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Disease, Insect - Pest and their management in Tomato

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Early Blight (*Alternaria solani*)-

A common disease can affect tomato leaves at any stage. The fungal infection attacks the plant's leaves, causing leaf spots and blight. The first signs of early blight are little, black lesions on mature leaves. When the spots reach a diameter of one-fourth inch or more, concentric rings like a bull's eye appear in the afflicted region. The patches' edges may be yellow. High temperatures and humidity kill most of the greenery. Lesions on stems resemble those on leaves and may surround the plant if they are at the soil line.

Management-

The process of eliminating and disposing of the plant parts that have been impacted. The implementation of crop rotation techniques has been found to effectively reduce the occurrence of diseases in agricultural systems. It is recommended to apply Difolatan (0.2%), Dithane M-45 (0.2%), or Bavistin (0.1%) as a means of effectively controlling diseases in the crop.

Damping Off (*Pythium spp.*)-

This disease is among the worst for tomato plants in the nursery stage. Tomato plants experience pre-emergence and post-emergence damping off. Seedlings are killed before they reach the soil surface during pre-emergence. The juvenile insurgent and embryonic shoot die, causing the early plants to decompose. The collar's ground-level juvenile tissues infiltrate during the post-emergence period. The damaged tissues soften and seem waterlogged. Seedlings tend to uproot or fail structurally.

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Management-

The application of fungal culture for seed treatment. The sole preventive treatment for controlling pre-emergence damping off is the application of *Trichoderma viride* at a rate of 4 g/kg of seed or Thiram at a rate of 3 g/kg of seed.

The use of Dithane M45 (3 g/litre of water) through soil drenching has been found to be effective in mitigating the occurrence of the illness in the affected seedlings.

Buck Eye Rot (*Phytophthora parasitica*)-

Fruit rot (buckeye rot) is a serious disease that impacts tomato crops worldwide. The disease that causes fruit rot mostly affects ground-level fruits. The pathogen does not affect leaves, distinguishing it from late blight. The sickness appears as a water-soaked greyish green to brown patch where the fruit touches the earth. As the spot grows, the lesion surface forms concentric rings of tiny, dark brown bands and large, light brown bands. Infected immature, unripe fruits often mummify.

Management-

To mitigate the risk of infection, it is imperative to uphold favorable drainage conditions inside the field. One effective method for managing this disease involves the practice of staking plants and selectively removing leaves and fruits up to a height of 15-30 cm from the ground level. The use of Difolaton (0.3%) via four rounds, with a 10-day gap between each application, has been found to be an effective method for disease control.

Bacterial Wilt-

Ralstonia solanacearum (previously Pseudomonas solanacearum) causes Southern bacterial blight, commonly known as bacterial wilt. The bacteria may survive in the soil for extended periods and reach the roots by transplanting, culture, insect feeding, and

natural wounds where secondary roots grow. Temperature and moisture accelerate disease development. The bacteria multiply rapidly in the plant's water-conducting tissue, accumulating a sticky material. This causes the plant to quickly wither while the foliage remains green. Infected stems are brown when cut transversely and may contain yellowish discharge droplets.

Management-

Controlling bacterial wilt in contaminated soil plants is tough. At least three years of rotation with non-susceptible plants including maize, beans, and cabbage helps control. Avoid pepper, eggplant, potato, sunflower, and cosmos in this rotation. Destruction all contaminated plant material. Certified disease-free plants only. Kewalo is rare and moderately resistant to bacterial wilt. Chemical control for this illness is unavailable.

Aphids-

Weather is moderate and humid in spring and fall, when aphids are most widespread. Small, soft-bodied, green, grey, or black insects with slender legs. Aphids move slowly and can be winged or wingless. Insects gather on plant stalk tips. They diminish plant vigor by sucking sap. Aphids can carry viruses that impair yields and quality. In a healthy garden, beneficial insects eliminate aphids, but it takes two weeks for them to multiply enough to lower populations. Aphids can be squished with finger and thumb, cut with soapy water, or pushed off plants with a hose jet.

Management-

Rotenone dust, potassium soap, and oil are organic controls. Low-toxicity systemic imidacloprid. Other pesticides include dimethoate, cyfluthrin, tau-fluvalinate, pyrethrum, and piperonyl butoxide.

Root Knot Nematode-

The root knot nematode, also known as the eelworm, is a very small worm that is so small that it cannot be seen by the human eye. It feeds on a wide variety of vegetables and can cause significant harm to tomatoes. Damage can be identified by the appearance of

larger swellings on the roots as well as a general withering of the plants.

Management-

Gardeners have the option of utilizing solarisation, which involves heating the soil with a transparent plastic sheet throughout the summer for a period of one month, or cleaning the soil with a biofumigant by cultivating a crop of mustard or marigolds.

Thrips

Thrips do not harm tomatoes, but they carry the spotted wilt virus, which does. Thrips are little, yellow, green, grey, or black torpedo-shaped insects with or without feathered wings that fold down their backs.

Their sucking mouthparts cut the surface and extract sap from leaves, fruit, and flowers. Spotted wilt virus requires regular spraying. This reduces thrips. Spraying is crucial early in plant development. Due of their vast numbers, major infestations are nearly hard to manage. They withstand many sprays.

Management-

Dustings of sulfur or thorough spraying with adequate coverage of the undersides of the leaves using horticultural soap, imidacloprid, cyfluthrin, diazinon, or dimethoate are effective methods of pest control. Dustings of sulfur can also be used.

White fly-

Whiteflies are very little insects that feed on sap and are typically found on the undersides of leaves. Adult whiteflies resemble extremely little moths and take to the air in great numbers when they are agitated. The early stages do not have wings and more closely resemble scale insects in appearance. They could be challenging to keep under control. Whiteflies are prey for a variety of other insects, including ladybirds, lacewings, and hoverflies.

Management-

Sprays of horticultural (potassium) soap, bioallethrin, and bioresmethrin will also help to decrease whiteflies and leafhoppers. Leafhoppers are tiny insects that feed on leaves and can cause harm to seedlings and young plants. Horticultural (potassium) soap will also help to minimize whiteflies.