



Important Disease of Tomato and Management

(*Pushpendar Singh Shekhawat and Pawan Kumar)

Agricultural Research Station, Sriganganagar

*Corresponding Author's email: shekhawatpushpendar@gmail.com

It is a known fact that tomato is major vegetable consumed by the majority of the population globally, which provides the majority of important vitamins, minerals, fibers and antioxidants required by the humans body. However, the tomato is susceptible to different types of disease, of which Fusarium wilt is the most destructive disease.

Fusarium Wilt of tomato

Pathogen: *Fusarium oxysporum f. Sp. Lycopersici*

Symptoms: This is one of the worst diseases of tomato occurring mostly in the nurseries. The first symptoms of the disease are clearing of the veinlets and chlorosis of the leaves. The younger leaves may die in succession and the entire may wilt and die in a course of few days. Soon the petiole and the leaves droop and wilt. In young plants, symptom consists of clearing of veinlet and dropping of petioles. In field, yellowing of the lower leaves first and affected leaflets wilt and die. The symptoms continue in subsequent leaves. At later stage, browning of vascular system occurs. Plants become stunted and die. which cause about 50 losses to the tomato crop caused by *Fusarium oxysporum f sp.lycopersici*.

Control: The nursery should be regularly inspected for wilt infected plants. The affected plants should be removed and destroyed. Prior to planting the beds should be drenched with Carbendazim (0.1%) and the seeds should be treated with the Thiram (2.5 kg/ha). Crop rotation with a non-host crop such as cereals helps to reduce the disease inoculum.

Damping Off

Pathogen: *Pythium aphanidermatum*

Symptoms: This is one of the worst diseases of tomato occurring in the nursery. Damping off of tomato occurs in two stages, i.e. the pre-emergence and the post-emergence phase. In the pre-emergence the phase the seedlings are killed just before they reach the soil surface. The young radical and the plumule are killed and there is complete rotting of the seedlings. The post-emergence phase is characterized by the infection of the young, juvenile tissues of the collar at the ground level. The infected tissues become soft and water soaked. The seedlings topple over or collapse.

Control: Seed treatment with fungal culture *Trichoderma viride* (4 g/kg of seed) or Thiram (3 g/kg of seed) is the only preventive measure to control the pre-emergence damping off. Soil drenching of the affected seedlings with Dithane M45 (3 g/litre of water) helps to reduce the disease incidence.

Early Blight of tomato

Pathogen: (*Alternaria solani*)

Symptoms: This is a common disease of tomato occurring on the foliage at any stage of the growth. The fungus attacks the foliage causing characteristic leaf spots and blight. Early blight is first observed on the plants as small, black lesions mostly on the older foliage. Spots

enlarge, and by the time they are one-fourth inch in diameter or larger, concentric rings in a bull's eye pattern can be seen in the center of the diseased area. Tissue surrounding the spots may turn yellow. If high temperature and humidity occur at this time, much of the foliage is killed. Lesions on the stems are similar to those on leaves, sometimes girdling the plant if they occur near the soil line. Transplants showing infection by the late blight fungus often die when set in the field. The fungus also infects the fruit, generally through the calyx or stem attachment. Lesions attain considerable size, usually involving nearly the entire fruit; concentric rings are also present on the fruit.

Control: Removal and destruction of the affected plant parts. Practicing crop rotation helps to minimize the disease incidence. Spraying the crop with Difolatan (0.2%), Dithane M-45 (0.2%) or Bavistin (0.1%) is recommended for effective disease control.

Late Blight of tomato

Pathogen: *Phytophthora infestans*

Symptoms: Late blight occurs when humid conditions coincide with mild temperatures for prolonged periods. If conditions are ideal for disease development, disease development is rapid causing severe economic losses. Lesions produced on the leaves are at first irregular, rather large, greenish-black and water-soaked. These areas enlarge rapidly, becoming brown, and under humid conditions, develop a white moldy growth near the margins of the diseased area on the lower surface of the leaves or on stems. The disease spreads rapidly under humid conditions, destroying quickly large areas of tissue. Lesions produced on the leaves are at first irregular, rather large, greenish-black and water-soaked. These areas enlarge rapidly, becoming brown, and under humid conditions, develop a white moldy growth near the margins of the diseased area on the lower surface of the leaves or on stems. The disease spreads rapidly under humid conditions, destroying quickly large areas of tissue. Fruit lesions occur as large, green to dark brown lesions, mostly on the upper half of the fruit, but they may also occur on other parts. White moldy growth may also appear on fruits under humid conditions. The disease attacks the fruits as well as the leaves of the plant. Symptoms on the fruits usually begin on the shoulders of the fruit because spores land on fruit from above.

Control: Control practices include rotating fields so as not to follow potato or tomato; avoiding planting tomatoes near potatoes; using disease-free seeds and transplants. Adopting certain prophylactic measures can also control the disease. Firstly, the seed material should be obtained from a disease free area. Before planting the seeds should be treated with Thiram (2-3 g/kg of seed). The plants must be sprayed with Captafol (2 g/litre of water) or Dithane M 45 (2 g/kg of seed) at 15 days interval, starting from 30 days after transplanting.

Powdery Mildew

Pathogen : (*Leveillula taurica*)

Symptoms: The disease occurs severely during dry seasons. A white powdery coating of the fungal growth appears on the leaf surface. Infected leaves may be dwarfed, stiff, and narrow. The fungus progressively attacks new leaves, spreading over leaf stems, twigs, and even the fruit. Terminal growth of the affected shoot is stunted or killed. The fruit yield is reduced and the affected fruit are smaller in size.

Control: Spraying with Karathane (0.1%) or Wettable Sulphur (3 g/ litre of water) twice at an interval of 10 days helps to control the disease.

Bacterial Wilt

Pathogen: *Pseudomonas solanacearum*

Symptoms: This is one of the most serious diseases of tomato crop. Relatively high soil moisture and soil temperature favour disease development. Characteristic symptoms of bacterial wilt are the rapid and complete wilting of normal grown up plants. Lower leaves

may drop before wilting. Pathogen is mostly confined to vascular region; in advantage cases, it may invade the cortex and pith and cause yellow- brown discolouration of tissues. Infected plant parts when cut and immersed in clear water, a white streak of bacterial ooze is seen coming out from cut ends.

Control: Crop rotations, viz., cowpea-maize-cabbage, okra-cowpea-maize, maize- cowpea-maize and finger millet-egg plant are reported effective in reducing bacterial wilt of tomato. Seedling treatment with Streptocycline (1 g/40 litres of water) for 30 min protects the seedlings in the initial stages of growth.

Bacterial Canker

Pathogen : (*Clavibacter michiganensis* pv. *Michiganensis*)

Symptoms: Temporary and later on permanent wilting of leaflets of affected plants is observed the disease in the field. Light streaks appear at the juncture of petiole and stem extending down the internode and up the petiole. At a later stage canker like opening may appear in stem, petiole and midrib. When the stem of diseased plants is cut longitudinally, a creamy white, yellow or brown line follows the phloem. The disease appears on the green fruit as water soaked spots with a white halo. Halo is the distinguishing Character of bacterial leaf spot of tomato.

Control: Hot water treatment of seeds at 50°C for 25 minutes is effective. Seed treatment with mercuric chloride (1:1000) is also recommended for control of disease. Crop rotation with non-host crop helps in reducing the disease incidence. Soaking of seed in solution of Streptocycline (1g/40 litres of water) for 30 min protects the seedlings in the initial stages of growth.