

HEALTH BENEFITS

- ❖ Tender frites used for culinary purpose in kitchen for different dishes.
- ❖ Due to easy digestibility good for patients of heart diseases, digestive problems and malaria.
- ❖ Fully ripe dried fruits of Bottle Gourd have large fibrous portion used in brushes, pad potholders, mats, pillows and filters.
- ❖ Oil extracted from seeds is cure to cutaneous complaints.
- ❖ Leaf juice is effective against diabetes and hemorrhoids.
- ❖ Fresh juice of leaves is dropped into the eyes of children in granular conjunctivitis.

CAUSES OF LOW YIELD IN BOTTLE GOURD

- ❖ High temperature
- ❖ High pest load in environment
- ❖ Poor quality water
- ❖ Low fertility and low drainage
- ❖ Inappropriate pH
- ❖ Poor production technology
- ❖ Improper weed management
- ❖ Inefficacy of pesticides



GROWTH AND DEVELOPMENT

- ❖ Flowers open in the early morning.
- ❖ Pollination is by insects.
- ❖ *Bottle Gourd* is self-compatible and natural propagation is by seed.
- ❖ At maturity, the operculum of the fruit opens and frees the seeds which are carried by wind, though not over long distances

PROPAGATION AND PLANTING

- ❖ Propagation is by seed. The 1000-seed weight is 70–100 g.
- ❖ In cultivation the seeds are saved from the previous crop. Seeds of hybrid cultivars should not be collected for planting.
- ❖ Germination is best at temperatures of 20–30°C.
- ❖ Plantations can be established by direct sowing or transplanting.
- ❖ *Bottle Gourd* is usually planted 1 m apart.

CLIMATE

- ❖ Subtropical vegetable and requires hot and humid climatic conditions for its fast growth and higher yield.
- ❖ Slightly wet to semi dry ecological condition is suitable for this crop
- ❖ Night and day temperature of 18-22⁰C and 30-35⁰C respectively is optimum for its proper growth and high fruit set.
- ❖ The seed germination is fast at the temperature range of 25 -30 ⁰C
- ❖ The crop grown at optimum temperature has higher proportion of female flowers and fruits/Plant

SOIL

- ❖ Grown on all types of soil if it is not too much acidic or saline and alkaline .
- ❖ Loam or sandy loam soil is most suitable.
- ❖ The Soil should be rich in organic matter and with good drainage.
- ❖ Two year crop rotation is advised to safeguard the crop from soil born



SEASON OF PLANTING

- ❖ Successfully grown during January –March.

Seed Rate

- ❖ 1-2 Kg/Acre

Sowing

- ❖ Two to three seeds are sown per pit.

Remove unhealthy plants after two weeks and retain one plant per pit.

Trailing can be done either on pandals or on the ground.



WEED CONTROL

- ❖ Being a shallow rooted crop only light inter cultural operations are done.
- ❖ Weeding and hoeing should be done along and between the rows.
- ❖ Application of Nitrogen and earthing up should done before emergence of tendrils
- ❖ Tall grass growing above the foliage should be pulled up.
- ❖ Apply weedicides like Butaclor (2kg / emergence spray .



IRRIGATION

- ❖ In February-March sown crop first irrigation is given 2-3 days after sowing.
- ❖ Light irrigation at 4-6 days interval in summer season.
- ❖ Moisture stress during critical stages can reduce yield severely.

Critical Stages:

1st true leaf initiation

Flowering

Fruit / Seed Setting

NUTRIENT MANAGEMENT

- ❖ Add farm yard manure @ 30 tones/ha at the time of field preparation.
- ❖ Application of 75 kg urea and 200 kg single super phosphate per hector at the time of final field preparation .
- ❖ Apply another 75 kg urea per hectare in 2-3 split doses at the time of vining and initial fruit set.
- ❖ Total P & K and one third of Nitrogen can be applied basally about 8-10 cm away from the seeds.
- ❖ Nitrogen deficiency causes yellowing of vine and foliage and checks the vegetative growth.
- ❖ Whereas the excess dose promote excess biomes accumulation which reduces-fruiting and produce more number of male flowers which is undesirable
- ❖ Deficiency of K reduces plant height and area of foliage causing flower drop and checks the fruiting.

