

Thermal Inactivation of Infested Plants, Nursery Equipment, and Soil is a Management Option for the Treatment of *Phytophthora ramorum*, Causal Agent of Sudden Oak Death¹

Wolfgang Schweigkofler,² Vernon Huffman,² Karen Suslow,² and Kathleen Kosta³

Abstract

Infested nursery plants play an important role in the spread of *Phytophthora ramorum*, the causal agent of sudden oak death and ramorum blight. In order to minimize the risk for disease transmission to new areas, nurseries are inspected regularly for *P. ramorum*, and federal regulations require the eradication of infested plants and the disinfection of nursery soil and equipment.

The National Ornamentals Research Site at Dominican University of California (NORS-DUC) is a federally funded research nursery devoted to testing and developing environmental friendly management options for quarantine pathogens of ornamental plants. In the laboratory, the effect of wet and dry heat on the survival rate of *P. ramorum* growing on Rhododendron leaf disks is tested. Incubation at 30 °C showed little effect on the survival rate. At 40 °C, growth rates started to decrease. Incubation at 50 °C for 30 minutes (wet heat) inactivated *P. ramorum* completely, whereas dry heat was slightly less effective. At the research nursery, thermal inactivation of plant debris, soil, and nursery equipment infested by *P. ramorum* was achieved by steaming using a commercial steaming unit (SIOUX Steam-Flo SF-1) at a minimum temperature of 50 °C. Temperature increase was influenced by ambient temperature, soil depth, moisture content, and compactness. Steaming was also used to decontaminate soil in a commercial nursery in the Central Valley of California which was found positive for *P. ramorum* previously. No *Phytophthora* was detected in official samples post-treatment; consequently, the commercial nursery was released from federal quarantine.

Further studies on heat treatment and steaming in the laboratory and the research nursery on other *Phytophthora* species, such as *P. tentaculata*, indicate that the method might be suited to control a wide range of plant pathogenic oomycetes in nursery soils.

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² NORS-DUC, Dominican University of California, 50 Acacia Avenue, San Rafael, CA 94901.

³ California Department of Food and Agriculture, Sacramento, CA.

Corresponding author: wolfgangschweigkofler@dominican.edu.