Biocontrol of Aflatoxin

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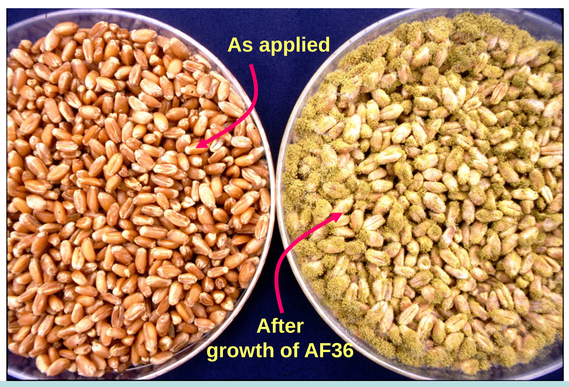
Molds that can produce aflatoxin in nut crops in California

INTRODUCTION

Aflatoxins, produced by *Aspergillus flavus* and *A. parasiticus*, are the most potent liver carcinogens and are widely regulated by governments who have set very low tolerances for aflatoxins in food and feed. The almond industry has taken extensive successful measures to control aflatoxin. The focus of this research is to provide background for obtaining an Experimental Use Permit (EUP) and ultimately an almond registration for the atoxigenic *Aspergillus flavus* strain AF 36 to use as a biocontrol agent to reduce aflatoxin potential in the orchard. AF 36 is currently registered and being used successfully in other crops.



AF36 product needs irrigation to produce spores

CONCLUSIONS

1. The atoxigenic strain AF36 became the dominant strain in the soil where the AF36 product was applied.
2. The atoxigenic strain AF36 persisted well in the soil for 2 years after application.
3. No increase in nut decay was observed after application of the AF36 product.
4. The sorghum-AF36 product shows promise as an alternative to the wheat-AF36 product.

AF36 in a Research Almond Orchard

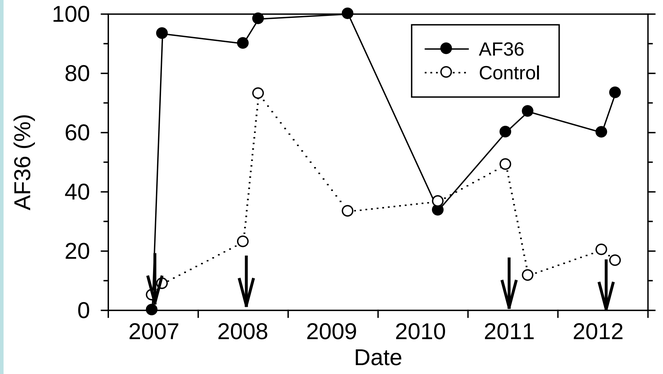


Figure 1. Percentage of *Aspergillus flavus* isolates belonging to the atoxigenic strain AF36 for isolates from soil collected from areas treated with the wheat-AF36 product or from untreated areas. Arrows indicate dates for application of the AF36 product.

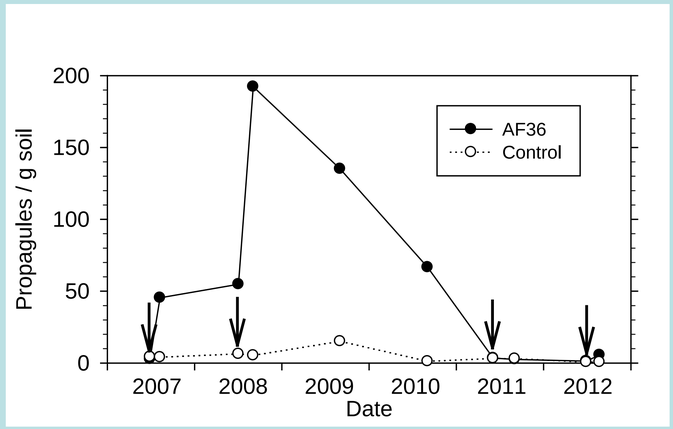


Figure 2. Density of *Aspergillus flavus* in soil collected from areas treated with the wheat-AF36 product or from untreated areas. Arrows indicate dates for application of the AF36 product.