INSECT MANAGEMENT

Following are the major insects attack Bottle Gourd

❖ Red pumpkin beetle

❖ Red spider mites

❖ Fruit Fly

❖ Aphids

RED PUMPKIN BEETLE

Damage

- ❖ It feeds on the roots and underground portion of host plants and fruits touching the soil.
- ❖ The infested portion start rotting due to secondary infection by saprophytic fungi and the unripe fruits of such vines dry up.
- ❖ Infested fruits become unfit for human consumption.
- ❖ Adult beetles feed on leaf lamina making irregular holes.
- ❖ They prefer young seedling and tender leaves.



CONTROL

- ❖ As insects pupate in the soil, deep ploughing soon after the crop exposes and kill grubs and pupae.
- ❖ Apply Furadan 3G Granule 3-4 cm deep in soil near base of germinated seedlings.
- ❖ Collect and destroy of beetles in early stage of infection.
- ❖ Spray Endosulphan and Malathion @ 2 ml /liter of water for effective control.
- ❖ Dusting with 5% Malathion @ 10kg/ha

FRUIT FLY

Damage

- ❖ The maggot burrow in to the fruits and suck the sap.
- ❖ Infested fruits decay and drop.
- ❖ The fly mainly prefer tender fruits for egg laying.
- ❖ Ovipositional punctures caused by adults also cause injury on fruits and fruit juices oozes out.
- ❖ This also results in distorted and malformed.

- ❖ The maggots feed on the pulp of fruits as well as on the immature seeds and cause premature dropping of fruits



Dacus punctatifrons male (IAMU/CIPE 1292 ex *Peperomia vogelii*)
[© R.S. Copeland 2005]

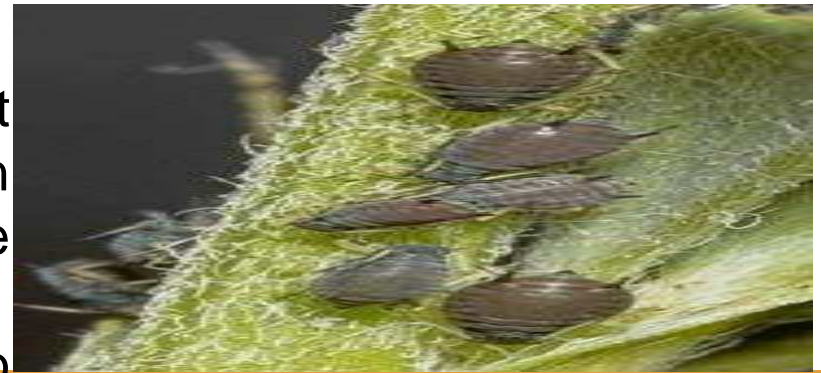
CONTROL

- ❖ Collect and destroy infested fruits.
- ❖ Cover developing fruits with paper or polythene cover immediately after anthesis and pollination.
- ❖ Maize plants grown in rows at a distance of 8-10cm in cucurbit field is effective as flies rest on such tall plants.
- ❖ Soil incorporation of seven dust /85 can be made in fruit fly endemic areas.
- ❖ Spraying of Cypermethrin/Chloropyriphos@ 2 ml/liter of water at fortnightly intervals.
- ❖ Deep ploughing to expose hibernating stages

APHIDS

Damage

- ❖ The affected parts turn yellow, get curled, wrinkled and deformed in shape and ultimately dry and die away.
- ❖ Fruit size and quality is also reduced.
- ❖ The aphids also exude copious quantity of honey dew on which sooty mould develops in turn hinder the photosynthetic activity of the vines, resulting in stunted growth.
- ❖ The fruits covered by sooty mould look unattractive and lose their market value



Control

- ❖ The affected plants have to be uprooted and destroyed to prevent the spread of the disease.
- ❖ Spray Malathian @ 2 ml or Advantage @ 2.5ml or Bifenthrin @ 3 ml/of liter of water at the fortnightly intervals

DISEASE MANAGEMENT

Following are the major diseases of Bottle Gourd

- ❖ Downy Mildew
- ❖ Powdery Mildew
- ❖ Alternaria blight
- ❖ Mosaic
- ❖ Collar rot

DOWNY MILDEW

Identification and Damage

- ❖ Water soaked lesions appears on under surface of leaf lamina.
- ❖ Angular spots appears on upper surface similar to water soaked lesions.
- ❖ Lesions appear first on the older croon leaves and progressively on the younger leaves.
- ❖ As the lesions expand, they may remain yellow or become dry and brown.
- ❖ Affected vines do not set fruit properly.



