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PLANT PEST Newsletter

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IN THIS ISSUE	PAGE
Aflatoxin Situation—1988	111
Field Fungi Common in Corn (from <i>Crops, Soils and Pest Newsletter</i> , Iowa State University Extension (IC - 27, 9/9/88).	112
ASCS Notice on Aflatoxin	113
Miscellaneous Dial U Clinic.....	113

This is the last bi-monthly issue of Plant Pest Newsletter. October through March issues will be published the third week of each month.

AFLATOXIN SITUATION FALL 1988

The high temperatures which have occurred during the drought have caused a change in the fungus flora of freshly harvested corn. *Aspergillus flavus*, normally considered a southern field fungus or storage fungus, is among the field invaders in Minnesota this year. This fungus has the potential of producing aflatoxin, a mycotoxin capable of causing considerable livestock feeding problems.

This first came to our attention when samples of corn from southern Minnesota were cultured in our Plant Disease Clinic. This corn yielded various levels of *A. flavus* and had the typical bright-green-yellow fluorescence which is an indication of the possibility of the presence of aflatoxin. We then collected a small number of samples from 2 counties and tested for the presence of aflatoxin. Four out of the 7 samples collected and tested had aflatoxin. This tells us that we have a toxin producing strain and that environmental conditions were right for aflatoxin production. We picked corn obviously infected with the fungus and tested only these so it was not a representative sample which would give an estimate of the concentration in the field.

Badly infected ears will have visible mold. Any mold with a brown-yellow green color is potentially *A. flavus*. Other molds could also be present. See attached for explanation of these molds (enc. P. 189, Iowa Newsletter).

Any corn that is suspected to contain this mold should be tested by a competent testing laboratory. The Minnesota Department of Agriculture, Division of Laboratory Services, the Plant Disease Clinic, (612) 625-6290, Minnesota Valley Testing at New Ulm, (1-800-782-3557) and Ingman Labs (612) 724-0121 are 4 local sources which have quantitative testing available. Other Private testing laboratories and State Plant Pathology or Veterinary Diagnostic clinics may also conduct these tests. Quantitative information is important to make intelligent feeding decisions so be sure to request this along with price before submitting a sample for analysis. Prices can range from \$30.00 - 125.00/sample.

The significance of all this is that feeding of contaminated grain can cause toxicity in livestock. FDA recommendations are: 1) less than 20 ppb for dairy as it has the possibility to become passed into the milk, (because of the risk of aflatoxin in milk it would be advisable not to feed any aflatoxin corn to lactating cows), 2) less than 100 ppb for mature non-lactating beef and hogs, and 3) less than 100 ppb for poultry. FDA does not permit any corn greater than 20 ppb for food purposes or greater than 100 ppb for animal feed to be shipped out of the state. It also does not permit blending for interstate shipment. They do not encourage blending at a

**For more information regarding the Plant Pest Newsletter
contact Extension Plant Pathology 612-625-6290.**

AFLATOXIN/Continued

local level but this is regulated by the State. No specific state regulations exist at the time of this writing, however, the State Department of Agriculture has informed me that these are forthcoming. Any blending at the farm level must be done at the risk of the producer. Blending depends on knowing the concentration of aflatoxin in the lots of grain to be blended.

Determining the aflatoxin concentration depends on obtaining the best representative sample possible. No sampling pattern is perfect but the more samples you take from a grain bulk the more accurate the results are going to be. Sampling during bin loading would be ideal. Obtain a 1 lb. sample every 500 to 1,000 bus. until a 10 lb. sample has been collected. Then pick random handfuls from this 10 lb. sample until a subsample of about 2 lbs. is collected. Submit this 2 lb. sample for analysis.

When sampling bins, a reasonable grid pattern should be followed and probed at no less than 3 levels (top, middle, bottom) at each grid intersection. Probe until 10 lbs. of grain is collected and reduced to 2 lbs. as outlined above.

When sampling feed, make sure the sample submitted is representative of the suspected feed.

