

Aflatoxin Q&A

I'm hearing a lot this year about aflatoxin. What's going on?

While southern corn growers often battle the mycotoxin known as aflatoxin, it is not typically an issue for most Midwestern corn growers. However, the hot, dry weather of 2012 has led to instances of aflatoxin contamination in corn in areas as far north as Missouri and Nebraska.

What is aflatoxin?

Aflatoxin (pronunciation: \af-lə-täk-sən\), is a naturally occurring toxin that can be found in harvested grain. It is produced by certain strains of the soil-borne fungi *Aspergillus flavus* and *Aspergillus parasiticus*. Aflatoxin is most common in southern US growing conditions because of the hot, dry weather. However, aflatoxin can occur anywhere and is commonly found following drought or high heat situations, or in corn that has suffered damage from ear-feeding insects such as corn earworm. After harvest, the damage can continue in storage bins with development of molds and mycotoxins such as aflatoxin.

Aflatoxin-producing fungi are quite common and have a yellow- or gray-green appearance when they are growing on corn kernels. Aflatoxin has serious implications for human and animal health, and it is important to minimize its occurrence within the food chain.



Yellow-green powdery growth of *Aspergillus flavus* on a corn earworm-damaged ear. (Photo courtesy of Alison Robertson, Iowa State University)

What does aflatoxin mean for growers?

Aflatoxin can cause health problems in animals and humans if it is at high enough concentrations in the grain. As a result, grain handling facilities may test for levels of aflatoxin in incoming grain supplies and may reduce their payments for grain determined to have high concentrations of this toxin, or even reject the grain altogether if it does not meet certain specifications concerning aflatoxin levels.

In addition, livestock producers who feed their own grain must be on the lookout for aflatoxin contamination as well to preserve the health of their animals.

Why are people talking about the Agrisure Viptera® trait and aflatoxin?

Anecdotal evidence from the field in 2012 suggests corn grain harvested from hybrids with the Agrisure Viptera® trait is registering dramatically reduced levels of aflatoxin vs. corn grain harvested from hybrids without the trait. In addition, there has been a report of at least one grain handling facility welcoming increased amounts of corn grain from Agrisure Viptera traited hybrids as a result of this enhanced grain quality.

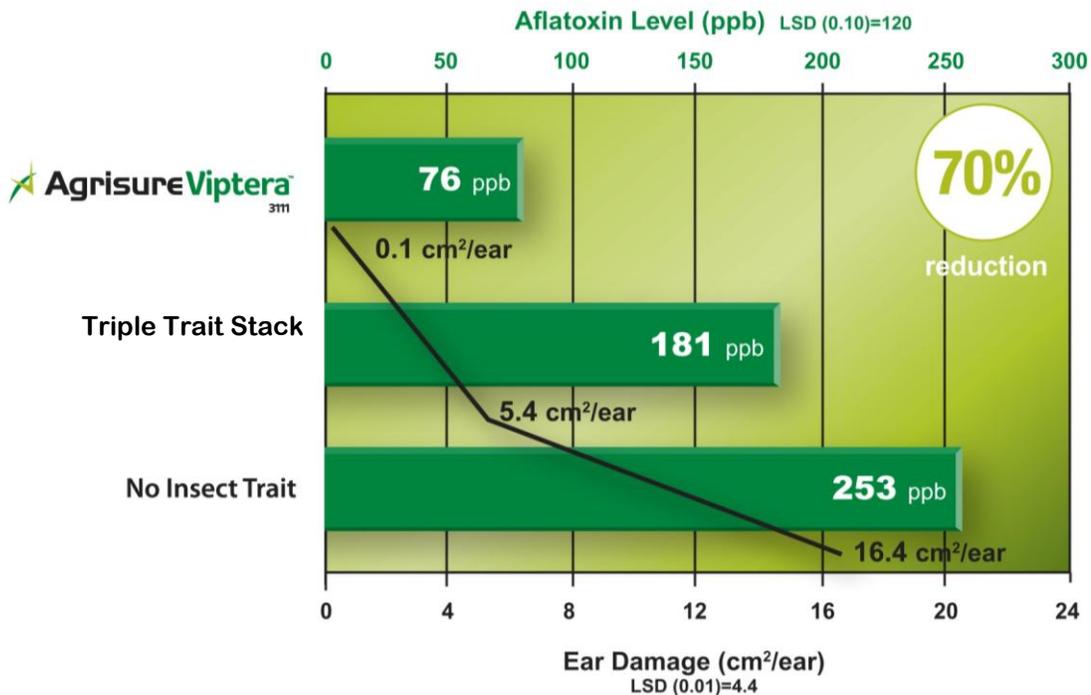
Why is the Agrisure Viptera trait effective at dramatically reducing aflatoxin levels?

