

Risk Factors, Spatial Patterns, and Biocontrol of Aflatoxin Contamination in California Almonds

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PROJECT SUMMARY

Objectives:

- Identify risk factors and spatial patterns associated with aflatoxin development in California almonds
- Determine the spread and survival of the atoxigenic *Aspergillus flavus* strain AF36 previously applied to orchards.

Background:

Aflatoxin is a carcinogenic contaminant produced by fungi *Aspergillus flavus* and *A. parasiticus*. The almond industry has taken extensive measures to control aflatoxin. This project seeks to further this effort with the the two pronged objectives outlined above.

Of note, the bio-control technique of “seeding” the atoxigenic (non-aflatoxin) producing AF36 strain of *A. flavus* is showing promise in almonds. This stain is inoculated into the field and displaces the naturally present aflatoxin-producing fungal strains. This approach in other crops like cotton seed has lead to a reduction in aflatoxin contamination.

Other key findings include the following. The incidence of *A. flavus* and *A. parasiticus* in orchards of all growing regions present the risk of aflatoxin contamination; however, aflatoxin was found more in samples from southern orchards.

This work continues to document insect feeding and damage, particularly by the navel orangeworm (NOW), contributes to the invasion and development of *Aspergillus* fungi and the production of aflatoxin. Almond mummies--the overwintering source for NOW—show high levels of infection by *A. flavus* and *A. parasiticus*.

Aspergillus growth and aflatoxin production in the new crop can occur throughout crop maturation and harvest, starting after hull spilt and through the harvest steps. Collaborative research (see 10-AFLA2-Lampinen “Stockpile Management to Reduce Aflatoxin Potential) shows contamination can continue in stockpiles containing too much moisture.

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For More Details, Visit

- Poster location 23, Exhibit Hall, Session 1 at the conference; or on the web (after January 2011) at AlmondBoard.com/AICposters
- 2009-10 Annual Report CD (09-AFLA1-Michailides); or on the web (after January 2011) at AlmondBoard.com/ResearchReports