



PACKAGE OF PRACTICES - TOMATO

● Introduction:

Tomato is one of the most popular and widely grown vegetables in the world ranking second in importance to potato in many countries. It is rich in pro-vitamin A and vitamin C and contains an antioxidant lycopene. Tomato is cultivated in 0.572mha with production of 10.26mmt & 17.9mt/ha respectively in the country. Leading Tomato growing states are Orissa, Andhra Pradesh, West Bengal, Bihar & Karnataka.

● Variety:

Naveen, Naveen 2000, Naveen 2000+, Himsona, and Rupali.

● Agro-climatic conditions suitable for the crop:

Day temperature of 25 to 30°C with night temperature between 16°C and 20°C are optimal for growth and flowering. Fruit set is best between 18°C and 24°C.

● Soil type suitability :

Tomato can be grown successfully on a wide range of soil types, from sandy to fine textured clays, as well as in soils of high organic content. A soil pH range of 5.5 – 7.0 is satisfactory for most cultivation.

● Preparation of land:

The field for growing tomato should be well pulverized by ploughing first with soil turning plough and afterwards with 4-5 ploughing. Ploughing should be followed by leveling. Tomato in mid-hills is generally planted in raised beds.

After land preparation, the field should be sterilized against the soil borne diseases and pests which can damage the crop extensively. The soil can be drenched with Dithane M-45 and then seed sowing can be done for nursery raising. Field can also be sterilized with Formalin: Water ratio of 1:7 and then covering with plastic mulch for 10-15 days. After 10-15 days, when the odour of formalin has subsided, turn the soil upside down so that whatever odour is left in the soil is also removed. Wait for 2-3 days, the field is ready for transplanting.

The other important method for sterilization is to solarize or cook the soil to kill diseases and pests. For this, the field can be covered with clear plastic mulch (100 micron) and let it be there for 8-10 days.

● Planting:

Before transplanting, the basal dose of 475 kg/ha SSP, 90 kg/ha MOP and 1/3rd CAN (130 kg/ha) may be applied in the field. The minimum soil temperature for seed germination is 10°C; the maximum is about 35°C. Between 25°C – 30°C, seedling emergence occurs within 6-9 days. Seeds can be treated with streptomycin for treating against bacterial diseases before raising nursery. In the mid-hill region, the nursery is sown in Mar-Apr with transplanting in Apr-May. For raising crop for one ha area, 150-200 g/ha seeds of hybrids are normally needed with plant spacing of 90 x 30 cm (row to row and plant to plant spacing). The seedlings are ready for transplanting at 4-5 leaf stage.

● Irrigation scheduling:

In tomato, in-line drip system can be used. Drip system having in-line emitters with a discharge rate of 4 lt/hour needs to be operated bi-weekly. Drip lateral spacing: 1.80m

Irrigation scheduling for tomato under drip irrigation system:

Irrigation parameters	May	June	July	August	Sept	Total
Irrigation water req. (K.lit/bigha) (800 m ²)	52.3	56.7	58.5	9.2	34.2	210.9
No. of irrigation	6	8	9	9	8	40
Time of operation/irrigation (hrs-min)	2-27	1-59	1-49	0-17	1-12	

● Fertigation scheduling:

Normally tomato crop requires 100 kg (80% of recommended dose through fertigation i.e. 80 kg) Nitrogen (N), 76 kg Phosphorus (P₂O₅), and 54 kg (80% of recommended dose through fertigation i.e. 43.2 kg) Potash (K₂O) for 1 ha. Nitrogen should be applied in split doses. One third of N and full P₂O₅ is applied at the time of transplanting and the remaining N is applied after 30 and 60 days of transplanting in liquid form through fertigation. Potash can also be applied as full dose at the time of transplanting or in liquid form through fertigation.

● Weeding:

As tomato crop matures during June-August, weeds are major problem. For controlling weeds, pre-emergence weedicidic like Lasso/Baseline @ 2-3 kg/ha and post-emergence weedicidic like Paraquat @ 60 ml/15 litres of water can also be applied. But all this requires huge investment in

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terms of money and labour, thereby increasing the cost of production. To avoid this, mulching of beds with black polyethylene film (25-50 micron) is very effective in controlling the weeds. For this mulch can be spread along side the beds.

Plant protection measures:

Insect pest	Symptoms	Control measures
Fruit Borer	caterpillar feeds on the vegetative parts and makes holes on the fruit	Spray carbaryl 0.1% or endosulfan 0.05% or spray fenvalerate 0.01% or cypermethrin 0.0075% or deltamethrin 0.0025% in 100 L water at flowering stage and repeat at 15 days interval
Fruit flies	The maggots feed inside the attacked fruits and make them unfit for human consumption.	In May-June, when the adults start appearing on the crop, spray 50 g sugar/gur + 10 ml malathion (Cythion 50 EC) in 5 L water. Spray Fenthion 0.05% or fenitrothion 0.05% in 100 L water.
Cutworms	Caterpillars cutting the stem of young plant at ground level.	Drench soil with Durmet (2 ml/litre) at the time of preparing the field for transplanting.
Root-knot nematode	The leaves turn yellow and growth becomes stunted. Heavily infested crop shows symptoms of water stress like leaf cupping and temporary day time wilting.	Grow nematode resistant varieties like 'S-120' in infested fields for 2-3 years. Apply carbofuran granules [Furadan 3 G @ 2.4 kg/bigha (30 kg/ha)].
Disorder	Symptoms	Control measures
Blotchy ripening, Vascular browning, white wall, grey wall	Causes due to the deficiencies of potassium and Magnesium.	Apply recommended dose of KCl or spray 0.2% solution of K ₂ SO ₄ . Apply 1.0% solution of MgSO ₄ as foliar spray.
Fruit cracking	Causes due to Boron and Calcium deficiency. Cracking appears all over the fruits.	Both seedlings and plants should be sprayed with 0.3-0.4% solution of borax. Apply borax @ 1.6-2.4 kg/bigha (20-30 kg/ha). Apply recommended dose of lime or single spray of 0.5% CaCl ₂ solution at the time of fruit development.
Blossom end rot	The affected portions of the fruit become sunken, leathery and dark coloured.	Single spray of 0.5% CaCl ₂ solution at the time of fruit development.
Cat face	Distortion of the blossom end of the fruit. Such fruits have ridges, furrows, indentation and blotches.	Single spray of 0.5% CaCl ₂ solution at the time of fruit development.

Different coloured mulches can also be used to protect the tomato against some major pests e.g. yellow mulch can be used against silver leaf white fly.

● **Yield and quality control:**

Under field conditions, a normal tomato crop yields 350 – 400 q/ha. Red coloured mulch can be used to improve the red colour of fruits and hence quality of fruit.

● **Post-harvest handling and storage:**

Tomatoes can be stored successfully for several weeks, but recommended storage temperature differs with stage of fruit maturation. When mature green fruit are stored, temperature should be between -13 to -18°C and 85-90% RH. Firm red fruit can be held at 7-10°C for several days without significant quality loss. Red fruit can be stored for 3 weeks at 0 – 1.5°C in acceptable condition.

● **Cost economics:**

The cost economics of tomato for conventional and drip irrigation + mulch comes out to be 2.06 and 4.98, respectively.

For more information, kindly Contact:

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