







# MISSOURI BOTANICAL GARDEN

## William T. Kemper Center for Home Gardening

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### *A Visual Guide - Problems of Tomato Fruit*

	<p><b><u>Are diseased tomatoes edible?</u></b></p> <p>No tomato problem listed here makes the fruit poisonous. In most cases, the affected part can simply be cut out and the tomato eaten although the quality of the fruit may be too poor for consumption. To grow better quality fruit, follow the recommendations in our Kemper Center Factsheet <a href="#">Tomatoes</a>, and for overall guidelines on disease prevention, see our Kemper Center Factsheet <a href="#">Tomato Diseases and Disorders</a>.</p>
	<p><b><u>Failure to set fruit or poor fruit set</u></b></p> <ol style="list-style-type: none"> <li>1. Night temperatures above 70 degrees F or below 55 degrees F.</li> <li>2. Day temperatures above 90 degrees F combined with low humidity and/or drought. Hot drying winds can add to the problem.</li> <li>3. Dry soil can cause blossoms to dry up and drop.</li> <li>4. Too much nitrogen fertilizer produces leafy growth at the expense of flowers and fruit.</li> <li>5. Cold soils at planting time can stunt growth and delay or eliminate flowering.</li> <li>6. Insufficient light. Tomatoes require at least 6 hours of direct sunlight per day.</li> <li>7. <a href="#">Viral diseases</a>, such as, curly top, mosaic viruses, etc., can affect flowering and fruit set.</li> <li>8. Lack of air circulation can inhibit the movement of pollen to the flower pistils.</li> </ol>
 	<p><b><u>Failure to ripen</u></b></p> <ol style="list-style-type: none"> <li>1. Temperatures below 60 degrees F or above 90 degrees F.</li> <li>2. Compacted soil and overly wet soil inhibit the root system which restricts fruit ripening.</li> <li>3. <a href="#">Low potassium (potash) levels</a> inhibit proper fruit growth and maturity; however, too much potassium can reduce the absorption of calcium and magnesium. Follow the recommendations from a <a href="#">soil test</a> to adjust soil fertility.</li> </ol> <p>Look-alikes: Depending on variety, a ripe tomato can be a wide variety of colors: red, orange, pink, yellow, brown, green-striped, or 'white' (bottom image). Know the expected color of your tomatoes before suspecting them of failure to ripen.</p>



### Uneven or blotchy ripening

Parts of the fruit remain yellowish or orange, failing to ripen. This condition can have several causes.

1. Temperatures below 60 degrees
2. Compacted soil and overly wet soil inhibit the root system which restricts fruit ripening
3. Tomato yellow shoulder disorder (see next section for details).
4. [Viral diseases](#)
5. Heavy [whitefly](#) infestation

Look-alikes: [Sunscald](#), cloudy spot ([stink bug](#) damage)



### Tomato yellow shoulder disorder

Characterized by the area around the stalk remaining hard and yellow or green with internal white or green tissue. The exact cause is unknown but it has been associated with adverse weather conditions and soils that are not conducive to good tomato growth; such as, soils with [low potassium levels](#), low organic matter, and a [high pH](#). A basic [soil test](#) will reveal all three. Also, some tomato varieties are simply more prone to yellow shoulder disorder than others.



Adverse weather conditions cannot be changed, but selecting resistant varieties and following the recommendations of a [soil test](#) can reduce the occurrence of tomato yellow shoulder disorder. Adjustments to the soil should not be made without a soil test because too much potassium can reduce the absorption of calcium and magnesium, and too much sulfur (used to acidify the soil) can burn plant roots.

Look alikes: Uneven ripening, [sunscald](#), cloudy spot ([stink bug](#) damage)



### Internal black mold

Possible causes include [anthracnose](#) (pictured on the left), [blossom end rot](#), and black mold entering at wounds, e.g., growth cracks.





### Seeds sprouting inside a tomato

Seeds that a tomato produces can sometimes start sprouting inside ripe tomatoes.



### Blossom-end rot

An early symptom of blossom-end rot is a light tan patch on the blossom end of the green fruit. Over time the area turns dark brown or black and may become sunken or leathery. Fruit that is one-third to one-half developed is most commonly affected. Sometimes an internal black rot will develop in the center of the fruit with little or no external symptoms. Some varieties of tomato (e.g., some Roma-type tomatoes) are more prone to blossom-end rot than others.

Look-alikes: Catfacing, soft rot from sitting on the ground, internal black mold due to [anthracnose](#) or infected growth cracks



### Catfacing

Catfacing is a deformity that occurs during the formation of the flower and is on the blossom-end of the tomato. It can be caused by cold temperatures during flowering, high nitrogen fertilization, or improper pruning. Large-fruited varieties of tomato (e.g., 'Brandywine') are more prone to catfacing than others.

