

## **GREENHOUSE CULTIVATION OF CAPSICUM-I**

(19)

### **Climate:**

- Cool season crop
- Day temperature of 30<sup>0</sup>C is favourable
- Higher temperature results rapid growth and affects fruit set
- Lower night temperature(20<sup>0</sup>C) favours flowering and fruit set
- Shading and fogging are required during summer to avoid temperature build up in greenhouse
- Moderately high RH (50-60%) is preferred which can be managed by regulating ventilation

### **Hybrids:**

- Capsicum hybrids are indeterminate growth habit which are suited for greenhouse cultivation and grows upto 2mt and utilises the greenhouse space.

### **Nursery:**

- Use vermicompost + sand(1:1)
- Fill portrays with it and tap gently to fill cells properly
- Drench portray with 0.3% copper-oxychloride solution.
- Seeds are to be treated with fungicide like Captan(2g/100g of seed)
- Fill portrays with seed i.e. one seed per cell to a depth of 0.5 cm.
- Cover seeds with growing media, water lightly.
- Seeds germinate in 5 to 7 days
- Seedlings ready for planting after 30 to 40 days of sowing.
- About 20 g seed is required for 500m<sup>2</sup> greenhouse area.

### **Growing medium:**

- Sandy soil and well decomposed FYM mixed in 1:1 proportion, is best suited.
- In heavier soil mixing with sand up to 25% is required to provide proper aeration in root zone.

### **Growing bed:**

- Soil should be fine tilth
- Beds of 100 cm width and 15 cm height leaving 50 cm working space between beds.
- Add 43 kg of FYM per m<sup>2</sup> of bed for first crop and mix thoroughly

- For subsequent crops add 20 kg of FYM/m<sup>2</sup> of bed
- For disinfecting beds, drench it with 4% formaldehyde solution and cover with black polyethylene sheet(400 gauge)
- Close all ventilation space
- 3 to 4 days after spraying remove polyethylene sheet and rake the bed repeatedly to remove the trapped formaldehyde fumes completely before transplanting.
- Disinfecting done once in a year.

### **Fertiliser Application:**

- NPK dose is 50:50:50 kg/ha respectively
- Apply neem cake and Trichoderma formulation(200g/m<sup>2</sup>) just before planting but only after formaldehyde fumes are completely exhausted.

### **Laying of drip line:**

- Placing one inline drip lateral at the centre of bed.
- Inline drip lateral should have an emitting point for every 30 cm interval with discharge of 2lt/hour.

### **Mulching:**

- Use 100 micron thickness, opaque polyethylene mulch film(black/reflective mulches) of 1.2 mt width to cover the planting bed.
- Make holes of 5 cm size on mulch film as per recommended spacing(45 cm x 30 cm).
- Water the planting bed to field capacity and then cover the planting beds with mulch by securing edges of sheet with pegs or burying in soil.

### **Transplanting:**

- Seedlings of 35 to 40 days old, vigorous and uniform size are selected for planting.
- Drench the portrays with seedlings with Bavistin(0.1%) in early morning hours or previous day evening.
- Transplant in early morning.
- Remove seedlings from portrays by giving slight pressure from bottom of individual cell.
- Recommended spacing 45 cm x 30 cm at a shallow depth of 2-2.5cm.
- Care should be taken to plant seedlings exactly in centre of holes in mulch film.
- Water the beds with rosecane immediately after transplanting.

## **GREENHOUSE CULTIVATION OF CAPSICUM-II**

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**Irrigation:**

- Drip irrigation given daily to replenish 50% of open pan evaporation.

**Fertigation:**

- Plants are fertigated with total 150:150:150 kg of NPK respectively using water soluble fertilisers(19:19:19 WSF)
- Start fertigation from 3<sup>rd</sup> week after transplanting.
- Fertigate crop twice a week.

**Pruning:**

- Prune capsicum plant to 4 stem.
- Prune at weekly interval starting from 15 to 20 days after transplanting
- It shows dichotomous branching.
- The tip of plant split into two at 5<sup>th</sup> and 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
- Prune all flowers that appear till one month after transplanting.
- Only one fruit per node is allowed to develop.