If the test results are negative no action needs to be taken but if feeding problems arise a veterinarian should be contacted and the feed retested if he deems it necessary.

Another significance concerning the potential of aflatoxin in corn is the recent ASCS announcement. They have requested that any corn designated for farm stored crop loans be tested for aflatoxin. They have not yet decided who is responsible for the cost of the test or the concentration of aflatoxin they will permit.

Quantitative aflatoxin analysis must be done by a competent laboratory. However, certain semi qualitative tests are available for field use.

A black light (365 nm) can be used to detect a bright green yellow (BGY) fluorescence indicating the possible presence of aflatoxin. Care should be taken in interpreting the color and any BGY positive samples must be confirmed with a more specific test. Black lights are available from Seedburo Co. and the various chemical supply houses.

Seedburo black lights B-100, 229 and B-16 are \$249.00, \$122.00, and \$109.00 respectively. Model B-16 is a portable battery operated one. These can be purchased by ordering from Seedburo Equipment Company, 1022 West Jackson Blvd., Chicago, Illinois 60607-2990, Phone (312) 738-3700. Fisher Scientific has a large variety of black lights (365 nm) ranging from \$60.00 - over \$300.00. Their address is Fisher Scientific 16230 West 70th St., Eden Prairie, MN 55344, Phone (612) 941-5460. American Scientific Products, 13505 Industrial Park Blvd., Minneapolis, MN 55441, Phone (612) 553-1171, also has a similar supply of 365 nm lamps.

Another rapid screening method which is available for field use, the ELISA kits. These and the new affinity column method can be used in field situations when used after proper training.

If you have questions concerning the aflatoxin situation, please call Richard A. Meronuck, Department of Plant Pathology, University of Minnesota (612) 625-6290.

—Richard A. Meronuck, Extension Plant Pathologist

FIELD FUNGI COMMON ON CORN IN IOWA

(from: *Crops, Soils and Pest Newsletter, Iowa State University Extension, IC-456 (27), Sept. 9, 1988*)

Alternaria or Cladosporium

Appearance in Field—Black, blue-black, or olive green to olive brown mold growth on husks, kernels and cobs. Individual kernels may have dark blotches or streaks. Pericarps may have split to reveal clumps or tufts of dark mold growth. Both fungi are common invaders of dead plant tissues so may be found on husks, leaves and stalks as well as on ears and kernels.

Diplodia

Appearance in Field—Frequently produces dense white to grayish white growth which mats between kernels and between the ear and husks. Small black fungal fruiting bodies may be scattered on husks, cob tissues and side kernels. The husks of early infected ears appear bleached or straw-colored. Entire ear may be grayish brown, shrunken, very lightweight and completely rotted.

Fusarium moniliforme (Fusarium kernel or ear rot)

Appearance in Field -- Damage tends to occur as a salmon-pink to reddish brown discoloration on caps of individual kernels scattered over the ear. A powdery or cottony pink mold growth may develop on infected kernels. Frequently Fusarium kernel rot becomes established around tunnels made by corn earworms or corn borers.

***Gibberella zeae* (*Gibberella ear rot, Gibb ear rot or Red ear rot*)**

Appearance in Field—Usually begins as a reddish mold at the tip of the ear. Early infected ears may rot completely with husks adhering tightly to the ear and a pinkish to reddish mold growing between husks and ears. Although mold growth usually has a pinkish to reddish color, it can appear yellow to yellow-orange or yellow-red. *Gibberella ear rot* typically begins at the tip of the ear but under favorable conditions it can move down the ear causing extensive damage. It may also develop around injuries from hail, birds or insects. *Gibberella zeae* is the perfect or sexual stage name for *Fusarium roseum* f. sp. *cerealis*.

Penicillium

Appearance in Field—Usually evident as discrete tufts or clumps of blue-green or gray-green mold erupting through the pericarp of individual kernels or on broken kernels. Colonies of *Penicillium* tend to be small, discrete colonies with a dusty or powdery appearance.

