

Excising Bark Tissue To Arrest Sudden Oak Death Canker Development

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Phytophthora ramorum causes a canker disease known as Sudden Oak Death (SOD). It is found in several species of oak and tanoak in California and Oregon, most notably the coast live oak, *Quercus agrifolia*. Once infection occurs, the pathogen can spread rapidly in the inner bark and sapwood resulting in stem girdling and death of the host tree. Infected trees are also more susceptible to bark beetle or ambrosia beetle attack as well as several wood decay organisms. The disease is prevalent in coastal areas of California and outbreaks can be especially severe in years following wet winters when rainfall extends late into spring months.

Phosphite fungicides were registered as bark spray and injection treatments to help prevent Sudden Oak Death (SOD) disease in 2003. Phosphites are systemic fungicides that are absorbed by stem tissues and stimulate production of defensive compounds within plant cells. When present at high concentrations, phosphite can also act directly on *Phytophthora* to inhibit its growth. The Bartlett Tree Expert Company does not recommend the phosphite injection treatment option because at labeled rates these injections cause damage to internal tissues, and the wounding required to inject trees is unnecessary due to the systemic nature and proven efficacy of the bark applied treatment. Since the first treatments were made available, thousands of susceptible oaks have been successfully treated in California. Phosphites have proven to be most effective as a preventive treatment on healthy oaks. Once infection occurs, treatments may slow progression of the pathogen but may not arrest disease development totally. Soil amendment with gypsum has recently been shown to increase the efficacy of the phosphite treatments.

The lack of effective fungicide treatments for arresting advanced canker development has led to attempts to excise diseased tissue by mechanical means. This

technique is commonly referred to as “bark tracing”. Excising diseased tissue has long been used as a management technique for canker diseases including *Phytophthora* canker on fruit trees.

A technique has been developed by the staff of the Bartlett Tree Research Laboratories in conjunction with Bartlett arborists in California to rapidly excise bark at the margins of cankers using a power planer (Figure 1). The planer is used to expose diseased tissue at the margin of the canker while minimizing impact to healthy inner bark and sapwood outside of the cankered area (Figure 2). There is no attempt to cut

Figure 1: Power planer used to rapidly excise bark tissue



Figure 2: Close up of canker margin exposed after bark excision



deeply into the wood: the intent is to expose the leading edge of the canker in order to interrupt further ingress by *Phytophthora* in the bark tissues. Dead tissue in the interior portion of the canker is also left undisturbed because *Phytophthora* does not survive on this tissue after death. Instead, this tissue is colonized by other fungi such as *Hypoxylon*, that only lives on dead sapwood and will not impact plant health or survival.

After the bark tissue is excised, the stem is treated with a Potassium phosphite-based material, according to the procedures listed on the product label (Figure 3).

Figure 3: Potassium phosphite bark spray treatment to fully exposed canker



The high dosage of fungicide is intended to further help arrest growth of *Phytophthora* and aid in recovery of the diseased tree. This bark treatment is applied in conjunction with a second material to prevent wood boring beetles that are attracted to the tree due to disease or the canker exposing process.

Observations to date indicate that canker development can be arrested as long as treatments are applied in the early stages of disease development. Once cankers encompass more than a third of the trunk circumference, the health of the tree will be severely compromised even if the disease is arrested. The Bartlett Tree Research Laboratories established research plots in California to fully assess the impact of canker excision as a technique to help manage SOD, and to date results are very positive. While not appropriate in all cases, this advanced treatment regime is being offered to clients as an option to preserve oaks that have Sudden Oak Death disease.



Founded in 1926, The Bartlett Tree Research Laboratories is the research wing of Bartlett Tree Experts. Scientists here develop guidelines for all of the Company's services. The Lab also houses a state-of-the-art plant diagnostic clinic and provides vital technical support to Bartlett arborists and field staff for the benefit of our clients.