Texas Root Rot
in Arizona

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What is Texas root rot?

Texas (cotton) root rot is the most serious disease of landscape plants in Arizona. It affects many different dicotyledonous plants such as fruit trees and broad leaved trees and shrubs, but monocots such as palms and grasses are immune. The disease often causes a rapid wilt and death of susceptible plants in late spring, summer and early fall when temperatures are warm. As its name indicates, the roots of dying or declining plants are rotted. Once symptoms appear, the entire root system is often affected. In most cases the dried leaves remain on the plant after it has died. Rapid wilting and death occurs in hot weather due to the inability of the host plant to take up enough water through its rotted roots. Host plants die rapidly in warm weather as demand for water increases.

The pathogen that causes Texas root rot, *Phymatotrichum omnivorum*, is an indigenous soil borne fungus that is found deep in soils. *P. omnivorum* produces fuzzy thread-like structures called strands that colonize the roots. The strands are made up of hyphae, the "body" of the fungus. *P. omnviorum* utilizes the plant roots as substrate, its sources of nutrients, and causes rot of the entire root system. A dense web of the strands and hyphae often covers the root once the fungus has penetrated and caused decay. With careful examination under at least 10X magnification, these light brown strands or hyphal webs can be observed on the root surface and used to make a positive diagnosis. The strands can grow through the soil and infect healthy roots nearby.

Where does Texas root rot occur?

Texas root rot occurs throughout the southwestern United States and Mexico. It is problematic throughout different areas in Arizona including low elevation deserts such as Phoenix and surrounding areas
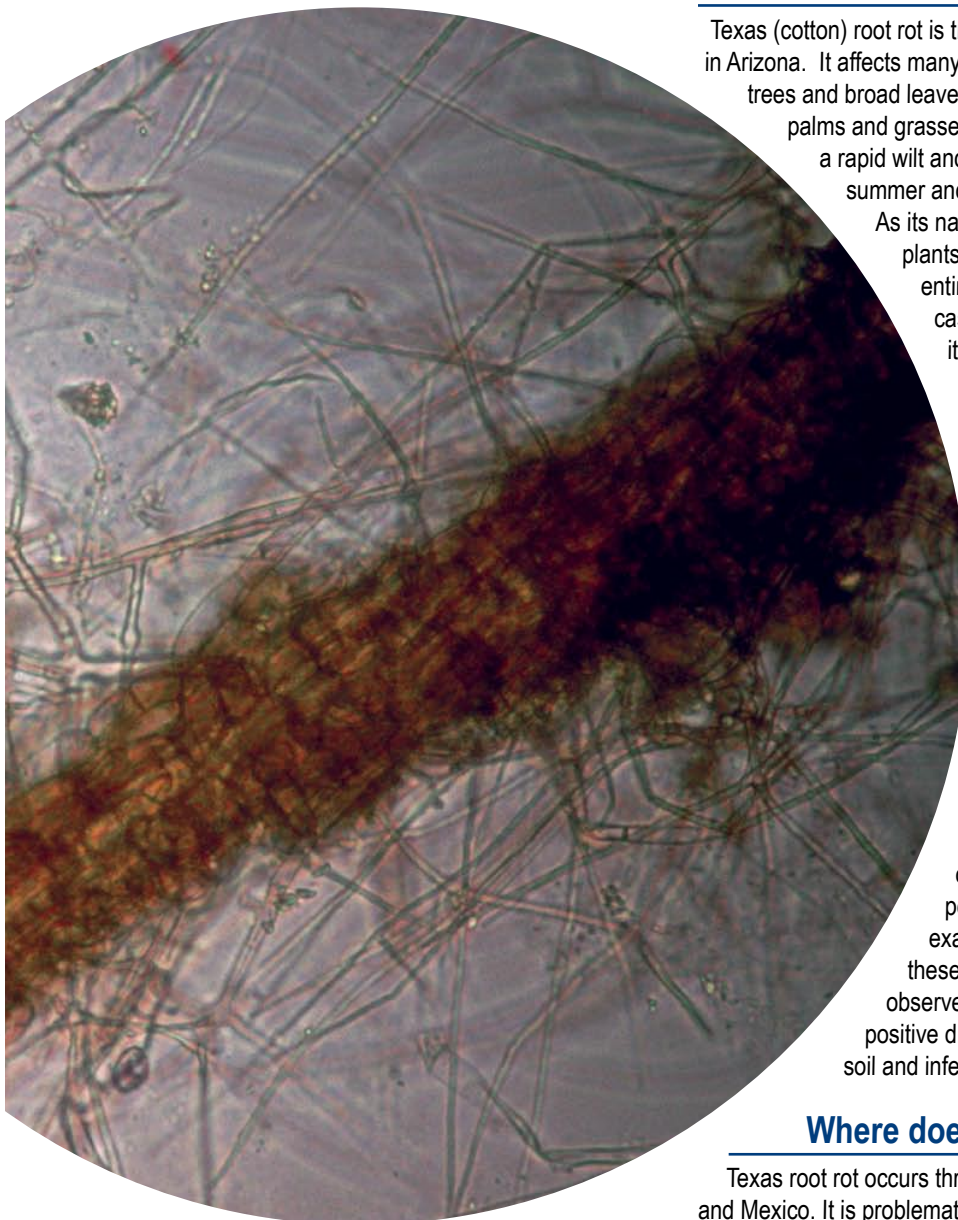
in Maricopa County; the entire Gila River watershed from Duncan to Yuma; much of Tucson and Pima County; hills and valleys around Benson and into the higher elevation grasslands around Sonoita; and throughout Cochise and Santa Cruz Counties, including Sierra Vista and Nogales. It does not occur above the Mogollon Rim, in the high, cold deserts of northern Arizona, nor in the Flagstaff area, but does occur near Sedona, the Verde Valley and Cottonwood, and near Kingman.

