

Verticillium Wilt

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Plant Disease Management: Horticultural Crops

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Pathogen

Fungus, *Verticillium dahliae*

Host

Trees and shrubs including olive and pistachio; vegetables including cucurbits, eggplant and pepper; many other hosts are often listed but disease has not been reported on them in Arizona.

Symptoms/signs

Verticillium Wilt may cause wilting of all or parts of plants. Leaves become mottled or chlorotic then turn brown, often in interveinal parts of the leaves only. Symptoms vary with plant species and severity of disease. Discoloration of the vascular tissue, especially in roots and lower stems, may be seen but is not always present. Trees may have symptoms on one branch or one side of the plant. Individual branches or portions of trees may die in one season or the entire plant may die suddenly in a few weeks or slowly over a period of years.

Environmental conditions

Verticillium Wilt is considered a cool season disease because the fungus grows only at temperatures between about 70° F to 85° F. Plants are infected when temperatures in soil are within this temperature range. During hot weather in the low desert, as well as cold weather in the high deserts or mountains, the fungus is not active but can survive in soils for long periods of time under extreme environmental conditions.

Disease

Verticillium Wilt is caused by the soilborne fungus, *Verticillium dahliae*. The fungus produces survival structures called microsclerotia that germinate in the presence of host plant roots when environmental conditions are favorable. The fungal hyphae enter the host plant roots and grow in the vascular tissue and block the movement of water through the plant. *Verticillium* does not cause root rot, but restricts the flow of water and nutrients.

Substances produced in the plant during infection may also result in discoloration of the vascular tissue or sapwood. Leaves turn yellow and die and entire limbs die as fungal growth progresses. Fungal growth continues as long as temperatures are favorable, but stops if air temperatures are above about 90°F. Disease symptoms usually are not expressed when temperatures are hot, as in the low deserts during the summer. When temperatures are optimal, as in the fall and spring in the low desert and much of the summer in the high desert, wilt symptoms reappear. When plants begin to die, microsclerotia are produced in the plant. Microsclerotia survive in soil under adverse environmental conditions and in the absence of a host for many years.

At a Glance

- *Verticillium* Wilt causes wilting and yellowing of leaves, death of limbs, often on one side or a portion of the plant. Foliar symptoms usually appear in the spring or fall.
- No root rot occurs.
- The pathogen is a soilborne fungus that persists in the soil for many years.
- Use resistant or immune plants in areas where disease is known to occur.

Prevention/control

Verticillium Wilt can be prevented by planting resistant varieties and by avoiding plants that are known to be susceptible in areas where disease has occurred. Disease may occur in residential areas built on old cotton land since cotton is a host. Resistant varieties of olive, pistachio and cucurbits are

available. Native species of trees and shrubs are not affected, and monocots such as grasses, palms and yuccas are immune. Once plants are infected there is no control. Rotations with non-hosts such as grasses may reduce disease in some cases but is not a reliable control.

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