

Aflatoxin Issues for Corn in the Texas Panhandle and NW Texas in 2011

What is Aflatoxin?

Aflatoxin is a fungal toxin produced by the fungi *Aspergillus flavus* and *A. parasiticus*. This toxin can cause disease in animals and/or humans. This toxin can cause gastrointestinal injury and severe liver injury, which may be fatal. This toxin may be produced in the field or after harvest. In Texas, aflatoxin is regulated in crops such as corn and any levels above 20 parts per billion (ppb) is unacceptable. In milk, greater than 0.5 ppb is unacceptable.

What does *Aspergillus flavus* or *A. parasiticus* look like?

Fungal growth will be light yellow green to dark olive (Fig. 1). *Aspergillus* spp. are responsible for some of the ear rots and storage rots that affect corn production.



Fig. 1 *Aspergillus* sp. in ears of corn. Photo: Greta Schuster.

What is the potential for Aflatoxin to become a serious issue for the Texas Panhandle and Northwest Texas?

The Texas Panhandle and NW Texas may not be as prone for high levels of aflatoxin contamination. Aflatoxin contamination is normally associated with non-irrigated corn faced with drought issues, high temperatures at flowering, insect injury, and other plant stresses. **However, in a year with severe drought and higher than normal temperatures during the day and night, conditions may exist for corn to be faced with aflatoxin issues.**

As recent as 2006, high levels of aflatoxin were mostly observed in the eastern part of Texas. In the Texas Panhandle and Texas High Plains, all but one county was below the 20 ppb threshold (Fig. 2). Other parts of Texas had levels as high as 2200 ppb.

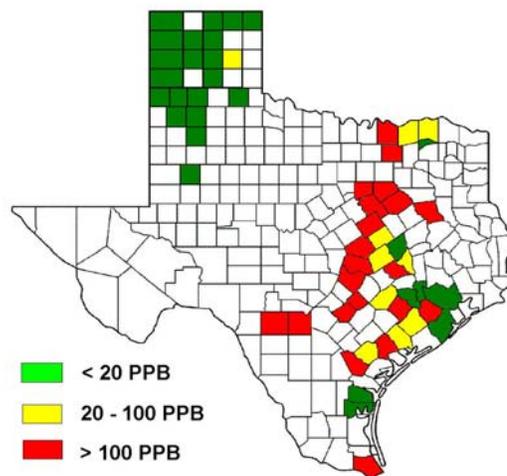


Fig. 2 Aflatoxin distribution in Texas (2006). Figure: Tom Isakeit.

Prepared by Ronald D. French¹

¹Assistant Professor and Extension Specialist in Plant Pathology; Amarillo, Texas.
Texas AgriLife Extension Service; The Texas A&M System

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Therefore, the potential exists for aflatoxin contamination to rear its head in these parts of Texas.

It is to be noted that contamination is not uniform and may vary by region, within a field, within a plant, within an ear, and within a seed.

How can we prevent or manage contamination of corn?

Unlike some fungi, this is not a seedborne issue, so a fungicide seed treatment will not have helped as a preventive practice. This is normally a crop debris issue, and our corn production practices lend themselves to a potential increase in levels of *Aspergillus* spp., whether they are toxigenic or not.

There are two products available that can be used by producers to minimize mycotoxin levels and potentially protect their yield: AF-36 and Afla-Guard®. Both are strains of *A. flavus* that do not produce the toxin that are grown on heat-killed wheat (AF-36) or barley seed coated with spores (Afla-Guard®).

By producing spores in the small grain seed, these spores will be spread throughout the field by air. Once they land on the silk and successfully colonize the ear, they will hopefully outcompete the toxigenic strains of *Aspergillus* spp.

The fact that kernels are infected with *Aspergillus* spp. does not mean that the toxin is present. Kernel moisture for aflatoxin production ranges from 16-20%. Optimal moisture is at around 18%. Storing seed below 16% moisture could limit aflatoxin production during storage or transport.

When should Afla-Guard® or AF-36 be applied?

Since spore production from these products need to take place so that atoxigenic producing spores are spread throughout the field, an application after silking will most likely not work.

AF-36 is labeled for application between V7 and silking and Afla-guard® between V10-V12 and silking. Because of dry weather conditions and low humidity, which is not conducive for sporulation and fungal survival, an application close to V10 might be more optimal.

Upon application of product, watering to activate dormant spores will increase the potential of the atoxigenic *Aspergillus* product to increase in efficacy. **Watering within 2-3 days of product application may prove most beneficial.**

Currently, there is no data to indicate that a fungicide application will affect these products.

Other Resources

Three factsheets have been written by Tom Isakeit (Extension Plant Pathologist at College Station, Texas) on aflatoxin are available in the “corn” section of <http://sickcrops.tamu.edu> or directly at: <http://sickcorn.tamu.edu>

1) “Prevention of Aflatoxin Contamination of Corn Using AF-36 and Afla-Guard®”; 2) “Best Management Practices to prevent or Reduce Mycotoxin Contamination of Corn in Texas”; and 3) “Aflatoxin in Baled Corn”

This fact sheet will also be posted there.

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¹Assistant Professor and Extension Specialist in Plant Pathology; Amarillo, Texas.
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