How do you know if Texas root rot has killed a plant?

Since other pathogens can cause root rots, and other factors such as termination of irrigation or chemical damage could result in similar symptoms, it is very important that a positive identification be made by an experienced person. Hyphae and strands of the fungus used for diagnosis are easiest to find on roots that still have their bark, and are at least as large as a pencil. If the plant is dead or dying, as much of the root system as possible should be salvaged when it is removed. At that time, samples of rotting and discolored roots on which the outer or cortical tissue still remains attached should be cut and stored in a plastic bag in the refrigerator until examined for signs of the *P. omnivorum* fungus.
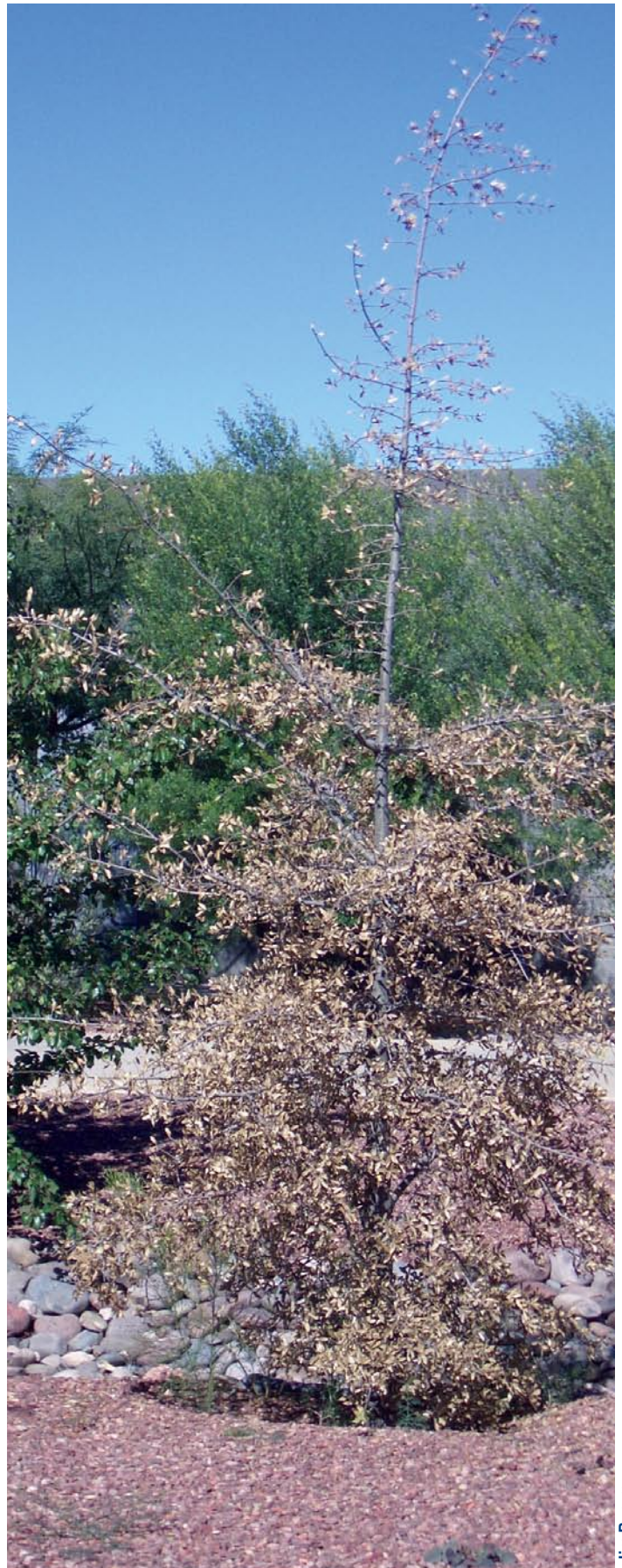
Can Texas root rot be controlled in landscape trees and shrubs?

Attempts to control Texas root rot usually are not recommended. There are no treatments that give consistent results, especially in very susceptible hosts. Treatments with soil additives, such as manures and fertilizers, are rarely successful, especially for long term control. Chemical controls including fumigants have been successful in some cases, but are expensive, must be applied by a licensed applicator, and must be repeated every year or two in order to sustain disease control. Unfortunately, there is no way to test soils for presence of the fungus before planting.

The best control is avoidance

Susceptible plants should not be planted in areas where Texas root rot is known to occur. Fruit and nut trees such as wine grapes, figs, apples, loquat, peaches and apricots are extremely susceptible; landscape trees such as ash, elms, bottle tree, silk oak, pepper tree and African sumac are considered very susceptible. Many shrubs including pomegranate, xylosma, cassia, Mexican bird of paradise, oleander, and roses also are very susceptible. Citrus, eucalyptus, tamarisk, live oak and pine are considered more tolerant, but Texas root rot has been confirmed on all of these trees. Others, including evergreens such as Arizona and Italian cypress, mesquites, palo verde, Atriplex species, hackberry, jojoba, and cacti are very tolerant.

All monocots, such as palms, yuccas, agaves and grasses are immune and are good choices to plant anywhere that Texas root rot has been observed. Annuals usually escape disease since they are in the ground such a short time. There is no evidence that Texas root rot kills native plants in their natural habitat, but it can occur on native plants that are used in landscapes. Examples are native oaks, cottonwood and sycamore that have died of Texas root rot when planted into yards, often near their native habitat. So beware! We still have a lot to learn about the susceptibility of native plants.

Jim Byrum