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Scientific cultivation of Tomato

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Tomato

Botanical name: *Solanum lycopersicum* L.
Family: Solanaceae
Chromosomal number: 2n=2x=24
Origin: Peru-Ecuador-Bolvia region of Andes (South America)

Introduction:

- Tomato is one the most important vegetables in the world ranking second in importance to potato in many countries. Its many forms are adopted to wide range of soils and climate. It is a warm season crop. It is grown as an off-season vegetable in the hills of India and farmers fetch good income after sending their produce in the plains from June to September Large quantities of tomatoes are used to prepare soup, sauce, juice, ketchup, pickle, puree and paste.

Importance and uses

- Tomato is one of the versatile crop in the world because of its fast and wide climatic adaption and it is universally treated as "**protective food".**
- Tomato is rich source of minerals, vitamins and organic acids
- (healthy acids).
- The total sugar content is 2.5 % in ripe fruit
- Rich in ascorbic acid 31 mg/100g.
- Also reported to have a antiseptic properties against intestinal infections and aslo fought against the cancer of mouth, etc.
- The solanine content of the pulp made from unripe tomato is much lower, similar to peeled potato (5mg/100g of edible part)
- Tomato is very good appetizer and its soup is said to be a good remedy for patients suffering from constipation.

Improved Varieties

IARI: Pusa Rohini (Lycopene rich

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variety), Pusa Early Dwarf, Pusa 120, Pusa Ruby, Pusa Sadabahar, Pusa Uphar, Pusa Sheetal, Pusa Gaurav

IIHR: Arka Abha, Arka Vikas, Arka Saurabh, Arka Alok, Arka Abhijit, Arka Shreshtha, Arka Vardan (Root knot nematode resistant), Arka Ananya (resistant to Tomato Leaf Curl Virus and bacterial wilt)

IIVR: Kashi Amrit, Kashi Hemant, Kashi Sharad, Kashi Anupam, Kashi Vishesh (resistant to Tomato Leaf Curl Virus).

ANDUAT: Narendra Tomato-1, Narendra Tomato-2, NDT-120.

Climate:

Warm season crop. Flowering and fruit setting is best at a day temperature of 25°C and night temp of 18°C. 21°C temperature is optimum for pollination. Lycopene is highest at 21°C-24°C while the production of this pigment drops off rapidly above 27°C.

Soil:

It grows well in all kinds of soil. For early crop, a sandy loam soil is the best, for higher yield heavy soils rich in organic matter are preferred. The pH should be 6.0 – 7.0. It is moderately tolerant to acid soil (pH 5.5)

Disinfection of soil

- Control of Phytophthora, Pythium, RKN
- Soil solarization
- Methyl Bromide
- Formalin

Nursery Management

- ✓ Sandy loam and loam soils rich in organic matter are suitable for raising the nursery
- ✓ In soil with good tilth 15 cm raised nursery beds of 3 m length and 1 m wide are prepared.
- ✓ 15 kg well rotten FYM and 300 g of N: P: K (15:15:15) complex fertilizer along with 7.5 g Carbofuran per bed is incorporated.
- ✓ The bed is drenched with Captan (2g/L) or copper oxychloride (4g/L) Seeds are sown thinly in rows 6 cm apart and 0.5 cm deep.
- ✓ The beds are covered thinly with straw or grass layer and irrigated with rose cane.
- ✓ On germination (5-7 days) the beds are drenched with Captan or copper oxychloride.
- ✓ After the appearance of first true leaf seedling are thinned out.
- ✓ During the last week in the nursery, the seedlings may be hardened by slightly with holding water for better establishment of seedlings.
- ✓ The seedlings with 5-6 true leaves are transplanted after 30 days.

Seed rate:

- ➢ For nursery Raising OPV: 400-500g/ha.

- Hybrids: 125 – 175g

Time of planting:

Tomato can be grown in any season as it is a day neutral plant. Three crops are taken in areas which are not affected by frost.

- Kharif crop transplanted in July,
- Rabi in October- November months.

Spacing:

Determinate varieties: 60 × 45 cm

Indeterminate Varieties: 90 × 30 cm

Cultural Practices of Tomatoes

- ✓ Weeding
- ✓ Staking (30 days after planting.)
- ✓ Training
- ✓ Desuckering
- ✓ De-leafing
- ✓ Fruit Pruning

Irrigation

The application of water is particularly sensitive to the tomato. Fruits fracture when they receive heavy irrigation during a protracted drought. It should therefore be avoided. Three to four days after transplanting, a light irrigation should be applied. Irrigation should be applied at intervals of 7-8 days during kharif, 10-12 days during rabi, and 5-6 days during the summer, depending on the soil type and rainfall. Tomato flowering and fruit development are crucial stages, hence water stress shouldn't be applied during this time.

Manures & Fertilizer

The amount of fertiliser needed depends on the crop's crop and the soil's fertility. 15-20 tonnes of thoroughly decomposed FYM are added to the soil for a decent yield. For the best yield, it is typically advised to apply 120 kilogramme N, 80 kg P2O5, and 50 kg K2O per acre. At the time of planting, a half-dose of N and full-doses of P and K are administered. 30 days after transplantation, the remaining half of N is administered as top dressing. The recommended dose per hectare for hybrid types is 180 kg N, 100 kg P2 O5, and 60 kg K2 O. At the time of transplantation, 60 kg of N and 50 percent of P and K are administered. Remaining quantities of P & K and 60 kg N is top dressed 30 after transplanting. A third dose of 60 kg N is applied 50 days after transplanting. Flowering and fruit development are the critical stages of tomato therefore; water stress should not be given during this period.

Harvesting

Harvesting of tomato fruits is carried out either at breaker stage or at half red depending upon the market preference. First harvest starts at 60 days after planting.

Yield

The yield per hectare varies greatly according to variety and season. On an average, the yield varies from 20-25 t/ha. Hybrid varieties may yield upto 50-60 t/ha.

Storage

- ✓ The tomato can be stored in low temperature and evaporative cool storage.
- ✓ The best storage temperature is from 12° C to 15°C. When stored at freezing point, the fruits show low temperature injury.
- ✓ Mature green fruits can be kept for as long as 30 days at 10°C to 15° C. Ripe tomatoes can be kept for 10 days at 4.5 °C.
- ✓ The recommended relative humidity is 85-90 per cent.
- ✓ Tomato can be stored under normal conditions for 7-10 days

Major Pests:

1. Aphids
2. Thrips
3. Whitefly
4. Leaf miner
5. Pin worm
6. Fruit borer

Major Diseases:

1. Damping off
2. Early blight
3. Late blight
4. Fusarium wilt
5. Bacterial wilt
6. Mosaic
7. Leaf curl virus