



EARLY BLIGHT OF TOMATO

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Occurrence

Early blight occurrence can be observed during both summer and winter crops in Khyber Pakhtunkhwa. However, high levels of disease could be prevalent in winter crop in the Province.

Cause and disease symptoms

Early blight caused by the fungus *Alternaria solani* and it can affect plants at any stage of development. All above ground parts of tomato are susceptible. Common names used for the disease at various stages of plant and fruit development include seedling blight, damping-off, foot and collar rot on young plant stems, stem blight and canker on stems and branches of older plants, early blight and *Alternaria* or target leaf spot, blossom blight, black rot and hard fruit rot, and fruit drop of fruit and petioles. The "early" in early blight was used to distinguish *Alternaria* blight from *Phytophthora* late blight, referring to the time when disease appears relative to the age of the plant. Pre and post-emergence damping-off occurs in seedbeds resulting in poor stands. Collar or foot rot may develop on young seedlings and transplants. Collar rot is characterized by a large, girdling, dark brown, slightly sunken, irregular lesion at the base of the stem. Similar but smaller stem cankers may develop further up the stem. Affected seedlings may be stunted, wilt and die, or be unproductive when set in field. Somewhat sunken spots (cankers) develop on the stems and branches. The cankers are dark, often target-like, with grayish white centers. The most characteristic symptom of early blight is expressed as small, brown spots on the lower or older leaves (Fig 1). The circular to angular spots enlarge until they are 1/4 to 1/2 inch in diameter and soon develop dark, concentric rings or ridges, producing a "target-board" effect. Affected leaves develop yellow areas around the lesions. Spotted leaves soon turn yellow, wither, and drop off. In severe cases plants can become completely defoliated late in the season. The fungus may cause lesions on the fruit around the stem end and shoulder. The lesion is usually dark brown to black, up to an inch in diameter, leathery, depressed, and with distinct concentric rings. The *Alternaria* fungus often covers fruit lesions as a dark brown, velvety layer of spores. Lesions on the flower stems cause some blossom drop and loss of young fruits.



Fig 1: Early Blight

Disease Cycle

Frequent showers, heavy dews, temperatures of 68 to 85° F (20 to 29° C) and over-crowding of plants favor the spread and development of early blight which tends to be more destructive during hot, dry seasons. The fungus may be carried on or in the seed and may overwinter in the soil or crop debris. In addition, the fungus also infects and over-winter on several species of weeds as well as crops in the tomato family. 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

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. Known early blight resistant transplants should be planted.