

Blossom-end Rot of Tomatoes

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Introduction

It's common for home gardeners in all parts of Oregon to become alarmed about blossom-end rot of tomatoes during the period when the fruits are enlarging. Other fruiting vegetables, including peppers, eggplants, pumpkin, watermelon, and squash, can also exhibit blossom-end rot. This is a physiological disease resulting from imbalances in water and plant nutrients. It is not caused by fungi or bacteria and does not spread from plant to plant. There are no tomato varieties adapted to Oregon that are highly resistant to this disorder. The control lies in understanding the causes and then applying the necessary gardening skills to prevent the disease.



Figure 1. A tomato showing a dark brown to black, leathery appearance at the bottom end of the fruit, typical of blossom-end rot.

Credit: C.M. Ocamb, © Oregon State University

Description

Blossom-end rot appears as a large, gray-to-black spot at the end opposite the stem, at the blossom end of the affected fruit. It affects immature as well as ripe fruit.

The first evidence of the injury is a brown discoloration at the blossom end. The spots may enlarge until they cover one-third to one-half of the fruit surface. The tissues beneath the spots become shrunken and dry, and the surface of the spot becomes flattened or concave. The skin may be black and leathery. Sometimes, affected tissues can be colonized by secondary microorganisms, and spots will take on the appearance of a fungal disease.

Causes

The fundamental causes of blossom-end rot are calcium deficiency in the plant and moisture stress. Calcium uptake by the plant may be inadequate for any of the following reasons:

- There is insufficient calcium in the soil.
- Excess nitrogen, magnesium, potassium, or sodium has been applied as fertilizer.
- Very wet or very dry conditions interfere with the uptake of calcium.
- There is a combination of these causes.

Another important factor to consider is the rate of plant growth. Tomatoes' calcium and water requirements increase as the weather warms up and the growth rate increases. Heat snaps with extraordinarily high temperatures will favor the development of blossom-end rot.

Controls

One or all of the following practices should provide relief from blossom-end rot.

Before planting

- Use a soil test to determine if there is a calcium shortage. Use pulverized limestone to adjust the pH of the soil to 6.8 to 7.2. Most garden soils benefit from applying at least 5 pounds of pulverized limestone to 100 square feet every three years. Mix the lime thoroughly throughout the top 8–12 inches of soil. Lime is best applied in the fall.
- Use only moderate amounts of additional fertilizer to keep the tomato plants normally green and vigorous but not luxuriant. About 1.5 pounds of 10-20-10 per 100 square feet mixed into the topsoil just before planting is usually enough. The complete fertilizer should be especially high in phosphate.
- Make sure you plant your tomatoes in an area with good drainage. Where water accumulates, roots are killed or rendered inactive.
- Provide for adequate irrigation.

After planting

1. Mulch the plants with black plastic or loose organic materials.
2. Fertilize only moderately to keep plants normally green and vigorous but not luxuriant. Fertilize with a nitrogen side-dressing only if necessary to maintain a green color and moderate growth. Use calcium nitrate or ammonium sulfate at a quarter-pound per 100 square feet.
3. Water judiciously so the soil is never too wet or too dry, to a depth of 2 feet. To avoid moisture stress, apply enough water to wet all the soil in the root zone every 7 to 10 days. About 24 hours after watering, dig a small hole with a trowel to a depth of 1 foot to ensure enough water was applied. The soil in the root zone should always be moist enough to form a ball easily.
4. Restrict all cultivation to the top inch or two to avoid damage to the roots, or use a mulch to eliminate cultivation.

In an emergency

If you have not followed the controls described above and you detect the symptoms of blossom-end rot, spray the leaves and fruits thoroughly with 2 tablespoons of calcium chloride in 1 gallon of water. Apply 2 more sprays at 1-week intervals. At the same time, correct the soil moisture problems; while irrigating, be careful not to wash the calcium spray residues off the plants.

Note: Control of blossom-end rot of peppers and other fruiting vegetables is the same as for tomatoes.

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