

## SHORT COMMUNICATION

# Greenhouse Cultivation of Capsicum

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Capsicum (sweet pepper or bell pepper) is the most popular salad vegetable grown in green house. It is rich in vitamin A, C, and minerals. Capsicum cultivation is gaining popularity in Peri-Urban production systems because of easy access to urban markets. Capsicum yields in open field cultivation ranges between 20 - 40 t/ha whereas in greenhouse the yield range varies between 100 to 120 t/ha. In addition to the quantum jump in yield, the superior quality and substantial reduction in use of pesticides makes it an economic and eco-friendly proposition to grow capsicum in naturally ventilated green houses.

### Climate

Capsicum is a cool season crop and day temperatures less than 30°C is favorable for growth and yield. Higher temperature results in rapid plant growth and affects fruit set. Lower night temperature (20°C) favors flowering and fruit set. Shading and misting is required during summer to avoid temperature build up in greenhouses. Moderately high RH (50 – 60%) is preferred, which can be managed by managing the ventilation.

### Hybrids

Capsicum hybrids with indeterminate growth habit are best suited for greenhouse cultivation, as these hybrids grow to a height of 2 m and above to utilize the greenhouse space, both horizontal and vertical. Commercial hybrids like Indra, Green Gold are suitable for green house cultivation, with a yield potential up to 120 t/ha from a crop of six months duration.

| Crop     | Variety/Hybrid | Salient features  | source                |
|----------|----------------|---|-----------------------|
| Capsicum | Bharat         | Darkgreen, 3-4 lobed, Indo-blocky, tolerant to TMV      | American Hybrid seeds |
|          | Altantic       | Green to red, 3-4lobed, PetoSeed long, resistant to TMV |                       |
|          | Lido           | Green to red, semi- PetoSeed long, resistant to TMV     |                       |
|          | Oscar          | Green to red, 3-4 lobed, PetoSeed resistant to TMV      |                       |

### Nursery

- Use of vermicompost + sand (1:1) or Phosphorous enriched cocopeat as growing media for nursery production.
- Fill the pro-trays (98 cell) with the growing media and tap gently to fill the cells properly.
- Drench the pro-trays with 0.3% copper oxychloride solution (3 g/litre).
- Sow the seeds treated with the Thiram (0.3g / 100g 89 seed), one per cell, to a depth of 0.5 cm.

- Cover the seeds with a thin layer of growing medium, water lightly and cover the tray with newspaper.
- Seeds germinate in 5 to 6 days and the seedlings will be ready for planting by 35 to 40 days after sowing.
- If cocopeat is used for seedling raising, drench the protrays with 0.3 percent (3 g/litre) 19-19-19 complex fertilizer 2 to 3 times after emergence.
- About 20-g seed is required to plant an area of 500-m<sup>2</sup> greenhouse area.

### Growing medium

Sandy loam soil and well-decomposed farmyard manure mixed in 1:1 proportions, is best suited for capsicum cultivation. In heavier soils mixing sand up to 25 percent is required to provide proper aeration in the root zone.

### Growing beds

- Loosen and work the soil to fine tilth.
- Prepare the beds of 100-cm width and 15 cm height leaving 50 cm between the beds.
- Add 45 kg of well-decomposed farmyard manure per square meter of bed for the first crop. Mix thoroughly and level the beds.
- For subsequent crops, apply 5 kg FYM per square meter of bed.
- For disinfecting the growing beds, drench the beds with 4% formaldehyde (4 litre / m<sup>2</sup>) and cover with black polyethylene (400 gauge) sheet.
- Close all ventilation spaces.
- While treating with formaldehyde, take care to wear mask, gloves and apron to avoid direct contact with the formaldehyde fumes.
- Three to four days after formaldehyde treatment remove the polyethylene cover. Two days after removing the polyethylene cover rake the bed repeatedly to remove trapped formaldehyde fumes completely before transplanting.
- Disinfecting is done once in a year.

