

Gibberella ear rot of corn—Charles Woloshuk and Kiersten Wise

Gibberella ear rot, or Gib ear rot, is caused by the fungus, *Gibberella zeae* (*Fusarium graminearum*). This disease can occur throughout Indiana, but it tends to be more prevalent in the northern half. The pathogen overwinters on corn and wheat debris. Spores produced on the debris lead to infection during the silking period. There is a higher incidence of Gib ear rot when cool, wet weather occurs during the first 21 days after silking. It will be most severe in fields where corn followed corn and where corn followed wheat affected by Fusarium Head Blight (Scab), which is caused by the same pathogen.

This bulletin describes:

1. How to recognize the disease
2. Danger to animals
3. How to minimize losses and handle diseased grain after harvest
4. How to manage the disease

Recognizing the Disease

Gib ear rot can be readily identified in the field on intact ears, but it is much more difficult to identify once the grain has been shelled. The easiest and most accurate visual detection of Gib infection can be made just before a field is harvested. Inspect at least 10 ears in several locations in a field prior to harvesting by peeling back the husks and observing the ears. Look for a pink to reddish mold that begins at the tip of the ear and develops toward the base (Figures 1 and 2). The pinkish mold is typically diagnostic of Gib ear rot. Severely affected ears may be largely rotted with husks and silks adhering tightly to the ear and may have a pink to reddish mold growing between the husks and the ear. Except in highly susceptible hybrids, the disease usually involves only part of the ears.

Danger to Animals

The pathogen that causes Gib ear rot can produce two mycotoxins in the infected kernels, deoxynivalenol and zearalenone. These mycotoxins can impact the health of many monogastric animals, but swine are especially sensitive. If Gib ear rot is present, one should assume that the mycotoxins are also present. A test is needed to determine the level of contamination. Contact your county educator or the Purdue mycotoxin specialist for information about testing options.

Deoxynivalenol, also known as DON and vomitoxin, causes swine and other animals to refuse infected grain and/or regurgitate feed. Zearalenone has estrogenic properties, which lead to infertility, abortion, or other breeding problems. As little as 1 to 5 ppm zearalenone in a feed ration may produce an estrogenic effect in swine.

The Food and Drug Administration has established DON advisory levels for animals as follows:

Animal affected	Maximum DON level allowed
Swine	5 ppm (not to exceed 20 percent of ration with finished feed = 1 ppm)
Ruminating beef and feedlot cattle, over 4 months old	10 ppm (not to exceed 50 percent of diet, with finished feed = 5 ppm)
Poultry	10 ppm (not to exceed 50 percent of diet, with finished feed = 5 ppm)
All other animals	5 ppm (not to exceed 40 percent of diet)

The following tables list specific effects of mycotoxins on swine:

Deoxynivalenol (vomitoxin, DON)			
Swine	Concentration	Duration	Effect
Feeder pigs	5-10 ppm	1-5 days	50% reduction in feed intake, vomiting
Feeder pigs	10-40 ppm	1-5 days	Complete feed refusal, vomiting
Sows	3-5 ppm	Gestation, lactation	Lower fetal weights, or no effect

Zearalenone			
Swine	Concentration	Duration	Effect
Prepubertal gilts	1-5 ppm	3-7 days	Hyperestrogenism, prolapse
Sexually mature open gilts	3-10 ppm	Mid-cycle (day 11-14)	Anestrus, pseudopregnancy
Bred sows	15-30 ppm	1 st trimester	Early embryonic death, small litters
Juvenile boars	10-50 ppm	Indefinite	Reduced libido, small testicles
Mature boars	200 ppm	Indefinite	No effect

Source: Munkvold, G., Osweiler, G., Hartwig, N. 1997 Iowa State University Ext. PM-1698

Minimizing Economic Losses

Fields with significant amounts of Gib ear rot should be harvested as early as possible and handled separately. Mycotoxin concentrations are almost always higher in fines and screenings. Adjust combines to reduce the amount of fines and small, shriveled or broken kernels. Grain should be dried to 15% or lower moisture immediately after harvest. Proper storage at or below 15% moisture will prevent further fungal growth and mycotoxin production.

Managing the Disease

To prevent a re-occurrence of Gib ear rot, tillage following a corn rotation is encouraged. Rotation out of corn (or wheat) will allow infected residue to degrade, reducing the presence of the causal fungus. Corn hybrids vary in their resistance to Gib ear rot. Check with your local seed dealer to find information on the availability of resistant varieties.

Partial list of grain inspectors offering DON analysis in Indiana:

The presence and amount of DON from infected grain can only be verified through chemical analysis. There are a variety of commercial laboratories and quick test kits for mycotoxin analysis. Romer Labs (<http://www.romerlabs.com>) and Neogen (<http://www.neogen.com/>) sell test strips for toxin analysis. For information about DON and other commercial laboratories visit the links at NC1025: Mycotoxins: Biosecurity and Food Safety (<http://www.btny.purdue.edu/NC1025>) Two grain inspectors in the central and north-central regions of Indiana that analyze grain for DON are listed here:

East Indiana Grain Inspection, Inc.
7020 North Walnut Street
Muncie, IN 47303-9796
765-744-6425
FAX 765-289-1206
Dan W. Gross, President and Official Agency Manager
e-mail: dwgross@comcast.net

Titus Grain Inspection, Inc.
1111 East County Road 800 North
West Lafayette, IN 47906-9006
765-463-3713
FAX 765-497-2202
Darwin E. Titus, Official Agency Manager
Nancy Titus, President
e-mail: titusgraininsp@aol.com



Figures 1 and 2:
The pinkish mold
present at the ear
tip is diagnostic of
Gibberella ear rot.