Aflatoxin, along with ear molds and other mycotoxins such as fumonisin, has been tied to ear damage by corn insects, especially ear-feeding lepidopteran insects such as corn earworm. When ears are damaged by these insects, they become especially vulnerable to fungal infestation. Aflatoxin levels also can be correlated with certain environmental and genetic factors, including heat and drought stress as well as hybrids with open type husk covers.

The Agrisure Viptera trait is highly effective against key ear-feeding lepidopteran insects and is expressed throughout the corn plant, including the silks and husks. This means that insects ingest the Agrisure Viptera trait protein regardless of the location where they first attack the corn plant. Most of the time, insects ingest the protein through the silks or husks, leaving the actual ears untouched. This means dramatically fewer to no potential infestation sites for the aflatoxin-producing fungi.

What has Syngenta research shown in regard to the Agrisure Viptera trait and aflatoxin?

Research from Syngenta demonstrates that corn grain damaged by ear-feeding insects is more susceptible to aflatoxin contamination, resulting in lower quality grain and price per bushel at the time of sale.



(Roy D.Parker, Texas A&M 2009/2010)

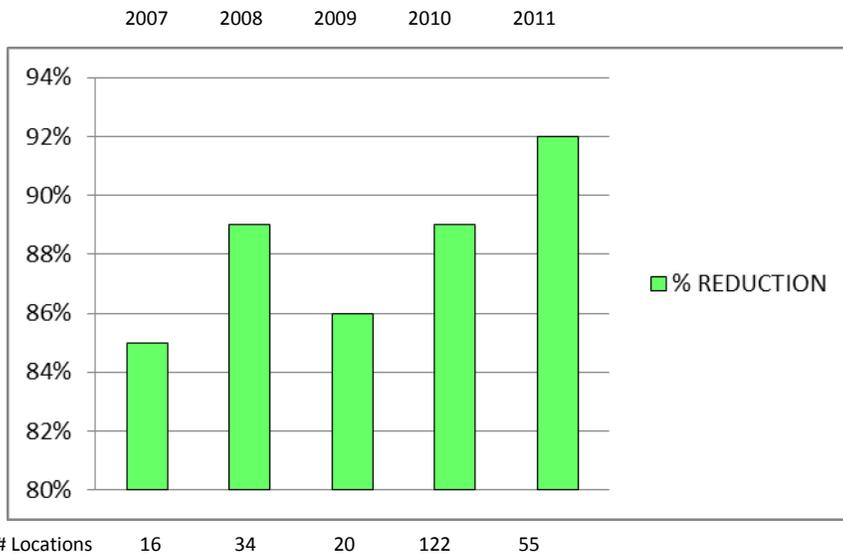
Syngenta research highlights demonstrate:

- Aflatoxin levels were correlated with grain damage from corn earworm (CEW)
- Agrisure Viptera traited hybrids reduced aflatoxin by 58% vs. standard triple stack hybrids
- Agrisure Viptera traited hybrids reduced aflatoxin by 70% of that detected in hybrids with no insect traits

Does Syngenta have other tools to help growers fight aflatoxin?

Yes. In addition to the Agrisure Viptera trait and its demonstrated benefits in the reduction of aflatoxin and other mycotoxins, Syngenta offers Afla-Guard® GR biocontrol agent. Afla-Guard GR is a nontoxigenic fungus that outcompetes the toxigenic strain of *A. flavus*, showing a significant reduction in aflatoxin contamination.

Syngenta currently is researching the benefits of combining both of these technologies in a grain quality solution. Be on the lookout this fall for results from this research and additional tools for your growers in the battle for clean, quality grain.



Effect of Afla-Guard GR on Corn Aflatoxin Levels (Syngenta commercial test locations).

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