Threatening Our Pines: White Pine Blister Rust

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Imagining our foothills and mountains – perhaps your own backyard – with no pines, is unthinkable. Pine trees are icons of the Sierra Nevada range, descending from ancient tree families dating as far back as 290 million years. These evergreens were revered by Native Americans as symbols of life and beneficent persons in the form of a talking tree, called "whispering pines," understood by anyone who has heard the wind blowing through the pine needles up high. With our abundance of pines it is easy to forget their important benefits, such as food for wildlife, stabilizers of soil and snow load, and the majestic beauty they bring to our landscape. Yet our white pines are threatened by the most destructive disease impacting five-needle pines in North America: white pine blister rust.

White pine blister rust came to this country accidentally around the beginning of the 20th century when infected European nursery seedlings were introduced in Canada, where devastation of white pine forests started and later spread south to Washington, Oregon and then California. Today, white pine blister rust is an epidemic in Lake Tahoe, where historically 25 percent of all the pine trees were white pines. Now, due to pine rust and other contributing factors, sadly less than five percent of white pines survived.

White pines have needles in bundles of five, and while a number of five-needle pines grow in California, the three white pines in our area impacted by rust disease are: White or Sugar pine (growing at 3-7,500 feet altitude), Western White pine (8,000 feet to timberline) and Whitebark pine (above timberline in small clumps). Symptoms of blister rust are first apparent with a canker or growth on a branch or limb. The canker kills the branch, causes the tree to die back above the point of infection, and creates large areas of reddish tree needles or "rust flags." The entire tree is usually killed, but some trees may live for many years in a weakened condition, often surrendering to other pests, such as bark beetles.

Blister rust has little to no cure or prevention and is responsible (along with the pine beetle) for killing 90 percent of infected white pines, with the youngest trees seeing the largest impact. Rust is a complex fungus that requires two different plant hosts, five spore stages, and several years to complete its life cycle. It is not spread from tree to tree, but requires an alternate plant host called Ribes, which are gooseberries or currants. Fungus spores produced on infected plants enter tree needles in late summer or fall, colonize the pine tree over several seasons, and then produce more spores that reinfect Ribes plants through wind dispersal.

Strategies to manage rust have yielded limited results. Costly attempts to eradicate Ribes from forests began in the 1930's, however they were never completely successful. It was illegal for gardeners to plant Ribes up to 1966, when it was determined wild gooseberry continued to regenerate in California. The University of California studied pruning of white pine lower limbs up to eight feet, which reduced blister rust infection. Gardeners with white pines in their landscape may benefit by avoiding over-watering, not planting Ribes, and pruning their pines to include removing all infected needles and pine branches as soon as rust symptoms are recognized.

A primary successful strategy to avoid further losses of our white pines is to breed and select for rust–resistant trees. Over fifty-years of research has identified about five percent of Sugar pines that are immune to blister rust. (Unfortunately there is no resistant stock yet for the Whitebark pine, though research is underway.) Some of the most significant research and reforestation in North America occurs right in our area at two USDA Forest Service operations in Placerville. Also, the non-profit Sugar Pine Foundation in South Lake Tahoe has worked since 2004 to harvest and replant white pine forests around Lake Tahoe and nearby areas (www.sugarpinefoundation.org). Interested individuals can help by sponsoring a restoration project, adopting a tree, or purchasing a seedling to plant in their yard. The next time you hear the pines whispering in the wind, give pause to consider ways to help preserve these majestic trees for our future generations.

Do you want to add color to your perennial beds, or an interesting plant at your front door? Join us this Saturday, July 16th, to learn more about adding beauty to your garden at our free education class, "Container Gardening," 9 a.m. to noon at the Veterans Memorial Building, 130 Placerville Drive in Placerville.

Master Gardeners are available to answer home gardening questions Tuesday through Friday, 9 a.m. to noon, by calling (530) 621-5512. Walk-ins are welcome. The office is located at 311 Fair Lane in Placerville. For more information about our public education classes and activities, go to our Master Gardener website at http://ucanr.org/sites/EDC_Master_Gardeners/. Sign up to receive our online notices and e-newsletter at http://ucanr.org/master gardener e-news/ . You can also find us on Facebook.

Do you have 1-gallon plant containers to recycle? Master Gardeners will gladly take them at the Master Gardener Office. Please call first to alert them you are coming and thank you for passing them on.