

Aflaguard® For Aflatoxin Control



DR. PAUL VINCELLI DR. DON HERSHMAN

LEXINGTON KY. PRINCETON, KY.

The current dry conditions across much of western Kentucky has some producers concerned about potential aflatoxin problems. Aflatoxin is a natural toxin and carcinogen produced in corn (and other crops) infected by the fungus *Aspergillus flavus*. Aflatoxin contamination in food and feed is regulated by the U.S. Food and Drug Administration (<http://www.fda.gov/oc/ohrt/aflatoxin.html>).

When preharvest aflatoxin contamination occurs in corn, it is most often associated with drought and high temperatures, especially during grain fill. Damage to the kernels increases the risk of contamination.

A novel product called Aflaguard® is being marketed for reducing aflatoxin contamination in corn and peanuts. It consists of non-viable barley seed coated with spores of a naturally occurring strain of *A. flavus* which is **atoxicogenic**. This means that this organism does not produce aflatoxin. It is thought to otherwise behave like toxin-producing strains of *A. flavus*, outnumbering the native, toxin-producing strains and displacing them within the ear of corn. This helps to reduce preharvest contamination. This approach is used successfully for aflatoxin control in cottonseed using another product, AF 36, which is a different atoxicogenic strain of *A. flavus*.

Dr. Tom Isakeit of Texas AgriLife Extension has evaluated Aflaguard® in replicated, randomized field trials, a challenging task for something as complex as this issue. His research thus far shows that, as expected, Aflaguard® often (though not always) reduces aflatoxin contamination in corn. His studies,

done in a year of severe drought, show that these reductions sometimes result in an economic benefit through a reduced discount on the harvested grain, though sometimes not, particularly when contamination levels are low. Dr. Isakeit is continuing to test the product under commercial conditions, under varying levels of aflatoxin pressure.

Reducing mycotoxin contamination through the use of a biocontrol agent in the field is biologically a very difficult challenge, yet Aflaguard® often provides measurable and significant reductions in aflatoxin contamination. To a microbiologist like me, this is really impressive. However, there are several complications in deciding where the product fits.

- The product should be applied before tasseling for optimal benefit, but aflatoxin contamination in Kentucky is often affected by the conditions that occur after silking.

- The majority of Kentucky corn fields that experience heat and drought during grain fill generally don't develop significant aflatoxin contamination, so widespread use may not make economic sense. And if contamination potential is high, not even Aflaguard® can bring down levels to make it safe for human consumption.

- The atoxicogenic strain requires moisture to be activated to produce spores. Application of the product during drought conditions can result in control failure.

Thus, if a producer is concerned about the risk of aflatoxin contamination, application of Aflaguard® prior to silking may help reduce anxiety, and that may be enough justification to use it. Plus, the product may sometimes improve marketability of the grain. However, I don't foresee widespread use of the product in Kentucky, even under the drought conditions we have seen this growing season.

Thanks to Tom Isakeit, Texas AgriLife Extension, for reviewing a draft of this article.

Δ

DR. PAUL VINCELLI: Extension Professor and Provost's Distinguished Service Professor, University of Kentucky

DR. DON HERSHMAN: Extension Plant Pathologist, University of Kentucky