Look-alikes: [Blossom-end rot](#), [tomato fruitworm](#), zippering with open holes



### Tomato fruitworm

The evidence of tomato fruitworm is usually a visible black hole at the base of the fruit stem. When the tomato is cut, tunneling is evident and the cavity may contain frass and decay as well as the worm (caterpillar) itself. The color of the caterpillar may vary from pale cream or green to nearly black.

Look-alikes: [Bird damage](#), zippering with open holes, spots from any cause hollowed by rot



### Zippering

Zippering usually occurs when the anther of the tomato flower sticks to the developing fruit and produces a scar as the fruit grows, extending from the blossom end to the stem. Sometimes an open hole develops in addition to the scar.

The only control is to select varieties that are less prone to zippering.

Look-alikes: Catfacing, growth cracks, [tomato fruitworm](#)

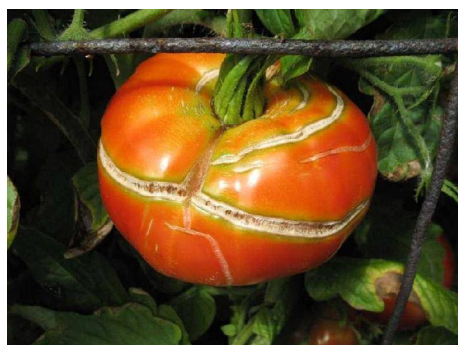


### Cracking (Bursting)

Both radial growth cracks and concentric growth cracks (bursting) are caused when the internal growth is faster than skin growth. This can be caused by:

1. Overfertilization
2. Extreme fluctuations in temperature
3. Extreme fluctuations in soil moisture
4. Not enough foliage to protect fruit
5. Some tomato varieties are more prone to cracking than others.

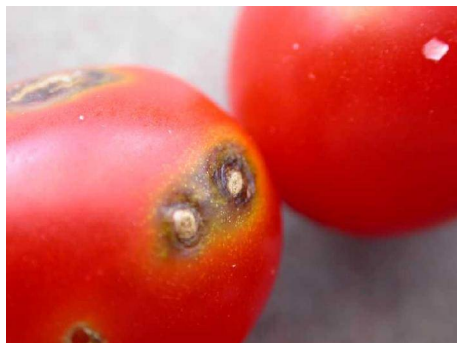
Look-alikes: Mechanical damage, zippering



### Anthracnose

Spots usually begin on ripe fruit as a sunken, flattened spot **without** a halo. As the spot enlarges it develops a bull's-eye appearance. Internal tissue may be black resembling black mold that has entered through cracks or as a result of blossom-end rot.

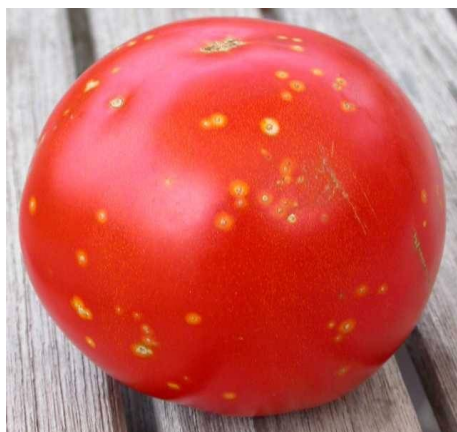
Look alikes: Bacterial spots (yellow halos) and other fruit spots



### Bacterial spot and speck

These are two separate but very similar diseases. Symptoms on the fruit of both are characterized by small round black spots with yellow halos. Bacterial spot begins as tiny spots that are slightly raised and surrounded by a narrow, water-soaked halo. They may enlarge to  $\frac{1}{3}$  inch in diameter and become scabby and cracked. Bacterial speck begins as slightly sunken dots that grow to no more than  $\frac{1}{16}$  inch and do not become scabby. Severity of both is increased by wetness of fruit and foliage from sprinklers, rain, or heavy dew. There are some varieties with resistance to bacterial speck but very few with resistance to bacterial spot.

