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Pumphlet No. 9



# GINGER

## PACKAGE OF PRACTICES

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# GINGER

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### 1. Introduction

Ginger of commerce is derived from the dried underground rhizomes of *Zingiber officinale* Rosc., a herbacious perennial belonging to the family Zingiberaceae. The dried rhizomes are valued for their aroma, flavour and pungency. Ginger is used as a spice in culinary preparations, as a flavouring agent and also in various medicinal preparations.

India accounts for about 50 per cent of the world's ginger production and exports about 15 per cent of the produce to Middle East countries. During 1983-84 the country produced an estimated 1,03,030 tonnes of ginger from 46,760 ha. Other important ginger producing countries are China, Taiwan, Nigeria, Sierra Leone, Jamaica, Thailand and Australia. Ginger is being cultivated in almost all the states in the country and Kerala alone accounts for about 32% of the country's production. Himachal Pradesh, West Bengal, Orissa, Karnataka, Tamil Nadu, Andhra Pradesh and Gujarat are the other important ginger growing states.

### 2. Climate and Soil

Ginger grows best in a warm and humid climate. It is mainly cultivated in the tropics from sea level to an altitude of 1500 m and it can be grown over more diverse conditions than most other spices. Ginger can be grown both under irrigated and rainfed conditions. For successful cultivation of the crop, a moderate rainfall at the sowing time till the rhizomes sprout, fairly heavy and well-distributed showers during the growing period and

dry weather for about a month before harvesting are necessary. Ginger thrives well in a wide range of soil with good drainage like sandy or clay loam, red loam or lateritic loam soils. A friable loam rich in humus is ideal. However, it may not be desirable to grow ginger in the same site year after year.

### 3. Varieties

Several cultivars of ginger are grown in the different ginger growing areas in India. They are generally named after the localities or places where they are grown. Some of the more prominent indigenous types are Maran (Assam), Kuruppampadi, Ernad and Wynad Local (all from Kerala). A high yielding introduction Rio de Janeiro has become very popular among the cultivators. The following is a list of the more promising cultivars:

- High yielding types : Maran, Karakkal, Rio de Janeiro
- Less fibre content : Jamaica, Bangkok, China (Exotic types, good for green ginger)
- High percentage of oleoresin: Ernad Chernad, China, Karuppampadi, Rio de Janeiro
- High dry ginger recovery: Karakkal, Nadia, Maran
- High volatile oil : Sleeva local, Narasapattom, Ernad Chernad, Himachal Pradesh

### 4. Cultivation

#### 4.1 Season

The best time for planting ginger in the West Coast of India is during the first fortnight of May with the receipt of pre-monsoon showers. Under irrigated conditions, it can be planted well in advance during the middle of February or early March. Early planting with the receipt of good summer shower consistently gives higher yield.

#### 4.2 Preparation of land and planting

Preparation of land starts with the receipt of early summer showers. The land is to be ploughed 4 to 5 times or dug thoroughly to bring the soil to fine tilth. Beds of about one metre width, 15 cm height and of any convenient length are prepared at an inter-space of 40 cm in between beds. In the case of irrigated crops, ridges are formed 40 cm apart.

#### 4.3 Propagation

Ginger is always propagated by portions of the rhizomes known as seed rhizomes or setts. Carefully preserved seed rhizomes are cut into small pieces of 2.5-5 cm length weighing 20-25 g each having one or two good buds. The seed rate varies from region to region and with the method of cultivation adopted. In Kerala, the seed rate varies from 1500 kg to 1800 kg per hectare. At higher altitudes the seed rate may vary from 2000 to 2500 kg/ha. The seed rhizomes are treated with 0.3 per cent Dithane M45 (3g in one litre of water) for 30 min., drained and planted at a spacing of 15-20 cm along the rows and 20-25 cm between rows. The seed rhizome bits are put in shallow planting pits prepared with a hand hoe and covered with well rotten farm yard manure and a thin layer of soil and levelled.

