Ceylon Coconut Planters' Review, Vol. V No. 3, December, 1968.

Pineapple Cultivation in Coconut Land in the Low-country Wet Zone

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The greater part of the low-country wet zone where the annual rainfall does not exceed 125" can be used for growing pineapple successfully. However, it is necessary that the soils selected for growing this crop should not be high in calcium and magnesium because that would tend to make the pH very high. This implies that acid soils are actually better for the crop because chlorosis of the leaves does not occur under such conditions.

The texture of the soil and the topography of the land should be such that water does not stagnate. Pineapple cannot stand 'wet feet.' This is why gravelly and lateritic 'Kabook' soils are preferred to clay soils for growing this crop.

A temperature range between 65-95°F. is the best for pineapple. Low night temperatures for short spells of time do not harm the crop. Prolonged cold spells, retard the growth of the plants, delay maturity of fruits and increase their acidity.

The space between rows, in young and old coconut plantations, where the trees are tall and the drooping fronds do not cast excessive shade, are now used for growing pineapple in the Colombo district. This system of planting has been the traditional method of growing pineapple in this district, and the two crops would appear to combine well in this area.

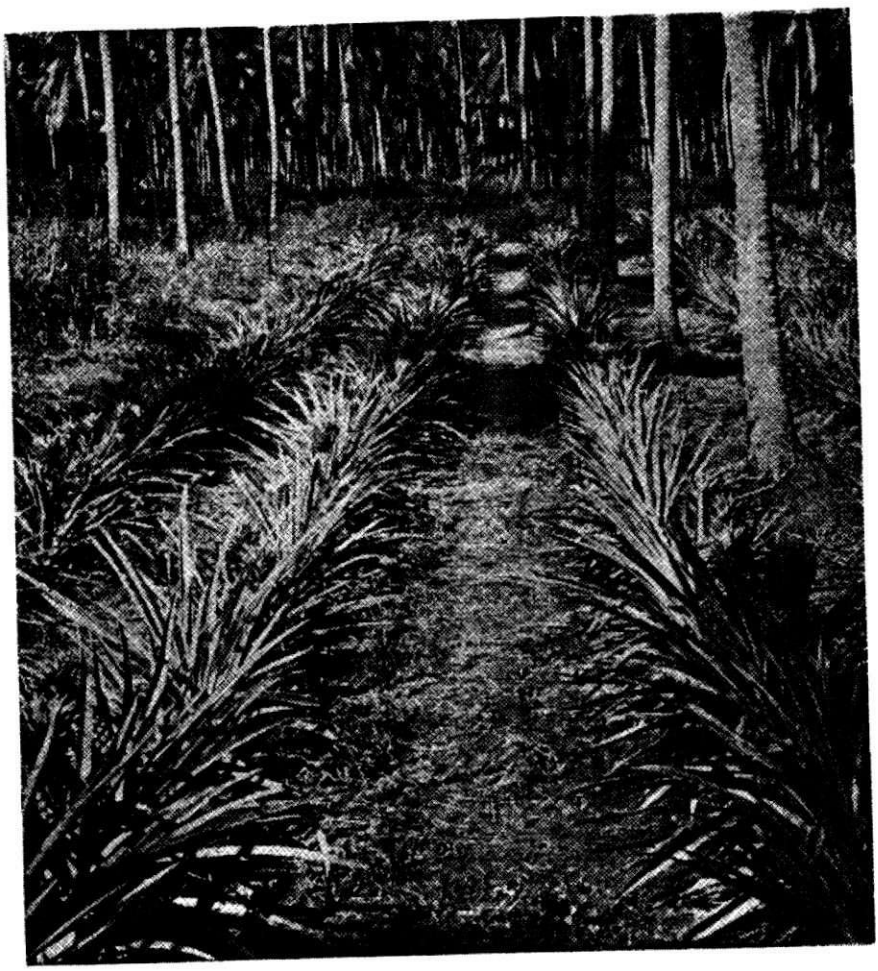
In young plantations (both in new clearings and replanted land), the soil in between the rows is not really made use of by the young palms. This unused area of land as a rule gets overrun with weeds, which compete severely with the young palms for nutrients. Pineapple grown as a catch-crop helps to keep these weeds down, and the normal fertilizers, applied to the pineapple promote vigorous growth of the young palms as well. More than these incidental benefits the income from the sale of pineapples enables the grower not only to cover up his expenses of planting the two crops but also to make some profit.