### Fertilizer application

- Apply 50: 50: 50 N: P<sub>2</sub>O<sub>5</sub>: K<sub>2</sub>O kg/ha, to the growing beds before formaldehyde fumigation.
- The quantities of fertilizers to be applied are CAN – 20 g/m<sup>2</sup>, Single Super phosphate – 30 g/m<sup>2</sup>, Muriate of potash – 9 g/m<sup>2</sup>.
- Apply Neem cake and Trichoderma formulation (100:1) (200 kg /ha + 2 kg /ha) just before planting but soon after formaldehyde fumes are exhausted completely.
- Repeat the Neem cake + Trichoderma application 3 times at monthly intervals.

### Laying of drip line

- Place one inline drip lateral at the center of the bed.
- Inline drip lateral should have an emitting point for every 30-cm interval with a discharge of 2 litre per hour.
- Before covering with the polyethylene mulch, check the emitting points for uniform discharge of water.

### Mulching

Use 100-micron thick black polyethylene mulch film of 1.2-m width to cover the planting bed. Make holes of 5-cm size on the mulch film as per the recommended spacing (45 cm x 30 cm). Then cover the planting beds with mulch by securing the edges of the sheet with pegs or burying in the soil.

### Planting

Water the bed to field capacity before transplanting. Seedlings of 35 to 40 day old, vigorous and uniform in size are selected for planting. Drench the pro trays with seedlings with Bavistin (0.1%) and Super Phosphate slurry (1.5%) in early morning hours or previous evening. Transplant in early morning hours or preferably in the evenings. Remove the seedlings from the pro trays by giving slight pressure from the bottom of the individual cell. Transplant the seedlings at recommended spacing of 45 x 30 cm at a shallow depth of 2 – 2.5 cm. Water the beds with rose can immediately after transplanting and every day until the plants get established. Mist the greenhouse in the seasons of low humidity. Drench the beds with 0.3% COC if mortality of seedlings is noticed.

### Irrigation

Drip irrigation is given daily to replenish 50 per cent of open pan evaporation.

### Fertigation

Fertigate 150: 150: 150 N: P<sub>2</sub>O<sub>5</sub>: K<sub>2</sub>O Kg/ha using water-soluble fertilizers (19:19:19: WSF). Start fertigation from 3rd week after transplanting. Fertigate twice a week for 18 weeks. Use 19:19:19 WSF at the rate of 2.2 g/ m<sup>2</sup> for every fertigation

### Pruning

Prune capsicum plants to four stems. Prune at weekly intervals starting from 15 to 20 days after transplanting. Capsicum plants show dichotomous branching. The tip of the plant splits into two at 5<sup>th</sup> or 6<sup>th</sup> node at first and these two branches again splits into two giving rise to four branches. Maintain only these four main branches. At every node the tip splits in to two giving rise to one strong branch (the branch with thick stem and larger leaf) and one weak branch (the branch with thin stem and smaller leaf). Remove the weak branch and retain strong branch. This operation needs to be done once in a week. Remove the shoots appearing at the base of the plants, as they are not productive. Prune all the flowers that appear till one month after transplanting. Only one fruit per node is allowed to develop.

### Training

Train the plants along a plastic twine. Each branch should have separate plastic twine to train along. Tie the branch to the twines with gunny twine (3 ply). Tying plants to the plastic twine starts from 6<sup>th</sup> week after planting at 20 to 30 day's interval.

### Harvesting

Harvesting of capsicum fruits starts 60 days after transplanting and continues up to 170 to 180 days at 10 days interval. Mature green capsicum / colored fruits weighing 150 to 250 g is harvested. Keep the harvested fruits in cool place and avoid direct exposure to sunlight. Harvest the fruits with sharp, knife close to the stem end to have good appearance and to reduce the possibility of fungal infection (Botrytis).

### Yield

An yield of 100 to 120 t/ha (10 to 12 kg/m<sup>2</sup>, 2.25 to 2.70 kg/plant) can be expected from one crop of six months duration. Average individual fruit weight varies from 180 g in initial harvests to 100g in last harvests.

### Post harvest handling and storage

Fruit should be graded to size and color to ensure an uniform attractive pack. Shrink wrapping each fruit and storing at 7 to 8°C will enhance storability to 45 to 60 days.

*Received on 28-01-2018      Accepted on 04-02-2018*