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Peculiarities of Viticultural Practices in Madurai District (South India)

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The district of Madurai in Madras State produces heavy crops of grapes in two clearly marked seasons of the year, a feature rather uncommon in other viticultural areas of temperate zone. It is known that grape is essentially a temperate region fruit. However the growers in Madura district have proved that in suitable situations and under intelligent culture, it is possible to produce grapes in large quantities even under tropical conditions. According to some estimates, the annual acre-yields in some of the well kept vineyards amount to more than 50,000 lb., as against the average yields of 7,380 lb. for the whole country and 7,678 lb. for an advanced grape growing region like California.

The unique double-cropping nature of the locally grown vines has enabled the growers to market the produce at high prices at a time when the supplies from the northern and north-western States which provide the bulk of Indian grapes, are scarce. This has greatly stimulated the local viticultural industry, particularly during the post-partition period, when some of the main grape producing areas like Baluchistan and North-West-Frontier Province went out of the Indian Union. Although the present area under this fruit in this district is believed to be in the neighbourhood of about 300 acres, as against 150 about a decade ago, the impetus given to the industry in recent years, has been responsible for a progressive annual increase in the area ranging from 15 to 20 acres.

The details embodied in this paper are as result of a tour by the author. This information would serve a useful purpose in indicating the economic possibilities of viticulture in this and other districts on the plains where similar conditions for the successful culture of grapes may exist.

Climate: This chief climatic features prevailing in two of the important taluqs, viz., Periyakulam and Nilakottai, where the vineyards are largely distributed are furnished below.

1. *Rainfall distribution:* (Average of about 60 years)

(a) South-west monsoon period (June to September)	7·36 inches	on 13·8 days.
(b) North-east monsoon period (October to December)	14·35 inches	on 21·3 days.
(c) Hot weather period (January to May)	9·17 inches	on 14·2 days.
Total	30·88 inches	on 49·3 days.

2. Mean maximum temperature 92·6° F (highest 98·8° F in May)
3. Mean minimum temperature 74·2° F (lowest 68·4° F in January)
4. Average humidity 72 per cent (from 60 to 83 per cent)
5. Wind velocity 3·9 M. P. H. (4·9 in June—July to 2·7 in October)

The tract possesses a fairly equable and mild climate, with a well distributed rainfall. The range of humidity, at no part of the year goes below 60 per cent. The severities of heat and cold characteristic of other grape producing regions in the north are also absent here. These factors combined with a fairly high level of humidity in the atmosphere almost throughout the year with no excessively dry or wet periods at any time appear to be largely responsible for a relatively long growing period and the consequent ability of the vines to flower in two distinctly different seasons of the year.

Varieties: The chief commercial variety is what is locally known as "Pachaidrakshai." This is a seeded type producing large, round, greenish coloured berries, with soft and juicy pulp, tasting sweet, but somewhat piquant, when fully ripe. The bunch is compact and medium in size, cylindrical and tapering at the lower end. This variety is largely preferred on account of its heavy bearing nature and the fairly good keeping quality of the berries.

The "seedless" grape known locally under the general name "Kishmish" was introduced some years ago from Baluchistan. Under this name, two distinct varieties producing greenish yellow to whitish berries with thin skin and soft to firm flesh have been favoured mostly for their sweeter taste than the local acclimatised Green variety and the almost seedless nature of the berries. But from the point of view of bearing and hardiness, the seedless varieties are shorter lived, being less hardy and yield less returns per acre as compared with the Green Seeded grapes. For this reason, most of the fresh plantings, have been confined largely to the latter.

Soils: The soils are mostly gravelly with a fair admixture of sand, deep to light red in colour, and are very well drained. The soil depth varies from six to eight feet with soft, friable rock below to a depth of nearly 25 to 30 feet. Chemical analysis of a representative sample taken near Periyakulam indicates that the soil is generally deficient in organic matter, nitrogen and is slightly alkaline in reaction.

Water table: The tract is characterised by a fairly low water table ranging from 20 to 25 feet rarely rising to more than 10 to 15 feet in the wettest part of the year. In some of the wells, the level of water goes down to 55 feet in the hot summer months. Water, although slightly brackish, seems to be well suited for the crop.

