Fungal Strains Can Mitigate Aflatoxin Levels in Maize

Some strains of the fungus *Aspergillus flavus* can contaminate valuable oilseed crops worldwide with carcinogenic toxins, called aflatoxins, resulting in human and animal health problems as well as significant economic losses. Current USEPA-approved biological control strategies used to combat the production of these toxins require reapplication every growing season, and little is known about how these approved strains compare with regionally native strains.

In an article recently published in *Agronomy Journal*, researchers report on field trials that compare the ability of various non-toxin-producing *Aspergillus flavus* strains to mitigate toxin levels in maize.

The team found that native, non-toxigenic *A. flavus* strains reduced aflatoxin levels and increased yield and were as effective as the commercially available biocontrol strains. Moreover, strain formulations that included compatible mating types showed the greatest reduction in aflatoxin levels.

Increasingly unpredictable seasonal weather makes it difficult to predict and manage the potential for aflatoxin contamination on an annual basis, suggesting the need for long-term solutions. This study suggests that a range of native fungal strains may be effective and that using a combination of native isolates of opposite mating types could potentially provide a more long-term form of control.

Adapted from Molo, M.S., R.W. Heiniger, L. Boerema, and I. Carbone. 2019. Trial summary on the comparison of various non-aflatoxigenic strains of *Aspergillus flavus* on mycotoxin levels and yield in maize. Agron. J. 111. View the full article online at http://dx.doi.org/doi:10.2134/agronj2018.07.0473

Yield Monitor Post-Harvest Data Cleaning Is Essential

Crop yield monitor data are increasingly used for a variety of purposes including on-farm crop management studies, assessing field and within-field nutrient balances, determining soil type specific crop yield potentials, and creating crop and soil management zones. To obtain actionable information, yield data need to be reliable across fields, farms, and years.

The first step in obtaining reliable data is yield monitor calibration. However, in a recent study published in *Agronomy Journal*, researchers show that calibration alone is insufficient. Lack of (or improper) post-harvest data cleaning can affect management decisions based on the data, especially when multiple years of data are combined.

The team studied post-harvest data cleaning needs for corn grain and silage, using yield data from 145 corn silage and 88 corn grain fields (three farms each). Results showed that use of raw data (i.e., without proper data cleaning) could lead to sizeable over- or under-estimation of actual yields, especially for silage but also for grain.

A data-cleaning protocol was developed based on findings in the study. The protocol allows for batch processing of all fields within a farm after determining appropriate cleaning setting (filter) values using a subset of fields and the interactive cleaning tool “Yield Editor” developed by USDA-ARS.

Adapted from Kharel, T.P., S.N. Swink, A. Maresma, C. Youngerman, D. Kharel, K.J. Czymmek, and Q.M. Ketterings. 2019. Yield monitor data cleaning is essential for accurate corn grain and silage yield determination. Agron. J. 111. View the full article online at http://dx.doi.org/doi:10.2134/agronj2018.05.0317

A corn cob infected with *Aspergillus* spp. Photo by Ignazio Carbone.

![A corn cob infected with Aspergillus spp.](image1)

One of the cleaning filter settings—flow delay—applied to a raw dataset to match with ground features.

![One of the cleaning filter settings—flow delay](image2)