

PACKAGE OF PRACTICES – GINGER



KERALA AGRICULTURAL UNIVERSITY- PACKAGE OF PRACTICE

GINGER (*Zingiber officinale*)

Ginger is a tropical plant adapted for cultivation even in regions of subtropical climate such as the high ranges. It prefers a rich soil with high humus content. Being an exhausting crop, ginger is not cultivated continuously in the same field but shifting cultivation is practised. The crop cannot withstand waterlogging and hence soils with good drainage are preferred for its cultivation. It is shade tolerant / loving crop with shallow roots and therefore suitable for intercropping and as a component in the homesteads where low to medium shade is available.

Preparation of land

Clear the field during February-March and burn the weeds, stubbles, roots etc. *in situ*. Prepare the land by ploughing or digging. Prepare beds of convenient length (across the slope where the land is undulating), 1 m width, 25 cm height with 40 cm spacing between the beds. Provide drainage channels, one for every 25 beds on flat lands.

Varieties

Dry ginger type: Cultivars: Maran, Wayanad, Manantoddy, Himachal, Valluvanad, Kuruppampady.

Improved varieties: IISR-Varada, IISR-Rejatha and IISR-Mahima.

Green ginger type : Rio-De-Janeiro, China and Wayanad Local

Dual purpose type: Athira (tolerant to rhizome rot and bacterial wilt).

Rio-De-Janeiro and Karthika (tolerant to rhizome rot and bacterial wilt).

Planting

material

- a. Select sites having proper drainage.
 - b. Select seed rhizomes from disease free areas.
 - c. Treat seed rhizomes with 0.3 per cent mancozeb.
 - d. When incidence of rhizome rot is noted in the field, dig out the affected plants and drench the beds with cheshunt compound or 1.0 per cent Bordeaux mixture or 0.3 per cent mancozeb.
 - e. Inoculation with native arbuscular mycorrhiza, *Trichoderma* and *Pseudomonas fluorescens* at the time of planting is recommended as a biocontrol measure.
3. For controlling the leaf spot disease, 1 per cent Bordeaux mixture, 0.3 per cent mancozeb or 0.2 per cent thiram may be sprayed.
 4. For control of nematode in endemic area, apply neem cake @ 1.0 t ha⁻¹ at planting followed by application of neem cake @ 1.0 t ha⁻¹ at 45 days after planting (DAP).

Harvesting and processing

For vegetable ginger, the crop can be harvested from sixth month onwards. For dry ginger, harvest the crop between 245-260 days. After harvest, the fibrous roots attached to the rhizomes are trimmed off and soil is removed by washing. Rhizomes are soaked in water overnight and then cleaned. The skin is removed by scrapping with sharp bamboo splits or such other materials. Never use metallic substances since they will discolour the rhizomes. After scrapping, the rhizomes are sun dried for a week with frequent turnings. They are again rubbed well by hand to remove any outer skin.

Ginger oil

Ginger oil is prepared commercially by steam distillation of dried powdered ginger. The yield of oil varies from 1.3 to 3.0 per cent. The major use of ginger oil is as a flavouring agent for beverages, both alcoholic and non-alcoholic.

Ginger oleoresin

Oleoresin from ginger is obtained conventionally by extraction of dried powdered ginger with organic solvents like ethyl acetate, ethanol or acetone. Commercial dried ginger yields 3.5-10.0 per cent oleoresin. Ginger oleoresin is a dark brown viscous liquid responsible for the flavour and pungency of the spice.

Package of Practices for Cultivation of Ginger

Botanical Name: *Zingiber officinalis*

Family: Zingiberaceae

Origin: South - East Asia, India

Area and Production of Ginger:

Ginger is an important spice crop of India and accounts for 45 % of the world's ginger production. It is mainly grown in Kerala and on a very small area in Karnataka, Tamil Nadu, West Bengal, Bihar, Himachal Pradesh, Uttar Pradesh and Maharashtra. The area under cultivation in India is about 63,000 ha with a total production of about 2 lakh tones. The average productivity is about 3 tones/ha:

Importance of Ginger:

1. Used as a spice on a large scale.
2. Used in the preparation of medicines and confectionaries. Flavor of ginger is due to zingiferine. Pungency of ginger is due to zingirone.

Soil:

1. Deep, well-drained, friable, loamy soil, rich in humus is ideal for ginger.
2. Crop does not thrive well in alkaline soil.
3. It is not desirable to grow ginger in the same field year after year.

Climate:

1. Tropical crop requires warm and humid climate.
2. Grows well in areas with annual rainfall between 125 to 250 cm.
3. Cultivated up to 1500 m above sea level.
4. Cool and dry climate is best for rhizome development.
5. Shade loving plant and requires ample moisture for normal growth.

Varieties:

Several cultivars are grown and are known by the particular area of the locality. The important cultivars are:

- High Yielding Types** : Maran, Karakkal, Rio de Janeiro, Mahim
- Less Fiber Content** : Jamaica, Bangkok, China Thingpuri (Exotic good for green ginger)
- High Oleoresin** : Emad Chemed, China, Karuppamadi, Rio de Janeiro
- High Dry Ginger Recovery** : Karakkal, Nadia, Maran, Tura.
- High volatile oil** : Sleeva local, Narasapattam, Emad.Chemad.

