GROWING COFFEE AS AN INTERCROP

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Coffee was a major plantation crop in Sri Lanka before tea, but the area has dwindled due to the coffee rust disease. With the introduction of varieties resistant to the rust disease and control methods, the area under coffee has increased gradually. Since the coconut small holders have experience in growing coffee, this has been popular as an intercrop.

Coffee can be marketed easily. A pound of coffee is about Rs.25/=. By growing improved coffee varieties, about 1½ lb of processed coffee could be obtained annually from a single bush. On the other hand, coffee as an intercrop can increase the coconut yield. This is brought about by effective weed control, incorporation of organic matter through the decay of fallen coffee leaves, desirable soil microbial activity and conservation of soil and moisture.

Subsidy for growing coffee

A subsidy of Rs.2125/= per acre is paid by the Coconut Cultivation Board in three instalments. Please contact the Coconut Development Officer of your area for further details.

Coconut Growing areas suitable for growing coffee

Districts of Colombo, Gampaha, Kegalle, Kalutara, Galle and Matara in the wet zone and A.G.A's Divisions of Polgahawela, Mawathagama and Dambadeniya in the Kurunegala district are suitable for growing coffee.

Selection of coconut lands suitable for growing coffee

(a) **Soil**- Sandy soils and clayey soils are not suitable. Loamy soils rich in organic matter are suitable. Well drained soils with good moisture holding capacity are the ideal soils. Soils with hard pan such as cabook are unsuitable.

(b) **Slope of the land** - Slopy coconut lands can be used for growing coffee since it reduces soil erosion. If the drainage is poor, the lower section of the slope should not be selected. The upper sections of the slope too should not be selected as these areas are subjected to moisture stress during drought periods.

(c) **Condition of the coconut plantation** - The coconut palms should be between 15 to 45 years. Young plantations and plantations that are too old are not suitable. If the density of coconut palms is high, the system of planting of coffee should be adjusted accordingly.

Suitable varieties and supply of planting material

The "Arabica" group with smaller and shiny leaves are not suitable for coconut lands. The "Robusta" group is recommended. The variety GCR is high yielding and suitable for coconut lands with fertile soil and good soil moisture status. Drought resistant strain CC- 1 is suitable for other coconut lands.

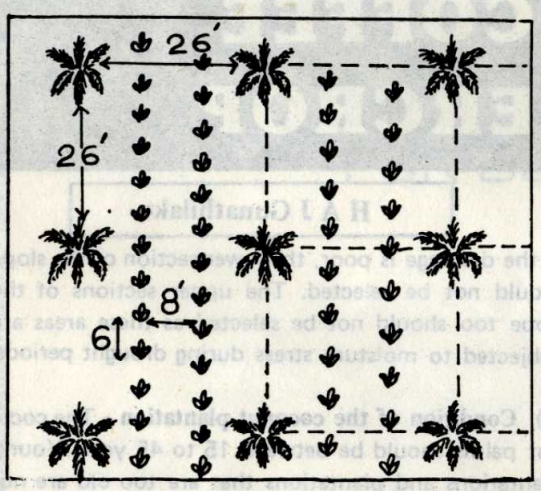
Remove coffee seeds from ripe fruits and dibble in rows with a spacing of 3 inches (7.5 cm). The seeds should be covered with sand to a depth of ½ inch and mulched with straw or dry grass. The nursery should be watered daily. The seeds will germinate in about four weeks. When the seedlings have developed two leaves, they should be planted in polybags of 6 x 8 inches (15 x 20 cm) filled with nursery soil. When these plants have developed 12 leaves, they are ready for transplanting in the field.

Coffee seedlings could be purchased from nurseries managed by the Minor Export Crops Department at the rate of 75 cts per seedling. These are also available in private nurseries approved by the Minor Export Crops Department.

