

RETURN OF THE KING: WESTERN WHITE PINE

Western white pine can grow on a wide variety of sites. Its range extends from California to British Columbia and from the Pacific Coast east to Montana. It can grow on very wet sites (on the margins of bogs), fairly dry sites and everything in between. Its elevation range is from about sea level to more than 10,000 feet (in the southern part of its range); it grows better than many other species in frost pockets, and is more resistant to damage from heavy snow than Douglas-fir or western hemlock.

Western white pine is classified as “tolerant” to several common root diseases and its growth rate can equal, and on some sites surpass, that of Douglas-fir. It can tolerate low nutrient conditions, which makes it a potential species for planting on problem sites such as landfills or sites where the topsoil has been removed. Old-growth trees of western white pine were the basis of forest industry in many areas in the past – especially in the Inland Empire region of northeast Washington, northern Idaho, southeastern British Columbia and western Montana.

So, why don't we see western white pine on more sites and why isn't it more widely planted? The answer is that a lethal disease – white pine blister rust – was introduced into British Columbia from France in 1910; this disease eventually resulted in the death of most western white pine trees. However, some pines were resistant to the disease, and after many millions of dollars and years of research, disease-resistant trees have been identified and seedlings from these resistant sources are available for planting.

Although seedlings were produced from disease-resistant trees 25 years ago, more recent testing programs have produced seedlings with more consistent resistance, and resistant seedlings have become more widely available (western white pine seedlings available from public agencies are blister-rust resistant; if you get white pine seedlings from other sources, be sure to ask if they are blister-rust resistant). For more information on the disease, breeding programs for disease resistance, and some excellent pictures of what blister rust looks like, visit www.fs.fed.us/r6/dorena.

You have now obtained blister-rust resistant seedlings from a source appropriate to your area and are ready to help reintroduce this species back into its native range. There is one very important piece of information you need to know: Blister-rust resistance of western white pine is not complete – that is, some of the seedlings you plant will die of blister rust even though the stock comes from a program that has certified its resistance. Some of the lack of resistance is planned so the tree species has wide diversity and won't be killed if the fungus evolves to a strain that the testing programs haven't evaluated. And part of the lack of resistance is due to the impossibility of testing for all possible strains of rust (think of the different strains of flu and how the flu vaccines change every year) and the underlying nature of the resistance available to this introduced pathogen. The level of resistance, infection and survival will vary depending on the site hazard.

But management can greatly improve the odds of these trees surviving. The key is to understand that the fungus gets into the tree through infected needles, generally on branches on the lower eight feet of the stem, so branch pruning is very effective in preventing infections from reaching the stem (the disease can cause cankers on the stem that girdle the tree). At the time of planting, clip off any branches that are right at ground-line – these are very important sources of early infection and hard to see later if they are partially buried and vegetation develops.

Next, when trees are 5' -10' tall, prune no higher than 50 percent of a tree's height to maintain a healthy crown. Then re-prune again two to four years later and continue to re-prune up to 50 percent of a tree's height until you have removed branches up to eight feet on the stem (probably three prunings).

Pruning prevents future infection from the needles and also removes branches that are already infected, but the infection has not yet reached the main bole. You will still lose some trees, but at the time of your first thinning you can select to favor the disease-free trees. Once you have started pruning the trees for blister rust, you may decide to continue pruning to increase the future value of the lower log (or half log). For more information on pruning and white pine blister rust, see PNW 584 (in publications of interest).

The disease has an alternate host, *Ribes* or currant, and some of you may have heard of the large-scale efforts by the CCC crews in the 1930s to pull or cut *Ribes* to save the pines. Those efforts were not very successful, but we can help keep inoculum levels low by not planting *Ribes* and by cutting or controlling it in the areas of plantings.

In addition, we can make the environment less favorable for the fungus by encouraging greater air movement and drier conditions (less favorable for the fungus) by initially controlling tall shrubby vegetation during site preparation and later by pruning.

So, this sounds like a lot of work – finding disease resistant stock and then having to prune several times. Yes it is, and to obtain the best success on sites with moderate to high levels of rust hazard, you must commit to pruning when you plant western white pine. But the species' excellent growth rates, tolerance to root disease, resistance to frost and heavy snows, and ability to grow on a wide range of soil conditions make it an excellent choice for some problem areas.

Note: This article was copied in its entirety from a forestry extension service newsletter, the source of which is unknown.