



What's wrong with my **TOMATOES!?**

William Stump

Tomatoes are very popular with home gardeners, and Wyoming gardeners are no exception.

However, many gardeners have been frustrated with seemingly endless plant afflictions that hinder even the best gardeners. Poor growing conditions, insects, and disease (either alone or in combinations) may cause tomato problems. Because of the many issues that can affect tomatoes, identifying the problem(s) before any kind of corrective strategy can be used is important.

First identify the affected area of the tomato plant. Having healthy tomato plants nearby is helpful for comparison. When looking at the leaves, are they spotted, wilted, curled, yellowed, mottled in color, or chewed upon? Are the developing fruits misshapen, discolored, cracked or rotted on the blossom end? What is the overall condition of the plant? Is the plant stunted, wilted, or misshapen? Are insects present?

Look on the leaves, especially the undersides and along the stems. If you need help with identification of the disease or insect, take quality photos or samples and contact your local University of Wyoming Extension office.

COMMON TOMATO PROBLEMS

Tomato problems can be divided into physiological disorders (due to poor environmental conditions), infectious diseases (caused by viruses, fungi, bacteria, and nematodes), and insects.

Physiological disorders

Wyoming certainly has its challenging environmental conditions from poor soils, short growing seasons, wind, and extreme temperatures. Over time, poor environmental conditions can interfere with normal plant processes, which, in turn, manifest into disorders. The following are some of the more common issues in Wyoming.

Physiological leaf roll

Leaf roll is associated with hot dry weather, rapid growth, certain varieties, and pruning. It's often a problem in tomatoes grown in hoop houses. Typically, starting with the lower leaves, leaf margins roll inward in an almost tube-like fashion. The affected leaves will be

firm and leathery to the touch. Once rolled, the leaves do not unroll, even if conditions improve, but this condition does not seem to affect yield.

Blossom end rot

Caused by a calcium deficiency, developing fruit have a tan to black flat spot at the blossom end of the fruit. Calcium is typically available in the soil, but the plant has trouble up taking the calcium if other salts are present or there is inconsistent watering. Maintaining uniform soil moisture, applying fertilizer per soil tests, and avoiding root injury can minimize blossom end rot.



Blossom end rot



Fruit cracking

Growth cracks or fruit cracks

As the name implies, the developing fruit develops unsightly cracks near the stem end or encircling the fruit. These cracks are the result of rapid growth brought on by uneven watering or periods of high temperature. Cracks can invite secondary infection from fungi and bacteria, causing rot. Maintaining even soil moisture can help reduce fruit cracking.

Herbicide injury

Tomatoes are very sensitive to many of the broadleaf herbicides commonly used by homeowners that include the auxin-type herbicides like 2, 4-D. Exposure can be from direct contact from foliar spray and indirectly from herbicide-treated grass clippings or herbicide-treated grass clippings used in compost and applied around tomatoes.

Infectious diseases

Tomatoes are susceptible to several fungal, bacterial, viral, and nematode pathogens that would take an entire book to adequately cover. The following are some of the more prevalent diseases a Wyoming gardener could face.



Tomato mosaic virus disease



Tomato fruitworm

Early blight (foliar fungal pathogen)

Early blight disease symptoms are brown to black lesions, which sometimes resemble target-like spots on the leaf. Disease initiates later in the season and on older leaves and will also attack potatoes. If disease worsens, lesions will appear on newer leaves and even on the developing fruit. Good control measures include removing fallen, diseased leaves, avoiding wetting leaves during watering, no dense plantings, and not planting tomatoes in the same space next year.

Wilts and root rot pathogens

Fusarium and verticillium are soil-borne fungal pathogens that attack the plant's vascular system (carries water and minerals up from roots to leaves). Symptoms include lower leaves yellowing then dropping, with overall plant wilting, leading eventually to plant death. A handy diagnostic test is inspecting a cut stem. Disease is present if instead of a nice, healthy, green color, there will be dark discoloration of the vascular system. Once these fungi enter the vascular system, there is little that can be done



Fusarium wilt disease



Spider mites on tomato plant

for the plant; the best defense is prevention. When selecting plants, most tomato seed or transplants will be labeled with a code indicating which diseases it is resistant to. For example, a code like "VFA" would mean the plant is resistant to Verticillium (V), Fusarium (F) and early blight (A). If plants become diseased, remove affected dead tissue and avoid planting back to tomatoes in that space for at least three years.

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Viral diseases

Several viruses can infect tomatoes in Wyoming including, but not limited to, curly top virus, tomato mosaic virus, and spotted wilt virus. Symptoms of virus infections include leaf mosaic (alternating areas of light- or dark-green or yellow areas), yellowing, necrosis, malformation (leaf rolling, puckering and twisting), leaves and stems become stiff, and stunting.

All of these viruses are spread by insects like leafhoppers and aphids and can survive in the absence of tomato on many common weeds and some agronomic and horticultural crops. The most effective management strategy, if viruses are a reoccurring problem, is to select resistant varieties. Again, consult the codes listed with the varieties, as these will indicate which viral resistance the variety has. Once a plant is infected, there is little that can be done, so remove the plant as a check on further spread.

Insects

If disorders and the diseases were not enough, insects can also cause significant problems in the cultivation of tomatoes. Many insects present in and around tomatoes are harmless and may be even be beneficial, so it's important to properly identify insects. Some insects are tiny and require careful, periodic scrutiny of plant surfaces. Plant sap feeders like psyllids, aphids, and spider mites would fall into this category. Of this group, psyllids are especially troublesome due to the toxic saliva they inject into the plant as they feed. This causes "psyllid yellows" characterized by yellowing leaves, leaf and stem distortion, stunting, and purple veins.

Larger insect pests like tomato hornworms or tomato fruitworm will

be more obvious. These can be controlled with insecticides but for the non-squeamish, these can be picked off by hand.

Management of disorders and pests in tomato is mostly preventative in nature and begins with good cultural practices that include:

- Use disease-resistant varieties.
- Maintain proper spacing of plants for maximum air circulation.
- Use consistent watering and proper nutrition.
- Avoid wetting foliage when watering.
- Remove dead diseased material.
- Rotate crops to avoid the buildup of disease organisms.
- Monitor for pests throughout the growing season.

There are a number of tomato pest keys available to help identify pest or production issues that may not be covered here. Some good ones include:

- bit.ly/IDtomatoproblems
- bit.ly/IDtomatodisease

Additional help is always available from your University of Wyoming Extension office, and plant samples can be sent to the University of Wyoming Extension Plant Clinic. Information about submitting samples and downloadable submission forms are at <http://wyoextension.org/plantclinic>

Information about insect diagnostics can be found at: bit.ly/UWbugID