Transplanting

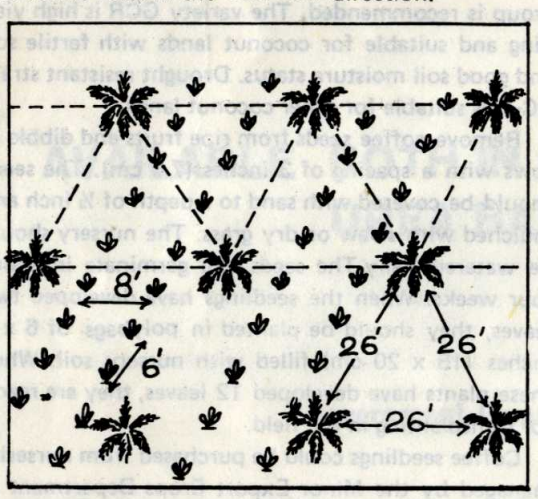
(a) **Marking planting holes and their preparation**

Two rows of coffee could be established between two rows of coconut. The spacing between the coffee rows should be 8ft (2.4 m) while the spacing bet-



In square planting of coconut

ween two coffee plants in the row should be 6ft (2.4 m). By marking planting holes in a triangular system, 525 coffee plants can be accommodated per acre (1300 coffee plants per hectare) (See diagram). Maximum sunlight for coffee can be had by aligning the coffee rows in the east-west direction.



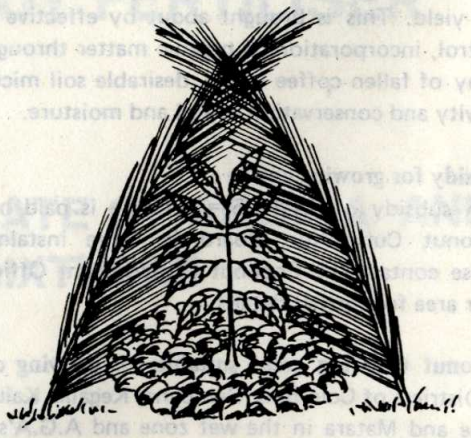
In triangular planting of coconut

If tractors and carts are used for field operations in the coconut land, leave a row of coconut every 4-5 coconut rows unplanted. Also, if coconut palms are of varying age or if the palms are planted irregularly an area of at least 8ft (2.4 m) from the palm should be left unplanted. The spacing between coffee plants should be 6 ft (2m).

The size of the planting hole depends on the nature of the soil. The planting hole in hard soils should be 2x2x2 ft (60x60x60 cm) while for sandy loam it should be 1½x1½x1½ ft (45x45x45 cm). Root development will be better in large planting holes, which will enable drought tolerance.

(b) **Planting**

The planting season is April-May or September-October with the commencement of the monsoon rains. April-May season is more suitable. Place a layer of coconut husks at the bottom of the planting hole, and fill it with a mixture of dry cow dung and top soil. Addition of 2 oz (50g) of rock phosphate will improve root development. The planting hole is filled with soil and cow dung mixture, leaving a depth of 3 inches from the ground level so that drying up of soil will be minimised. Coffee plants should be planted carefully, without bending the tap root, after removing the polybag.



Provide shade after planting

(c) **Mulching**: After planting coffee, place two pieces of coconut fronds in the east-west direction to reduce direct sunlight falling on the seedlings. The soil round the coffee plants should be mulched with coconut husks, dry grass or straw.(Vide diagram 2).

(d) **Filling vacancies**: At the time of planting coffee, an additional stock of seedlings should be maintained in order to fill the vacancies during the same planting season or in the next planting season so that a uniform coffee stand could be established

Maintenance of the coffee plantation

(a) **Management:**

Cow dung, compost or inorganic fertilizer could be used. The recommended inorganic fertilizer mixture contains 4 parts of Urea, 5 parts of Saphos phosphate, 3 parts of Muriate of Potash and 3 parts of Kieserite.

