Bangalore, and (iii) Messrs. Techno Chemical Industries Ltd., Kozhikode. The Agricultural Research Station, Ambalavayal and the other Agricultural Research Stations to which the seed was distributed by the Government Lecturing and Systematic Botanist, may be able to supply a few pounds annually in the years to come.

Regarding yield, it is reported that in Dehra Dun the yield of camphor for *Ocimum Camphora* per acre is 18 lbs. per acre per year in addition to which about 60 lb. of oil can be obtained per acre per year. The Pepper Specialist, Taliparamba has however, reported that from an acre of *Ocimum Camphora* it may not be possible to obtain more than about 40 lbs. of camphor annually. Messrs. Techno Chemical Industries Ltd., get about 1% of camphor from the leaves of this plant grown in their Estate in Wynaad. At the Agricultural Research Station Taliparamba, five pounds of fresh leaves was recently distilled and 0.75% of camphor was obtained. The camphor was found to be of excellent quality and not mixed with oil.

Wynaad, Yercaud and Anamalais appear to be the most suitable places for this species of plant for the reason that the plant makes excellent growth even under purely rainfed conditions. The West-coast may also prove suitable for growing this plant as a purely rainfed crop.

In view of the low price level for camphor, it would not, perhaps, be profitable to grow *Ocimum camphora* as a pure crop, but it is worth-while to grow this as an inter-crop in plantations of coconut, mango, pepper etc.

Ocimum camptora appear to hold out good promise for development of camphor industry in this State on a large scale for the following reasons:

(a) The plant is said to grow in any kind of land which is unfit for any other cultivation (such as waste lands in forest areas) as a purely rainfed crop. (b) The plant begins to yield camphor after about 4 to 6 months of its introduction and 3 to 4 cuttings can be taken per year easily. (c) The plant is not grazed or browsed by animals and even the dried leaves can be distilled for camphor extraction. (d) The plant serves as a preventor of soil erosion in places where it is grown. (e) An average yield of about 40 lb. of camphor can be expected from one acre of this crop per year.

Data pertaining to imports and prices of camphor: India depends practically for her entire requirements of camphor on foreign countries. The important countries from which camphor is imported are Japan, Formosa, Hong-kong, U. K., and U. S. A. The quantity of camphor imported into Madras State has been increasing year after year after the war, as shown below:—

Year.	Imports by sea. (in pounds)
1944—45	124
1945—46	8,702
1946—47	48,873
1947—48	2,37,096
1948—49	2,89,123
1949—50	3,82,630
1950—51	5,89,240
1951—52	6,22,981

The prices of camphor have, of late, come down as shown below :—

Period.		Price of Japan camphor in Madras City, (per pound)
1951	January	Rs. 6—6—0
	July	„ 4—2—0
	December	„ 3—10—0
1952	January	Rs. 3—8—9
	April	„ 2—15—0
	July	„ 3—0—6
	October	„ 3—0—0
	December	„ 3—5—0

No survey of the camphor industry has been made in this State and details of production of camphor in Madras State are not available. No commercial quantities at economic levels could be produced so far in this State and that only feeble attempts to manufacture camphor have been made here and there.

Mofussil Notes :

The Silver Sickle (Crop Competition)

The phenomenal yield of 12,000 lb. (wet grain yield) by the State prize winner attracted the attention of every one in the state including Sri K. Subbayya Naidu and two others of Vedullavalasa village, Narsannapeta Taluk of Srikakulam District. As has already been stated by Sri K. Subbayya Naidu in his experiences (Published in Vol. 9 No. 9 September 1952) in the Padipantalu he took it very seriously and attempted to reach that yield by intensive cultivation. His attempt in 1951-'52 gave an acre yield of 9,660 lb. (wet grain yield) thus raising the rank of Srikakulam district to the second place and securing for him the Regional prize for the Visakhapatnam region.

Many cultivators in this and the neighbouring districts still disbelieved the possibility of producing such a heavy crop as 9,666 lb. (58 bags) and almost challenged Sri K. Subbayya Naidu to repeat his performance. While several others, of his own village tried to emulate his method of cultivation and few of them entered into the crop competition of 1952-'53. To meet the challenge Sri K. Subbayya Naidu has cultivated the same land in 1952-'53 season also, using similar methods of cultivation. He has grown a mixed green manure crop of sunnhemp, Pillipesara and Sesbania which was estimated to have yielded green leaf at 6,000 lb. per acre. To supplement it, he has carted an additional quantity of 4,000 lb. per acre of green leaf consisting of calotrophis and wild indigo. The entire quality of green manure was puddled and at the time of the final ploughing Super Phosphate at 264 lb. per acre and Ammonium Sulphate at 132 lb. per acre were also

puddled into the soil. Well grown seedlings of MTU. 19 were transplanted on 1st August 1952. In the middle of September a top dressing of 'Parry's mixture' manure at the rate of 801 lb. per acre was applied at the time of weeding. In the middle of October another application of Ammonium sulphate and Super phosphate at the rate of 130 lb. and 65 lb. respectively was made. The crop grew and tillered very well. Sri K. Subbayya Naidu adopted three different spacings in the plot. In 70 cents he planted the crop at a spacing of 18"×18" while in 50 cents the crop was planted at 12"×12" and in the remainder of 50 cents the spacing adopted was 12"×10". Just a fortnight before the harvest, counts of ear bearing tillers were taken by the Seed Development Officer, Kakinada with the following results.

Spacing	Average No. of tillers per plant	Calculated tillers per unit area of 20 Sq. ft.
18"×18"	15.5	137.7
14"×12"	12.0	205.7
12"×10"	9.6	230.4

Seeing that the closer spacing has given the maximum number of tillers per unit area and thereby is likely to produce the maximum yield, he has selected that part of the field for harvesting for crop competition. Ten cents of area was first harvested by the Agricultural Demonstrator, Narsannapeta, Sri J. Suryanarayana in the presence of the local competitors and the public and a yield of 9234 lb. of wet paddy per acre was obtained. Since the yield is over 8,000 lb. the District Agricultural Officer, Srikakulam was wired for and on 9—12—1952 another patch of ten cents was harvested by Sri P. Somayajulu, the then District Agricultural Officer, Srikakulam. It so happened that the Seed Development Officer, Kakinada was also present at the time of the harvest. Most of the competitors of the village and some leading ryots of the district were again present and after threshing, the yield recorded was 9,110 lb. of wet paddy per acre. If the usual allowance for dryage of grain of 15% is allowed the yield of the dry weight of the production per acre is 7,744 lb. or 46 bags and 108 lb. which really is very good. From the scientific aspect, the main feature of the Japanese method of cultivation of rice are adopted in the cultivation methods adopted here namely, (1) Application of heavy dose of green manure (2) incorporation of fertilizer in the soil so that it is readily and for a long time available to the plant at its root zone and (3) the closer spacing. The strain MTU. 19 used being a comparatively nonlodging one, the crop did not lodge till the ripening stage of the earhead and even thereafter, it has not completely and flatly lodged to damage either the grain or the straw.

Seeing the result of this competition the spirit of producing more by adopting the above methods has taken hold of many cultivators who have determined to cultivate their entire holdings with the improved methods in the next year. The noteworthy event which requires mention in this connection is that the enthusiasm of the taluk ryots in the achievement of high production prompted them to honour Sri K. Subbayya Naidu at a public function organised by them at Narsannapeta on 21—12—1952 presided over by Sri L. Lakshmanadas, M. L. A. and presenting him with a SILVER SICKLE with ivory handle in the presence of Sri M. B. V. Narasinga Rao, the Paddy Specialist who by chance was touring in the area at the time.

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