

## Blossom End Rot in Tomatoes

Laurie Hodges, Extension Vegetable Specialist

Knowing how to avoid blossom end rot in tomatoes, a common problem for growers, can improve yield and quality.

Blossom end rot of tomatoes is a common problem. It occurs under conditions of high plant water stress and heavy fruit load. The first sign is a small, water-soaked area around the blossom end of the fruit that rapidly darkens and enlarges. As this lesion enlarges, it shrinks and the area becomes sunken and leather-like. This depressed area may become infected with secondary pathogens. Early fruits on the plant may have blossom end rot, while those that develop later are normal.

Blossom end rot is a symptom of calcium deficiency in the fruit. It can occur even when abundant calcium is in the soil and tissue tests show high levels of calcium in the plant. Poor calcium distribution in the plant results in low calcium levels where the lesion occurs.

Calcium, dissolved in water, moves through the plant in the vascular system from the roots to the leaves. Leaves are the primary sink for movement of water because of water loss through transpiration. Under high moisture stress, water containing calcium and other minerals moves rapidly to the leaves.

Fruit does not transpire as much as leaves and thus tends to be bypassed. This results in a localized calcium deficiency. This calcium deficiency in an area of rapid growth, the end of the fruit, causes cells to collapse and the sunken-lesion symptom of blossom end rot.

Blossom end rot may appear on some of the first fruit clusters on a plant, due to the combination of rapid plant growth with a large leaf area for water transpiration, water stress, and fruit enlargement. Even a temporary water stress during early fruit enlargement can cause blossom end rot because the fruits are the last to receive adequate calcium.

Calcium, unlike potassium or phosphorus, is not remobilized from the leaves to the fruits. Thus, foliar sprays of calcium won't correct blossom end rot. Tomato fruits do not have openings in the epidermis (skin) where moisture can be lost or where calcium can enter the fruit from surface application, so direct application of calcium to fruit is ineffective.

Another cause of blossom end rot is over-fertilization, especially of nitrogen, which stimulates vegetative growth. Excessive vegetative growth increases the transpiration surface and further prevents calcium accumulation in the fruit. Tomato varieties with large amounts of foliage tend to be more susceptible to blossom end rot. Adjust the nitrogen rate for each cultivar to reduce blossom end rot. Avoid ammoniacal forms of nitrogen that compete with calcium during uptake from the soil.

Hot, windy conditions with low relative humidity can cause high transpiration rates ideal for inducing blossom end rot. Fluctuations in soil moisture during periods of rapid plant growth create moisture stress and limit calcium distribution to the fruit.

Preventing moisture stress is important to control blossom end rot, especially during fruit set and fruit enlargement. Plants require 1 acre-inch of water per week or more in sandy soil and during hot, windy weather.

Mulch to conserve moisture and adjust the nitrogen rate to the type of tomato being grown to avoid excessive vegetation. Use nitrogen in the form of potassium or calcium nitrate and avoid ammonium nitrate. Check soil pH and soil nutrient levels annually and adjust the pH to between 6.5 to 6.7 if necessary. Apply potassium, phosphorus, and magnesium as recommended because balancing these nutrients with calcium is also important in preventing blossom end rot. The primary factor, however, is maintaining uniformly adequate soil moisture throughout the season.

### Acknowledgment

The author would like to acknowledge the work of Don Steinegger, Extension Horticulture Specialist, who was a contributor of the previous edition of this publication.

UNL Extension publications are available online at <http://extension.unl.edu/publications>.

**Index: Horticulture  
Vegetables**

Issued October 2007

Extension is a Division of the Institute of Agriculture and Natural Resources at the University of Nebraska–Lincoln cooperating with the Counties and the United States Department of Agriculture.

University of Nebraska–Lincoln Extension educational programs abide with the nondiscrimination policies of the University of Nebraska–Lincoln and the United States Department of Agriculture.