

# Refining Fungicide Spray Timing: Extending Test of Fungicide Residual Effects on Fertilization through Stigma-Receptivity, 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.
- Increase testing to a broader spectrum of FRAC groups to add generality of previous results.
- 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:

This proposal builds on past years' exploration of two fungicide FRAC groups. We will extend the testing to two additional FRAC groups. 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 may affect 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 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 field trials on how on how the timing of fungicide application relative to pollen deposition and flower stage might affect the fertilization process.

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 provides a more robust first step in addressing *in vivo* how fungicide exposure may impact the fertilization of almond.

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**Project Cooperators and Personnel:** Kimiora Ward, Claire Brittain UC Davis; Jim Adaskaveg, UC Riverside

### For More Details, Visit

- Poster location 8, Exhibit Hall A and B during conference; or on the web (after January 2016) at [www.almondboard.com/researchreports](http://www.almondboard.com/researchreports)
- 2014 - 2015 Annual Reports CD (14-POLL3-Williams); or currently the web at [Almonds.com/ResearchDatabase](http://Almonds.com/ResearchDatabase)
- Related project: 14-POLL16-Pettis/Johnson