

| <i>Shaking with water.</i> | | | |
|------------------------------|----------------|------------------|--------|
| Sample. | Fine fraction. | Coarse fraction. | Total. |
| 1 | 68.2 | 32.5 | 100.7 |
| 2 | 70.1 | 31.3 | 101.4 |
| <i>International method.</i> | | | |
| 1 | 69.4 | 23.2 | 92.6 |
| 2 | 70.3 | 23.1 | 93.4 |
| <i>Puri method.</i> | | | |
| 1 | 75.3 | 24.9 | 100.2 |
| 2 | 78.0 | 23.0 | 101.0 |

On comparing the International method and Puri method which employs sodium saturation, it will be noticed that the former gives too low values for the aggregate and the values for the coarse fractions are almost the same. It may, therefore, be concluded that the deficit is entirely due to the fine fraction which seems to contain all the soluble portion. It is immaterial which of the two methods of dispersion is adopted provided the coarse fraction is estimated directly and the fine fraction calculated by difference. Simple shaking with water gives obviously high results for coarse fractions and low results for fine fractions.

When a large number of soil samples of the same type have to be studied rapidly it is advisable to find out with one sample whether it requires efficient dispersion or not. Subsequently it is enough to estimate only the coarse fractions which is quite early and rapid and calculate the fine fractions therefrom.

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PINEAPPLE CULTIVATION IN MALABAR

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In all countries where the value of fruit diet has been recognised, pineapple occupies a high rank. In most of the western countries and in all tropical islands within easy reach of the West this has assumed great commercial importance. In India where the plant seems to have been introduced about 300 years back and has spread through the West Coast to Bengal Assam and Burma, little attention seems to have been paid to improve the quality or commercial possibilities of this valuable fruit plant.

In this Presidency it occurs in several places as a hedge plant or as an ill-kept bush yielding stray fruits of small size and of an insipid sour taste. In the Simhachalam hills of the N. Circars and in isolated estates of the southern and western portions of the Western Ghats it

has received some attention at cultivation. During the last decade the cultivation of this has been taken up in several places on the West Coast through the activities of the Agricultural Department and this note deals with the experience gained in its cultivation on the West Coast both in the Government farms and outside.

Climate. The pineapple is a hardy plant thriving best under conditions of moist, heat and well distributed rainfall of 50 inches and above, but it does not seem to stand extremes of temperature or very high altitudes.

Soil. A rich sandy loam is the best suited, but under proper care even the shallow gravelly soils of the high level dry lands of the West Coast have been found to produce fruits of excellent quality. High level sand and heavy clays are unsuitable. The plant can hardly stand water-logging or heavy shade.

Varieties. The local variety yields only fruits of very poor quality. Of the imported varieties the 'Kew' and the 'Mauritius' have been found to be the best. The Kew is distinguished by its ashy deep green violet-tinged leaves with smooth or sparsely thorny leaf margins by the stout build of the plant and by the remarkable size of its sweet fruit weighing 10 to 15 lbs. and more. The Mauritius is of a much smaller build with reddish tinged leaves and sharp close-set thorny margins and producing small bright yellow fruits with prominent eyes and of excellent flavour and taste.

Preparation of land. To get fruits of uniformly good size without exhausting the soil, great care is required in the preparation of the land. Clearing the scrub jungle, terracing, and drainage have to be arranged for in advance. In the neighbourhood of jungles a rubble-stone wall or wire-net fence or a strong thorny hedge should be provided and the area must be as compact as possible. Planting is best done in trenches 2 feet deep and $1\frac{1}{2}$ ft. wide and 3 to 4 feet apart. An extra space of 1 foot for alternate trenches will facilitate all cultural operations.

Manuring. Pineapple is a heavy feeder and demands heavy manuring. Where virgin soils are not available about 25 to 30 cartloads of cattle manure or an equivalent of compost or other bulky manures and about 2 cartloads of ashes per acre may be worked in the trenches before planting. The same must be applied every year in 2 doses. An equal dose may be given during the succeeding years. Where enough bulky manures are not available a supplementary dose of about 1 lb. of fish guano, or a mixture of $\frac{1}{4}$ lb. of bonemeal, $\frac{1}{4}$ lb. of ammonium sulphate and $\frac{1}{4}$ lb. of sulphate of potash may be applied per year per plant in 2 doses.

Propagation. The plant is best propagated from suckers produced on the mother plant just above the ground level. Those from the base

of the fruit known as slips or robbers and those from top of the fruit known as crowns take a considerably longer period to bear. For rapid multiplication especially of rare varieties, each mother plant can be made to produce a large number of suckers by removing them as soon as they develop to convenient size. Great care should be taken not to break the butt-end of the suckers while removing them from the mother plant. These can be set out in a close-set nursery until required for planting.

Planting. This is done with the first heavy rains in May-June in trenches prepared in advance. A spacing of 3 feet will be enough for Mauritius while an extra foot may be required for Kew. This with the extra spacing for alternate trenches will give about 4100 plants per acre for Mauritius and 2400 plants for Kew. The removal of a few scale leaves and dead roots from the suckers will facilitate quicker rooting. Care should be taken not to get the central shoot clogged with mud.

After-Cultivation. This consists mainly of weeding, mulching and gradual filling up of the trenches just to cover the subsequent doses of manure. The fruits may require propping, and protection from enemies when about to mature. After the first fruiting which takes about 1½ years from planting for Mauritius and 2 years for Kew all extra suckers except one or two of the lowest are to be removed and the plants manured and earthed up to cover the manure but not to cause the development of a shallow root-system which will weaken the plant during the hot season.

