

Be Aware Of Molds In Stored Corn

URBANA, ILL.

A lot of corn went into on-farm storage during the last two years, due in part to poor prices in the marketplace, and with that additional storage comes an increased likelihood of mold problems in the grain bin.

For the most part, the probability of encountering grain molds becomes more likely as moisture levels reach the upper teens or low twenties. However, a few molds, especially some “more” harmful ones, can attack kernels in the mid-teens if relative humidity is high. Of the several dozen fungi that attack stored grain, only two can result in contaminants lethal to most animals. All molds have the potential to reduce quality and thus grain value, and all molds, even those that cannot produce toxic contaminants, have the potential to severely affect certain species of livestock such as horses as well as pregnant or lactating animals.

During periods of unusually warm fall temperatures, such as those encountered in 2012, moisture may begin to migrate in a poorly aerated bin starting a “mold” domino effect. All grain molds have a certain “window” of moisture, relative humidity, and temperature in which they are designed to best perform. As moisture begins to migrate, one mold begins to grow releasing moisture and heat. As it grows, this increase of moisture and heat encourages another species of grain mold to grow and the process continues until several different grain molding fungi have colonized the affected region. This domino effect is often further encouraged if there is an abundance of plant stress or kernel damage in the field.

The two fungi that generate the most contaminant concerns in stored grain, *Aspergillus* and *Penicillium*, invade grain at relative humidities ranging from 70 to 90 percent. They, therefore, tend to be more likely in the bin than in the field. However, as has been mentioned, conditions in the field may predispose grain to storage problems with these diseases. *Penicillium* infections result in a condition termed “blue eye” in which the embryo of an individual kernel

is discolored by a powdery blue or green-blue fungal growth. Kernels infected by blue eye often appear bleached of their normal waxy yellow color. *Aspergillus* results in a tan, sooty-black, green or yellow green mold that grows between stored kernels. In both cases, the major concern is the production of mycotoxins by the molds. Mycotoxins are carcinogenic chemicals that can prove very toxic to animals. The most prominent of these chemicals are the aflatoxins, a group of closely related materials produced by the fungus *Aspergillus flavus*. Occasionally, aflatoxins develop in the field, but field conditions that favor that development seldom occur in Illinois.

What can be done to avoid problems with grain molding and mycotoxins in storage? First, grain should be probed every few weeks especially in poorly aerated bins for hot pockets. If a hot spot is found in the mass, grain molds have set in, the moldy grain needs to be removed, and the remaining mass needs to be agitated. Secondly, bins should always be cleaned thoroughly previous to grain storage. Cleaning a grain bin is never a “fun” job but by removing old grain producers may just remove contaminants that could encourage future molding problems. Third, any cracks or open seams in the bin should be repaired. This decreases the chances of moisture migration into the bin and reduces the likelihood of a subsequent domino effect. Fourth, grain should, as producers know, be stored at 13 percent moisture. That dry down needs to be accomplished within two days of harvest, and while a few fungi can attack grain at these lower moistures, the possibility of molding problems is greatly decreased as the grain is cooled down and temperature is maintained. Fifth, since *Aspergillus*, *Penicillium*, and other grain molds often enter via normal growth cracks in the pericarp of the kernel, further damage to kernel during harvest should be avoided at all costs. Fields under a lot of stress, such as those consisting of downed corn, are often more prone to kernel damage during combining. Δ