

## MEMO

**RE: Harvesting Flood Damaged Corn for Silage or Grain**

**TO: County ANR Agents**

**FROM: Chad Lee and Jim Herbek (Extension Grain Crops Specialists) and Donna Amaral-Phillips (Extension Dairy Nutritionist) University of Kentucky**

### **Stalk Deterioration**

Corn stalks often deteriorate rapidly after flooding. Corn plants will survive submerged conditions for about 24 hours when soil temperatures are higher than 70 degrees F (Thelen, 2001). Water that has been over corn for more the 24 hours will likely kill the corn plant and weaken the stalk.

### **Mold to Corn Ear**

Corn ears submerged in the water can develop mold. Moldy corn is often not accepted at elevators or is heavily docked. Aflatoxins and fumonisins are often associated with moldy corn. Fumonisin is the most prevalent mycotoxin in corn in this part of the United States (Vincelli and Parker, 2002).

All moldy corn should be sampled and tested for fumonisin before shelling and/or feeding to livestock. Contact your county extension office for more information about where testing is possible. Corn samples that will not be tested for 12 to 24 hours should be dried to 16% moisture. Corn kernels at higher moisture levels will cause the fumonisin to increase in the sample, which will result in a falsely high report. The laboratories in Table 1 will conduct fumonisin tests. Call the laboratory prior to shipping the sample for specific guidelines on sampling.

**Table 1.** Laboratories that conduct mycotoxin testing in corn kernels.

#### **A & L Laboratories**

411 North Third St.  
Memphis, TN 38105  
(901) 527-2780  
(800) 264-4522

#### **UK Grain Quality Testing Lab**

Attn: Michael D. Montross  
Biosystems & Agricultural Engineering  
128 Barnhart Bldg.  
University of Kentucky  
Lexington, KY 40546-0276  
Voice: (859) 257-3000 x106  
Fax: (859) 257-5671  
Email: montross@baeuky.edu  
(KY farmers only)

#### **Breathitt Veterinary Center**

Murray State University  
P.O. Box 2000  
715 North Drive  
Hopkinsville, KY 42241-2000  
(270) 886-3959  
Fax: (270) 886-4295

#### **Iowa Testing Laboratories, Inc**

Highway #17 North,  
P.O. Box 188  
Eagle Grove, IA 50533-0188  
(515) 448-4741  
Fax: (515) 448-3402

(Samples must be submitted by a veterinarian only from KY)

Use the fumonisin levels reported from the laboratory and the information in Table 2 to determine if the corn can be fed to livestock. Corn that cannot be fed to livestock will likely not be accepted by grain elevators. Scouting the field and sampling the grain prior to harvest will help the producer determine if the field should be harvested.

**Table 2.** Maximum levels of fumonisins in corn and corn by-products recommended by the U.S. Food and Drug Administration (November 9, 2001): Adapted from Vincelli and Parker, 2002.

<b>Animal Feeds</b>	<b>Total Fumonisin (FB1+FB2+FB3)</b>
Equids (equine) and rabbits	5 ppm (no more than 20% of diet)**
Swine and catfish	20 ppm (no more than 50% of diet)**
Breeding ruminants (including lactating dairy cows) and breeding poultry (including hens laying eggs for human consumption)	30 ppm (no more than 50% of diet)**
Ruminants greater than or equal to 3 months old being raised for slaughter	60 ppm (no more than 50% of diet)**
Poultry being raised for slaughter	100 ppm (no more than 50% of diet)**
All other species or classes of livestock and pet animals	10 ppm (no more than 50% of diet)**

\*\*Dry weight basis.

**Sprout in the ear**

Some elevators will dock sprouting in the ear. Sprouting kernels in the ear are not harmful to livestock for feeding. While the sprouting, itself, is not a danger to livestock, sprouting in the ear is often associated with moldy corn kernels.

**Harvest options**

*Silage*

Once the damaged corn plants have been scouted for moldy ears, mycotoxins (if moldy), sprouting ears and weakened stalks and the crop is deemed worthy of harvest, then harvest can begin. Optimum plant moisture is 30 to 35% dry matter (65 to 70% moisture) for ensiling, depending on storage structure. Corn plants that have less moisture will not ensile as well and can result in a lower quality feed.

Plants covered with mud can increase the iron content of the ensiled silage. Once the crop has fermented for 3 to 4 weeks, the ensiled feed should be analyzed for its nutrient content. This analysis should be done using wet chemistry methods so that the iron and other trace mineral content of the silage can be determined. Higher concentrations of iron in the silage can increase the cattle’s requirements for copper and other trace minerals which are important in their health. Farmers should work with their nutritionists to make sure the proper mineral balance is provided through the mineral and/or grain mixture.

### *Grain*

Once the damaged corn plants have been scouted for moldy ears, mycotoxins (if moldy), sprouting ears and weakened stalks and the crop is deemed worthy of harvest, then harvest can begin. The stalk strength will be low and the corn should be harvested as soon as possible once the grain moisture is at or below 25%. Harvesting the corn at 25% and immediately drying the grain to a moisture at or below 16% will reduce the spread of fumonisin in the sample.

High moisture corn (corn grown specifically to be harvested at high moisture and fermented for cattle feed) should be analyzed for mycotoxins before storage or feeding. Flooded high moisture corn should be stored in separate, temporary structures such as bags to avoid possible contamination of permanent storage structures.

### *Grazing*

Corn that is lodged, but has been determined safe for animal consumption can be grazed by cattle. Strip grazing will improve the harvest efficiency of the cattle, but will require more fencing and slightly more labor. Cattle should be monitored closely when first put into a field of corn to graze. Be sure to have ample water supply and mineral supplements.

### *Too Damaged for Harvest*

If the fumonisin levels in the corn are too high for livestock consumption and/or the forage quality is too poor for ensiling, then reporting a crop loss to your crop insurance agent may be your only option remaining. Once an agreement has been reached with the insurance agent, the remaining crop should be destroyed with a mower or plowed under to hasten breakdown of plant material and reduce pathogen inoculum levels for corn the following year.

### *Cited Resources:*

Thelen, K. 2001. Managing corn and soybean fields submerged by recent heavy rains. Field Crop Advisory Team Alert. Vol. 16 no. 6. [http://www.ipm.msu.edu/CAT01\\_field/FC05-17-01.htm](http://www.ipm.msu.edu/CAT01_field/FC05-17-01.htm)

Vincelli, P. and Parker. 2002. Fumonisin, vomitoxin, and other mycotoxins in corn produced by *Fusarium* fungi. ID-121. Univ. of Kentucky Cooperative Extension Service.

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