TOMATO Anthracnose

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Occurrence

Anthracnose is commonly observed during summar crop of tomato while its incidence is generally very low during winter in Khyber Pakhtunkhwa. In summer crop its incidence can go up to 12% in Peshawar region.

Cause and disease symptoms

Colletotrichum coccodes is the most common specie of fungi, which causes tomato anthracnose. The most characteristic symptom develops on ripe or over-ripe fruit. Although many infections occur when the fruit is green, the disease is generally not evident until the fruit is ripe or nearly so. Initially, fruit lesions are small, circular, water-soaked, and slightly sunken (Fig 1). However, in warm weather, the lesions expand rapidly to a diameter of about 1/2 inch, sometimes marked with concentric rings. The center of each lesion may be blackish due to a large number of black specks, which are the spore-producing bodies (acervuli) of the anthracnose fungus. In moist weather the acervuli produce large numbers of slimy, cream to salmon-colored spores (conidia) on the surface of the lesions. If conditions are favorable, the entire fruit may be almost completely covered with anthracnose spots within 24 hours after harvest. Spotted fruits may rot completely, often due to invasion of anthracnose lesions by secondary soft-rot organisms. The fungus is also able to infect the leaves, stems, and roots. Foliar symptoms are uncommon, but are seen as tiny, circular to angular necrotic lesions surrounded by a yellow halo. The anthracnose fungus often becomes established in early blight lesions or insect-feeding injuries. When tomato seeds germinate, the anthracnose fungus can cause brown lesions on the hypocotyl and radicle if there is sufficient inoculum in the soil. Roots on senescing plants usually are affected, and said to have black dot because of the tiny, black specks (sclerotia) which form on the roots. These sclerotia, which are survival structures, may also form on and in the stems, leaves, and fruit skins of tomato refuse.

Fig 1: Anthracnose

Disease Cycle

Frequent showers, heavy dews, temperatures of 68to 85^{o} F (20 to 29^{o} C) and over-crowding of plants favor the spread and development of anthracnose. The fungus causing anthracnose may be carried on or in the seed and may overwinter in the soil or crop debris. In addition, the fungi also infect and over-winter on several species of weeds (such as ground cherries, horsenettle, Jimsonweed, and nightshades) as well as crops in the tomato family (Solanaceae). The host range of the anthracnose fungi includes 13 or 14 families, most of the hosts occurring within the plant families Solanaceae, Cucurbitaceae, and leguminosae. The spores and other fungal structures are spread by water splash, on tools and farm equipment, by insects, by handling wet plants, and by any agency that moves infested soil and plant debris from one place to another (such as wind and water). Infection may occur through natural openings (largely stomata), wounds, or directly through the surface of leaves, stems, fruit, and roots.

Management

Growers need complete disease management program and following practices are very important in keeping fruit losses to a minimum.

A. For Transplant Growers

1. Purchase only disease-free certified seed from a reputable firm and ask if the seed has been hot water treated.
2. If you suspect the seed is infected, and not hot water treated, soak the seed in hot water (exactly 122(F [50(C] for 25 minutes), and then dust with a seed-protectant fungicide before planting.

3. Treat the seedbed soil with chemicals before planting.
4. Provide ample ventilation for plants in the seedbed. Do not overhead water, or water in the evening, and avoid overcrowding the seedlings. Fertilize based on a soil test.
5. Do not hold plants in the seedbed or in storage any longer than is absolutely necessary after they have reached the proper stage for transplanting.

B. For Field Growers

1. Purchase only disease-free certified transplants. When transplanting, discard all seedlings with cankers or lesions on the stem and leaves. Space the plants so the tops will not be crowded at maturity.
2. Eradicate all weeds preferably before planting and during the season, particularly those in the family Solanaceae. It is also important to keep down all weeds as far around the field or garden as is practical.
3. Do not cultivate or work with plants when the foliage is wet with rain or dew.
4. Some losses from these diseases can be avoided if high, balanced soil fertility is maintained and tomatoes are planted in well-drained soil. Staking, caging, or mulching plants to keep fruit off the soil will reduce losses from these diseases as well as other fruit rots.
5. Routine applications of fungicides (i.e. spray 0.2% each Captan or Dithane z-78 and seed treatment @ 0.2% with Captan or Thiram) with 7-10 days interval are essential in controlling these diseases.
6. Harvest all ripe fruit at each picking. If left in the field, such fruit will soon decay and serve as a major source of infection for the remaining fruit.
7. After harvest is completed, spade or cleanly plow down, compost, or burn all tomato vines and unharvestable fruit.
8. Rotate three or four years before planting tomatoes, eggplant, peppers, or potatoes in the same area. This helps prevent buildup of the causal fungi in the soil.
9. Plants with resistance to one or more of these should be planted.