

## Blossom End Rot



**Photo:** Missouri Botanical Garden Kemper Demonstration Gardens. Blossom end rot can affect many commonly grown vegetables including squash and tomatoes.

After receiving multiple questions about blossom end rot of squash, I decided make it this week's Nature's Advocate column topic. Blossom end rot can be a troublesome issue in growing tomatoes, peppers, squash, cucumbers, and eggplant; a problem with conflicting information on the best ways to treat.

Blossom end rot is an abiotic (non-living) disease caused by a deficiency of calcium. The deficiency causes the "blossom end" of the fruit to appear to rot. Symptoms can include necrotic spotting on the fruits of peppers and water soaked spots on the ends of fruit of other commonly susceptible plants. Although not part of the top three nutrients listed on a bag of fertilizer, calcium along with Nitrogen, phosphorus, and potassium are considered macronutrients; those nutrients needed in large quantities.

Because typically calcium content of soils are adequate for proper plant growth, the main cause of blossom end rot is commonly due to other abiotic factors such as changes in water transpiration rates (water movement up through the plant towards the leaves) and excessive amounts of nitrogen fertilizer in the form of ammonium. Too much potassium and magnesium in the soil can lead to the plant not taking up enough calcium it needs. All of these nutrients in excess can limit the uptake of calcium.

A common misconception when battling blossom end rot calcium deficiency is spraying the plants with a calcium chloride or other calcium rich foliar spray. Calcium only travels through the xylem of

plants vascular system as water is moved through the plant through the process of transpiration. The xylem carries the water and nutrients up the plant. What often happens related to excess nitrogen applications is a flush of vegetative growth. As water evaporates from the newly formed leaves, the transpiration rate increases, and calcium may bypass the fruit. Soil temperature and moisture content can all affect the transpiration rate and in return the amount of calcium absorbed and carried by the xylem. Because of the way calcium is carried through the plant from the roots towards the leaves and fruits by the xylem, spraying calcium on the leaves of plants will not solve blossom end rot calcium deficiency.

Uptake of calcium is limited in fluctuating overly wet and dry soil conditions. To limit the occurrence of blossom end rot, plants should be kept consistently watered. Mulching beds in summer and using drip irrigation on a timely basis can help alleviate the problem. In years past, overly dry conditions caused blossom end rot of a tomato plant that I grew in a raised bed situation. Another method of control is to use a nitrate based nitrogen fertilizer, and not ammonium. It is very important not to over apply a nitrogen fertilizer to limit an excessive flush of new leaf production. University Extension experts recommend the use of a super phosphate, which can help turn around the deficiency.

If a soil sample is taken and a calcium deficiency is detected, lime, gypsum, or other calcium rich soil amendments can be added to the soil. Remember, lime will raise the pH of the soil and should not be used unless the soil is acidic and the pH needs to be increased. A good soil pH of around 6.5 is adequate for most vegetable plants.

Blossom end rot is a abiotic disease which, although caused by a calcium deficiency, often leaves the fruit open to other biotic (living) diseases such as fungi. A soil test before planting, appropriate fertilizer application rates for the crop planted, and consistent soil moisture can help eliminate the chance of a destroyed crop due to this nutrient deficiency.<sup>123456</sup>

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<sup>1</sup> <http://ucanr.edu/sites/placernevadasmallfarms/files/86509.pdf>

<sup>2</sup> <http://hort.uwex.edu/articles/blossom-end-rot>

<sup>3</sup> [http://pubs.ext.vt.edu/450/450-703/450-703\\_pdf.pdf](http://pubs.ext.vt.edu/450/450-703/450-703_pdf.pdf)

<sup>4</sup> <http://ohioline.osu.edu/hyg-fact/3000/3117.html>

<sup>5</sup> <http://www.soils.wisc.edu/extension/pubs/A2523.pdf>

<sup>6</sup> <http://www.missouribotanicalgarden.org/gardens-gardening/your-garden/help-for-the-home-gardener/advice-tips-resources/pests-and-problems/environmental/blossom-end-rot/blossom-end-rot-of-tomato-and-pepper.aspx>