**Training:**

- Train plants along a plastic twine.
- Each branch should have separate plastic twine to trail along.
- Tie the branch to the twines with gunny twine.
- Tying plants to the plastic twine starts from 6<sup>th</sup> week after planting at 20 to 30 days interval.

**Harvesting:**

- Harvesting starts 60 days after transplanting in case of green, 80 DAT in yellow, 90 DAT in red.
- Mature green capsicum/coloured fruits weighing 150 to 250 g is harvested.
- Harvested fruits are kept in cool place to avoid direct exposure to sunlight.

**Yield:**

- An yield of 100 to 120 t/ha (green and yellow) after 6 to 7 months
- Average fruit weight varies from 180 gm in initial harvest to 100 gm in last harvest

**Storage:**

- Temp of 7 to 8<sup>0</sup> C enhance storability to 45 to 60 days.

**Diseases:**

1. Damping off:  
Symptom-wilting of seedlings  
Control-Bavistin(1g/L), Blitox3g/L
2. Powdery Mildew:  
Symptom-Powdery growth on under surface of leaf  
Control-Karathane(1ml/L)
3. Cercospora leaf spot:  
Symptom-shoot hole  
Control-Dithane Z-78 (g/L)

**Pests:**

1. Thrips:  
Symptom: upward curling of younger leaves  
Control: Drenching of beds with chloropyriphos 1.5 ml/L @ 4L /m<sup>2</sup>
2. Mites:  
Symptom: downward curling of younger leaves  
Control: Vertimec 0.5 ml/L, Dicifol 2ml/L

**GREENHOUSE CULTIVATION OF TOMATO-I**

(21)

**Climate:**

- Day temperature of 28<sup>0</sup> C and night temperature of 18<sup>0</sup> C is ideal for its growth.
- Fruit set is affected at temperature higher than 35<sup>0</sup> C
- RH of more than 90 percent.

**Hybrid:**

- Hybrids with indeterminate growth habit are suitable.
- Hybrids grow to a height of 15 feet and above which utilises greenhouse space, both horizontal and vertical.

### **Nursery:**

- Use vermicompost + sand(1:1)
- Fill portrays with it and tap gently to fill cells properly
- Drench portray with 0.3% copper-oxychloride solution.
- Seeds are to be treated with fungicide like Captan(2g/100g of seed)
- Fill portrays with seed i.e. one seed per cell to a depth of 0.5 cm.
- Cover seeds with growing media, water lightly.
- Seeds germinate in 5 to 7 days
- Seedlings ready for planting after 30 to 40 days of sowing.
- About 20 g seed is required for 500m<sup>2</sup> greenhouse area.

### **Growing medium:**

- Sandy loam soil and well decomposed FYM mixed in 1:1 proportion, is best suited.
- In heavier soil mixing with sand up to 25% is required to provide proper aeration in root zone.

### **Growing beds:**

- Soil should be fine tilth
- Beds of 100 cm width and 15 cm height leaving 50 cm working space between beds.
- Add 43 kg of FYM per m<sup>2</sup> of bed for first crop and mix thoroughly
- For subsequent crops add 20 kg of FYM/m<sup>2</sup> of bed
- For disinfecting beds, drench it with 4% formaldehyde solution and cover with black polyethylene sheet(400 gauge)
- Close all ventilation space
- 3 to 4 days after spraying remove polyethylene sheet and rake the bed repeatedly to remove the trapped formaldehyde fumes completely before transplanting.
- Disinfecting done once in a year.

### **Fertiliser Application:**

- NPK dose is 50:50:50 kg/ha respectively to the growing beds before fumigation
- CAN-20g/m<sup>2</sup>, SSP-30g/m<sup>2</sup>, MOP-9g/m<sup>2</sup>
- Apply neem cake and Trichoderma formulation(200g/m<sup>2</sup>) just before planting but only after formaldehyde fumes are completely exhausted.

### **Laying of drip line:**

- Placing one inline drip lateral at the centre of bed.

