GINGER AND TURMERIC CULTIVATION IN COCONUT LANDS

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Ginger cultivation

According to the prevailing prices, ginger as a short term intercrop gives the maximum profit compared with other short term crops. Until recently, the local requirement of ginger has been met through imports from India. In the Gampaha district, ginger has been grown for a long time as a popular intercrop, specially in coconut lands. At present, ginger is cultivated on a large scale in areas such as Divulapitiya, Mirigama, Gampaha, Giriulla, Dambadeniya and Polgahawela.

Since ginger is a shade loving crop, it is suitable for growing in coconut lands.Most of the local ginger production is carried out in coconut lands.

Sri Lanka is not a major ginger producing country in the world. The major ginger producing countries in the world are India, China, Australia, Jamaica, Nigeria, Sierra Leon and Thailand. In addition to these countries Malaysia, Indonesia, Philippines, Mauritius, Burma, Brazil and Fiji grow ginger on a small scale. At present, even Sri Lanka could be considered as a small scale producer of ginger. Sri Lanka has recently exported small consignments of ginger but the exports could be further expanded. Therefore, it is essential to popularise ginger cultivation as an intercrop.

Areas suitable for ginger cultivation

Coconut growing areas in the wet zone are suitable for ginger cultivation. Accordingly, coconut lands in Colombo, Gampaha, Kegalle, Kalutara, Galle, Matara districts as well as areas like Polgahawela, Mawathagama and Giriulla in the Kurunegala district are suitable. If coconut lands in the intermediate zone (Bingiriya, Melsiripura, Dickwella) are selected, supplementary irrigation is required during the dry season.

Selection of coconut lands suitable for ginger cultivation

Special attention should be paid to the selection of land when ginger is to be cultivated.

a) Soil: Since ginger is a root crop, sand or clayey soil is not suitable. Loamy soils with organic matter are suitable. At present, ginger is grown to a very large extent on lands with gravelly soil in the wet zone. However the gravelly soil should be fairly fertile. Since ginger is sensitive to water-logging, lands with poor drainage should not be selected. Well drained lands with good water holding capacity during the dry season are suitable for ginger cultivation.

b) Slope of the land: Since tractors have to be used for tillage, coconut lands selected for growing ginger should not be too slopy. If moderately slopy lands are selected soil and moisture conservation measures such as opening contour drains and husk burying should be done prior to initial tillage for planting ginger.

C) Age of the coconut plantation:

1. Young plantations up to 5 years of age are not suitable as there is insufficient shade, as ginger is a shade loving crop. If such lands are selected for growing ginger, cassava or banana should be planted with wider spacing to provide shade.

11. Coconut plantations between 5-15 years of age-Since there is excessive shade in such plantations, these too are not suitable for growing ginger. In addition to this, drooping coconut fronds hinder tillage operations and ginger will also not receive the rainfall evenly.

111. Coconut plantations between 15-60 years of age - These plantations are suitable for growing ginger.

IV Lands with an underplantation - - Land selection for ginger cultivation under these conditions will depend on the availability of shade and the facilities for tillage.

Varieties of ginger suitable for planting

Although there are many varieties of ginger cultivated in the world, there are only two varieties in Sri Lanka, viz., the local variety and the Chinese variety.

a) The local variety: This is cultivated on a large scale and is used for local consumption. However, the rhizomes of the local variety are smaller compared with the Chinese variety. The crop is low. The ginger bushes are small but ginger is more pungent. Since this variety is popular for local consumption, it can absorb the price fluctuation in the foreign market.

b) THe Chinese variety: Growers refer to this as "Rata Inguru" (Foreign ginger). Vegetative growth of this variety is more vigorous than the local variety. A relatively higher crop is obtained. Lands with fertilie soil are required. Proper fertilizer is required for this variety unlike in the case of the local variety where fertilizer application is rare. This variety is selected mostly for export. Hence growers show interest according to the foreign demand.

Land Preparation

Ginger should be planted from March to April,but the best period is mid March. Accordingly, the land should be prepared 21 days prior to planting ginger having considered the rainfall. The land is prepared by digging with a mammoty or ploughing with a tractor to a depth of 25.0 cm (10 inc.). While preparing the land, special attention should be paid to the following:

a) Soil erosion should be minimized. Soil conservation measures should be adopted and ploughing should be done across the slope.

b) Ploughing should be avoided in an area 2.0 m around the base of the palm. Ginger is planted 2.0 m away from the base of the palm.

c) If tractors are used for ploughing, the soil should always be inverted in the direction of the palm. Inversion of soil so as to make a drain close to the palm should be avoided. The second tillage should be done 14 days after the first tillage. This is done with mammoties or harrowing with a tractor-mounted harrow. The operation will prepare the ground with a better tilth devoid of weeds, suitable for planting ginger

Planting

a) System of planting: There are three systems of planting.

1. Leave a space of 2.0 m around the palm and plant ginger. This system is especially suitable for flat lands. Growers generally follow this system of planting.

