Jeffers, S.; Meadows, I.; Hwang, J.-S. Studies on Soil Mitigation of *Phytophthora ramorum*.

Based on research conducted in our laboratory over the past several years, with collaboration from USDA-APHIS and USDA-Forest Service, we have determined that *Phytophthora ramorum*, causal agent of sudden oak death and ramorum blight, continues to be present in container-grown nursery plants shipped to the southeastern region of the United States from nurseries on the west coast and elsewhere. Inoculum from infested and infected plants has escaped from these containerized plants and has become established in field soil at nurseries in several states. This inoculum is active and appears to have caused infections on plants that previously were free of *P. ramorum*. Inoculum of *P. ramorum* has been detected in runoff water leaving some of these nurseries, and there is concern that this pathogen will become established in the natural ecosystems in the southeastern USA—where many susceptible plants (e.g., trees in the Fagaceae and shrubs in the Ericaceae) are present—and will cause devastation in the forests of the Southeast similar to that occurring in the coastal forests in California and Oregon.

Currently, effective mitigation treatments for P. ramorum once it has escaped containergrown nursery plants and become established in the soil at a nursery are very limitede.g., fumigation, solarization, asphalt paving-and often site constraints prevent application. Therefore, an effective alternative mitigation treatment for soil is needed. My hypothesis is that a topical application of a copper-based fungicide to the soil surface may be such a treatment. Most copper fungicides are insoluble in water and immobile in the soil profile. So, it is unlikely that they would be washed down into the soil profile, and they probably would be washed away by lateral water flow very slowly. Low doses of coppers are lethal to spores of *Phytophthora* spp., including *P. ramorum*. Consequently, zoospores, chlamydospores, sporangia, and infested debris washing or splashing out of infested pots would come into contact with copper residues on the soil surface and should be killed. Likewise, an established population in soil would not be able splash onto healthy plants because propagules at or near the soil surface would be held in check by copper residues at the surface. Obviously, topical applications to the soil surface would need to be repeated periodically throughout the year to maintain the copper barrier. This hypothesis could be tested at the NORS-DUC. Additional experiments in the laboratory could be conducted to corroborate field experiments.