Aspergillus flavus

Appearance in Field—Usually evident as a greenish-yellow, felt-like mold growth on or between kernels, especially adjacent to or in insect damage kernels on ears.

ASCS NOTICE ON AFLATOXIN

Agricultural Stabilization and Conservation Notice (ASCS) LP-1254, Tests For Aflatoxin Required Before Approving Farm-Stored 1988 Crop Loans, dated September 8, 1988, requires aflatoxin tests and ASCS County Office action in certain states or counties. The notice provides for testing of corn which has been pledged as loan collateral. The notice erroneously contains some provisions relating to the disaster program which have to do with the destruction of aflatoxin contaminated grain. While grain placed under loan cannot contain aflatoxin, there is no provision for destruction of it.

An amended ASCS LP Notice is being prepared and will be forwarded to state and county ASCS offices.

We have additional information available relating to aflatoxin contamination. Contact Basil Eastwood (202) 447-6486, Rich Reynnells (202) 447-4087, Gary Weber (202) 447-2677 or Henry Bahn (202) 447-4387 if you need it.

We expect that provisions relating to the livestock and crops portions of the Disaster Assistance Act of 1988 will be announced late this week or next. Implementation should begin in early October. We will forward copies of the provisions upon receipt.

MISCELLANEOUS

DIAL U HIGHLIGHTS—Period: Sep 4-17, 1988

Needle drop—With the cooler weather and shorter days leaves are beginning to turn color and fall. This includes the leaves on evergreens: needles. The inner needles, the ones produced a few years ago, turn yellow, orange, or brown and are shed at this time of year. Norway and white pines and arborvitae are the most noticeable. This phenomenon is often most pronounced on stressed trees, and this past summer's drought certainly stressed trees. However, fall needle shedding is as natural as deciduous leaf shedding and should cause no undue concern.

Boxelder bugs in fall—The recent cold weather is encouraging boxelder bugs to search for places to spend the winter. In urban areas, this usually means homes and other buildings. Boxelder bugs are harmless but people often attempt to control them because they are nuisances.

Boxelder bugs can be difficult to control but can be minimized. Cracks in the foundations, gaps around windows and doors and other openings where insects can enter into buildings should be caulked or sealed. Insecticides, such as diazinon or chlorpyrifos, can be sprayed around the outside of buildings in a wide band, although the results are variable. A soap solution mixing 1/2 cup laundry detergent to 1 gallon of water is as effective as insecticides (sometimes more effective). It must be sprayed directly on the bugs and applied liberally. The soap mixture can stain some wood siding, such as cedar, and should be tested on a small inconspicuous spot before spraying a large area.

Boxelder bugs should be sprayed as often as they are clustered on the sides of buildings to minimize not only the bugs seen in the fall but also during the winter and in the spring. Boxelder bugs that get inside can be removed by hand or vacuumed.

Harvesting winter squash and pumpkins—Winter squash and pumpkins have little or no frost tolerance, so must be harvested—or covered—when severe weather threatens. If pumpkins haven't yet turned solid orange, they will probably continue to color up after bringing them indoors. Squash should have a deep rich color and thick, tough rind when they are harvested. Leave an inch or more stem attached.

DIAL U/Continued

To store squash and pumpkins, 'cure' them first by keeping them in a warm (75 degrees, if possible) dry room for ten days before putting them into cooler (50 to 55 degrees) long range storage. Check periodically for any signs of mold and remove affected produce immediately.

Water plants outdoors—We continue to receive calls about watering outdoors. Because the heat and drought this year was so hard on landscape plants, it's important to continue watering right up till the time the ground freezes. Water thoroughly any time there is a week or more without good rainfall. For trees and shrubs on heavy clay soil, check first to see the soil has dried before watering again. Water is used more slowly in cooler weather, and you don't want to overdo it and end up with root rot.

Other common calls include questions on pantry insects, fleas, carpenter ants, wilt diseases, smooth patch, stinkhorn mushrooms, and wood decay.

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Horticulture

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Entomology

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