

**PHENOLOGY OF *XYLELLA FASTIDIOSA* AND *DRAECULOCEPHALA MINERVA* IN CALIFORNIA ALMOND NURSERIES: AN ASSESSMENT OF PLANT VULNERABILITY TO ALMOND LEAF SCORCH DISEASE**

**Principal Investigator:**

Rodrigo Krugner  
Crop Dis., Pests, & Genet. Res. Unit  
USDA ARS  
Parlier, CA 93648  
Rodrigo.krugner@ars.usda.gov

**Co-Principal Investigator:**

Craig A. Ledbetter  
Crop Dis., Pests, & Genet. Res. Unit  
USDA ARS  
Parlier, CA 93648  
craig.ledbetter@ars.usda.gov

**Reporting Period:** The results reported here are from work conducted October 2007 to September 2011

**ABSTRACT**

Almond leaf scorch disease is caused by the xylem-limited bacterium *Xylella fastidiosa* (*Xf*), which is transmitted by several species of leafhoppers. The objectives of this research were to elucidate the fate of bacterial inoculations in almond nursery plants; to elucidate patterns of insect vector population dynamics and movement relative to host plant assemblages in habitats surrounding commercial nurseries; and to investigate the temporal distribution of *Xf*-infected plants in those habitats. In an experimental nursery, disease incidence was markedly affected by rootstock type. Prior to budding, nursery plants were immune from bacterial infection if using Nemaguard rootstock. After budding with a susceptible scion, plants were vulnerable to infection regardless of the rootstock type. Surveys in commercial nurseries revealed that only habitats with permanent grass cover sustained vector populations throughout the season. A total 87 plant samples tested positive for *Xf* (6.3%) using ELISA, with a higher number of *Xf*-infected plants found in weedy alfalfa fields than in other habitat types. Among *Xf*-positive plants, 33% were winter annuals, 45% were biannuals or perennials, 22% were summer annuals. Collectively, these findings identified an infection pathway other than primary spread that may occur in established orchards.

**FUNDING AGENCIES**

Funding for this project was provided by the USDA Agricultural Research Service.

**ACKNOWLEDGEMENTS**

We thank Alessandra Rung and Raymond Gill for identifying the leafhoppers; Bradley D. Hanson, Ellen Dean, and Joseph M. DiTomaso for their help identifying the plants; Theresa De La Torre, Greg Phillips, Mario Venegas, and Aaron J. Salyers for technical assistance; and the anonymous almond nurseries and their neighbors for providing research sites.