Tomato Diseases, Part Three: Non-Infectious Diseases

Welcome to the third and final installment of our three-part tomato disease series. If you're just now joining us, the first article can be found in the newsletter archive on the Tulsa Master Gardeners website. Last month we covered tomato diseases caused by bacteria, viruses and nematodes, and the previous article examined diseases caused by fungi.

Tomato diseases caused by non-infectious agents will be this month's focus. Also referred to as physiological or abiotic, these stressors are environmental or chemical in nature, are non-contagious, and affect the growth and development of the plant. As the cause may be temporary or remediated, the symptoms may resolve when the stressor eases, but may also be serious and widespread if the exposure is severe.

Blossom Drop

Symptoms: Blossoms dry, wither and may drop from the plant without producing fruit.

Cause: Pollination affected by unfavorable temperatures, wind and improper soil fertilization.

Control: Correct soil fertility, often reducing nitrogen, and follow fertilization recommendations for tomatoes. Windy days with extended periods of daily temps exceeding 90℉, and nighttime temps outside the range between 55 and 70℉ encourage blossom drop. The use of heat tolerant varieties, and efforts to cool the plants (overhead watering with care and temporary shading) may improve results.

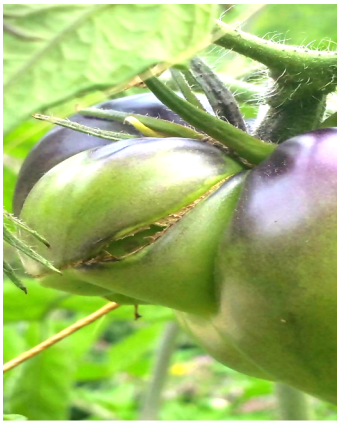
Blossom End Rot

Symptoms: Blossom end of half-grown fruit develops a tan, saturated spot, which enlarges and becomes darker. Fruit prematurely ripens and succumbs to rot-causing pathogens.

Cause: Blossom end rot results from a failed dynamic involving irregular calcium availability to growing fruit tissue. This is generally not due to low calcium content of the soil; rather, how high temperatures, uneven watering and excessive wind affect transpiration and calcium uptake to localized developing fruit tissue.

Control: Follow fertilization recommendations for tomatoes. Choose nitrate forms of fertilizer over ammonium to aid calcium uptake. Drip irrigation should be used with organic or plastic mulch to maintain even soil moisture. Gypsum or agricultural lime should only be applied during transplanting and only if a soil test proves calcium deficiency. Calcium foliar applications do not promote absorption by the fruit and are therefore ineffective.

Catface



Symptoms: Misshapen fruit with brown scarring on blossom end. Occurs more often on first fruit. Uneven ripeness and distortion reduce the overall quality of the fruit.

Cause: The part of the flower that forms the fruit (pistil) is affected by exposure to hormone-type phenoxy herbicides (e.g. 2,4-D) and low temperatures below 58℉ during the time flowers develop and bloom.

Control: Large-fruited varieties are more severely affected by catface. Avoid exposure to hormone-type phenoxy herbicides, and be aware that low temperatures during blossom development and bloom may result in catface. No other control or prevention is recommended.

Sunscald

Symptoms: Bleached and sunken, paper-like areas where fruit is exposed to direct sunlight.

Cause: Direct sun exposure caused by lack of sun protection provided by healthy foliage

Control: Correct and control foliar problems caused by bacterial, fungal or insect damage. Ensure health of foliage and protect fruit by proper staking and support techniques, as well as providing artificial shade if necessary.

Sunscald
(Photo: UK Vegetable IPM Team)

Phenoxy Herbicide Injury

Symptoms: Stunted and irregular growth of leaves, fruit and stems. Young leaves develop a thin, pointed profile. Fruit may catface, and stems are contorted and brittle. Symptoms may appear similar to virus diseases, but comparatively may be more uniformly widespread.

Cause: Tomatoes are highly sensitive to hormone-type phenoxy herbicides used on broadleaf weeds in lawns. These products may drift and cause widespread permanent injury if exposure is heavy. Light exposure may delay harvest and can be outgrown.

Control: Avoid use of these herbicides on pastures and lawns near tomatoes and other sensitive vegetable crops.

Physiological Leaf Roll

Physiological Leaf Roll
ipmimages.org

Symptoms: Older leaflets show first symptoms of edge rolling and leathery texture, progressing to the entire plant. No other symptoms appear and the plant grows to a normal size and the yield is not affected.

Cause: Certain varieties carry a gene that manifests when the plant is exposed to prolonged periods of high temperatures and wet soil conditions.

Control: Proper drip irrigation techniques and well-drained soil are the only effective cultural controls for this problem.

Yellow Shoulder

Tomato Yellow Shoulder
purdue.edu

Symptoms: Unripened top sections of fruit remain green or turn yellow but not red.

Cause: Yellow shoulder is a ripening disorder where sections of, or the entire top of the fruit stays green or yellow, and the fruit tissue inside these areas remains hard and white. Disease appears in periods of high temperatures.

Control: Use varieties with a resistance to yellow shoulder. If high temperatures are persistent, pick at the breaker stage (when the fruit first begins to redden) and allow it to ripen indoors.

Resources are Always Available

Each growing season affords the opportunity to learn more about tomatoes. Regardless of the kind of disease each season may bring, knowing which agents are affecting your tomatoes will dictate your treatment program.

Consider these tips:

- Using disease resistant and certified disease-free seeds and transplants
- Avoid the use of hormone-type herbicides and potential drift effects on vegetables
- Drip irrigation vs. overhead watering
- Observe blossom and fruiting disorders and make adjustments whenever possible
- Proper or alternative mulching products to prevent fruit-to-soil contact
- Crop rotation to lower risk of spread and perpetuating disease
- Sanitation to remove diseased crop debris quickly before spread
- Bactericide treatment programs: foliar and/or fruit coverage, depending on agent
- Soil sampling to monitor nematode population
- Use information and diagnostic resources available from OSU: OSU Plant Disease and Insect Diagnostic Laboratory and Tulsa Master Gardeners

Your OSU Extension Office is always available for diagnostic guidance. More information and photographs for each of these diseases can be found at the links at the end of this article.

Resources

Fact Sheets and Resources for Tomato Diseases, Part 3: Non-Infectious Diseases

OSU Fact Sheet EPP-7627: Common Diseases of Tomatoes, Part III: Non-Infectious Diseases
OSU Fact Sheet HLA-6012: Growing Tomatoes in the Home Garden
OSU Fact Sheet L-492: 2021 Tomato Variety Suggestions
Oklahoma Gardening: Tomato Diseases

Fact Sheets and Resources for Tomato Diseases, Part 2: Bacteria, viruses and nematodes

OSU Fact Sheet EPP-7626: Common Diseases of Tomatoes: Part 2 Bacteria, Viruses and Nematodes

OSU Digital Diagnostics
OSU Fact Sheet EPP-7640: Soil Solarization for Control of Soilborne Diseases

Fact Sheets and Resources for Tomato Diseases, Part 1: Fungi

OSU Fact Sheet EPP-7625: Common Diseases of Tomatoes: Part 1. Diseases Caused by Fungi

OSU Fact Sheet L-492: 2021 Tomato Variety Suggestions
OSU Fact Sheet HLA-6431, Cultural Control Practices
Cornell University: Disease-Resistant Tomato Varieties
OSU Fact Sheet HLA-6032: Vegetable Varieties for the Home Garden in Oklahoma
OSU Plant Disease and Insect Diagnostic Laboratory