



SOUTHWEST NEW YORK FIELD CROP CHRONICLE

Compiled by Josh Putman - Field Crops Specialist, SWNY Dairy, Livestock, Field Crops Program

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Ear Rots and Mycotoxins of Corn Grain in New York

Mycotoxin is a general term for **a poison produced by a fungus** and can be toxic when inhaled, absorbed through the skin, or consumed at very low concentration levels. Corn and small grain cereals are especially prone to mycotoxin accumulation in their seed tissue. In the past, it was believed that the fungus affected grain only during the postharvest stage, particularly when grain was stored under suboptimal conditions (hot and humid/moist). Although these factors can promote fungal growth in storage, this occurs during the growing season as well. In the field, mycotoxin outbreaks are seasonal, and will occur under favorable weather conditions for disease development. Bird and insect damage can also increase the risk for mycotoxin contamination. These pests will damage the kernels and allow mold to establish on an ear of corn.

The three common types of ear rots that have been seen in SWNY are Diplodia ear rot, Fusarium ear rot, and Gibberella ear rot. Diplodia ear rot usually begins at the base of the ear and can overtake the entire ear creating a lightweight mummified ear. Although this disease does not produce mycotoxins, it can significantly reduce grain quality. Fusarium ear rot typically takes advantage of wounds created by insects, birds, or hail. It can be identified on the ear by scattered tufts of mold that may be white to light pink in color and accompanied by starburst patterns on the kernels. Gibberella ear rot is commonly recognized by the red or pink discoloration of kernels and mold around the kernels. This infection typically begins at the tip of the ear. If you are noticing a high number of infected kernels in your bin, here are a few action items to consider: adjust your combine so that it is removing fines and broken kernels, dilute contaminated corn with clean corn to reduce levels for livestock consumption, dry grain to less than 15% moisture within 48 hours of harvest and, when possible, avoid storing grain from fields with high incidence of ear rot disease. This could lead to the development of hot spots in your grain bin.

Table 1. Main Mycotoxins Occurring in Corn Produced in the Northeastern U.S.

(Adapted from Gary Bergstrom, Plant Pathology and Plant-Microbe Biology, Cornell University)

Mycotoxin	Predominant toxigenic mold	Lowest level of concern	Common effects on animals
Deoxynivalenol (vomitoxin) or DON	<i>Fusarium graminearum</i> (<i>Gibberella zeae</i>)	1-3 ppm * <i>USDA recommends less than 1 ppm deoxynivalenol in finished food products and less than 2 ppm in unmilled grain destined for human consumption.</i>	Feed refusal in mono-gastric animals; severity increases with level. Swine and dogs are the most sensitive species; adult cattle and poultry tolerate > 10 ppm.
Zearalenone	<i>Fusarium graminearum</i> (<i>Gibberella zeae</i>)	1-5 ppm	Hyperestrogenism and infertility. Swine (gilts) are most sensitive; adult cattle tolerate 50 ppm.
Fumonisin	<i>Fusarium verticilloides</i> ; <i>F. proliferatum</i>	5-10 ppm >100 ppm	Brain deterioration, death (horses); liver damage (horses, swine, cattle, poultry, others). Lung damage in swine

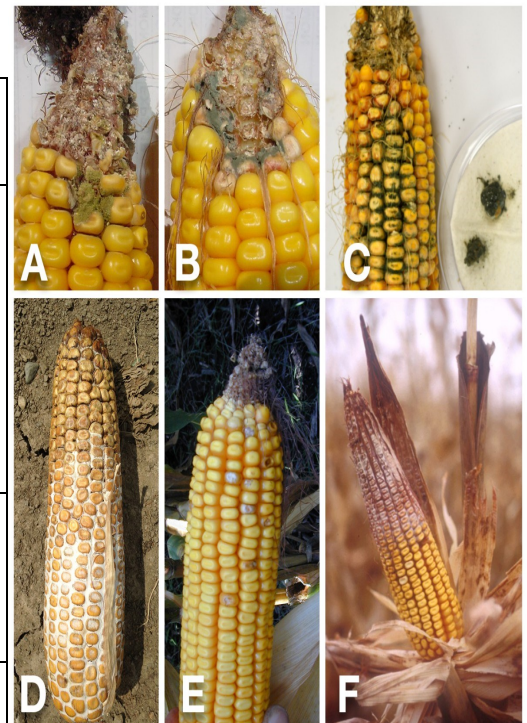


Figure 1. (A), Aspergillus ear rot (B) Penicillium ear rot, (C) Trichoderma ear rot, (D) Diplodia ear rot, (E) Fusarium ear and kernel rot, and (F) Gibberella ear rot



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Stalk Rots of Corn in Southwest New York

In addition to mycotoxin contamination, mycotoxigenic fungi cause stalk rots in corn. Stalk rot diseases are common in corn. They can weaken the stalks, leading to stalk lodging and harvest difficulties for producers. It is important to note that many stalk rot disease symptoms have similarities and that identification can be difficult to confirm in the field. Some corn fields in SWNY are beginning to lodge due to stalk rots. Photos were sent to Dr. Gary Bergstrom, Field Crops Plant Pathologist at Cornell University, and it was confirmed that we are experiencing stalk rot damage; the type of stalk rot was not confirmed. "It is believed that drought stress was a likely contributor this year," says Bergstrom. It is critical to scout fields to determine which ones might need to be harvested first or earlier to avoid losses due to lodging. To help reduce the risk of late-season corn disease next year, here are a few practices to consider: plant locally adapted corn hybrids that have tolerance to the diseases, avoid corn-after-corn rotations, apply appropriate amounts of fertilizer, and plan ahead.

**Photos by Josh Putman unless noted different*



Early signs of lodged corn in Southwest NY



Breakage of corn stalk near crown of plant



Splitting the stalk reveals discoloration & decay in SWNY



Entire field lodged due to stalk rot
(Source: Dr. Damon Smith, University Wisconsin-Madison)



Healthy corn stalk (left), diseased stalk (right)
(Source: Tamra Jackson-Ziems)



Gibberella Stalk Rot of Corn
(Source: G. Munkvold)

HELPING YOU PUT KNOWLEDGE TO WORK

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