Can *Phytophthora ramorum* be Spread With Contaminated Irrigation Water?[1]

D. Seipp,[2] T. Brand,[3] K. Kaminski,[4] S. Wagner,[4] and S. Werres[4]

Abstract

In a two year study, the spread of *Phytophthora ramorum* with contaminated irrigation water and the survival of the pathogen in water reservoirs were studied (Werres and others 2007). In addition at the end of each experimental period root ball samples from asymptomatic plants were taken to look for contamination with *P. ramorum*. For the study, an open air simulation system with nine separate container stands was used. The surplus water from each container stand ran back to a separate water basin. From the water basins, the water was taken for overhead irrigation of the plants on the container stands. In both years rooted *Rhododendron* cuttings of the cv 'Cunningham's White', in the second year also *Viburnum plicatum* cv 'Mariesii' were placed on the container areas and irrigated from above with water taken from the water reservoirs. The reservoirs were inoculated once a year in June with two different inoculum concentrations (low inoculum density: 12.5 Petri dishes per reservoir = 1000 L, high inoculum density: 25 Petri dishes per reservoir in 2004 and 50 in 2005). Three reservoirs were not inoculated.

Phytophthora ramorum was able to survive in the water reservoirs during all seasons but there were differences between the inoculum densities and within the season. The pathogen could be spread with contaminated water. First disease symptoms on *Rhododendron* occurred 7 and 16 days after the first irrigation with contaminated water. The maximum incidence of *Rhododendron* plants infected visibly with *P. ramorum* was below 19 percent. The incidence varied between the two years of the study and within the season. There was a high variability in the total amount of symptomatic *Rhododendron* infected with *P. ramorum* between the three container stands belonging to the same inoculum density. The percentage of symptomatic *Viburnum* infected with *P. ramorum* was below 1 percent.

At the end of the two experimental periods when the plants were removed from the container stands, *P. ramorum* could be detected in some of the pooled root ball samples of asymptomatic plants with the bait test with *Rhododendron* leaves. *P. ramorum* was detected in the bait leaves by direct isolation and by PCR.

Key words: *Phytophthora ramorum*, sudden oak death, ramorum blight, water, nursery, survival, spread.

---

[1] A version of this paper was presented at the Sudden Oak Death Third Science Symposium, March 5–9, 2007, Santa Rosa, California.

[2] Chamber of Lower Saxony, Department Nursery Stock, Hogen Kamp 51, 26160 Bad Zwischenahn, Germany.

[3] Chamber of Lower Saxony, Plant Protection Service, Sedanstraße 4, 26121 Oldenburg, Germany

[4] Federal Biological Research Centre for Agriculture and Forestry, Institute for Plant Protection in Horticulture, Messeweg 11/12, 38104 Braunschweig, Germany.
Corresponding author: S. Werres, S.Werres@BBA.de.

Acknowledgments

We would like to thank the United States Department of Agriculture Forest Service, Pacific Southwest Research Station and the European Commission for funding the project.

Literature Cited

Werres, S.; Wagner, S.; Brand, T.; Kaminski, K.; Seipp, D. 2007. Infectivity and survival of *Phytophthora ramorum* in recirculation water. Plant Disease. 91, 1034–1044.