

Bridging the Use of Biocontrol Products with the Active Ingredient *Aspergillus Flavus* AF36 from Pistachio to Almonds

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PROJECT SUMMARY

Objectives:

The focus of this research is to provide background for obtaining an almond registration for the atoxigenic *Aspergillus flavus* strain AF36 to use as a biocontrol agent to reduce aflatoxin potential in commercial orchards. AF36 is currently registered and being used successfully in other crops, such as cotton seed, corn, and pistachios. The current objectives are:

- Evaluate formulations of AF36 product in almond and pistachio orchards.
- Obtain registration for AF36 in almonds.

Background and Discussion:

Aflatoxin is a carcinogenic contaminant produced by the fungi *Aspergillus flavus* and *A. parasiticus* which occur in nut crop orchards. The almond industry has taken extensive measures to control aflatoxin. The almond industry has made a number of measures pre- and post-harvest to assure control and compliance with aflatoxin standards. These measures include: 1) Good agricultural practices like insect pest management and product handling; 2) Sorting of insect damaged kernels; and 3) Aflatoxin sampling, testing and certification of processed almonds. This project seeks to further this effort with the objectives outlined above.

The registered use of the atoxigenic *Aspergillus flavus* strain AF36 (a strain not able to produce aflatoxins) as a biopesticide has been successful in reducing aflatoxin contamination of pistachio nuts in commercial pistachio orchards in California in addition to reducing contamination of cottonseed and corn. The AF36 product was registered by the US Environmental Protection Agency (EPA) in 2012 for application in commercial pistachio orchards in California. We are attempting to obtain registration with the EPA of the AF36 product for application in almond

orchards. To accomplish this, we compared the AF36 product in an almond orchard with that in a pistachio orchard. In our study, we examined spore production on the AF36 product in both types of orchards, since the spores produced would spread the biocontrol agent throughout the orchard contributing to its effectiveness. We found that the spore production on the AF36 product was similar in almond and pistachio orchards.

The manufacturer who produces the AF36 product has now started using sorghum instead of wheat as a carrier of the AF36 inoculum. Furthermore, a new process is being used to produce the AF36 product. This new process coats the seeds with spores of the AF36 fungus (instead of inoculating and incubating the seeds), resulting cheaper and faster production. In our study, the new seed-coated sorghum-AF36 product performed similarly to the wheat-AF36 product in the almond orchard, suggesting that the new AF36 product is an adequate replacement for the original product.

The results of this study support bridging the use of biocontrol products with the active ingredient *Aspergillus flavus* AF36 from pistachio to almonds and the US EPA has accepted the results, which furthers progress toward almond registration. These two nut crops, pistachio and almond, have significant contiguous acreage in California resulting in natural and unavoidable movement of fungi from one to the other. The registration of the AF36 product will facilitate the industry's efforts to achieve area-wide reductions in the vulnerability of both crops to aflatoxin contamination.

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For More Details, Visit

- Poster location 80, Exhibit A + B during the Almond Conference; or on the web (after January 2017) at Almonds.com/ResearchDatabase
- 2015 - 2016 Annual Reports CD (15-AFLA1-Michailides-15-AFLA4-Michailides); or on the web (after January 2016) at Almonds.com/ResearchDatabase