

## Insect Pest and Diseases of Tomato

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### INTRODUCTION

#### INSECTS:-

##### 1. Fruit borer (*Helicoverpa armigera*):-

**Symptoms & Damage:** The moths are brown to yellowish brown and measure about four cm in length with slight stripes the caterpillars' are greenish with dark brown grey lines around the side of the body. Damage starts from the flowering stage. Eggs are laid on young leaves which are damaged by young larvae, the larvae then they migrate to developing fruit. The larvae feed by boring circular holes into fruits with half of its body hanging outside. A single larvae feeds on many fruits, causing 5-50% losses. The infected fruits are unfit for consumption and marketing.

#### Management:

- Deep ploughing after harvesting the crop to expose the pupae for natural killing affords good protection.
- Hand picking and removal of larvae in small areas is also recommended.
- Planting of 40 days old African tall marigold seedlings and 25 days old tomato seedlings in a planting pattern of 1:16 rows.
- Spraying of following insecticides with 400-600 ltr water / ha thrice at three weeks interval starting from the initiation of flowers- 2kg carbaryl 50 WP, 250 ml fenvalerate 20 EC, 50 ml cyper methrin 10 EC.

##### 2. Leaf eating caterpillar (*Spodoptera litura*):-

**Symptoms & Damage:** The moth is greyish brown with white markings on the forewing while the hind wings are radiantly white with a brown border. The thorax and abdomen are light brown & display a tuft of hairs in the end. Eggs are laid in clusters. The caterpillars feed voraciously on the leaves, shoots and fruits at the night and become isolated at the later stage of growth.

**Management:**

- Larvae should be controlled by hand picking and killing.
- Spray Cypermethrin 0.01% or Neem seed kernel extract @ 4% when larvae are small.
- Spray of Indoxacarb @ 0.2% at 15 days intervals.

**3. White flies (*Bemisia tabaci*):-**

**Symptoms & Damage:** They are very small white insects which suck the sap of the plant. White flies transmit the leaf curl virus disease. Losses may amount to 80-90%.

**Management:**

- Spray of imidacloprid @ 0.03% should be applied.
- Apply NSKE (Neem seed kernel extract) @ 5% at 10 days intervals.

**4. Fruit sucking moth (*Othreis spp.*):-**

**Symptoms & Damage:** Adult moths puncture ripening fruit and suck the juice, damaged area becomes soft and rots and close examination reveals pin hole.

**Management:**

- Spray of monocrotophos @ 0.05%.
- Spray of dimethoate 30EC @ 0.03%.

**5. Mite (*Tetranychus cinnabarinus*):-**

**Symptoms & Damage:** This is a minor pest and is found in colonies under the leaf surface. They feed by sucking the sap. The infected leaves curl and dry up.

**Management:**

- Spray Wettable sulphur @ 2gm/ltr of water.
- Spray Dicofol/Ethion @ 0.005% or neem oil @ 1%.

**Diseases**

**1-Damping off:** - Damping off is an important disease of solanaceous crops including tomato and egg plant in nursery. Damping off is caused by various fungal pathogens such as *Pythium* species (*Phytophthora parasitica*), *Phomopsis vexans*, *Rhizoctonia solani* and *Sclerotium rolfsii*).

**Symptoms:** Seedlings affected by damping off fail to emerge or fall over and die. Soon after the emergence, stems usually have a dark shriveled portion at the soil line. Damping off is generally limited to areas where drainage is

poor or where soil is compacted, but the whole field can be affected especially in early plantings exposed to rain. Two types of damping off first one is pre emergence and second one post emergence. In the pre-emergence seedlings sprout but then pale, curl, wilt or collapse at the soil line. The stem is water soaked and turns grey, brown or black before disintegrating.

**Management:-**

- Avoid nursery sowing in the same bed year after year with frequent heavy irrigation.
- Extensive work has been done on seed treatment and soil sterilization with fungicides for management of this disease in the nursery.
- Clean all tools that will be used in planting and maintenance of the seedling.
- Do not apply fertilizer to seedling until several true leaves have developed then apply ¼ strength standard soluble fertilizer.
- Treat the seeds with fungicides such as Copper oxychloride, Agrosan GN @ 2.5 G/kg of seed.
- Treat the seed with biological *Consortium pseudomonas*, *Azotobacter* spp. or *Trichoderma harzianum*, *Trichoderma viride* formulations.

**2-Late blight:** - This disease is caused by *Phytophthora infestans*.

**Symptoms:** Symptoms of late blight on tomato leaves and stems are similar to those on potato. Disease symptoms appear as pale green irregular shaped water soaked lesions on the leaves, at the tips and margins. Under humid conditions lesions become brown, eventually the leaves shrivel and become necrotic and die. Brown streaks also develop along the stems. The pathogen can also infect tomato fruit and causes symptoms appear on green fruits as olivaceous greasy spots and later gradually cover the entire fruit surface. Initially the tissue remains firm with varying depths of discoloured tissue below the skin but, when it followed by soft rot the fruit soon

disintegrates.

**Management:-**

- Remove and destroy affected plants.
- Cultural practices like sub terranean irrigation summer ploughing ,crop rotation, avoiding taking tomatoes, crop in succession to the same crop, potatoes or other solaneous plant proper spacing avoid direct contact of the fruits and foliage with soil.
- Grow resistant varieties like solangola and hybrids like Naveen and BSS-99.
- Spray of Ridomil MZ, Curzatz M-8, Ridomil 45 @ 0.3% should be apply.

**3-Buckeye rot or fruit rot:** This disease caused by (*Phytophthora nicotianae var-parasitica*)

**Symptoms:** The disease appears on the lower fruits in the form of spots the spots are pale brown with concentric rings. These spots may be small or they may cover a major portion of fruit surface. If the green fruits are attacked, they show brownish circular spots at the blossom end, shrink and get mummified. The symptoms appear mostly at the point of contact between fruit and soil. The disease is prevalent in wet weather. Disease is soil borne and the fungus survives in the soil.

**Management:-**

- Remove foliage and fruit up to a height of 30cm to avoid moist and stagnant air conditions. Mulch the field found effective for the control of this disease.
- Staking of plants and removal of lower leaves and fruits help in preventing the diseases.
- Provision of good drainage and destruction of weeds will check the

disease incidence.

- Apply light irrigation with optimum crop water use to reduce incidence of fruit rot
- Tomato lines EC129602, EC113809, EC129602, LO701 and KT10 are resistant to this disease.
- Spraying of dithane M-45 or bordeaux mixture or captafol along with staking.
- Spray of copper sulphate, ridomil MZ, is best effective to control the disease.

**4-Leaf curl:** - This disease is caused by tomato leaf curl virus and tomato yellow leaf curl virus. The viruses are transmitted between plants by silver leaf white fly (*Bemisia tabaci*).

**Symptoms:** -The characteristics symptoms are the severe stunting of plants with downward rolling, crinkling of the leaves. The newly formed leaves show chlorosis. The older, curled leaves become leathery and brittle. The infected plants look pale color and yield more horizontal branches giving a bushy arrival. The disease plants are partially or completely sterilized in case of severe infection the disease is more severe during rainy season.

**Management:-**

- Use seedling plants produced in an area free from virus and white flies.
- Control silver leaf white fly adults before destroying crops to reduce the migration of silver leaf white fly to other crop.
- Plants new crops as far as possible as existing crop may harbour the virus and the white fly.
- For control white fly using appropriate chemicals like-Ekatos @ 0.02% and Rogor @ 0.05% and Imidacloprid @ 0.02%.