In coconut plantations, which have mature stands over 35 years old, the land between the rows of palms is not heavily shaded. This land could grow good crops of pineapple provided there is adequate manuring to avoid competition between the two crops. Since the fertilizers used for pineapple are high in nitrogen and potash they indirectly benefit the coconut crop also causing an increase in yields.

In addition to these two types of planting, it is possible to plant coconuts in avenues, at suitable distances, perhaps 30-40 ft. apart, and utilize the land between these avenues for planting pineapple. This system of 'hedge-planting' should enable the pineapple crop to grow well as the shade factor is more or less eliminated.

Pineapple growers in the Colombo district aim at producing large fruits, weighing as much as 14 lb. each. To accomplish this, the planting distances adopted are 1½-2 ft. apart in single rows, and 7 ft. between rows. Usually double rows of pineapple are planted between two rows of palms. This spacing is really too wide as not more than 4,000 pineapple plants could be planted to the acre. Closer planting would ensure production of uniform medium sized fruits and a higher yield in 3 years than what

FIGURE 1



System of planting Pineapple under Coconut

could be obtained in 5 years with a lower planting density. A further point is that the large fruits are very uneconomical for canning. They mature unevenly and the acidity and quality of the fruit vary widely from bottom to top. With closer planting to give 12-13,000 plants per acre, the fruit size, shape and yield can be very favourably improved. To eliminate the build up of pests and diseases replanting at short intervals has been found favourable.

Most of the coconut lands in the wet zone should be soil conserved for planting pineapple. It would be best to have storm drains to lead out the excessive water and contour drains or bunds to break the force of surface run-off and promote better infiltration of water into the soil. Having laid out these soil conservation structures, planting should be undertaken preferably on the contours, as this too would serve to augment the above conservation measures.

On good coconut lands the need to apply fertilizers may not be very great. In the Colombo district, on lateritic soil it would be necessary to apply both organic and inorganic manures. The pineapple plant has a high requirement of nitrogen and potassium, for successful growth. Its requirements of phosphorus is very little. Potassium can be applied as a basal dressing and as a side dressing every 6 months. Nitrogen can be sprayed along with insecticides once every month. Urea is the most easily absorbed form of nitrogen and it is compatible with insecticides used on pineapple. Urea is claimed to produce sweeter fruits.

Planting materials used for the propagation of pineapple are ratoons suckers, slips and crowns. Where very good clones are selected, stem segments and segments of crowns can also be made to produce planting material in skilled hands.

The varieties grown in Ceylon are the *Smooth Cayanne*, which is the popular canning variety. *Mauritius*, with the spiny leaves is used mainly as a fresh fruit. The popular canning varieties used in Malaysia are the *'Singapore red'* and *'Selangore green'*. These varieties are not as good as the *Smooth Cayanne* grown in Ceylon, Australia, and Hawaii, as they have deep eyes and produce smaller fruits. These two varieties produce fruits with a rich golden colour.

The planting material selected should be treated with appropriate insecticides to kill mealy bugs and other pests, and air dried before planting.

Problems encountered in growing pineapple in Ceylon are (1) Mealy bug induced wilt (2) Weed control (3) Condition called 'standout plants' (4) Over production during certain seasons and (5) Marketing.

Mealy bugs (*Desmicocus brevipes*), and (*D. neobressipes*) cause a disease condition known as 'wilt'. This disease causes the leaves to change into an orange brown colour. The leaves of affected plants wither, showing symptoms similar to those of very severe water stress. This condition is created by root decay of the pineapple plant. There is no treatment possible, once the plants have contracted the disease. It can nevertheless be prevented by (1) Planting healthy material (2) Treating all plant material

FIGURE 2

A productive field of Pineapple under Coconut

with insecticides before planting (3) Regular spraying (at least once in three months) with insecticides to control the mealy bug, (4) Spraying or dusting Aldrin to control the ants which transport the mealy bugs from diseased to healthy plants.