11. Planting across the slope in between coconut rows.

This system of planting is suitable for lands with a slope. As the soil in between ginger rows is left undisturbed and as there is naturally-occurring grass cover, soil erosion, is minimized in this system of planting. This method is suitable for lands where husk burying has been done according to the recommendations.

111. In addition to the above two systems, planting ginger in raised beds is popular among some growers. This system is suitable for lands with low drainage.

b) Spacing - A single ginger bush requires a land area of 1 sq.foot. By adopting this spacing, the first system will accommodate about 70,000 ginger bushes per ha. The second system will accommodate about 55000 ginger bushes/ha. (These densities have been calculated without considering drains etc).

c) Planting Material and their treatment - One of the main constraints in ginger cultivation is rhizome rot disease. Planting material should therefore be selected from disease-free crops. The first step in preventing disease is the treatment of seed rhizomes with the fungicide Ceresan. Prior to planting, the seed rhizomes should be immersed for 30 minutes in a 0.25% Ceresan solution. (Fungicides should be handled with care and gloves should be worn when dipping rhizomes) For replanting, the original mother rhizome should not be used.

The size of ginger piece used for planting is about 25.0 cm (1 oz). About 1200 kg of ginger is required to plant one hectare of coconut (500 kg per acre). For planting in between coconut rows the seed rate will be less (about 1000 kg per hectare of coconut). When Chinese ginger variety is used for planting, the seed rate will have to be increased.

d) Preparation of Planting holes - About 12.0 cm (5 inches) deep planting holes are prepared with mammoties. Add a small quantity of dry cow dung to each planting hole and place a piece of planting material and cover up. The seed material should then be covered with 5-8 cm thick layer of soil and pressed hard to prevent the loss of moisture.

Mulching the soil:

After planting, soil should be mulched to prevent soil erosion conserve soil moisture and specially to control weed growth. Dried straw, dried coconut fronds, and fibre dust can be used for this purpose.

a) Straw - This is used mostly and is the best material for a mulch.It is easy to obtain from the Maha season paddy harvest. Fifteen cart loads of straw will be required for one hectare of coconut. A 4 cm thick layer of straw is adequate.

b) Coconut fronds - This is a popular mulch. Coconut fronds should be placed with mid ribs facing upwards, after removing leaf petioles. The coconut fronds are not so efficient as straw in the control of weeds.

c) Fibre dust - Some cultivators use fibre dust as a soil mulch. During rainy season it tends to retain moisture excessively and this could lead to rhizome rot. Hence fibre dust should be used with some care. If fibre dust is used, a 5.0 cm thick layer is adequate.

Weed control: Weed control is necessary to get a successful ginger crop. Ginger plant will emerge through the mulch about one month after planting. Once all the ginger rhizomes have germinated, the weeds should be hand-weeded. Hand weeding should be done before each fertilizer application The ginger plots should be kept free of weeds.

Herbicides are not generally used in the control of weeds in ginger plantations. No information is available on the feasibility of using pre-emergent herbicides.

Manuring:

Ginger shows very good response to manure. Application of manure will result in a good crop. In ginger cultivation, organic as well as inorganic manures could be used. Trials have not been conducted locally to ascertain the nutrient requirements of ginger, but the following general guidelines could be given.

At the time of planting, several handfuls of well decomposed cow dung should be added as a basal dressing. As a top dressing, growers mostly apply the coconut fertilizer mixture. Generally, the dosage applied is as follows.

	Months after planting	Dosage per plant (in grammes)
a) First top dressing	1½	10.0
b) Second top dressing	3	20.0
c) Third top dressing	5-6	25.0

Fertilizer mixture should be applied in a circle 10 cm (4 inches) away from the plant.Fertilizer should be applied on a wet day.

In addition to ginger, fertilizer should be applied to coconut.

Diseases and pests:

Deseases:

a) Rhizome rot disease - Moulds known as *Pythium* cause this disease. This is a major disease of ginger and could cause severe damage.

The first symptom of the disease is the yellowing of leaf tips. The yellowing gradually extends along the margins. Thereafter, leaves drop.. Such plants can be easily pulled out. The rhizome gets rotten and a liquid with foul odour oozes out. The disease will be found in patches. The pathogen spreads rapidly during the rainy season. If diseased rhizomes are stored, the entire stock will get spoilt.

The most effective method of control is to abandon ginger cultivation for several years in lands where it is prevalent. The seed rhizomes should be selected from disease-free ginger crops for planting. Prior to planting, treatment of such seed material by immersing in a 0.25% Ceresan solution for 30 minutes will reduce the incidence of the disease.

If the disease is epidemic, the crop should be harvested quickly. When diseased ginger bushes are removed, a few healthy ginger bushes around them should also be removed. Application of fungicides such as Bordeaux mixture or systemic fungicides such as Benlate will control the disease.

b) Leaf Blight - This is caused by a mould. Only the leaves are affected. The leaves develop circular spots which later dry up and coalesce, resulting in large brown patches. This disease can retard the growth. When the disease first appears, the affected bushes should be uprooted and destroyed promptly. A copper fungicide should be applied.