Control

- ❖ Plucking and destroy of affected leaves.
- ❖ Use resistant cultivars.
- ❖ Spray Dithane M-45 or Redomil gold on under surface of leaves.
- ❖ Crop rotation and sanitation reduces the severity of the disease

POWDERY MILDEW

Identification and Damage

- ❖ White to dirty gray spots or patches appears on leaves which become white powdery as they enlarge.
- ❖ A white powdery coat of fungal growth appears on the leaf surface, generally on upper surface but sometimes also on lower surface and on stem.
- ❖ The affected leaves become yellow and later on fall down.
- ❖ The vines do not set fruits properly.
- ❖ Powdery coating covers entire vine plant parts and causes defoliation



Control

- ❖ Fortnightly spray of Antracol or Carbendazim or Topsin M.
- ❖ Use sulphur dust @ 15 to 20 Kg/ha.
- ❖ Spray 0.3% solution of Wettable Sulphur such as Sulfex etc.

ALTERNARIA BLIGHT

Identification and Damage

- ❖ Yellow spots appears on leaves which turn brown and finally turn black on aging.
- ❖ They usually start from margins and produce concentric rings.
- ❖ Severely affected vines look like burnt charcoal.



Control

- ❖ Use disease free seeds.
- ❖ Adopt clean cultivation and crop rotation cultural practices are adopt for prevention of disease.
- ❖ Spray of Copper oxychloride @ 0.25% at 10-15 days intervals.

MOSAIC

Damage

- ❖ In infected plants, the younger leaves unfold very late show complete chlorosis following by green vein banding.
- ❖ The older leaves exhibit prominent dark green raised blisters.
- ❖ The malformed leaves assume a filiform shape.
- ❖ Mosaic mottling, curling and twisting of leaves, shortening of internodes, stunted growth are common symptoms of mosaic.
- ❖ Vegetative growth, flowering and productivity are also adversely affected.
- ❖ Severely affected vines do not set fruit



Control

- ❖ Use healthy seed.
- ❖ Treat the seed with hot air (70°C for days) or hot water treatment (55°C for 60 minutes).
- ❖ Remove alternate hosts particularly weeds.
- ❖ Avoid relay cropping of susceptible crops.
- ❖ Cultivate tolerant/ resistant varieties.

COLLAR ROT

Identification and Damage

- ❖ It is more serious under water logged conditions and during rainy seasons.
- ❖ Dark brown water soaked lesions and girdling at the base of stem occurs.
- ❖ Finally the entire plant to rot and die.
- ❖ Cottony white mycelium in the surface of the infected tissue occurs with advanced infections.
- ❖ Affected plants can be easily uprooted but the lower part of the root usually remains in soil



Control

- ❖ Treat the seed with Copper oxy chloride @ 3 g /kg of seed before sowing.
- ❖ Sow seeds on raised beds.
- ❖ Dranch vine with
- ❖ Redomyl(0.2%) or Carbendazime (0.1%) are recommended for control.
- ❖ Previous crop residues should be buried deep.

HARVESTING

- ❖ Fruits for consumption should be harvested before they become fibrous; their harvesting starts 2 months after planting.
- ❖ Immature fruits do not store well, and should be marketed or prepared for consumption as soon as they are harvested.

YIELD

- ❖ *Bottle Gourd* can produce more than 62,000 fruits/ha with a plant density of 11,000 plants/ha, the number of fruits per plant being limited to 5–6.
- ❖ In natural stands, the number of fruits produced per plant can be much higher than 6.
- ❖ Yield 5-6 tons/acre.

POST HARVEST MANAGEMENT

Grading

- ❖ The fruits are graded as per its size, color and tenderness.
- ❖ Over mature fruits will be fibrous and are unfit for consumption

Packing

- ❖ The fruits are packed in bamboo baskets or wooden boxes.
- ❖ Before packing leaves or new paper is spread at the as padding material.
- ❖ Fruits are carefully piled up and covered with gunny bags before sending to the market

STORAGE

- ❖ The fruits can be stored for 2 to 3 days without any damage under shade provided they are sprinkled with fresh water.
- ❖ The fruits can also be stored at 50 °C to 80 °C in cold storage for 20 to 25 days