

Investigating the Impact of Fungicide Application on Pollen Germination and Tube Growth

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PROJECT SUMMARY

Objectives:

The purpose of this work is to refine guidelines to optimize the timing of fungicide sprays for minimal impact on fertilization of almond flowers, while maintaining protection from pathogens. Specific objectives are:

- Investigate how pollen variability, stigma receptivity and pollen tube growth in almond are affected by the timing of fungicide application.
- Use hand pollination experiments and pollen tube staining to test the viability of pollen and pollen tube growth in flowers that receive fungicide treatment.
- Evaluate whether the developmental stage of the flower (fully open or bud) at the time of fungicide application alters its impact on fertilization of the flowers.
- Evaluate whether the time since pollination alters the impact of fungicide application on fertilization of the flowers.
- Analyze the impact of fungicide application using flowers exposed in the field to gain a more accurate reflection of real field-based exposure on fertilization.

Background and Discussion:

Fungicide application to prevent pathogen infection and resulting fruit and nut loss are integral parts of best practice in almond cultivation. Despite its importance, however, we lack robust information for how fungicide

application at different times during bloom affects fertilization. Fungicides potentially impact pollen vigor, stigma receptivity, pollen tube growth or some combination of these. Application may impact open flowers and those still in bud. Such information would help to refine guidelines to optimize the timing of spray for minimal impact on fertilization of almond flowers, while maintaining protection from pathogens.

Laboratory experiments suggest that fungicide application could interfere with and reduce the fertilization of almond flowers; however it is crucial to know how the application of fungicides in the field during almond bloom effects the fertilization of ovules. Currently there is little information from flowers exposed in the field on how pollen viability is affected or on how the timing of fungicide application relative to pollen deposition and flower stage might affect the fertilization process. In particular we do not know the impact on flowers that have yet to open when the fungicide is applied.

This experiment will quantify whether differences in the timing of spray affect successful fertilization, and specifically whether there are differences in the impact of fungicide on fertilization in flowers that are open when the fungicide is applied versus those that have yet to open when the fungicide is applied. This project will be a first step in investigating *in vivo* how levels of fungicide exposure impact the fertilization of almond.

Project Cooperators and Personnel:

Claire Brittain, UC Davis; Jim Adaskaveg, UC Riverside; Eric Mussen, UC Davis.

For More Details, Visit

- Poster location 8, Exhibit Hall A and B during conference; or on the web (after January 2014) at www.almondboard.com/researchreports