



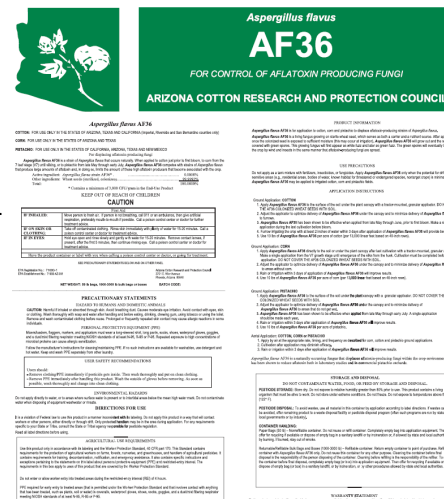
Arizona Cotton Research and Protection Council

UTILIZING AF36 TO MANAGE AFLATOXINS IN CORN AND COTTON

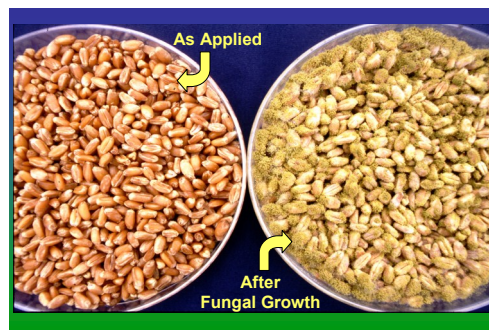


What is *Aspergillus flavus* (AF36)?

AF36 is a strain of *Aspergillus flavus* that occurs naturally but does not produce aflatoxin. When AF36 is applied to corn and cotton fields at the appropriate time, it actually competes with other strains of *Aspergillus flavus* that do produce large amounts of aflatoxin and, in doing so limits or reduces the amount of these high aflatoxin producers that become associated with the crop. Because AF36 is a living biological control agent, it functions best under moist sheltered conditions out of full direct sunlight.



How AF36 acts in the fields



AF36 is a fungus grown on sterilized wheat seed (or sorghum) which serves as both a carrier and a nutrient source for fungal growth.

After application and once the colonized seed is exposed to sufficient moisture (i.e. irrigation, rainfall, etc.), AF36 will grow out and the carrier seed will be covered with green spores. The growing fungus will first appear as white fuzz and later as green fuzz. The green spores will eventually be spread to the crop by wind and insects in the same manner that aflatoxin producing fungi are spread. Once in place AF36 acts to competitively displace aflatoxin producing strains.

How is AF36 best applied?

AF36 can be applied by ground or air from V7 to R1 on corn and at layby on cotton. Application rate for corn and cotton is 10 lbs. per acre.



Aflatoxins: Costly Contaminants in Corn and Cotton

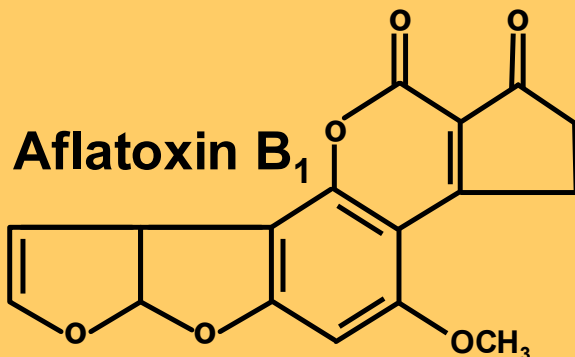


Aflatoxins are toxic chemicals produced by various strains of the common fungus *Aspergillus flavus*. Aflatoxins cause cancer in certain experimental animals at very low concentrations (1 part per billion). Aflatoxins are also associated with human liver cancer.

Governments around the world regulate the quantity of aflatoxins allowed in foods and feeds. In the U.S. the aflatoxin content of food must be below 20 ppb (parts per billion) and milk must have less than 0.5 ppb. Aflatoxins are a serious problem in corn and cottonseed. Crops with very low but detectable levels of aflatoxin often have a severe trading disadvantage in competitive markets worldwide.

Higher toxin levels result in deep domestic discounts or may even render the crop unmarketable.

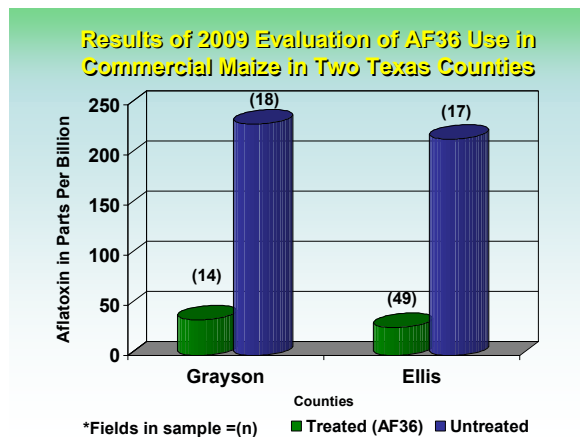
ppb (parts per billion) means 1 part per billion (or microgram per liter) and corresponds to 1 second in 32 years, 1 penny in \$10 million, 1 inch in 16-thousand miles, 1 pinch of salt in 10-tons of potato chips or 1 bad apple in 2-million barrels.



How Do We Know That AF36 Works?

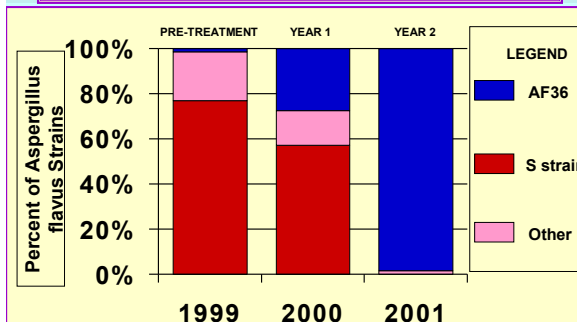
Extensive replicated tests in corn and cotton, as well as commercial treatments of more than 300,000 crop acres since 2001, have validated the ability of AF36 to competitively displace aflatoxin producing fungi.

What Results and Benefits Can I Expect?



Full field commercial testing of AF36 versus untreated controls in two Texas counties in 2009.

Displacement of Aflatoxin Producing "S" Strain fungi by AF36 Through Multi-Year Treatments in Arizona Cotton (1,000 acre block)



Displacement of toxin producing fungi following AF36 treatment in Arizona cotton.

For More Information Contact:

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Arizona Cotton Research and Protection Council (Manufacturer)
602-438-0059
WWW.AZCOTTON.ORG

AF36 does not directly reduce aflatoxin; it competitively displaces other fungi (*A. flavus* strains) that do produce aflatoxin. As a result, use of AF36 acts to change the community profile of fungi associated with the treated crop so that the atoxigenic strain (AF36) becomes very common and the incidence of aflatoxin producers is greatly reduced. It has been observed that influences of AF36 treatments extend beyond the treated crop. AF36 treatments may provide beneficial displacement even in fields adjacent to those treated and over multiple years. Cumulative effects may thereby result especially in areas undergoing an area wide aflatoxin management program. Because background aflatoxin levels vary greatly from year to year, best results are achieved where single applications of AF36 are made annually.