There are many pathogens that cause ear rots. Identify which ones are associated with mycotoxin contamination!

With corn harvest approaching, the combinations of different weather patterns impacting corn production raise concerns about ear rots, sprouting, and the risk of mycotoxin contamination. Mycotoxins are toxic compounds produced by fungal pathogens of maize (and other grain crops) that cause ear rots and decrease grain quality and silage. Contamination with mycotoxins occurs in the field when environmental conditions are favorable for disease development. At harvest, grain drying is critical to stop fungal growth and further mycotoxin contamination; however, since mycotoxins are highly stable, drying will not reduce the already existing mycotoxin levels in grain.

It is important to note that not all pathogens that cause ear rots produce mycotoxins. Before managing grain affected by ear rots and mycotoxins, you should correctly identify the type of ear rot(s) impacting your crop. There are many fungal species associated with ear rots. However, there are distinctive characteristics and scouting tips that you can use to identify the causal agent and to know if there is a risk for mycotoxin contamination.

The most common ear rots in Pennsylvania are:

**Diplodia ear rot**: Caused by *Stenocarpella maydis* (*Diplodia maydis*) and *Stenocarpella macrospora*. Signs of the disease include a gray to brown mold mat that starts to develop at the base, middle, or tip of the ear and black specks (pycnidia) on the husks, shanks, and kernels (Figure 1). The causal agent can produce toxins called diplodiotoxins and chaetoglobosins that have been reported to cause intoxication in ruminants (diploidiosis) in South Africa, Australia, Brazil, and Argentina. However, there have been no reports of diplodiosis in the United States.

**Gibberella ear rot**: Caused by *Fusarium graminearum* and favored by cool and humid weather conditions. Symptoms include a reddish discoloration that begins at the tip of the ear, where a red to bright pink mold develops toward the base of the ear (Figure 2). The fungus may contaminate corn with the mycotoxin *deoxynivalenol* (also known as DON or Vomitoxin) and Zearalenone, which can cause feed refusal and reproductive problems in farm animals, respectively. Many online resources have valuable tools for identifying **Gibberella** and sampling corn for DON.
There are several other ear molds that we often see in Pennsylvania when conditions are favorable, including:

**Trichoderma ear rot**: Caused by *Trichoderma viride* and favored by excessive rain. Signs include a dark green mold growth that covers most of the ear (on and between the kernels), which can also be observed on the husks (Figure 3). No mycotoxin issues have been associated with Trichoderma ear rot.

**Fusarium ear rot**: Many different *Fusarium* species cause this ear rot. Signs include a brown discoloration or a white mold on scattered kernels (Figure 4). Affected kernels may also show a starburst pattern (white streaks radiating from the point where the silk was attached). Fusarium ear rot may lead to contamination with mycotoxins called *fumonisins* which are highly toxic for horses and swine.

**Penicillium ear rot**: Several *Penicillium* species can cause this ear rot. Signs include a green-blue powdery mold between kernels near the tip of the ear (Figure 5). Different *Penicillium* species affecting different maize can produce mycotoxins. However, these are considered to be a more significant problem in silage.
Aspergillus ear rot: This ear rot is caused by the fungal species *Aspergillus flavus* and *Aspergillus parasiticus* and it is characterized by a dusty olive-green mold on kernels. The disease is favored by years with above-average temperatures and below-average rainfall. In addition to kernel damage, the risk associated with Aspergillus ear rot is the contamination with aflatoxins.

Once you have identified the type(s) of ear rots in your field, you should assess the severity and the extent of the damage.

Scout before harvest and pay particular attention to areas in your field exposed to the most severe weather conditions. If the risk of mycotoxins is high, you should contact your crop insurance agent and take a proper sample for mycotoxin testing.

If your corn tests positive for mycotoxins, that does not mean you have to dispose of it immediately. Depending on the levels of mycotoxins, there are maximum limits and recommendations that can guide you on what to do with the contaminated grain, in addition to local recommendations.

There are also recommendations for the next growing season that can help you reduce the risk of mycotoxins, including hybrid selection, insect protection, and residue management.

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