



Common Vascular Diseases of Plants – Verticillium Wilt and *Botryosphaeria* Dieback

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Plants can be affected by a number of diseases, among them are diseases that target their vascular systems, the channels that allow the transport of water and nutrients to upper portions of the plant. Two common examples include Verticillium wilt, caused by fungi in the genus *Verticillium* and Botryosphaeria dieback or canker, caused by fungi in the genus *Botryosphaeria*. The fungi that cause Verticillium wilt and Botryosphaeria dieback can affect a wide variety of plants, including many species of vegetables, weeds, herbaceous ornamentals, shrubs, and trees.

Initial symptoms of vascular diseases such as these usually begin as chlorotic (yellowing) leaves that drop prematurely. For Verticillium wilt, this is followed by wilting and branch dieback in sections, progressing gradually over time. In a tree, for example, this may appear as a single branch yellowing and wilting in the first year, then progress to several branches dying back the next year, then half the canopy the year after. If you peel away bark from symptomatic branches or look at a cross section of a branch, you will often be able to see discolored, brown vascular tissue. The *Verticillium* fungus will move through the vascular tissue of different plants at different speeds. Woody plants develop symptoms more slowly than herbaceous plants, for example. Additionally, environmental conditions contribute to the progression of symptoms – plants that are water-stressed will have more severe symptoms than those that are provided ample water.



Vascular tissue of a Maple tree damaged by *Verticillium dahliae*. Photo credit: Penn State Department of Plant Pathology & Environmental Microbiology Archives , Penn State University, Bugwood.org

Symptoms of *Botryosphaeria* dieback include leaf yellowing followed by girdled limbs, twig dieback, and eventual death. Cankers usually appear as a “wound” on the stem of a plant - either slightly swollen or sunken and with cracked patches of discolored bark. Some cankers may not be visible early on, but will later appear as pale patches, swellings, or cracks along the stem and crown. Tissue below the canker may turn brown. This discoloration often extends several inches above and below the canker margin. Cankers often continue to expand until the diseased limb is completely girdled, at which point, all tissue above the canker dies.

Both *Botryosphaeria* and *Verticillium* fungi overwinter on dead plant tissue. *Botryosphaeria* fungi usually enter a plant through wounds such as cracks, insect damage, etc., and lenticels, which are pores that allow gas exchange. *Verticillium* fungi often infect healthy plants through belowground tissues that come in contact with contaminated plant debris, such as roots. Spread of both of these fungi also occurs through air movement or rain splash dispersal of spores, and may also occur through use of contaminated pruning tools.

Management

Unfortunately, there are no fungicides available that provide satisfactory control of these diseases. All plants infected with either *Botryosphaeria* or *Verticillium* fungi will perish from the associated disease, but good preventive management can prevent the spread of these fungi to healthy plants nearby, and affected woody plants can be maintained for a few extra years by ensuring plants are in optimal health.

Plants that you suspect may have Verticillium wilt or Botryosphaeria dieback should be isolated from healthy plants as soon as possible. Minimize stress by providing supplemental water, especially during drought conditions. Woody plants may have their symptomatic tissue pruned away to slow the spread of these fungi. Make your pruning cut several inches (4 to 8) past the point where symptomatic tissue transitions to healthy tissue. Disinfect your pruning tools after each cut by spraying with rubbing alcohol or a similar disinfectant. Do not compost or bury plants that you suspect may have one of these diseases! Always burn symptomatic plant tissue according to local regulations or throw it in landfill trash. Whenever possible, select plants that are not susceptible to these diseases for your garden or landscape. Disease resistance is usually indicated in the catalogue or website, on the seed packet, or on the plant tag at the store.

If you have questions about plant diseases or if you have any other gardening questions, contact the UConn Home & Garden Education at (877) 486-6271 or www.homegarden.cahnr.uconn.edu or your local Cooperative Extension Center.