Catch crops. Under systematic cultivation pineapple allows of shorter duration catch-crops especially in the first year of plating. Since the suckers take about one year to cover the ground, a crop of vegetables or chillies can be planted between the suckers in the heavily-manured trenches while on the loose ridges a catch crop of sweet-potatoes, groundnut, redgram, gingelly or other rainfed short-duration crops can be taken in the first year. In virgin soils even plantains and tapioca can be grown with advantage especially in badly exposed situations where some shade is not unwelcome. Pineapple also allows itself to be grown as an inter crop in young plantations of cocoanut or fruit trees. Not only as a profitable catch crop, but even as a decorative plant this can be given a place in all well-kept house gardens.

Pests and Diseases. In the neighbourhood of jungles, the wild boar, the jackal and the toddy-cat do lot of damage when once they chance to taste the fruit. Rubble stone wall, wire-net fence or thorny hedges combined with careful watching can save the crop to a great extent. In extensive plantations the percentage of loss from such enemies is much less than in small isolated blocks. In certain places even crows do considerable damage. This can be prevented by tying

up strings across the plots supported on poles struck along the border and by occasional shooting.

No serious disease has been observed except excessive vegetative growth of the plants and deformities of fruits noted more in Kew than in other varieties. These can best be avoided by using suckers only from healthy plants.

Yields. The Kew variety takes about 2 years from planting to harvest while Mauritius takes about 1½ years. About 75% of the plants may be expected to yield during this period. The rest may be expected to yield in another six months. The main flowering season is from December to February with the fruits ripening from April to June while a small crop may be expected in November—December. In the case of Mauritius the fruiting season is spread over a slightly longer period. Good suckers of the first ratoon will yield in about a year.

Ratooning. Pineapple yields best during the 2nd and 3rd year of planting. The suckers from the subsequent ratoons will lift up too high to be benefited by manuring and earthing up and the yields will be consequently poor. It is then advisable to shift the plantation to a new site. It is said that where new sites are not available the plantation can be indefinitely continued on the same site by starting fresh planting in the trenches formed between the ridging of the previous plantation.

Marketing. The profits from the plantation depend mainly on proper marketing. Early in the season Kew fruits may fetch up to Re. 1 each but the average can be put at about 4 annas. Until the value of the fruit is appreciated locally the planter must take special care in getting in touch with a good market like Bangalore and Madras where good fruits are always in demand. The fruits should be harvested with a bit of the stalk just when the lowest eyes turn yellow. The least injury to the fruits will start rotting. For safe transport they are best packed with dry packing in single or double bamboo baskets. In this condition Kew fruits will keep about 10 days while Mauritius will keep about a fortnight and so can be sent to fairly long distances.

Uses. The improved varieties rank among the best of fruits. Due to its refreshing and even medicinal properties, pineapple is considered to be good even to invalids and children. It is also a vermifuge. Boiled with sugar it makes preserves of good colour, flavour and keeping quality. The juice itself can be preserved and kept for flavouring other preparations. Half-ripe fruits are good for chutney. The fleshy thornless leaves of Kew can be fed to cattle during the dry season. The leaves also yield about 3% of cleaned fibre of good quality.

Profit. Pineapple is one of the most paying crops especially as it can be successfully grown even on cheap lands. A Kew plantation kept

for four years may yield about 7000 fruits of an average weight of 5 lb. Valued at a modest rate of 6 pies per pound, this will fetch about Rs. 1000 per acre. In the case of Mauritius though the fruits are only about 2 lb. on an average the total income can be expected to be equally good due to its earlier bearing and superior quality of the fruit. The cost of cultivation as done in the Government Farm comes to about Rs. 500 per acre so that under proper care the plantation can give an average annual profit of Rs. 125. Where local preservation of fruits and ready marketing can be arranged for, the profits will be much more. In a newly introduced locality a decent amount can be made by the sale of suckers which sell at Rs. 2 to Rs. 3 per 100.

Scope. Judged from the experience of areas where concentrated work has been done to increase the area under this crop, there seems to be great scope for expansion (in all wasteland areas) near big towns. Among the fruit-bearing plants it is perhaps the earliest and the most paying. With a long sea-coast and rail road and with plenty of road and river communications to the interior where plenty of cheap land and manure are available the pineapple cultivation has a great future.

For suckers and for information regarding the cultivation and disposal of the crop help can be obtained from the Deputy Director of Agriculture, VII Circle, Tellicherry.

CASUARINA PLANTATIONS IN CUDDALORE

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Casuarina is a tree of rapid growth introduced into India about 60 years ago. It is good as fuel which burns well though not of much value as a timber. This is grown in extent in South Arcot District owing to the ready demand for fuel at Madras to which place it is carried in boats along the Buckingham canal and also by rail. Owing to the increasing scarcity of fuel, the area under casuarina is steadily increasing.

Soil. The casuarina is planted on all kinds of soils ranging from pure sands on the edge of the sea to the stiff clay soils in the inland. Sandy-loams with a water table at a depth of about 4 to 6 feet in summer are the best for casuarina.

Gathering of seed and nursery. The fruits that ripen during December to April are gathered from the trees of 6 to 8 years old and are dried on a good drying floor protected from wind. The fruit bursts and scatters the seed. The seed is collected and dried. Ash is mixed along with the seed as a prevention from ant attack and preserved in good pots or tins. The seed is generally collected just before sowing as it is found to lose its vitality after three or four months.