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Aflatoxins in corn this year?

Drought stress during pollination and grain development can increase aflatoxin levels in corn grain. Some areas of Northeast Missouri experienced significant drought stress during the 2017 growing season. The following information from University of Missouri Extension guide G4155 "Aflatoxins in Corn" may be helpful to corn growers during the 2017 corn harvest.

Aflatoxin is a term generally used to refer to a group of extremely toxic chemicals produced by two molds, Aspergillus flavus and A. parasiticus. The toxins can be produced when these molds, or fungi, attack and grow on certain plants and plant products. In the United States, aflatoxin production occurs when A. flavus and A.parasiticus attack peanuts, cottonseed, white and yellow corn, certain nuts and wheat. Most of the aflatoxin problems on corn in the United States are caused by A. flavus, and the most potent toxin produced by this mold is called aflatoxin B1. Drought, extreme heat, and corn ear injury from insect feeding stress the corn and create an environment favorable to these molds and to aflatoxin production.

Problems with aflatoxin-contaminated corn have been most severe and occurred most often in the southern and mid-south regions of the United States. In Missouri, severe problems with aflatoxin-contaminated corn developed in 1971, 1975, 1980, 1983, 1988, 1993, and 1998 and were most severe in 1993 and 1998. The loss in income for Missouri corn farmers due to aflatoxin contamination was estimated at $10 million in 1993 and $20 million in 1998 [1].

The fungi A. flavus and A. parasiticus are widely distributed in nature, although A. flavus is more common in Missouri. A. flavus has been reported to occur on many types of organic material, including forages, cereal grains, food and feed products and decaying vegetation in cultivated soils. A. flavus can also produce specialized survival structures that enable the fungus to survive in the soil for extended periods.

Temperatures ranging from 80 to 100 degrees F and a relative humidity of 85 percent are optimum for A. flavus growth and aflatoxin production. Periods of drought and heat stress during the growing season, especially during pollination and as kernels mature, favor A. flavus infection. Corn damaged by insects or weather conditions such as hail, early frost that cracks the kernels, and windstorms may also be predisposed to infection by A. flavus.

On ears of corn in the field, A. flavus is evident as a greenish yellow to yellowish brown, feltlike or powdery mold growth on or between the corn kernels. Mold growth is more likely to develop adjacent to or in insect-damaged kernels on ears. Visible A. flavus symptoms in the field can be considered an increased risk for high aflatoxin levels in grain, however, predicting harvested grain aflatoxin levels based on field observations is very difficult.

Typically, aflatoxins are not distributed uniformly through a field of corn or mass of grain. Improper sampling of the field or grain mass can result in misleading (either high or low) mycotoxin levels when samples are analyzed for aflatoxin concentration. It is extremely important to collect samples that are representative of the entire grain mass. A good composite sample consists of subsamples taken from every part of a load, bin or unit of corn.

Samples for aflatoxin testing can be submitted to the Veterinary Medical Diagnostic Laboratory, College of Veterinary Medicine, P.O. Box 6023, Columbia, MO 65205 (phone: 573-882-6811). The sample should consist of a half-pound of grain that is representative of the entire load or volume of grain. There is a current $53.00 fee for aflatoxin analysis.

University of Missouri Extension guide G4155 titled "Aflatoxins in Corn" provides a list of management practices to minimize aflatoxin problems in corn. Find this guide online by visiting extension.missouri.edu and searching for G4155, or contact your county MU Extension office.

[1] Information obtained from MU Guide - G4155 "Aflatoxins in Corn"

Source: *Max Glover, agronomy specialist*

Renting Corn Stalks

A low cost feed resource available to a cow/calf producer is grazing crop residues. Livestock specialists have received questions about cash renting stock fields, sustainable grazing periods and the nutritional profile of crop residues.

When determining the appropriate stocking rate and grazing time, it is important to consider the amount of residue that will be trampled and wasted in the grazing process. Research indicates cattle grazing a whole field will utilize only 20% of the residue. The nutritional quality of grazed corn residue is quite high early in the grazing period: approximately 70% total digestible nutrients (TDN) and 8% crude protein (CP), then will gradually decrease over time to approximately 40% TDN and 5% CP. This reduction is a result of cattle selecting the highest quality feed first then weathering and leaching of nutrients from the residue over time. Cattle will first consume any grain that remains then shift their preference to leaves and husks, finally moving to cobs and stalks. However, if harvesting conditions become less than ideal producers should give extra attention to the shape of the field and if equipment has buried much of the nutritional residue. Moreover, fields harvested late have delayed grazing days, which will be more susceptible to weathering and leaching of nutrients.

As a rule of thumb, grazing densities under ideal conditions should be figured one cow per acre per month of residue. To determine when supplementation is necessary, producers should observe the manure from the cows. As corn in the manure begins to disappear, it is time to begin protein supplementation. Many of the by-product feeds readily available are a great choice given the high protein low starch content which aid in the digestion of much of the more indigestible material being consumed as the grazing period matures.

When renting stock fields, several factors need consideration to arrive at a "fair" rental value. First and foremost is the availability of water and fencing. Costs can rise significantly when fields are absent of both of these inputs. Some phosphorus and potassium will be removed from the field when stalks are grazed, but part of it is returned in the form of manure. Finally, corn stalk residue is correlated to corn yield, which can account for the variance in price, so asking the owner what the field yielded is a definite. Considering all the above factors cash rental rates for stock fields have been documented between 5 and 15 dollars per acre, however typically the price falls between 5 and 9 dollars per acre.