Mealy bugs can be controlled by spraying Sumithion, Folithion or Malathion.

Weed control is one of the most difficult and expensive operations on a pineapple plantation. The practice of coir dust mulching has been tried in the Colombo district with the object of weed control in view. It has no doubt proved successful in controlling weeds—though a somewhat expensive operation. Coir dust mulched areas however have shown a tendency to produce plants which fail to flower or delay to flower. Hand weeding is the other common practice in Ceylon as our labour is not so expensive as in other countries. Hand weeding has several disadvantages in that it

promotes soil erosion, and it has to be repeated frequently as weed fall in wet areas is heavy. It is also a relatively expensive item as weeding in pineapple areas is very hazardous.

Weedicides are commonly used in other countries, and our experimental work has also proved very successful. Chemicals in the groups of Monuron and Diuron, Amino-triazole and a product (supplied by M/s. A. Baur & Co.,) known as C 243, which contains Amino-triazole have been found very effective in weed control both as pre-and post emergence weedicides. The only limitation to the use of these chemicals is the foreign exchange component involved. Should the planting industry establish an export market in pineapple, then it would be possible to use a part of the earnings to import these chemicals and improve the efficiency of pineapple production in this country.

FIGURE 3

Harvesting the Crop

'Stand-out plants' which show a growth habit similar to the 2-4, D treated plants, have been observed in pineapple plantations in the Colombo district. These plants produce short leaves, and grow tall producing a thick stem. They sometimes flower late or may not produce fruits at all. This condition has been seen to be very serious in coir dust and paddy husk treated plots at the Walpita Farm, Negombo. During my study tour of the pineapple producing countries in the East, I noticed similar plants in Malaysia, and the Philippines. In Hawaii this condition is not common and in my discussions with the workers at the Pineapple Research Institute I learnt that it might be due to certain nutritional deficiencies or the growth habit of a mutant clone. This problem is now under investigation. It is hoped that a solution will soon be found.

Over-production during the peak periods can be reduced to a large extent by (1) adjusting time of planting (2) using different types of planting material (3) application of flower inducing hormones. By using these three methods it should be possible to extend the period of production over 4 months for each season.

Flower inducing hormones are very effective in promoting flowering when applied during the three months immediately preceding the natural flowering. For the production of average sized fruits, plants should have reached the 30-leaf stage at the time flower inducing hormones are applied.

Marketing, is a problem during the peak periods of production, as the organization for processing the fruit is very poor, and collection and transport facilities are hopelessly inadequate. This is largely because the Government is the main processing organization, and the indifference of the Government employees to efficiency. It is very essential to promote processing of fruits by the Private Sector, as commercial production cannot be done with the procedure, laid down for Government Departments.

Should the planting industry take up pineapple production on a commercial scale, it would then be possible to place this industry on a very sound economic footing. I hope that in order to compete in the world markets, Government would grant an export subsidy as it is done in Australia, for export of butter and dairy products. It is very unlikely that the pineapple industry in small holdings, and in backyard home gardens, would be sufficient to earn any foreign exchange. It is my view, that it should be organised on a plantation scale, as a strict commercial venture, so that the produce could be handled at the plantation itself, as they handle the other plantation produce.

Ceylon Pineapples are of relatively high quality, and with further work on selection, breeding, fertilizer use and better field practices it should be possible to improve their quality to a high level. This crop has not drawn the interest of the commercial plantations so far. In Hawaii, Malaysia, Philippines and Taiwan large plantation companies have been formed for growing this crop and they make very large profits indeed. In Ceylon with the very favourable soil and climtaic conditions we are endowed with, I reckon a very bright future for enterprising and intelligent investors in pineapple cultivation*.

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