The fertilizer recommendation is as follows:

Manuring season	*lst year per plant*	*2nd year per plant*	*3rd year and thereafter per plant*
Yala Season	At the rate of 1.1oz (32 g) twice during the monsoon	4.4 oz (125 gm)	6.2 oz (175 gm)
Maha Season	At the rate of 1.1 oz (32 gm) twice during the monsoon	4.4 oz (125gm)	6.2 oz (175 gm)

As indicated in the table, fertilizer should be applied in four doses during the first year during the two rainy seasons. From the second year after planting the fertilizer is applied with the commencement of the monsoon rain.

From 3rd year and thereafter, composition of fertilizer mixture for 100 coffee plants for one manuring season is as follows:

	Lb	Kg
Urea (Nitrogen-46%)	12.1	5.5
Saphos phosphate (Phosphorus 28%)	14.0	6.5
Muriate of potash (Potassium 60%)	8.8	4.0
Kieserite (Magnesium 24%)	3.0	1.4

The recommended fertilizer is marketed in 5 kg packets by the Ceylon Fertilizer Corporation. Please contact the nearest Agrarian Services Centre or your Coconut Development Officer for your requirements of fertilizer.

Application of fertilizer according to the age

It is very important to apply fertilizer on a wet day. Careless application of fertilizer can cause the death, wilting or scorching of plants. During the first year, fertilizer should be applied about 6 inches (15 cm) away from the plant. From second year onwards it should be 1 foot away from the plant in a circle upto half the canopy radius (Vide diagram 3). After applying fertilizer it should be forked in lightly and area mulched with coconut husks.

The commonly observed yellowing of coffee leaves is caused by nitrogen deficiency. This condition could be corrected by spraying 1% urea solution onto the leaves. Zinc deficiency causes sickle-shaped leaves. This is corrected by spraying a solution of 1 lb of Zinc sulphate dissolved in 50 to 55 gallons of water (sufficient for one acre of coffee).

It is very important to apply fertilizer to coconut palms in addition to coffee as recommended by the Coconut Research Institute.

(b) **Weed control :**

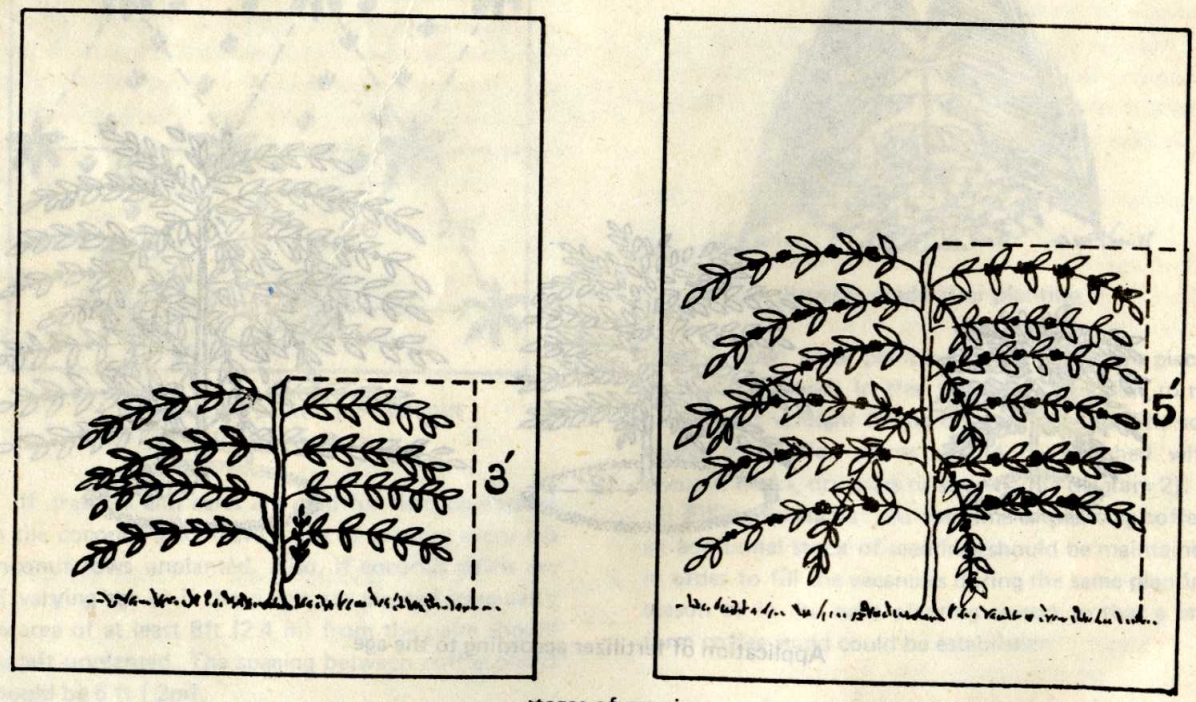
Clean weeding with mammoties is not recommended. Weeding around the plants is more popular than chemical or other methods of weed control. An area upto 3 ft (1m) around coffee plants should be weeded before manuring. Weeds in other areas should be slashed. Once the coffee is well established, weed growth will be reduced.

