

Corn lines resist fungal toxins

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ARS geneticist Paul Williams is part of a multidisciplinary team of researchers and university cooperators that is developing new corn lines that are genetically resistant to aflatoxin-producing fungi.

(PhysOrg.com) -- Corn germplasm lines developed by U.S. Department of Agriculture (USDA) scientists are scoring high marks in field trials for resistance to aflatoxin produced by *Aspergillus flavus* and *A. parasiticus* fungi.

According to geneticist Paul Williams with USDA's Agricultural Research Service (ARS) in Mississippi State, Miss., the presence of aflatoxin in corn greatly reduces its value and marketability. That's because aflatoxin is carcinogenic to humans, pets and wildlife. Annual losses incurred by the corn industry to aflatoxin contamination of kernels are estimated at \$192 million.

At the ARS Corn Host Plant Resistance Research Unit in Mississippi

State, Williams works with a multidisciplinary team of researchers and university cooperators to develop, test and release new corn lines that are genetically resistant to aflatoxin-producing fungi.

In 2008 field trials, for example, two germplasm lines that the team developed—Mp715 and Mp717—showed the highest levels yet of resistance to aflatoxin contamination. A more recent line, Mp04:097, also performed well in 2009 trials.

Mp715 and Mp717 are also resistant to the accumulation of another fungal toxin—fumonisin, which is produced by *Fusarium verticillioides*. The toxin causes neurological abnormalities in horses after they consume infected corn.

According to Williams, the lines have been widely requested and used in plant breeding programs at state, federal and international research institutions, plus three major commercial seed companies and several smaller ones.

In related work, the researchers are mapping chromosome regions associated with aflatoxin resistance in crosses between resistant lines and susceptible ones with good agronomic qualities. The goal is to identify markers that can be used in marker-assisted breeding.

On yet another front, the team has developed corn lines that resist fall armyworms and southwestern corn borers, [insect pests](#) whose feeding damage can contribute to aflatoxin contamination.

[Read more](#) about research to improve corn in the September 2010 issue of *Agricultural Research* magazine.

Provided by USDA Agricultural Research Service

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