

## Troublesome Tomatoes

Tomatoes are not an easy crop to grow. With a couple weeks of hot temperatures and the usually foliar diseases this time of year presents many challenges to home gardeners. While tomato diseases can be prevented and treated, some of the fruiting issues have to be tolerated until the weather cools.

### Not Setting Fruit

Temperatures that remain above 75 degrees F at night and day temperatures above 95 degrees F, especially with dry, hot winds will cause poor fruit set on tomatoes. While cherry tomatoes seem to be more heat tolerant, slicing tomatoes struggle in warmer temperatures. High temperatures interfere with pollen viability and can cause excessive style growth (an important part of the flower for fertilization) leading to a lack of pollination. Though there are "heat-set" slicing tomatoes such as Florida 91, Sun Leaper and Sun Master that will set fruit at higher temperatures, that difference is normally only 2 to 3 degrees. When cooler temperatures arrive flowers will resume fruit set as normal.

### Slow to Ripen

Hot weather interferes not only with flower pollination but also can affect how quickly fruit matures. The best temperature for tomato growth and fruit development is 85 to 90F. When temperatures exceed 100 degrees F, plants focus on survival. Water movement becomes the plants primary function and fruit maturation takes a backseat. When temperatures moderate, even to the mid-90s, the fruit will ripen much more quickly.

Tomato color can also be affected by heat. When temperatures rise above 95 degrees F, red pigments don't form properly though the orange and yellow pigments do. This results in orange fruit. This doesn't affect the edibility of the tomato, but often the deep red is considered more appetizing. To obtain the deep red color, pick tomatoes in the "breaker" stage. Breaker stage tomatoes are those that have just started to turn color. At this point, the tomato has cut itself off from the vine and nothing will be gained by keeping it on the plant. If tomatoes are picked at this stage and brought into an air-conditioned house, they will ripen more quickly and develop a good, red color.

### Tomato Cracking

Tomatoes often have problems with cracking caused by pressure inside the fruit that is more than the skin can handle. Cracks are usually on the upper part of the fruit. A tomato's root system is very dense and fibrous and is quite efficient in picking up water. Unfortunately, the root system can become unbalanced with the top of the plant. Early in the season the root system may be small in relation to the top of the plant, resulting in blossom-end rot when the weather turns hot and dry. Later it may be so efficient that it provides too much water after rain or heavy irrigation. This quick influx of water can cause the tomato fruit to crack. Therefore, even, consistent watering can help with cracking. Mulching will also help because it moderates moisture levels in the soil.

Even with mulch and consistent water you may still have problems with cracking. K-State has evaluated varieties for cracking during their tomato trials. The old variety Jet Star has been the most crack resistant of any tested including the newer types. Unfortunately, Jet Star is an indeterminate variety that puts out rampant growth which is sometimes undesirable to gardeners. Mountain Spring, Mountain Pride,

Mountain Fresh, Floralina and Sun Leaper are smaller-vined types that have shown good resistance to cracking.

### Tomato Leaf-Spot Diseases

Two common leaf-spot diseases will likely appear on tomato plants soon if they haven't already. Septoria leaf spot and early blight are both characterized by brown spots on the leaves. Septoria leaf spot usually appears earlier in the season than early blight and produces small dark spots. Spots made by early blight are much larger and often have a distorted "target" pattern of concentric circles. Heavily infected leaves eventually turn yellow and drop. Older leaves are more susceptible than younger ones, so these diseases often start at the bottom of the plant and work up.

Anything that keeps tomato plants off the ground like mulching, caging, or staking makes them less vulnerable. Better air circulation allows foliage to dry quicker than in plants allowed to sprawl. Mulching also helps prevent water from splashing which can spread the disease from the ground to the plant. In situations where these diseases have been a problem in the past, rotation is a good strategy. If you have room, rotate the location of the tomatoes each year to an area that has not had tomatoes or related crops (peppers, potatoes, eggplant) for several years.

If rotation is not feasible, fungicides are often helpful. Be sure to cover both upper and lower leaf surfaces, and reapply fungicide if rainfall removes it. Plants usually become susceptible when the tomato fruit is about the size of a walnut. Chlorothalonil is a good choice for fruiting plants because it has a 0-day waiting period, meaning that fruit can be harvested once the spray is dry. Chlorothalonil can be found in numerous products including Fertilome Broad-Spectrum Landscape and Garden Fungicide, Ortho Garden Disease Control, GardenTech Daconil, Bonide Fungonil and others.

Be sure to start protecting plants before these diseases are first seen if they have been a problem in the past. It is virtually impossible to control these diseases on heavily infected plants. If chlorothalonil doesn't seem to be effective, try mancozeb (Bonide Mancozeb Flowable). Note that there is a five-day waiting period between application and when the fruit can be harvested. You may wish to pick some tomatoes before they are fully red just before you spray if you use Mancozeb and allow them to finish ripening indoors.