#### 4.4 Manuring

At the time of planting, well decomposed cattle manure or compost at the rate of 25-30 tonnes per hectare is to be applied. It may be applied either by broadcast over the beds prior to planting or applied in planting pits at the time of planting. Application of neem cake at 2 tonnes per hectare helps in reducing the incidence of rhizome rot of ginger to an extent and increases the yield.

The recommended dosage of fertilizer to ginger is 75 kg N, 50 kg P<sub>2</sub>O<sub>5</sub> and 50 kg K<sub>2</sub>O per hectare. The fertilizers are to be applied in three split doses as detailed in Table below.

Fertilizer schedule for ginger in kg/ha.

Fertilizer	Basal application	After 40 days	After 90 days
N	—	37.5	37.5
P <sub>2</sub> O <sub>5</sub>	50	—	—
K <sub>2</sub> O	25	—	25
Compost/Cowdung	25-30 tonnes	—	—
Neem cake Powder	2 "	—	—

The beds are to be earthed up, after each top-dressing with the fertilizers.

#### 4.5 Mulching

Mulching the ginger beds with green leaves is essential to enhance germination and to prevent washing of soil due to heavy rain. It also adds organic matter to the soil and conserves moisture during the latter part of the cropping season. The first mulching is done at the time of planting with green leaves at the rate of about 10-12 tonnes per hectare. Mulching is to be repeated at the rate of 5 tonnes of green leaves per hectare at 40th day and 90th day after planting, immediately after weeding and application of fertilizers.

#### 4.6 After cultivation

Weeding is done just before mulching. One to three weedings are required depending on the intensity of weed growth. After the fifth month of the crop, there may not be any need for weeding. Proper drainage channels are to be provided when there is stagnation of water.

#### 5. Rotation and mixed cropping

Ginger is commonly rotated with other crops. The crops most commonly rotated with ginger in Kerala are tapioca, chillies, dry paddy and gingelly in rainfed areas, and ragi, groundnut, maize and vegetables in irrigated conditions. In Karnataka ginger is also cultivated mixed with ragi, red gram and castor. Ginger is also grown as an intercrop in coconut, arecanut, coffee and orange plantations.

#### 6. Harvesting and curing

The crop is ready for harvest in about eight months' time when the leaves turn yellow, and start gradually drying up. The clumps are lifted carefully with a spade or digging fork, and the rhizomes are separated from the dried up leaves, roots and adhering soil. The average yield of fresh ginger per hectare varies with the varieties ranging from 15 to 25 tonnes.

For making green ginger, harvesting is done from 6th month onwards. The rhizomes are thoroughly washed in water twice or thrice and are sun-dried for a day.

For preparing dry ginger, the produce is kept soaked in water overnight. The rhizomes are then rubbed well to clean them. After cleaning, the rhizomes are removed from the water and the outer skin is removed with bamboo splinters having pointed ends. The peeled rhizomes are washed and dried uniformly for one week. In order to get rid of the last bit of the skin or dirt, the dry rhizomes are rubbed together. To get good appearance peeled rhizomes are soaked in 2 per cent lime water for 6 hours and dried thereafter. The yield of dry ginger is 16-25 per cent of the green ginger depending on the variety and location where the crop is grown.

## 7. Preservation of seed rhizomes

In order to get good germination, the seed rhizome are to be stored properly in pits under shade. For seed material, big and healthy rhizomes from disease free plants are selected immediately after the harvest. For this purpose, healthy and disease-free clumps are marked in the field when the crop is 6-8 months old and still green. The seed rhizomes are treated with a solution containing 0.05 per cent Malathion and 0.3 per cent Dithane-M 45 for 30 min. Drain the solution and dry the rhizomes under shade. The seed rhizomes are stored in pits of convenient size in sheds. The pits of the wall may be coated with cowdung paste. The seed rhizomes are put in pits in layers along with well dried saw dust (ie. put one layer of seed rhizomes, then put 2 cm thick layer of saw dust). Sufficient gap is to be left at the top of the pits for adequate aeration. The pits can be covered with wooden plank with one or two small holes for aeration. Seed rhizomes in the pits need checking once in about twenty days by removing the plank and shrivelled and disease affected rhizome are to be removed. The seed rhizomes can also be stored in pits dug in the ground under shade. In some areas, the rhizomes are loosely heaped over a layer of sand or paddy husk and covered with dry leaves in a thatched shed.

