

Effectiveness of Fungicides in Protecting Douglas-fir Shoots From Infection by *Phytophthora ramorum*¹

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Key words: *Phytophthora ramorum*, sudden oak death, fungicide effectiveness, Douglas-fir seedlings

Abstract

The effectiveness of 20 systemic and contact fungicides in protecting Douglas-fir seedlings from infection by *Phytophthora ramorum* was determined. Some systemic products were applied about a week prior to bud break, while most treatments were applied just after bud break. In addition to the fungicides, two surfactants were included in the post-bud break application tests. One day after the post-bud break treatment applications, all the seedlings were inoculated by spraying seedlings with zoospore suspensions obtained from isolates of A1 and A2 mating types of *P. ramorum*. Inoculated seedlings were then incubated under optimal conditions for disease development. The only pre-bud break treatment that completely prevented infection was the drench application of Subdue MAXX. Pre-bud break drench applications of Stature, Insignia, and Terrazole had no effect on the number of infected seedlings. The reduction in infection by the pre-bud break applications of Heritage and Chipco Signature was variable and applications of Phostrol reduced infections by 71 to 75 percent. Post-bud break applications of the contact fungicides Dithane, Gavel, Maneb, and Polyram provided 100 percent control. Although not as consistently effective, applications of Champ Formula 2F, Reason, Daconil Ultrex, Stature, and IKF – 916 reduced the number of infected seedlings by 70 to 100 percent. Most of the other fungicides included in these tests provided more limited or variable reductions in the number of infected seedlings. Post-bud break applications of the organosilicone surfactant, Silwet L-77 had no effect on infection of seedlings. However, the post-bud break application of Latron CS-7 reduced infection by 67 to 100 percent. Our results indicate that several fungicides and possibly some surfactants have the potential to provide excellent control of *P. ramorum*. One common concern associated with the potential use of fungicides to control this disease is the possibility that fungicides might suppress symptom development on infected plants. While systemic fungicides might have the potential to suppress symptom development, it is unlikely that this would be an issue with any of the contact types of fungicides that were found to be effective in protecting seedlings from *P. ramorum*.

¹ A version of this paper was presented at the Sudden Oak Death Second Science Symposium: The State of Our Knowledge, January 18-21, 2005, Monterey, California

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