

Effect of Oomatistatic Compounds and Biological Control Agents on Production of Inoculum and Root Colonization of Plants Infected With *Phytophthora ramorum*¹

Nina Shishkoff²

Abstract

In this study, viburnum (*Viburnum*) cuttings were treated with oomatistats (Subdue Maxx[®], Banol[®], and Aliette[®]) at standard rates for use as soil drenches or with biological control organisms (*Streptomyces lydicus* formulated as Actinovate SP[®] and used as a soil drench, and *Trichoderma asperellum* formulated in wheat bran and used as a top dressing) 4 days after roots were infected with *Phytophthora ramorum*. The amount of inoculum in runoff samples taken weekly for 5 weeks was studied using a quantitative assay analyzed as a mixed model regression and the percent colonization of roots at the end of each experiment analyzed by a general linear model. Experiments were run three times for each compound or biological control agent, except for *Trichoderma*, which was run twice. Root-infected viburnum cuttings treated with Banol[®] did not show any reduction in inoculum production compared to non-treated cuttings, and there was no significant difference in root colonization at the end of the experiment. Aliette[®]-treated viburnum cuttings gave off significantly less inoculum than non-treated plants at all sampling dates (days 7, 14, 21, 28, and 35; $p < 0.02-0.0001$), and root colonization was significantly reduced ($p < 0.01$). Subdue Maxx[®] significantly reduced inoculum at all sampling dates ($p < 0.02-0.0001$) and reduced root colonization ($p < 0.0001$). When Actinovate SP[®] was applied as a soil drench to root-infected cuttings, significantly less inoculum was released than from non-treated ones at all sampling dates ($p < 0.002-0.0001$), and root colonization was reduced ($p < 0.05$). When *T. asperellum* in wheat bran was applied as a top dressing to pots containing root-infected cuttings, runoff contained significantly less inoculum than non-treated plants at all sampling dates ($p < 0.0001$), and root colonization was reduced ($p < 0.0001$). These results suggest that biological control agents are as effective as Subdue Maxx[®] and Aliette[®] at reducing inoculum production and root colonization in experiments lasting 35 days and are more effective than Banol[®].

¹ A version of this paper was presented at the Sudden Oak Death Fifth Science Symposium, June 19-22, 2012, Petaluma, California.

² ARS-USDA, 1301 Ditto Ave., Frederick, MD 21702.
Corresponding author: Nina.shishkoff@ars.usda.gov.