2017 Missouri Livestock Symposium Announces Programs and Events

The 2017 Missouri Livestock Symposium features something for everyone. This year's Symposium will be held December 1 & 2 at the William Mathew Middle School, former Kirksville Middle School, 1515 S. Cottage Grove in Kirksville, MO. There is no cost to attend and no pre-registration is required. Symposium hours will be from 4 to 10 p.m. on Friday, December 1 and from 8 a.m. until 5 p.m. on Saturday, December 2.

The Missouri Livestock Symposium takes pride in providing producers with top-notch science based information on current topics and concerns providing information leading to better decisions on their operations. Tony Clayton, Clayton Agri-Marketing, Inc. will deliver the keynote address on Friday night titled, "In Exporting, I Have Seen the Enemy and He is Us."

The Beef Cattle Section will concentrate on getting the

most value out of your cattle in all types of marketing situations. The Missouri Livestock Symposium committee has contracted several nationally recognized speakers to tackle the tough issues. Speakers such as Wally Olson, Olson Ranches LLC; Tom Brink, Red Angus CEO and founder of Top Dollar Angus; Mark Harmon, marketing manager of Joplin Regional Stockyards; Jodie Pitcock, Assistant Field Chief, USDA national market reporting and Dr. Eric Bailey, MU Extension Beef Cattle Nutiritionist will headline the beef section.

Other program highlights feature nationally and internationally recognized speakers on horses, forages, meat goats, sheep, stockdogs, estate planning, farm management, bees, chickens and much more.

The Symposium will once again feature North Missouri's largest agriculturally-related trade show and a Classic Tractor Contest with the top tractors on display.

A free beef supper will be at 6 p.m. on Friday, December 1 and a free Governor's Style Luncheon on Saturday at noon.

Additional information about the program, speakers and trade show can be found at missourilivestock.com or email Zac Erwin at erwinz@missouri.edu (please put MLS in the subject line). You can also call Zac Erwin at 660-665-9866 or Garry Mathes at 660-341-6625.

Source: *Zac Erwin, livestock specialist*

Complete Fall Garden Tasks Before Hard Freeze

There are several lawn and garden tasks to complete during the month of October. Finish fall seeding of lawns by October 15. MU Extension has several guides on lawn care including a lawn care calendar, which gives tips for each month of the year. Contact your county Extension center to request these guides or download them at http://extension.missouri.edu/.

Fall is a good time to plant trees and shrubs. The warm soil and cool air is ideal for root development. Some species planted in the fall tend to establish themselves better than ones planted in the spring. They have fall and the following spring to become established before summer, the most stressful time of the year.

Plant spring flowering bulbs like tulips and daffodils before the ground freezes. When planting bulbs, plant them in groups. Bulb flowers planted in groups of 5-8, are more eye appealing when in bloom, than those planted individually. Dig a hole 6 to 8 inches in diameter and place the bulbs in each hole. Bulbs can be planted at different levels in the same hole to extend the time that they bloom. In a hole 8" deep, 3 or 4 bulbs can be planted and covered with soil and 3 or 4 added at a 6" depth. The bulbs planted at 8" deep will start flowering when the ones at 6" are almost finished. Dig tender bulb flowers like cannas and dahalias and store overwinter in a cool, dry location.

Floating row cover can be used to extend the vegetable harvest into November and even December. Row cover can add a few extra degrees of protection against a hard frost for cool-season vegetables like leafy greens, broccoli, carrots and others. Floating row cover is a translucent, spun polyester material that traps the soil's latent heat underneath it when it is spread over plants. Since sunlight can pass through, it can be left in place for several days during a cold snap. This product is relatively inexpensive, can be found at garden centers and can be reused for several years.

Dig sweet potatoes before a killing frost. A hard frost or freeze can damage this warm-season crop. Pumpkins and gourds are readily available in October. Gourds are ready for harvest when the stems dry and turn brown. It is best to harvest gourds before frost. Mature gourds, which have a hardened shell, will survive a light frost, but less developed gourds will be frost-damaged. Harvest pumpkins when they have developed a deep, uniform, orange color and the rind is hard. Pumpkins can remain in the garden through a light, vine-killing frost. All mature pumpkins should be harvested before temperatures drop into the mid to low 20's. Green, immature pumpkins will not turn orange after a killing frost.

The most popular use of pumpkins is for decoration as jack-o-lanterns. Besides being used as jack-o'-lanterns at Halloween, pumpkins are used to make pumpkin butter, pies, custard, bread, cookies and soup. When selecting a pumpkin for cooking, the best selection is a pie pumpkin due to its' meatier texture. These are smaller than the large jack-o-lantern pumpkins and the flesh is sweeter and less watery. However, jack-o-lanterns can be substituted with good results.

Source: *Jennifer Schutter, horticulture specialist*

New Farm Labor Guide Available

A common challenge among farmers is the need for additional farm labor. The issues begin with finding quality potential employees. The next steps include the following: hiring, training, day to day operations, and retaining the employee. It is also important to know the proper way to terminate employees if the need arises and the rules for hiring youth labor.

These types of human resource skills are not traditional skills associated with agriculture in Missouri. Historically, most farm labor has been family members; therefore, these skills are less common. As agriculture has evolved, many farms now need additional labor.

MU Extension state agricultural economists have published a resource to help with farm labor. The Missouri Farm Labor Guide is filled with 39 pages of topics related to employees. The guide is free online - http://agebb.missouri.edu/commag/farmlabor/

Source: *Mary Sobba, agriculture business specialist*

Missouri Farm Labor Guide

2017 Edition: Missouri Farm Labor Guide

Update to August Issue:
The source of the graphic on the last page titled *The Soil Food Web* is USDA NRCS