Trunk and Scaffold Canker Diseases of Almond in California

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PROJECT SUMMARY

Objectives for current year:

- Diagnosis & Incidence – Continue TSCD survey of almond orchards in the Central Valley (*completed*)
- Identification & Pathogenicity – Characterize the major pathogens associated with TSCD using taxonomic methods and pathogenicity tests (*completed*)
- Establish effective control strategies against canker pathogens of almond (*in progress*)
- Assess seasonal and duration of pruning wound susceptibility to TSCD pathogens (*in progress*)

Background and Discussion:

Trunk and scaffold canker diseases (TSCD) of almond have been an increasing concern to growers in recent years. They are increasingly affecting young trees, causing significant tree losses and impairing orchard establishment. Symptoms of TSCD include discoloration of vascular tissues, wood necrosis, and extensive gumming. Dieback of scaffold branches may occur, and eventually the whole tree can die. Canker diseases usually prevailed in orchards as trees age. During the last three years, we have surveyed 70 orchards throughout California to identify the main fungal pathogens causing canker diseases. The survey revealed a broad diversity of fungal pathogens associated with cankers including Botryosphaeriaceae spp., *Ceratocystis fimbriata*, *Eutypa lata*, *Cytospora* spp., *Collophora* spp., *Phomopsis/Diaporthe* spp., and *Phytophthora* spp. Botryosphaeriaceae cankers and Ceratocystis canker appeared as the most widespread canker diseases of almond. Pathogenicity studies on almond suggested that *Phytophthora cinnamomi* and several Botryosphaeriaceae species (*Neofusicoccum arbuti, N. parvum* and *N. mediterraneum*) are the most aggressive canker pathogens of almond, causing extensive damages to trees. This work has improved considerably our capacity to accurately diagnose canker diseases, which is critical to tailor effective control methods. This year, three trials were conducted in the field to test the efficacy of 21 fungicides and other products to protect pruning wounds against infection by TSCD pathogens. Results varied slightly among trials but several products showed some efficacy to protect pruning wounds. Trial 1 (Colusa Co.) included 10 fungicides tested on pruning wounds made on one-year-old shoots. Topsin M (FRAC 1) provided the best protection (100% disease control) across all pathogens tested, including Botryosphaeriaceae spp.*, E. lata, Cytospora* sp. and *C. fimbriata*. The fungicides Quash (FRAC 3), Quadris Top (FRAC 3/11), Rally (FRAC 3) and Inspire Super (FRAC 3) also performed well against several pathogens. Trial 2 (Kern Co.) and 3 (Colusa Co.) tested 21 products against eight fungal pathogens using two to three-year-old branches. Results of trial 2 showed a greatest efficacy for Merivon (FRAC 7/11), Luna Experience (FRAC 3/7), and Quilt Xcel (FRAC 3/11). Trial 3 was conducted using high level of pathogen inocula on wounds (10,000 spores per wound) and best protection was achieved with a Trichoderma product (biocontrol agent). Field trials will be repeated in December 2017 to test the most promising 10-15 products from this past year experiments and determine confidently the best products for pruning wound protection in almond.

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For More Details, Visit

- Poster location 78, Exhibit Hall A + B during the Almond Conference; or on the web (after January 2018) at Almonds.com/ResearchDatabase
- 2016 - 2017 Annual Reports (16-PATH12-Trouillas) on the web at Almonds.com/ResearchDatabase
- Related Projects: 16-PATH11-Rizzo/Johnson