(c) **Pruning**

The robusta variety should be pruned to have a single stem.

Initially the plants are allowed to grow. Remove all water suckers. If the main stem is damaged for some reason (falling coconut fronds.) the lower most water sucker should be allowed to grow. Once the main stem has grown up to a height of 3 ft(1m), the terminal bud should be removed. At this height fruiting branches are produced. After several harvests, the main stem is allowed to grow further 2 ft.

The coffee plants should not be allowed to grow more than 5 ft. (Vide diagram). The fruiting lateral branches should be maintained. When these branches become weak after several years, they should be pruned, leaving only one node in the main stem to produce new branches. When the main stem has become weak it should be pruned a few inches above ground level to allow the growth of a water sucker. The cut end should be dressed with a suitable wound dressing.



stages of pruning

(d) Diseases and pest control

Diseases

Rust disease - Rust disease is caused by the fungus *Hemileia vastatrix*, under wet and humid conditions brown spots appear on the coffee leaves. Rust coloured pustules appear on the underside of these leaves. When touched, a rust coloured powder will get dislodged. When the disease is severe, leaf shedding will be seen, resulting in death of the plant.

However, the 'Robusta' variety is generally resistant to this disease. Proper spacing and pruning will reduce this disease. During the rainy weather the disease could be controlled by spraying a copper fungicide or 0.5% Bordeaux mixture (prepared by dissolving 500 g of copper sulphate and 500 g of slaked lime in 100 litres water separately and mixing together).

2. Sooty mould

This is a black mould which grows on the entire leaf surface. The productivity of the plant is reduced. Leaf shedding can also occur resulting in crop loss.

Mealy bugs spread this mould. Therefore a systemic insecticide should be sprayed to control mealy bugs.

Pests

1. Berry borer

The grubs of this insect bore into the coffee berries. As a result of this damage, empty seeds are produced. The damage is not very serious in the coconut growing areas. In order to prevent the spread of the pest the berries should be harvested before they are fully ripe. At the same time the fallen ripe berries should not be left under the coffee bushes. When the last coffee crop is being harvested during the coffee season, the remaining raw fruits should also be harvested to starve the pest and arrest the breeding of the pest.

If the pest damage is serious, insecticides should be used. When the berries are mature, insecticides will not give satisfactory results. The insecticides should be used when the berries are about the size of a greenpea. Any systemic insecticide could be used at the recommended rate.

2. Stem borer

This is found in the coconut growing areas. Once the mature coffee stems are bored by this pest, the bush will collapse. The infested fallen stems should be burnt and a systemic insecticide should be applied to the holes.

Harvesting of coffee

Coffee flowers two years after planting. Early flowering will weaken the coffee plant. They come to full bearing after 5 years. Generally, coffee could be harvested twice a year. The harvesting seasons are normally June-July and December-January, but these change with the rainfall pattern.

During the harvesting period, fruits are harvested several times. The ripe fruits are first subjected to pounding and subsequently sun dried. Once again they are pounded to remove the peel.

Under good management, the recommended coffee varieties give about 1½ lb of coffee per plant annually.

A well managed coffee plantation can last more than 20 years in a coconut plantation.