## 8. Plant protection

### 8.1 Pests

#### 8.1.1 Shoot Borer (*Dichocrocis punctiferalis* Guen.)

The pest generally damages the pseudostem and some times rhizomes also. The pest incidence can be detected by the presence of holes on the pseudostem, frass thrown out of the holes and the yellowish withered central shoots (dead hearts). The affected central shoot comes out when pulled. The pest can be controlled by spraying

0.1 per cent Malathion from July to October at monthly intervals.

#### 8.1.2 Rhizome flies (*Mimegralla coeruleifrons*, *Eumerus* sp.)

The maggots of these two flies bore into the rhizome and feed on the internal content. These maggots are seen predominantly in rhizome rot affected fields. The adult flies lay eggs in the soil around the rhizome. The pest can be controlled by spraying 0.05% methyl parathion at monthly intervals from July onwards. Two to three sprayings will control the pest.

#### 8.1.3 Leaf roller (*Udaspes folus* C.)

The caterpillar folds the leaf and feeds from within. The pest can be controlled by spraying 0.1 per cent carbaryl or 0.05 per cent dimethoate/phosphamidon.

#### 8.1.4 Scales (*Aspidiella hartii* C.)

The pest causes damage to ginger rhizomes under field as well as under storage conditions. They suck sap from the rhizomes as a result of which the rhizomes shrivel and dry up. The pest can be controlled by dipping the seed rhizomes in 0.05 per cent Malathion or dimethoate at the time of planting/storing seed rhizomes.

## 8.2 Diseases

### 8.2.1 Soft rot (*Pythium apahanidermatum*)

It is the most destructive disease which results in total loss of the affected clumps. Disease symptoms appear as light yellowing of the tips of lower leaves which gradually spreads downwards to the leaf blades. In the early stages the middle portion of the leaf remains green while the margin becomes yellow. Yellowing spreads to all leaves of the plants from bottom upwards and is followed by drooping, withering and drying. The collar region of affected pseudostem becomes water soaked and rotting spreads to the rhizome resulting in typical soft rot of the rhizomes. Lack of drainage and continuous

dampness of the field predispose the plant to disease. The disease spreads through seed rhizomes and soil. Control measures include provision of adequate drainage in the field, selection of disease free seed rhizomes, treating the seed rhizomes with 0.3 per cent Dithane-M 45 for 30 min before storage and before planting, drenching the beds with the same fungicide or cheshnut compound 0.3% or captafol 0.1%. Once the disease is located in the field, careful removal of the affected clumps and drenching the affected and surrounding beds with the above mentioned fungicides would check the disease spread.

#### 8.2.2 Bacterial wilt (*Pseudomonas solanacearum* EF. Sm)

The first conspicuous symptom is mild drooping and curling of leaf margin of the lower leaves which spread upwards. Yellowing starts from lower-most leaves and gradually progresses to the upper leaves. In the advanced stage the plants exhibit severe yellow and wilt symptoms. The collar region of the pseudostem becomes water-soaked. The vascular tissues of the affected pseudostem shows dark streaks. In the initial stages the disease can be controlled by treating the seed rhizomes with 200 ppm of any one of the antibiotics like Streptomycin/Plantomycin/Agrimycin. In advanced stage the diseased clumps should be immediately removed and destroyed and the area should be drenched with 200 ppm of antibiotics or 1% Bordeaux mixture.

#### 8.2.3 Leaf spot (*Phyllosticta zingiberi*)

The disease appears as small oval to elongated spots on leaves. The spots are white and papery at the centre of which a dark brown margin surrounded by yellow hallow appears. The disease incidence is severe when ginger is grown under exposed conditions. This can be controlled by spraying 1% Bordeaux mixture or 0.2% Dithane-M 45.

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