Corn and Grain Sorghum Promotion Board – 2014 End of Year Report

Title: Assessment of the occurrence and distribution of mycotoxins in sorghum in Arkansas

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Status: Year 2 (2014 to 2015)

Goal: To identify which mycotoxins are most prevalent and potentially problematic in Arkansas sorghum production systems.

Specific Objectives:

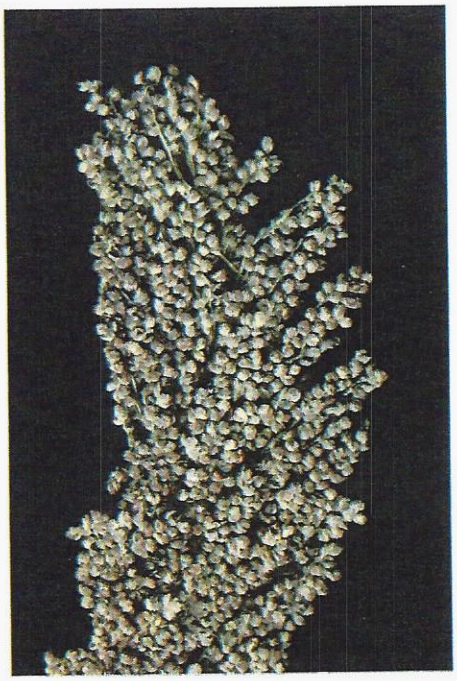
1. Survey Arkansas sorghum for the types and amounts of mycotoxins present.
2. Assess the resistance or susceptibility of white sorghum to mycotoxins.

2014 Findings:

Widespread damage of Arkansas sorghum caused by sugarcane aphids was associated with substantially higher levels of head mold than observed over the last few years. Increased fungal colonization resulted from two issues: 1) increased avenues of entry due to physical damage of kernels, and 2) compromised plant resistance to fungal pathogens as a result of impaired photosynthesis/resource allocation in response to insect attack.

The predominant fungal pathogens associated with head mold in 2014 belonged to the genus *Fusarium*. It was interesting that, despite instances of severely compromised host resistance and increased avenues of fungal entry, the diversity of fungal pathogens associated with head mold was low. This is consistent with our working hypothesis (based on data from prior years) that many *Fusarium* species associated with sorghum are often asymptomatic, in that under "normal" sorghum growing conditions, they do not cause disease. However, when the environment is favorable (such as warm, humid conditions during heading) or if sorghum's resistance is compromised (for example, in response to heavy insect attack), these endophytic fungi make the switch to pathogenesis.

Interestingly, despite incidences of severe head mold in some locations, the overall level of mycotoxin contamination was low in many of the sorghum samples analyzed this year. We predict that this may result from the fact that some of the *Fusarium* species most commonly associated with sorghum are different than those commonly associated with corn, and thus may not possess the genes required to produce fumonisin or trichothecene mycotoxins. Experiments are underway currently to test this hypothesis.



Example of extensive head mold associated with sugarcane aphid damage.