

Blossom End Rot of Tomato

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Blossom end rot is a physiological disorder of tomato fruits that affects both greenhouse and field grown plants. Blossom end rot occurs more frequently when plants grown under favorable conditions early in the season are subjected to long periods of drought during the early stages of fruit development. However, it can also occur after periods of unusually heavy rainfall. Losses from this disorder vary from negligible to severe, depending on the environmental conditions. Blossom end rot also affects peppers and eggplant.

Calcium deficiency has been shown to be a contributing factor to the occurrence of blossom end rot. Failure of sufficient calcium to reach the blossom end of the fruit early in fruit development causes the cells in this area to die. Many of the factors that contribute to this physiological process are not known; however, it has been shown that pathogenic organisms are not involved. It is common for secondary fungi and bacteria to invade dead tissue on fruit affected with blossom end rot. These organisms are sometimes mistakenly assumed to have caused the symptoms.

Symptoms

The first evidence of blossom end rot consists of a brown or watersoaked discoloration near the blossom end (opposite the stem end) of the fruit. The discolored area enlarges and darkens until it covers $\frac{1}{3}$ to $\frac{1}{2}$ the surface of the fruit in severe cases. As the spots increase in size, the tissue becomes shrunken and the area becomes flattened or concave. The skin of affected fruit becomes black and leathery in appearance (Fig. 1). Fruit do not soft rot unless the spots are invaded by secondary organisms.

Tomatoes affected by blossom end rot grow slowly and often ripen prematurely. Under certain conditions the outward symptoms may be suppressed almost entirely, while the inner tissue near the blossom end is completely discolored and collapsed. Blossom end rot is most frequently observed on fruit that is $\frac{1}{2}$ to $\frac{2}{3}$ its mature size. Symptoms on pepper and eggplant are similar to those on tomato; however, on peppers the discolored area is often tan rather than brown and the rot may occur on the sides of the fruit near the blossom end.



Fig. 1. Tomatoes showing rot at the blossom end only. Secondary fungi have begun to invade the rotted tissue. (Photo by M. A. Hansen)

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Control

Cultural Control

- Maintain a uniform supply of soil moisture by watering plants during drought and mulching to retain soil moisture.
- Avoid using excessive amounts of ammonia forms of nitrogen, which reduce calcium uptake. Use nitrate forms of nitrogen instead. Avoid overfertilization during early fruiting.
- Light applications of fertilizers high in superphosphate will aid in reducing blossom end rot.
- Maintain a soil pH of approximately 6.5. Liming helps supply calcium.
- Do not subject plants to sudden and severe hardening before transplanting.

- Avoid setting plants in the field too early when the soil is still too cold for rapid growth.
- In cultivated fields, cultivate plants to a shallow depth to avoid root injury.

Chemical Control

- Foliar applications of calcium can be used but they are not always effective. Apply calcium chloride as a spray if the soil is deficient in calcium and blossom end rot begins to develop. Use 4 teaspoons of 96% calcium chloride per gallon of water. Sprays should be applied at weekly intervals until 3 or 4 applications have been made. Prolonged applications of calcium chloride may cause marginal leaf burn.

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