

Seedling treatment with *Trichoderma* culture @ 10% for 15 minutes

Soil drenching with Bordeaux mixture (1:1:100) after 15 days of planting

Spray of Bordeaux mixture (1:1:100) at fortnightly interval after one month of planting.

In severe infection application of Ridomil/Matko @ 2g/l manages the disease effectively.

Early blight

Early blight of tomato, caused by the fungus *Alternaria solani*, is a common foliar disease of tomato. This disease causes direct losses by the infection of fruits and indirect losses by reducing plant vigor. The disease can be managed by spray of Bordeaux mixture (1:1:100).



Grey mould

Grey mold, a fungal disease (*Botrytis cinerea*), is an important disease of tomato and its infection occurs after flowering and fruit set. In case of severe infection flowers and pedicel starts dying and in later stage fruits also starts rotting. The infection starts from peduncle end and infected fruits are not suitable for consumption.



Management

Application of Bordeaux mixture (1:1:100) after one month of planting.

In case of severe infestation spray of Kavach (Clorothalonil) @ 1.5g/l minimizes the infestation.



Cercospora leaf spot

It is one of the important foliar disease caused by *Cercospora* sp. Infected leaf has brown spots with curled leaf margin and later on it withers. As the disease progresses, the leaflets turn yellow and also with curled

margins. Spots on the leaf petioles, stems, and flower parts become elongated and have dark-brown color. On heavily infested plant, defoliation may occur. The disease can be managed by the application of Bordeaux mixture (1:1:100).

Fruit borer

Fruit borer (*Helicoverpa armigera*) is the most important pest of tomato. It causes serious damage during the fruit development and ripening. The larva feeds on the pulp by making hole. The infested fruit is not suitable for consumption.



Management

Application of NPV (Helicide) @ 0.5ml/l after 15 days of fruit set.

Yield

The average yield of tomato under protected conditions may vary 6-8kg/m² if proper care is taken. The average yield per plant may be 3-4kg/plant with the fruit number of 40-60/plant and fruit weight of 80-90g.

Profitability

The cultivation of tomato is highly profitable if fruits are harvested between June October. They cost of cultivation may vary from Rs. 20-25/m² while the earning may be between Rs. 100-130/m². So the cost benefit ratio in tomato is generally as high as 1:4.

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TOMATO

UNDER PROTECTED CULTIVATION



TECHNOLOGY MISSION

(Mini Mission-1)



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India is the world's fifth largest producer of tomato accounting for 6.0% of world production. Tomato is the 3rd most important vegetable of India by sharing 8.5% of total vegetable production. The total tomato production is 8.6 million tonnes and its productivity is 14.0t/ha which is half of the world productivity. Orissa, Andhra Pradesh and Karnataka are the major tomato growing states. Tomato (*Lycopersicon esculantum*) is an important crop of solanaceous group with potato, brinjal and chilli.

Sikkim is gifted with suitable climates for round the year tomato cultivation. It is cultivated in the open field during rabi season and under protected condition during summer and rainy season.

Nutritive value

Although a ripe tomato contains as much as 93 to 94 percent water, it has a high nutritive value being a good source of vitamins and minerals. It is very appetizing and removes constipation and has a pleasing and refreshing taste. Nutritive value of tomato is given below (per 100 g of edible portion) which may vary with variety and climate.



Parameters	Content	Parameters	Content
Energy (kcal)	22.0	Fat (%)	0.2
Water (%)	93.0	Fibre (%)	0.7
CHO (%)	3.6	Minerals (g)	0.6
Protein (%)	1.9	Vit. A (µg)	320 IU

Protected structures

The main purpose of protected cultivation is to create a favourable environment for the sustained yield as to realize its maximum potential even in adverse climatic conditions. The protected structures may be a high cost or low cost polyhouse, net house, tunnels etc. A partially ventilated low cost polyhouse with both polythene and agroshred net may be suitable for farmers.

The site for protected cultivation should be

accessible, sunny, with no waterlogging. To minimize the diseases new area should be selected for cultivation. The soil should be well-drained, loamy with adequate organic matter (>2.0%). Crops are successfully grown in the moderately acidic soils (pH 6.0-7.5). The pH can be maintained by adding lime/dolomite @ 100g/m²

Climate

Tomato prefers moderate temperature and thrives well in the temperature range of 25-30°C. The prevalence of low temperature and high humidity causes severe infestation of diseases.

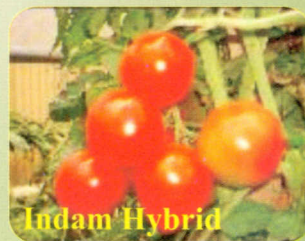
Nursery management

Seeds are sown in raised beds under protected structures. Seeds can be sown about 20-25 days before planting. The average seed rate for tomato is 350-400 g/ha. Seeds are sown with row spacing of 10 cm and seed spacing of 0.5 cm. Densely populated seeds produce weak and lanky seedlings. The beds should be drenched with *Trichoderma+Pseudomonas* culture @ 2% to manage damping off.



Varieties

Indeterminate tomato varieties are suitable for cultivation under polyhouse. Avtar, Indam Hybrid, All Rounder, Arka Meghali, Arka Surabhi, etc. are suitable varieties for tomato cultivation.



Planting

Tomato should be planted on the raised bed with the bed width of 1.5m. There should be a path of 0.6m between two beds. 20-25 day old seedlings should be planted at the distance of



1.0x0.8cm. Before planting the root of seedlings should be dipped for 15 minutes in *Trichoderma+Pseudomonas* culture @ 10%. Planting should preferably be done in small pits for better root development.

Nutrient management

The nutrient requirement of tomato is moderately high (N100, P 60, K 80 kg/ha) and shows good response with the addition of nutrients. FYM should be applied @ 5.0kg/m² along with neem cake @ 200g/ m². At the time of planting seedling should be treated with Azospirillum+PSB (20%) for 15 minutes. The addition of vermicompost @ 1kg/m² further improves the production.



Interculture and irrigation

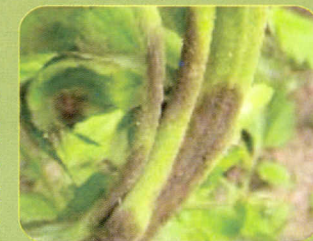
Tomato is a shallow rooted crop and roots are restricted within 15- 20 cm of soil so light earthing up should be done after 30 days and 45 days of planting. Good quality water should be applied at 10 days interval. The plants should be provided with strong multiple stakes after one month of planting.



Diseases

Late blight

Late blight of tomato is the most devastating disease caused by a fungus *Phytophthora infestans*. It infects and destroys the leaves, stems and fruits. Its infection is most rapid during conditions of high moisture and moderate temperatures (20-25°C).



Management

- Nursery soil treatment with *Trichoderma* culture @ 2%
- Soil drenching with *Trichoderma* culture @ 2% before planting