RESEARCH LABORATORY TECHNICAL REPORT

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Madrone (Arbutus) Canker

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The most common disease found on *Arbutus menziesii* (Pacific madrone), which causes dieback as well as branch and basal cankering, is caused by the fungus *Neofusicoccum arbuti (*formerly *Fusicoccum arbuti)*. This newly described species is related to the fungus *Botryosphaeria*, which causes canker and dieback diseases on a large number of plant species. Cankers begin as bark discoloration, followed by bark splitting and an eventual darkening of the tissue that resembles fire damage (Figure 1). This disease was first reported in the late 1960's, but for many years had mistakenly been attributed to the fungus *Nattrassia mangiferae*. This fungus is commonly isolated from cankers, but it has been proven to be a secondary organism that colonizes tissue after it has been killed by *Neofusicoccum*.

Figure 1

Research suggests that stressed madrone is most likely to become infected and inland trees are less commonly affected than coastal trees. Common stress factors connected with this disease include drought stress, wounding (including pruning or construction damage), heat or sunscald, cold damage, age, and root damage (Figure 2). Madrone is sensitive to temperature and mechanical injury due to thin bark. Its roots are intolerant of compaction. *Phytophthora cactorum* is also a common pathogen that causes root disease which may be a predisposing factor. Madrone is very sensitive to excess irrigation and poor drainage.

Figure 2: Old, slowly advancing basal canker extending up trunk, likely initiated by root damage and/or improper irrigation for turf

Drought stress can be mitigated with infrequent, deep watering (3-4 week intervals in summer). Madrone is naturally a very deep-rooted species and frequent watering causes the production of surface roots, which are less tolerant of drought and less structurally supportive. Surface irrigation may also lead to *Phytophthora* root disease. Irrigation should not be

applied to the stem to avoid the risk of *Phytophthora* canker infections. Suggested control measures include pruning out twig and branch cankers when they are first noticed (Figure 3). Pruning when the bark surface is dry may reduce transmission to pruning wounds. No chemical control method has proven totally effective in eradicating the disease, however research at the University of Washington showed a reduction in canker growth following treatments with a potassium phosphite based fungicide.

Figure 3: Pruning out branch cankers in dry conditions when they are first noticed may reduce transmission

If nursery stock is being planted, potted plants are less prone to problems because root damage is less severe than with field grown trees that require digging. Field observations suggest that there is some genetic disease resistance in the native madrone population, but breeding efforts have not been successful in producing resistant lines.

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