Land

Preparation:

- 1) Land is ploughed 2 times (crosswise) in summer (March - April) to a depth 15 to 22 cm
- 2) Exposed clods are crushed with Norwegian harrow.
- 3) 3-4 crosswise harrowing are given to make soil loose and friable.
- 4) Temporary ridges are opened to prevent soil erosion on slopy lands.
- 5) 15 tons of FYM/ha is applied before last harrowing,

For raising rainfed crop, land is divided into raised beds of 1 m width and of convenient length varying from 3 - 6 m and 15 cm height with spacing of 30 cm between beds for drainage channel.

On hill slopes, (he beds are formed along the contours. Ginger is planted in shallow pits in rows 25 cm apart and at a distance of 15-20 cm within the rows.

In case of irrigated crop, ridges 40-45 cm apart are opened. Planting is done in shallow pits on top of ridges at a distance of 22-30 cm.

Propagation:

Ginger is propagated by using portions of mother rhizomes called as sets. Each healthy set to be used for planting should be 2.5 to 5 cm long, weighing 20-25 g and having two or three buds each. The seed rhizomes should be treated with Dithane M-45 @ 3 g per liter of water for 30 minutes, drained and then used for planting.

Seeds and Sowing:

a) Selection of Planting Material:

- 1) Select healthy rhizomes free from diseases (rhizome rot and leaf spot) and pests (rhizome fly).
- 2) Sprouted rhizomes are broken into pieces keeping 2-3 sprouted eye buds on each rhizome.
- 3) Each piece should be 2.5-5 cm long and 20-25 g in weight.

b) Time of Planting:

- 1) Ginger can be planted from start of May up to middle of June.
- 2) 2nd forth night of May is found to be the best time for planting of ginger.
- c) Seed rate: 1500 kg/ha mother rhizomes is the recommended seed rate for Maharashtra.

d) Preparation of Seed Material:

- 1) For planting on 1 ha area, 1500 kg rhizomes free from pests and diseases are selected 1 1/2 month before planting.
- 2) These rhizomes are treated with 25 % agallol and Macrotophos for 30 minutes for control of rhizome fly.
- 3) Treated rhizomes are stored in trenches prepared under shade. The trenches are bottoms-lined with dry leaves/straw. Rhizomes are spread on this arid are again covered with dried leaves / straw. This helps to control moisture loss and improves germination percentage.
- 4) During this period there is 30-35 % loss of weight in the rhizomes.

Methods of Planting:

- a) Ridges and furrows - 75 cm apart for irrigated crop.
- b) Hat bed method - 20-30 x 20-30 cm (25 x 22.5 cm)
- c) Raised beds - 30 x 30 cm.
- d) New improved Technique- Planting is done by broad ridge method (75 cm broad, 20-30 cm high and 30 cm apart).

Pre-sowing irrigation is given and planting is done at 'Wapsa' condition. During planting, the tip of eye buds should face upwards. The rhizomes are planted at a depth of 5 cm.

The researches at Kerala, M.P.K.V. Rahuri and Borgaon (Satara) have shown that planting on flat beds gives better yields.

Manures and Fertilizers:

Sr. No.	Time of application	F.Y.M. (ton/ha)	N (kg/ha)	P ₂ O ₅ (kg/ha)	K ₂ O (kg/ha)
1.	Preparatory tillage	15	-	-	-
2.	At planting	15	60	50	50
3.	45 days after planting	-	50	-	-
4.	120 days after planting	-	40	-	-
	Total	30	150	50	50

Irrigation:

- 1) First light irrigation is given immediately after planting.
- 2) Subsequent irrigations are given at 10 days intervals.
- 3) Total -16-18 irrigations-
- 4) Water requirement of crop is 90-100 ha cm.

Inter Culturing:

a) Mulching:

It is followed in rain fed crop to prevent weed growth, for protection from sun, preventing evaporation losses, to maintain soil temperature for protection from heavy rains and for consequent enhancement of organic matter.

b) Shading:

Seeds of cluster bean, pigeon pea or castor are sown in irrigation channels on the corner of raised beds for shade.

c) Weeding:

- 1) The plot is kept clean by hand weeding during first 4 - 6 weeks.
- 2) Depending upon intensity of weeds, 5-6 weeding are given to have better yield.

d) Earthing -up:

The soil around the plants is worked with the help of *khurpi* in the first week of September. It helps to break the fibrous roots and thereby supports new growth. The soil near the rhizomes becomes loose and friable and helps in proper development of rhizomes.

Harvesting:

- 1) For green ginger, harvesting is done 210-215 days after planting.
- 2) For curing purpose, harvesting is done 245-260 days after planting when the leaves start yellowing and pseudo stem begins to dry.
- 3) The rhizomes are lifted either with digging fork or using *kudali* and are cleaned-off the roots and adhering soil particles.

Yield:

10-15 tons/ha green ginger (Green rhizomes). If there is a market glut at the time of harvesting, irrigation is continued instead of harvesting at an interval of 8-10 days. At the end of April sprouting is seen. Manures and fertilizers are applied as per recommendations and harvesting is done in the month of August, In this case, average yield obtained is about 30 to 40 t/ha.

Yield of Cured Ginger - 15-20 % of fresh produce.