Culture: The vines are usually raised from unrooted cuttings (taken from one year old vines) planted *in situ* at the rate of four to five cuttings per hole, of which only two strong growing plants are ultimately allowed to develop. About six months prior to planting, pits (3' × 3' × 3') are dug at distances varying from eight to ten feet in the row and 25 to 30 feet between rows and large quantities (150 to 200 lb.) of leguminous green leaves such as Kolingi (wild indigo), Cassia, etc. are composted in the pits by mixing them in layers of tank silt, ant-hill earth, etc. and watering them at intervals, to aid quick decomposition. Planting is normally done in December after the pits have well settled. A mixture of neem cake powder and sand is some times sprinkled around the freshly planted cuttings to prevent white ant attack. In about four to six months the vines grow to a height of about five to six feet. These are allowed to grow straight with *Agati* (*Sesbania* spp.) twigs or other cheap supports. Growth of side shoots on each main stem is suppressed during the initial growing period to develop a strong trunk and ultimately a strong frame work. At this stage, pandals, eight feet square, and six feet high from the ground are erected by planting live supports of *Commiphora beryii* ("Kiluvai") or *Erythrina indica*. When the vines reach the top of the pandal, the growing point is nipped off and the side shoots that develop are systematically trained to spread evenly over the pandals. This initial training of the vines to regulate growth to the desired extent requires some skill. Intelligent pruning of unwanted growth is also necessary.

In about 18 to 22 months after planting of the cuttings, the vines yield their first crop, but commercial bearing commences from about the third year. In some of the well kept vineyards, the vines have yielded fair-sized crops even in the second year of planting.

Regular pruning of the vines is practised after they reach the bearing age. The method adopted locally appears to be somewhat simpler than that practised elsewhere. Pruning follows each harvest which usually takes place once in March—April for the first crop and again in October—November for the second. Pruning, accordingly, is taken up in May—June for the second season crop and in December—January for the first. The time at which the pruning has to be done is decided by the absence of fresh growths soon after each harvest. Usually, water is withheld from the vines about a fortnight before pruning. Before actually commencing the pruning of shoots, green leaves are incorporated into the soil by digging around each vine, during which process some of the fibrous roots get pruned or exposed.

The degree and extent of pruning are decided by the general vigour of growth of the vines and the nature of the shoot to be pruned. After leaving aside the main leaders and laterals which form the central frame

work, each side cane which has attained pencil thickness and which contains well formed buds (this is considered as a potential fruit bearing cane) is cut leaving three to five buds on it. Weaker or thinner canes are cut back severely to one or two buds only to allow them to develop later into fruiting canes in the subsequent year. The local growers usually consider green and pale green canes as immature and light greyish ones as mature. The former are rubbed off as and when they appear and the latter pruned to form fruiting or renewal wood. Diseased wood is also systematically cut off. At the time of pruning complete defoliation of the leaves is also done in most of the vineyards. Some enlightened growers, however, adopt lighter pruning in December—January and severe cutting back in May—June, apparently to regulate cropping.

Soon after pruning, heavy doses of cattle manure at the rate of nearly one-fourth to half a ton per vine are applied, followed by copious irrigation. Cakes or chemical manures are not usually applied.

The vines thereafter are weeded and irrigated regularly. As a rule, four irrigations per week in summer and about two per week in winter are given, depending on the rainfall and its distribution. Weeding is done at least once a month. Of late, systematic spraying of the vines with Bordeaux mixture against mildew is adopted as a routine orchard operation.

The most outstanding feature of the local viticultural practices is the exceptionally heavy annual applications of organic manures. An acre of vineyard receives annually on an average 25 tons of green leaves and about the same quantity of cattle manure. The benefits of such heavy manurial applications are reflected in the remarkably robust growth and heavy yields of the vines.

