**Bitter gourd**

a. **Name of crop** – Bitter gourd

b. **Common names** – Karela (hindi); Karala (Marathi),

c. **Scientific name** - *Momordica charantia* L.

d. **Family** - Cucurbitace

e. **Mostly grown in**: Kerala, Karnataka, Tamilnadu etc...

f. **Importance** –

   The immature fruits and tender vine tips are used in a variety of culinary preparations. The fruits and shoots are soaked in salt water to remove some of their bitterness and then boiled, fried or pickled. The fruit of bitter gourd fruit is similar in nutritional value compared to other cucurbits, with the notable exceptions that it is much higher in folate and vitamin C.

   parts used: fruit, seeds, seed oil, leaves; uses: antidiabetic, antiinfective, antipyretic, anthelmintic, laxative, possible antifungal, androgenic, antiviral, antimalarial actions; possibly useful for infertility; precautions: pregnancy, lactation, children, patients taking hypoglycemic medications; may cause uterine bleeding or contractions, hepatotoxicity; seeds are toxic to children.

g. **Cultivation** – In pit sow two or three seeds per hole at a depth of 2 cm. Space holes 40–60 cm apart in pit spaced 1.2–1.5 m apart.

h. **Soil and climate**

   a. **Soil** - Well drained, loamy soil,
      - pH 6.5 – 7.0

   Climate:
      - Tropical and subtropical regions
      - Warm and dry weather with 300c-350c temperature is optimum

b. **Season and months**:

   In South India: Jun - Jul, Dec – Jan
   North India: Jan – Feb.

c. **Varieties**:

   Varieties in Kokan: Arka harita, Co1, Hirkani, Konkan Tara, 1, Phule Green Gold, Phule Priyanka, Phule Ujwala Preeti, Priya, Kalyanpur Barmasi, Pusa Do Mausami, Pusa vishesh, MDU 1, Coimbatore long, etc...

d. **Methods of cultivation**:

   Make a Pit: 45 cm × 45 cm × 45 cm

   The Long channels should be in size of 60 cm wide

e. **Seed rate** – In Pits: 4 – 4.5Kg/ha

   In polybags – 2.5 – 3.0 kg/ha then transplant in pits

f. **Spacing**: It should be Row to row: 1.5 – 2.0m

   Ridges to Ridges: 1.0m

g. **Land preparation** - dig out the pits in the land at recommended space then add well rotten farm yard manure in it.

h. **Seed treatment** - Application of Azospirillium + Phosphobacteria to improve yield and quality of fruit.

i. **Sowing / planting Pre-planting**: seeds in water 24 hr and kept in moist gunny bags.

   - Direct sowing 4 – 5 seeds in each pit
- After germination 2 – 3 retained in each pit
- For planting 15 day old seedlings directly planted @2 seedlings.
- Preparation of pendal
- Training the vines are allowed to spread on bower made from bamboo sticks.
- Spraying of MH (150 – 200 ppm) or Ethrel (250 ppm)
- 1st spray- two expanded true leaves
- 2nd spray- 2 times at weekly intervals for increase production of female flowers

Training the vines are allowed to spread on bower made from bamboo sticks.

j. Pruning : Bitter gourd develops many side branches that are not productive. To improve yield, remove lateral branches until the runner reaches the top of the trellis. Leave 4–6 laterals and cut the tip of the main runner to induce early cropping. Removal of lateral branches in the first 10 nodes has a positive effect on total yield.

Without pruning, most of the female flowers occur between the 10th and 40th nodes, or at a height of 0.5–2.0 m.

k. Fertilizer Management: Bitter gourd requires a balance of nutrients from organic and chemical fertilizers. Fertilizer application rates depend on soil type, fertility level, and soil organic matter.

Chemical fertilizers –
- N:20kg
- P:30kg
- K:30kg
- Last dose of N 20 kg/ha give 40 days after sowing
- Application Methods - Fertilizers are applied in several ways like ring method.

i. Interculture operations

a. Thinning gap filling - Thinning & gap filling is done for keeping 2 healthy seedlings per spot. The gap filling is done in missing areas of the planted main field to maintain optimum population.

b. Water management - Immediately after sowing/planting.
   - Irrigated once a week depending on soil moisture.
   - Drip irrigation should be prefer than flood irrigation.

c. Earthing Up - It is the process of putting the earth or soil just near the base for certain crops to give support to the plants.

d. Crop protection –

High Temperature: Mosaic diseases
Damage: It causes to produce more male flowers and plants prone to mosaic diseases
Management: Spraying of MH (150 – 200 ppm) or Ethrel (250 ppm)
   1st spray- two expanded true leaves
   2nd spray- 2 times at weekly intervals for increase production of female flowers

Rust (Ravenelia emblica)
Damage: affected fruit drop off prematurely
Management:
   1. wettable sulphur / chlrothalonil 2 g/litre.
   2. Bitteranol 1 g/litre during December
e. Weed management- Weeding is the process of eliminating competition of unwanted plants to the regular crop in respect to nutrition and moisture. So that crops can be grown profitably. It also facilitates other operations like irrigation and fertilizer application. The advantages of weeding are Conservation of soil moisture and reduced competition for nutrients, sunlight, space and water.

j. Harvesting & post harvest processing

**Method of harvesting** - The Bitter gourd fruits are harvested when they are immature; the fruits are harvested when they reach marketable size. Although the fruit is harvested before it fully ripens, it should be allowed to attain a good size and colour. They should be firm, and the outside color glossy green. Its surface should not lose its bright and glossy appearance. At harvesting, the calyx and stem-end are left attached to the fruit. Large, round varieties should be handled with care. Over mature fruits are spongy and seedy.

**Production** - At tender stage, immature stage

- Fruits are washed and dried after harvesting
- Yield average is 100-150q/ha.

k. Post harvest processing –

**Packaging:**

- Neatly arranged in bamboo basket/plastic crate on newspaper

**Products:**

- Preparation of Bhaji
- Preparation of mung-karela wada

**Market availability:** Bitter gourd are sold for distant as well as for local markets, because the fruits do not keep well, they are stored only for incidental movement to market.