Blossom End Rot of Tomato Fruit

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A disorder affecting tomato fruit known as blossom end rot is frequently found wherever tomatoes are grown. Symptoms first appear as water-soaked spots at or near the blossom end of immature fruits. Spots enlarge rapidly and may coalesce to form extensive areas of damage. As the tissue dries and shrinks, the lesion surface becomes sunken, leathery and dark brown to black in color. Affected areas are commonly invaded by secondary fungi and bacteria that cause soft rot and fruit decay.

Figure 1. Symptoms of tomato blossom end rot (pear shaped variety).

Figure 2. Blossom end of tomato fruit exhibiting a sunken leathery lesion characteristic of blossom end rot.
Internal discoloration and tissue collapse may be present without the characteristic end rot symptoms being visible.

Causal Factors

Blossom end rot is frequently found on light sandy soils where there is a tendency for irregular fluctuation of the moisture level. These soils have a low water holding capacity so water becomes limiting in hot weather when the plant is carrying a heavy fruit load. Although blossom end rot is basically the result of insufficient calcium within the tomato fruit, factors which place a stress on water uptake or interfere with the concentration of available calcium in the soil or uptake of calcium by the plant contribute to the incidence of blossom end rot. A factor that appears to directly affect calcium uptake by tomato plants was recently elucidated by Purdue University researchers G. E. Wilcox and coworkers, Department of Horticulture. Their findings show that nitrogen applied as ammonium N produced a marked reduction in the calcium absorption and accumulation in leaf tissue by tomatoes when compared with calcium absorption and accumulation in the presence of nitrate-N. In addition, the application of the ammonium form of nitrogen during fruiting resulted in the rapid development of blossom end rot.

Control of Blossom End Rot

The incidence of blossom end rot is reduced in greenhouses and home gardens by providing an even supply of moisture with irrigation or controlled watering and mulching. An even moisture supply helps to promote steady growth throughout the season. Avoid excessive use of nitrogen fertilization particularly the ammonium form as side dress applications when the plant is fruiting. This is particularly important in cold or acid soils where high levels of the ammonium form of nitrogen are maintained for prolonged periods.

The timely and repeated spraying of tomato fruit and foliage with a dilute (0.2%) solution of calcium chloride has been reported to prevent blossom end rot by some workers. Use calcium chloride (77% product) at the rate of 5 pounds per acre in 100 gallons of water. On garden tomatoes use a tablespoonful or half-ounce per gallon on 75 to 100 feet of row. The sprays are needed before and during stress periods of heat and drought. Weekly or twice-weekly applications should be made, but repeated no more than necessary because of possible injury from accumulated salt on the foliage.

Varieties of tomato differ in susceptibility to blossom end rot, with pear shaped varieties most susceptible. There are currently no varieties with sufficient tolerance to provide a dependable means of control.

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