Look alikes: Bacterial canker (whitish halo), [anthracnose](#) (no halo), other fruit spots



### Bacterial canker

The symptoms of bacterial canker are "bird's eye" lesions (tiny black spots with whitish halos) on ripe tomato fruit. This is a serious infectious disease with no cure and no resistant varieties available. It will kill the plant and may spread to others, requiring extensive measures for disinfection. *Plants with this disease should be removed from the garden as soon as possible and discarded. Do not compost.*

Look alikes: Bacterial spots (yellow halos) minor [stink bug](#) damage



### Cloudy spot (stink bug damage)

Stink bugs feed by inserting their needle-like mouthparts into the tomato fruit and sucking out the juice. Tomatoes with stink bug damage have pale yellow, irregular spots on the skin and white pithy areas just under the skin at the puncture site.

Look-alikes: Internal symptoms could be mistaken for internal white tissue usually associated with tomato yellow shoulder disorder.



### Sunscald

Sunscald usually begins on green fruit. White or yellow blisters will develop on the sides of the fruit that are facing the sun. With continued exposure to the sun, the damaged areas may become papery, flattened, and grayish white. Black mold may grow in the papery patch and cause the fruit to rot.

Look-alikes: Extensive [stink bug](#) damage, [tomato spotted wilt virus](#), [hornworm](#) damage



### Viruses

Symptoms on fruit, depending on the virus, can include mottling, ringspots, dimpling, rough skin, deformed fruit, blossom or fruit drop.

Look alike on fruit: [Sunscald](#), [hornworm](#) feeding, late blight, [stink bug](#) damage (cloudy spot). Even unusual varieties of tomato, such as, brown tomatoes or green-striped tomatoes, can sometimes be mistaken for a virus.



### Early blight

Early blight infects the stem end of the tomato fruit (the area where the fruit attaches to the stem). It appears as a series of concentric rings. The fruit can become infected at any stage of development, however, symptoms may not be noticeable until fruit ripens.

Look-alikes: Fruit rots



### Late blight

On the tomato fruit, late blight appears as rough-textured, firm, dark-colored spots.

Look alike: [Sunscald](#), [viruses](#), [fruit rots](#)



### Fruit rots

Both [bacteria](#) and fungi can enter through openings in the fruit, either through natural openings or through wounds. Any injury to the tomato fruit can provide an entry point for a rot. Fruit spots, insect feeding, cracking, bursting, blossom-end rot are just few examples of conditions that can provide entry points for a fruit rot. Just allowing fruit to sit on the ground can result in a rot on the bottom of the fruit. Some of these rots will stink. Bacterial rots are usually associated with smells but they are not the only ones. Some of the fungal rots can also produce a disagreeable odor.



### Hornworms

Hornworms are the larval stage (caterpillars) of sphinx moths. They are called hornworms because of the tell-tale horn or spike on their tail end. These caterpillars have voracious appetites and can consume entire leaves and small stems in a short time. They may also chew large pieces from green fruit, usually on the top of the fruit near the stem. Hornworm damage is obvious when the infestation is moderate to heavy because of the large amount of defoliation. Search for the large caterpillars and the large, black droppings on the leaves or ground beneath the plant.



Hornworms that are not feeding should be left on the tomato plant. They may have been infected with Bt, an organic pesticide that only attacks caterpillars, or they may have been parasitized, like the hornworm pictured on the left. The tiny white cocoons sprouting from its back are the pupal cases of tiny wasps that have eaten the hornworm from the inside out. If left alone, the adults will emerge and fly off in search of other caterpillars to parasitize and kill.



### Squirrels

Squirrels prefer fruits which are beginning to ripen and often eat only a few bites before discarding the tomato and proceeding to find another.

Look alikes: Other fruit chewers, such as, [tomato fruitworm](#), [birds](#), [crickets](#), [ground squirrels \(chipmunks\)](#), turtles, [raccoons](#), etc.



### **Birds**

Tomatoes show wounds that appear to have been made by very small daggers with sizeable holes often evident, exposing the pulp. Damage begins just as fruit begins to ripen and continues throughout the ripening stage.

Look alikes: Other fruit chewers, such as, [tomato fruitworm](#), [crickets](#), [ground squirrels \(chipmunks\)](#), [squirrels](#), turtles, etc

### **Other eaters**

Fruit close to the ground may be eaten or damaged by [crickets](#), turtles, [ground squirrels \(chipmunks\)](#), and other critters. [Raccoons](#) and [deer](#) will eat both tomato plants and fruit.

### **Other problems:**

**Alleopathy:** Roots are inhibited by the presence of a chemical released by another plant, such as, [black walnut](#). Tomatoes should not be planted within 50 feet of the drip line of a black walnut.

**Diseases:** There are many diseases of tomato not listed here. Some caused by bacteria, some fungal, some viral, some nematodes and others with unknown causes. See our [Kemper Center Factsheets](#) for information on [how to grow tomatoes](#), what varieties to select, and for more information on [tomato problems](#).

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