- Inline drip lateral should have an emitting point for every 30 cm interval with discharge of 2lt/hour.
- Before covering the polyethylene mulch, check the emitting point for uniform discharge of water.

### **Mulching:**

- Use 100 micron thickness, opaque polyethylene mulch film(black/reflective mulches) of 1.2 mt width to cover the planting bed.
- Make holes of 5 cm size on mulch film as per recommended spacing(60 cm x 45 cm).
- Water the planting bed to field capacity and then cover the planting beds with mulch b y securing edges of sheet with pegs or burying in soil.

### **Transplanting:**

- Seedlings of 35 to 40 days old, vigorous and uniform size are selected for planting.
- Drench the portrays with seedlings with Bavistin (0.1%) in early morning hours or previous day evening.
- Transplant in early morning or evening
- Remove seedlings from portrays by giving slight pressure from bottom of individual cell.
- Recommended spacing 60 cm x 45 cm at a shallow depth of 2-2.5cm.
- Care should be taken to plant seedlings exactly in centre of holes in mulch film.
- Water the beds with rosecane immediately after transplanting.
- Mist greenhouse in seasons of low humidity.
- Drench beds with 0.3% COC of mortality of seedlings noticed due to damping off disease.

## **GREENHOUSE CULTIVATION OF TOMATO –II**

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### **Irrigation:**

- Drip irrigation given daily to replenish 50% of open pan evaporation.

### **Fertigation:**

- Plants are fertigated with total 250:250:250 kg of NPK respectively using water soluble fertilisers(19:19:19 WSF)
- Start fertigation from 3<sup>rd</sup> week after transplanting.

- Fertigate crop twice a week for 18 weeks.
- Use 19:19:19 WSF at the rate of 3.7 g/m<sup>2</sup> for every fertigation.

### **Pruning and Training:**

- Are pruned to two stems per plant.
- Pruning usually starts 20 to 30 days after transplanting.
- Prune the plants at weekly intervals.
- The main stem of tomato plant branches into two after first flower cluster.
- Retain only these two branches and remove all other branches.
- Also remove all the branches developing at the base of stem.
- Top the plants 6 weeks before crop is removed.
- Train the plants along the plastic twine.
- Provide separate plastic twine to each branch.
- Tie branches to plastic twines so that the branches do not break up due to weight of fruits.
- Tying of plants to plastic twine starts from 4<sup>th</sup> week after transplanting and tying is usually done at weekly interval along with pruning operation.

### **Lowering of plants:**

- Plants are periodically lowered so as to attain workable height.
- It is done at 20 to 30 days interval starting from 80 to 90 days after transplanting.

### **Deleafing:**

- Deleaf the older leaves periodically starting from 70 days after transplanting.
- Retain leaf in stem to a length of about 5 feet from growing tip at any given point of time.

### **Harvesting:**

- Starts at 70-80 days after transplanting and continues till 170 to 180 days.
- Harvesting done at weekly interval.
- Fruits harvested at breaker stage.
- Harvested produce should be kept in cool place and avoid direct sunlight.

### **Yield:**

- Tomato fruit yield is 70 to 180 t/ha
- Individual fruit weight varies from 100g/fruit during initial harvest to 60 g/fruit during last harvest.

### **Diseases:**

1. Seedling Wilt:

- Bavistin (1g/L), Ridomil (2g/L)
2. Powdery Mildew  
Karathane (1ml/L)
  3. Early blight and Late blight  
Dithane Z 78 or Dithane M 45(2g/L)
  4. Buck eye rot  
Proper staking and spray Ridomil(2g/L)
  5. Leaf curl and Potato Virus Y  
Raising nursery bed under 40 mesh nylon net

**Insect-Pest:**

1. Whitefly:  
Spray Imidachloprid (0.4 to 0.5 ml/L)
2. Red spider Mite:  
Spray Vertimec(0.5 ml/L) or Pongamia oil 50 to 8 ml/L
3. Thrips  
Acephate 1.5g/L or Imidacloprid 0.5 ml/L
4. Leaf Miner  
Spray Deltamethrin(1ml/L) or NSKE 4%