Yields: Exceptionally high yields are reported from some of the well kept vineyards. On an average, 12,000 to 15,000 lb of Green grapes (Variety: Pacchadrakshai) in the main (March—April) season and 7,000 to 8,000 lb. in the second (October—November) season may be expected from an acre of adult bearing vines. Higher yields upto 50,000 lb. and 20,000 lb. respectively have been reported by some growers. Individual bunches of the local seeded Green Variety are known to weigh as much *as two pounds each.*

Marketing of the produce: A major portion of the fresh produce reaches Madurai city, the main pooling centre, from where it is transported to different places in the South after meeting the local demand. Of late, considerable quantities are being exported to far off places such as Vijayawada, Tenali and Guntur in the northern portions of the State and Calcutta where good demand for these grapes exists. Enquiries reveal that in March—April every year (in the main cropping season) more than

twenty maunds of fresh fruit are exported by rail to some of the places mentioned above. The demand from places outside the State is also reported to be steadily increasing.

Cost of production and net returns. (For one acre)

A. *Expenditure:*

First year:

	Preparation of land including digging of pits and basal applications of leaf composts, tank silt, etc.	Rs. 250/-
2.	Planting, staking and erection of pandals, including cost of materials	Rs. 700/-
3.	Manuring—top dressings with green leaves and cattle manure including cost of manures	Rs. 300/-
4.	Irrigations	Rs. 75/-
5.	Other cultural operations like weeding and hoeing, training of vines, spraying with B mixture, etc.	Rs. 150/-
	Total	Rs. 1,475/-

Second year:

1.	Manuring as above including cost of manures	Rs. 500/-
2.	Irrigations	Rs. 150/-
3.	Other cultural operations like pruning, weeding, spraying etc.	Rs. 200/-
	Total	Rs. 850/-

Third year:

1.	Manuring	Rs. 800/-
2.	Irrigations	Rs. 150/-
3.	Weeding and hoeings	Rs. 100/-
4.	Pruning	Rs. 150/-
5.	Spraying including cost of materials	Rs. 100/-
6.	Harvesting and other transport charges	Rs. 150/-
	Total	Rs. 1,450/-

Receipts:

1. *Second year*—(First bearing)

Value of 200 maunds of fresh grapes (2,500 lb.) @ Rs. 7/- per maund .. Rs. 1,400/-

2. *Third year:*

(a) Value of 480 maunds or 12,000 lb. @ Rs. 7/- per maund (first crop) Rs. 3,360/-

3. Value of 280 maunds or 7,000 lb. @ Rs. 6/- per maund. (Second crop) .. Rs. 1,680/-

Total .. Rs. 5,040/-

Grand Total .. Rs. 6,440/-

Deduct expenditure till the end of third year .. Rs. 3,775/-

Net income at the end of third year .. Rs. 2,665/-

1.	Gross receipts from the fourth year onwards. Value of 800 maunds or 20,000 lb. at a flat rate of Rs. 6—8—0 per maund (for both crops)	.. Rs. 5,200/-
2.	Expenditure from the fourth year at Rs. 1,450/-	.. Rs. 1,450/-
3.	Net return	.. Rs. 3,750/-

The above figures are based on conservative estimates of yields obtained from a small holding owned and managed by a grower of average means. In some of the well kept vineyards owned by enlightened growers with adequate means and facilities, the yields are reported to be as high as 1,000 maunds or 25,000 lb. for both the seasons, ensuring an annual return of nearly Rs. 5,000/- per acre.

A Little Known Spice Plant

Zanthoxylum Rhetsa, DC.

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Description and distribution: *Zanthoxylum Rhetsa* Dc., termed fittingly as the Assembly tree by Roxburgh because of its large size and spreading branches under whose shade the hill tribes used to conduct their meetings belongs to the family Rutaceae. In Malayalam it is called Kattamanakku, or Mullilam, in Tamil as Elavangam and in Telugu as Rhetsa maram. The tree has a wide distribution at low elevations in the forests of the Eastern ghats from Ganjam to the Godavari upto 3,000 feet and in the Western Ghats in South Kanara, Mysore, Malabar and Travancore at about the same altitudes. Plants collected from most of these places are preserved in the Madras Herbarium at the Agricultural Research Institute, Coimbatore. The tree has a very striking appearance with prominent spines which clothe densely the trunk, branches and petioles. In the older parts of the trunk and the branches, the spines have a solid conical base. The bark is cream coloured. The leaves are alternate, imparipinnate, leaflets opposite, entire, strikingly oblique base