Pests:

Pest damage is not significant. Caterpillars boring stem and rhizomes have been reported. Spraying of a systemic insecticide will control these caterpillars.

Rabbits cause damage to ginger at the time of germination. They cut the emerging ginger shoot. Vigilance and a protective enclosure are suggested. When the ginger crop is fully grown, the damage will not be serious.

Harvesting:

Ginger matures in nine months after planting. Growers generally harvest ginger from December to March, after taking the market price into consideration. On account of the drought prevailing in January and February, ginger rhizomes growing on the surface should be mulched with coconut fronds.

Ginger is harvested with mammoties. As far as possible, damage to rhizomes should be avoided. Harvested rhizomes should be cleaned by removing the soil and the roots.

Raw ginger is processed to make dry ginger. This is not done by growers but by people specialised in the trade.

Harvest and the income

The local ginger variety yields about 40 kg (84lb) of raw rhizomes from a coconut square. On this basis, 6½ tons of raw ginger could be produced from a hectare of coconut. The Chinese variety generally gives a higher yield.

The present market price of 50 kg of raw ginger is about Rs. 800-900. On this basis, an income of about Rs. 90,000 could be expected from a hectare of coconut in 9 months. When the planting cost is deducted, the nett income will be about Rs.60,000 per hectare of coconut (Rs.25,000/= per acre).

Growing ginger with other intercrops

Ginger can be successfully planted with other intercrops such as pineapple and passion fruit. Ginger could also be planted during the first two years where other perennial crops such as coffee, pepper and cacao have been established. Ginger could be grown in between rows of intercrops.

Crop Rotation

Ginger should not be grown continuosly in the same land for an extended period. Such practice will promote the incidence of rhizome rot disease and also lower the soil fertility status of the coconut land. Therefore ginger should be grown once in 3-4 years as a rotational crop.

TURMERIC CULTIVATION

Tumeric is an important short-term intercrop in coconut lands. Most of the turmeric production is consumed locally. The major turmeric producing countries in the world are India, Bangladesh, Jamaica, Sri Lanka, Taiwan, China, Burma and Indonesia. Sri Lanka imported turmeric upto 1972. Expansion of production has enabled us to meet our requirements locally.

Turmeric is a shade-loving plant and can be successfully grown under coconut. Most of the local turmeric cultivation is done as an intercrop in coconut lands. Gampaha, Mirigama, Giriulla and Polhgahawela are major turmeric producing areas. Income from coconut lands can be considerably increased by popularizing turmeric cultivation as an intercrop.

Areas Suitable for turmeric cultivation

Areas suitable for ginger are also suitable for turmeric cultivation. Turmeric can tolerate drought better than ginger and can therefore be grown in Nattandiya, Bingiriya, Hettipola and in other areas in the intermediate zone.

Selection of Suitable Coconut Lands

This is similar to the selection of lands for ginger. Turmeric can tolerate sunlight better than ginger, and can therefore be grown in lands where underplanting has been delayed.

Turmeric Varieties

Although a large number of turmeric varieties are grown in the world no selections have been made in Sri Lanka. A number of varieties are available locally.

Varieties which produce large tubers (rhizomes) are preferred, as the yield will be higher.

Land preparation and planting

These activities are similar to those in ginger cultivation. Each seed rhizome should be about 20 g (2/3 oz). Accordingly, about 950 kg of seed rhizomes are required for one hectare of coconut leaving an area of 2 m from the coconut palm (8 cwt/ 1 ac). If turmeric is cultivated between coconut rows only, the seed requirement is 750 kg/ha. The seed rhizomes should be treated with Ceresan (as in the case of ginger) before planting.

Mulching

Similar to ginger. As rhizome rot is less common in turmeric, fibre dust can be used for mulching.

Weed control and fertilizer

Similar to ginger.

Pests and Diseases

Diseases

Leaf Blight - This is caused by a mould. Only leaves are affected. Initially, pale yellow spots appear, which gradually enlarge and coalesce to become large, brown patches. Yield can be considerably reduced. Leaf blight can be controlled by the application of a copper-based fungicide and by crop rotation.

Other leaf diseases are rare and not important.

Pests

No pests of significant importance have been recorded. Occasionally, a stem borer is found. Stem borer damage causes plants to collapse. The stem also dries up.

The affected stems should be cut and burnt to control the pest. If the infestation is severe, application of a systemic insecticide is recommended.

Harvesting

Similar to ginger, the crop matures in nine months. The growers generally sell raw turmeric, which is processed by experienced people.

Income

About 40 kg (85 bs) of raw turmeric could be obtained from a coconut square. Accordingly, a hectare of coconut would yield about 6½ tons of raw turmeric.