

When is a Rot not *Phytophthora*?

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Things aren't always what they seem. That was something retired, but still very active forestry plant pathologist, Dr. Chuck Hodges, showed us this past June in Ashe County. Della Riley, new agricultural extension agent in Ashe County, invited Dr. Hodges to examine some trees with an unusual branch dieback. Dr. Hodges helps out at the Plant Disease and Insect Clinic at North Carolina State University. Della had sent him several samples looking for *Phytophthora cinnamomi* and other potential causes, but nothing ever came back conclusively. So Dr. Hodges came to visit with his wife and see the fields first hand. What he found in one field was a root rot that isn't *Phytophthora*.

If you have friends growing Christmas trees in other states, they may have talked about Annosus root rot. Also called Annosum or *Heterobasidium* root rot, this fungal disease is caused by *Heterobasidion annosum* (formerly called *Fomes annosum*). It has become a terrible problem the last few years in the Pacific Northwest on noble fir, especially in second and third rotations. In the summer 2000 issue of LIMBS & NEEDLES (Vol. 27, No. 2) Dr. Glen Stanosz and Mark Guthmiller had an article reprinted from the WCTPA Quarterly Journal of January 2000 entitled, "Protect Christmas Tree Plantations by Preventing Annosum Root Rot." The disease was reported as affecting pines, firs, Douglas fir and spruces in Wisconsin.

So far we've been lucky in western North Carolina. The field identified by Dr. Hodges was only the second occurrence that I'm aware of. However, it's still important for growers to be aware of this disease and the potential damage it can do. So what clued Dr. Hodges in that *Phytophthora* didn't kill the trees? Above ground symptoms are similar between the two diseases. Tree growth is reduced and foliage is off-color and yellow. The infected trees were easy to push over, as the roots were rotten. But herein lay part of the difference. With *Phytophthora* root rot, roots appear blackened. The outer portion of the root slips off of the inner core. There is often a reddish, brown lesion that runs up the trunk, but the wood is still hard. With Annosus root rot, the wood in the trunk is rotten as well as the roots and can appear stringy though still light colored. In one place, Dr. Hodges found the white rot pocket of the fungus itself which appears just under the bark. In noble fir in the Pacific Northwest, trees infected with the pathogen have irregularly shaped dark stained older wood in the tree trunk that is evident when the tree is cut.

The fungus infects new trees through recently cut stumps – in this case, white pine timber that had been cleared for Fraser fir production. The air-borne fungal spores infect fresh cut stumps of conifer trees, particularly pines. Spores are present throughout the year, but are more prevalent in the fall. Spread occurs to living trees – in this case the Fraser fir Christmas trees – through root-to-root contact. Therefore in western North Carolina, disease has only occurred near areas where pine woods have been cleared. Infected trees occur in pockets called infection centers. It may take 1 to 3 years or longer for symptoms to become apparent. In the Pacific Northwest, diseased trees are usually only apparent at the end of the rotation. Problems in pine timber stands are often linked to soil type, but in the mountains of western North Carolina, eastern white pine is very susceptible to infection by Annosus root rot regardless of soil type.

Be aware when clearing land for Christmas tree production – particularly when white pines are abundant – that this disease can develop. To prevent future problems with Annosus root rot, treat freshly cut pine stumps with granular Borax. Do this even if Fraser fir will be planted in an adjacent field. Freshly cut stumps are susceptible for about one month. Once the disease is found in a plantation, removing stumps and roots and reducing root contact to still healthy trees may reduce spread.

Unfortunately, other sites that had dieback in trees didn't turn out to be either *Phytophthora* or Annosus root rot. Dr. Hodges thought that root injury and dieback, probably from weather or site-related factors, were the cause. Anyone having unusual dieback in their trees should contact their local County Extension Agent so that we can further study this problem. 

Just a note...Trees For Troops

Thanks to all of you who donated trees for our troops in Iraq last Christmas and thanks to all who have called expressing an interest in doing the same this Holiday Season. The US Army and the National Guard are only allowing necessary supplies for troops on the big transports and have told us that they will not ship Christmas trees this year. This is something that everyone supported and was behind but regretfully we are unable to send a little Christmas Spirit this year.