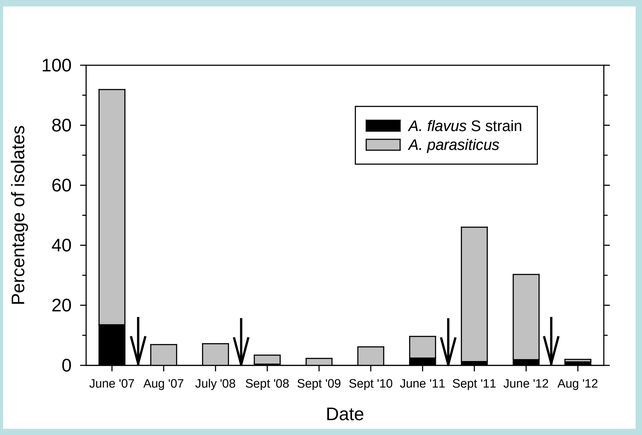


Figure 3. Percentage of *Aspergillus flavus/A. parasiticus* isolates that are the aflatoxin-producers *A. parasiticus* and *A. flavus* S strain for isolates from soil from areas treated with the AF36 product. Arrows indicate dates for application of the AF36 product.

Use of Sorghum for AF36

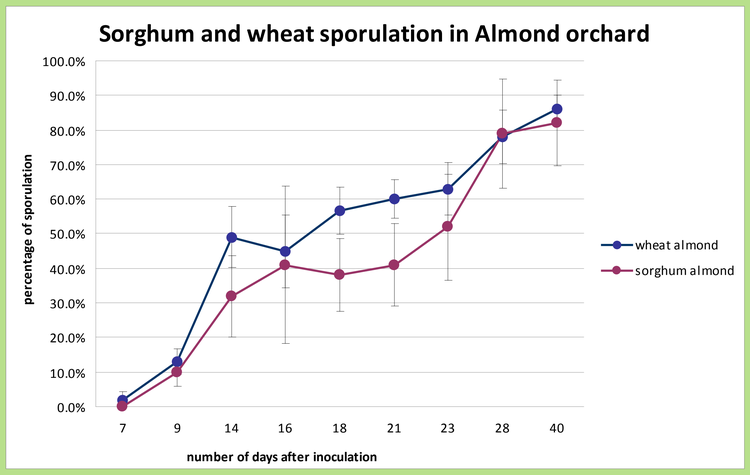


Figure 4. Sporulation incidence of *Aspergillus flavus* strain AF36 on wheat and sorghum products applied in an almond orchard.

Aflatoxin-producing Fungi on NOW Moths

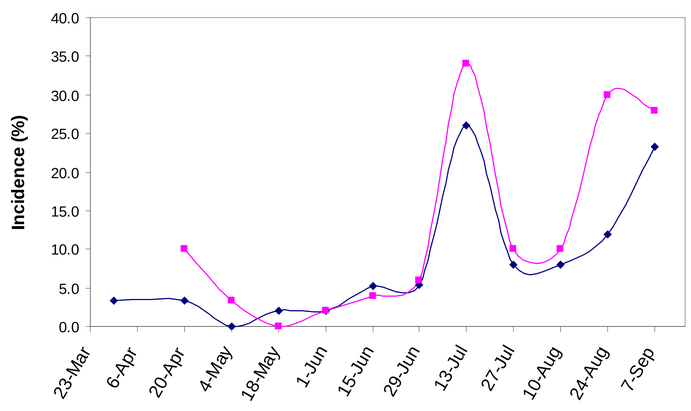


Figure 5. *Aspergillus flavus* group fungi on navel orangeworm (NOW) moths trapped in two almond orchards.