Mold Damaged Corn Susceptible To Mycotoxins

DR. PAUL VINCELLI AND DR.SAM MCNEILL

PRINCETON, KY.

USDA's mid-October crop report predicted a national record high average yield of 164.2 bushels per acre and a near record production of 13.0 billion bushels, which is second only to the 2007 crop. The mid-South region will certainly contribute significantly to this total, however the maturity of this year's crop is delayed from late planting and cool, wet weather which has led to stalk, ear and kernel rots. As noted in previous news stories this fall, potential problems with field fungi (Diplodia, Gibberella, Fusarium, etc.) have lead to concerns about subsequent storage. While not all fungi produce mycotoxins, mold-damaged kernels are more susceptible to those that do. So it is best to err on the side of caution and check corn lots with field mold for mycotoxins before feeding to livestock.

When harvesting mold-damaged corn, adjust combines to minimize mechanical damage so that sound kernels are protected. Also adjust the fan and separation sieves to maximize cleaning so that lightweight kernels are removed. Harvest, handle and store damaged corn separately when feasible and market early to reduce demands on storage management.

Grain moistures above 18-20 percent favor the growth of field fungi and the longer corn remains in the field the greater the chance of mycotoxin production. Thus where possible, damaged corn should not be allowed to dry in the field to avoid drying costs. Corn with light damage should be dried to 15 percent within 24 hours after harvest and cooled to 40 degrees as soon as weather permits to control mold growth during storage. This will create an environment within the grain mass that is below 65 percent humidity, which is dry enough to control mold growth and development (see values in the equilibrium moisture table). Corn with moderate to heavy damage should be dried to 14 to 13 percent, respectively, cooled as quickly as possible, inspected safely every 2 weeks and moved before March.

Table 1. Equilibrium moisture contents for shelled yellow corn at different temperature and relative humidity conditions. (Example: Corn that is 40 degrees and 15.0 percent moisture will create a relative humidity of 63 percent within the grain mass, which is safe for storage.)

Temperature 'F	Relative Humidity, %				
	45	55	65	75	85
	Corn Moisture, %				
40	12.2	13.7	15.3	17.2	19.6
50	11.6	13.1	14.7	16.5	18.9
60	11.1	12.5	14.1	15.9	18.3
70	10.6	12.0	13.6	15.4	17.7

If mycotoxin problems are suspected, check with crop insurance providers to see if adjustments may be needed and how to account for those areas in the field that are impacted. Insurance adjustments generally need to be made on standing corn at or before harvest. Δ

The following UK publications provide more specific information on vomitoxin, aflatoxin and grain testing labs in the region:

http://www.ca.uky.edu/agc/pubs/id/id121/id121.pdf

http://www.ca.uky.edu/agc/pubs/id/id59/id59.pdf

http://www.ca.uky.edu/agcollege/plantpathology/ext_files/PPFShtml/PPFS-MISC-1.pdf Δ

DR. PAUL VINCELLI: Extension Plant Pathologist, University of Kentucky

DR. SAM MCNEILL: Extension Agricultural Engineer, University of Kentucky