

UNIT: 2

Describe the climate and soil, seeds and sowing, manuring, irrigation, diseases and their controlling, harvesting and yield in Cultivation of tomato.

Tomato:

Climate:

Tomato is a day neutral warm season crop, which cannot tolerate frost. Cool and dry weather is preferred by the crop and optimum temperature is $21-28^{\circ}\text{C}$ during day and $15-20^{\circ}\text{C}$ during night. Night temperature is more critical than day temperature. High temperature results in exerted stigma, dryness of stigma, burning of anther tip, poor pollen dehiscence, low pollen viability, and slow pollen tube growth leading to low pollination and fruit set.

Optimum temperature for colour development of fruit is $21-24^{\circ}\text{C}$. Development of lycopene will be hampered above 27°C .

Based on night temperature requirement for fruit set, tomato varieties are classified into three.

(a) Normal set varieties: Set fruits at $15-20^{\circ}\text{C}$

(b) Hot set varieties: Set fruits below 15°C above 20°C

Eg: Philippine, Punjab, Tropic,

Pusa hybrid 1.

(c) Cold set varieties: Set fruits below 15°C

Eg: Pusa sheetal, Avilanche.

Soil:

- Tomato plant species grow in sandy loam

soil, with a soil pH 5.8 - 7.

- fortunately tomato plants, do well in almost all types of soil except heavy clay soil.

Seeds and Sowing

Under mild climatic conditions, where there is no danger of frost, three crops can be raised in a year. In the hills, seeds are usually sown in March - April. In plains it is grown during June - November.

Under Kerala conditions, seeds are sown in September and transplanted in October.

Seed Rate :

Open pollinated variety : 400 - 500 g/ha

Intermediate F_2 hybrid : 125 - 175 g/ha

Seeds are sown in an area of 4-5 cents (~~1~~ hectare) (200 - 240 m²) will be sufficient to plant one hectare.

Four to Five weeks old seedlings are used for transplanting.

Chemicals :

Hardening of seedling is essential for their establishment in main field and is done by withholding irrigation for 1 week before transplanting, adding NaCl (400 ppm) to irrigation water (or) by spray of cycocel (200 ppm) and zinc sulphate (0.025%) + 25 ppm prolin at time of transplanting.

Seedlings transplanted on Raised beds

- 80-90 cm of height
- with ridges and furrows

3 types of spacing

1. determinate - 60 x 30 - 45 cm
2. Indeterminate - 75 - 60 cm
3. Semi-determinate - 75 - 75 cm

Manuring :

In most states, 15-20 tonnes of Farm Yard Manure (FYM), 100-125 Kg of 'N', 50-60 Kg P_2O_5 , 50-60 Kg K_2O are recommended for one hectare.

For F_1 hybrid is 250 : 250 : 250 Kg NPK/ha.

$\frac{1}{3}$ N, Full P and K may be applied as basal dose either just before transplanting (or) 5-10 days after transplanting. Remaining $\frac{2}{3}$ N is applied 20 and 45 days thereafter.

In Tamil Nadu, additional dose of 10 Kg borax and 5 Kg zinc sulphate

Apply FYM 25 tonnes/ha, N-75 Kg, P=100 Kg, K-50 Kg (NPK). 1 ppm of Triaccontanol, 15 days after transplanting.

Irrigation :

Furrow irrigation is most common method in tomato. In summer crop should be irrigated at 3-4 days interval. Water stress at flowering stage will adversely effect fruiting and productivity.

Drip irrigation and Sprinkler irrigation are becoming more common in areas of water shortage.

Diseases :

Blossom diseases

Rot diseases.

(1) Fruit cracking :

1. Damping off :

At the pre-emergence and post-emergence stage, the seedling and plumule are killed at soil.

2. Septoria leaf spot :

spots coalesce and leaves are blighted.

3. Bacterial stem & Fruit Canker :

white blister like spots in margins of leaves.

4. Early blight :

Fungus attacks leaves causes spots and blights

5. Bacterial leaf spot :

Due to Moist weather and splattering rains, effects the leaf's.

Control Measures :

1. By crop Rotation.
2. Pinch off leaves with any signs of diseases
3. Choose disease - Resistant variety.
4. Using fungicide, Weedicide, Bactericides.
5. 0.5% of Calcium chloride
6. Early blight : Chlorothalonil (or) Copper fungicides

Ex: Mancozeb.

7. Mulching, Weeding - off

8. Use of Pathogen-free seeds.
9. controlled irrigation
10. Sanitation

Harvesting :

Crop starts yielding by 70 days after planting. Intervals of Harvest, depends on season and it is twice in a week during summer, weekly during winter and rainy days.

Maturity standards like :

1. Mature green - fruit colour green to yellowish
2. Turning breaker stage - changes pink colour
3. Pink stage - surface changes pink
4. Light red - fruit surface is red flesh, firm.
5. Red ripe / Hand ripe - fully ripened fruit.

Yield in Cultivation :

Open pollinated varieties : 20-25 t/ha

F₁ hybrids : 50 t/ha