

# Heat Causes Ripening Problems in Tomatoes

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Tomatoes that mature under high temperatures often ripen unevenly. This condition is known as yellow shoulders. Photo by Paul Bachi, University of Kentucky Research and Education Center, Bugwood.org

The mild weather that has blessed our gardens with bountiful harvests so far this summer came to screeching halt this past week as temperatures soared into the triple digits. Any time temperatures get that high vegetables production will drop temporarily, especially in tomatoes. In addition, tomatoes that ripen during a heat wave are likely to develop heat related ripening disorders.

## Less Fruit

Tomatoes are more sensitive to heat than other summer vegetables. Their most common response to heat stress is to drop flowers without setting fruit. Extended hot weather, when daytime highs reach into the 90's and night time temperatures stay above 75 degrees, is the main reason so many gardeners experienced poor tomato production in the excessively hot summers of 2010 and 2011.

While temperatures up until now have been nearly ideal for tomatoes this summer, the heat of this past week will likely cause most gardeners to see a drop in fruit production for the next week or two. There is little gardeners can do to increase fruit set during a heat wave. Keeping plants well watered will help plants cope with excessive heat and recover faster when milder temperatures return.

## Ripening Disorders

While still edible, fruits that mature during hot weather are usually less flavorful than those that ripen under milder temperatures. Green tomatoes that have already formed on the vines will continue to ripen during a heat wave, but rarely ripen evenly. One of the most common heat related complaints is yellow shoulders, in which the top end of the tomato stays yellow or green while the lower half turns red. Sometimes referred to as solar yellowing, this disorder occurs when surface tissue temperatures exceed 86 degrees, inhibiting the development of red pigments. Since the top part of tomatoes are more directly exposed to sunlight, those tissues get hotter and do not turn red.

A more severe form of heat injury is sunscald, where exposed surface tissues are burned by the sun. These areas, which develop on the sides of fruits exposed to direct sunlight, turn white or tan and appear leathery and sunken. Fruits covered by leaves are protected. Maintaining dense leaf coverage by controlling foliage diseases and not over pruning is the best way to avoid sunscald.



High temperatures cause hard white spots to form inside tomato fruits.

A less obvious heat related ripening disorder in tomatoes is the development of internal white spots. On the outside fruits usually look completely normal, but when cut open you will find areas of hard white tissue within the fruit walls. Some varieties are more prone to developing internal white spots than others. This condition is exacerbated by low potassium levels. Also known as potash, potassium is often deficient in sandy soils and usually needs to be applied every year. Gardeners should soil test each year to determine how much potassium and other nutrients their garden needs.

### **Blossom End Rot**



Extreme heat increases the risk of fruit developing blossom end rot.

In addition to uneven ripening, extreme heat is a contributing factor to blossom end rot (BER). This disorder occurs when there is not enough calcium available within developing fruit, causing the lower end of the fruit to turn tan or black. Other factors that increase BER include uneven watering, over fertilization, and low soil pH (acid soil). The most important things gardeners can do to minimize BER is to keep plants evenly moist, avoid high nitrogen fertilizers, and soil test to check soil pH levels. Lime will raise soil pH and supply calcium to the soil, but should only be applied if soil test results indicate it is needed. Lime must be mixed into the soil at or before planting time to do any good. Applying lime or gypsum to the soil surface now will not prevent BER.

### **Learn More!**

If you have questions about plant problems, contact your local Extension office. If you live in Pender County, call 259-1235. In New Hanover County, call 798-7660. In Brunswick County call 253-2610, or visit <http://www.ces.ncsu.edu/> where you can post your questions to be answered via the 'Ask an Expert' widget.

- I learn more about **blossom end rot** from this Alabama Extension fact sheet: <http://www.aces.edu/pubs/docs/A/ANR->

- Cornell Extension explains several **common ripening disorders** (including images) here: [http://vegetablemndonline.ppath.cornell.edu/NewsArticles/Tom\\_ComDis.htm](http://vegetablemndonline.ppath.cornell.edu/NewsArticles/Tom_ComDis.htm)
- Further discussion of **heat related problems** on tomatoes: <http://www.salisburypost.com/Lifestyle/070612-extreme-heat-leaves-mark-in-garden-qcd>
- Not sure what is wrong with your tomatoes? Try the Tomato Problem Solver from Texas Extension: <http://aggie-horticulture.tamu.edu/publications/tomatoproblemsolver/>

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