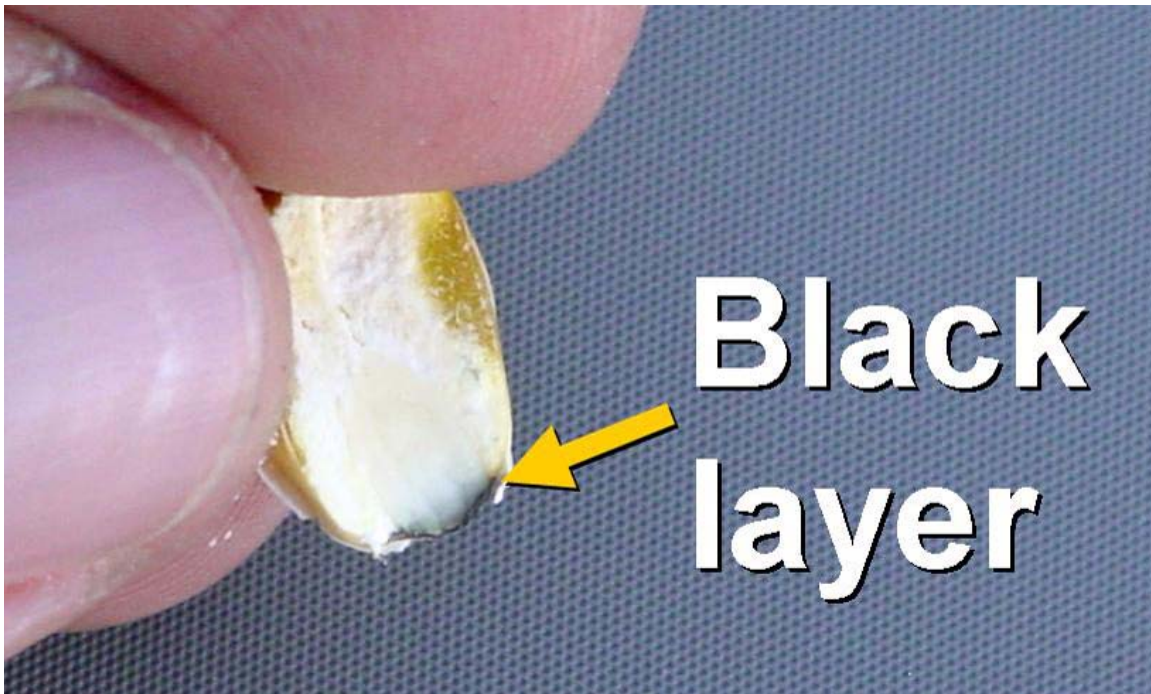


**MSU Grain Crops Update
September 11, 2008
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Corn Harvest and Aflatoxin Tips

Why is the corn not drying down? – Corn normally dries about 0.6% per day in Mississippi after it reaches physiological maturity or black layer (when grain moisture is around 30%) down to 15% moisture. The “black layer” is an abscission layer that effectively cuts off moisture transfer between the plant and the grain. Thus, corn grain drying rate is primarily dependent upon environmental conditions. Of course, frequent rainfall, cloudy days, high humidity and low temperatures have dominated our weather since early August. These conditions have considerably slowed or totally suspended field drydown of corn grain, compared to normal August and early September weather.

Figure 1. A cross-section of a physiological mature corn kernel showing the “black-layer.”



Aflatoxin tips – Aflatoxin is a wildcard that can further complicate harvest timing and grain management. If aflatoxin is present during harvest, there are several things you can do to reduce the threat of a problem.

Aflatoxin is a naturally occurring chemical by-product from *Aspergillus* fungi, which commonly infect corn. However, fungal presence does not necessarily mean aflatoxin will develop. Historically, aflatoxin contamination is most likely to occur during seasons with extreme drought stress in dryland fields. Therefore, if you suspect any problems, harvest visibly drought-stressed, stunted or damaged areas and field edges separately from good areas or irrigated corn.

You should also be keenly aware that aflatoxin can develop either in the field and/or storage. Many problems encountered this season are likely related to rainy weather slowing grain drying, encouraging harvest of high moisture corn. Problems can quickly develop because high moisture corn (18-20%) harvested and stored during warm weather (80-90 deg F) are optimum conditions for *Aspergillus flavus* growth, which can rapidly escalate aflatoxin contamination. If you are hauling high moisture corn directly to an elevator, **deliver it absolutely as quickly as possible** for the reasons noted above. Do not store grain in trucks, combines, bins, or any non-aerated site for more than 4 to 6 hours.

These same precautions should be followed if you intend to dry it on farm. Corn should be dried to less than 15% moisture with 24 hours after harvest. High capacity continuous flow driers are generally capable of immediately drying corn to 15 percent moisture or less, but the corn should also be cooled thereafter as well. Fungal growth and subsequent aflatoxin development is dormant when grain moisture drops to about 12 percent, especially when grain temperatures decline to around 55°F, so this should be your goal for long-term storage (through the fall-winter).

Figure 2. Storing and drying high moisture corn presents considerable challenges when the threat for aflatoxin is likely.



Drying grain using in-bin systems are considerably more challenging because of the inherent drying limitations of these systems. These systems rely on air flow through a large grain mass to slowly dry grain as it reaches equilibrium with the air. Therefore, in order to dry grain within the necessary constraints previously noted, you must normally minimize grain depth (commonly 3-6 feet deep) to quickly dry high-moisture corn. As grain depth increases, static pressure against the fan increases, decreasing air output and grain drying capability. Supplemental heat and use of stirring devices will assist drying but cannot overcome air flow limitation that extends drying time in deep-layered grain. Producers should also thoroughly sanitize all handling and storage facilities before and during harvest.

We have limited experience with storing corn in poly bags, particularly related to aflatoxin contamination, so producers should utilize considerable caution and sound grain storage principles with these systems.

Fungal infection is more likely in underdeveloped, shriveled, cracked kernels and foreign material. Also, the percentage of kernels generally contaminated by aflatoxin is very small. Thus, grain quality may be significantly improved by removing these potential sources of contamination from your grain. You should carefully adjust, monitor and operate your combine so that it not only threshes, but also effectively cleans grain while minimizing kernel damage. Cleaning small grain particles and foreign material from the grain is very dependent upon proper sieve and fan settings. A post-harvest mechanical cleaner or gravity separator may also help clean contamination sources from your grain. Combine efficiency is best when ground speed is sufficient to keep the machine full, without overloading. Excessive cylinder or rotor speed is the leading cause of kernel damage during combine harvest. Kernel damage during harvest and handling should be avoided because fungi infect broken kernels more readily than intact ones.

Figure 3. You should carefully adjust and operate your combine to efficiently clean the grain, while minimizing kernel damage. If you suspect any aflatoxin, harvest visibly stressed areas separately from better areas or irrigated corn.



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