

Facts and Management Considerations for Pine Wilt Disease

- Pine wilt is caused by a plant parasitic nematode (roundworm) known as *Bursaphelenchus xylophilus* and vectored from tree to tree by a group of beetles known as longhorn sawyer (*Monochamus* spp.) beetles. A Carolina pine sawyer common to Kansas pines is shown to the right after emergence. Note the round exit hole.



Image by Jon Appel, KDA

- Some common planted pine species that are susceptible to pine wilt disease include Scotch, Austrian, and mugo (shrub) pines. Occasionally, eastern white pine has been diagnosed with the disease in situations where disease pressure is high. Ponderosa pine, a native North American pine has very few reports to the disease and considered a non-host. The disease is believed to be a secondary disease to native North American pines like Ponderosa and only affect trees that are near death or failing.
- Once a susceptible tree is infected, the nematodes multiply inside the wood of the tree feeding on the resin canals that are important to water translocation. In summer infections, disease often progress rapidly and trees die in six to twelve weeks. Fall infections often take longer because of cooler temperatures and sometimes trees may not die till late winter or early spring. Needles will cling to the branches and turn from a healthy dark green to tan as the tree dies, often the entire tree will die out but occasionally some trees sections will remain green. Needles and branches are often brittle and have very little resin in them.
- A single brood tree for the sawyer beetle may have well over a hundred beetle larvae in the wood.
- If a diseased tree is left to stand through the following spring into summer, on average 3-4 trees the will become. Over a few years, entire windbreaks or other plantings have been lost to the disease.
- Management of the disease is directed at reducing the spread of the disease by destroying the sawyer beetle larvae, planting non-hosts, and not using pine wood for firewood.
- In the winter, the larvae of the beetle overwinter in the wood of the pine trunk and branches. The larvae pupate and emerge as adults containing nematodes beginning in late spring through the summer. The sawyer beetle can be killed and the disease cycle broken if folks destroy the wood by cutting the tree down and either chip, burn, or bury

the wood. The best time to do this in a windbreak or landscape is soon after tree death. Infected dead trees can be removed any time though through the winter months and into the spring and give the desired results of breaking the vector's life cycle.

- Another important management tool is to plant a non-host. Pine wilt is host specific to pines and deciduous trees such as oak, maple, elm, and many others. These trees will not come down with the disease. Eastern red cedar is another alternative to planting pines in situations such as windbreaks or privacy fences. Ponderosa pine can be used in planting and foresters are evaluating other native North American pines for pine wilt resistance and suitability to the Kansas climate. A general rule of thumb is to diversify plantings with species as over time pests, climate, or other events may threaten one species more than others.
- Firewood or other stored wood articles: Several introductions have been documented where well intentioned individuals have taken the dead tree down for a neighbor or family member and then transported the wood back to their residence. The wood is not burned immediately and beetles emerge in the spring and infect nearby pines. Do not save the wood for firewood or other articles.
- The wood chips of an infected tree can be used for mulch on deciduous trees without concern to those trees and will not infect nearby pines. The disease is not present in the needles.
- Specialty trees of high value can be injected with pesticides to prevent infection. Consult a certified pesticide applicator and arborist for this control measure.