

Fusarium Head Blight Scab in Wheat vomitoxin

Wheat Head scab, Fusarium head blight, is showing up in Southeast Missouri Wheat fields. Affected wheat heads will appear “bleached” in color. The potential for Fusarium head blight (scab) especially in susceptible wheat varieties was greater this year due to the rainy conditions that coincided with flowering (Feekes 10.51) of wheat in much of the area.

In addition to potential yield loss, the fungus that causes scab can produce mycotoxins known as DON (deoxynivalenol) or vomitoxin. Visibly scabby wheat seed or tombstones will in general be shriveled and lighter than healthy wheat. Seed can also have a white to pink discoloration. In addition, Fusarium infected wheat seed can cause seedling blight problems.

Current management of scab fields includes properly setting combine to blow out lighter seeds and chaff. Recent research conducted at the Ohio State University indicated that adjusting the combine’s fan speed between 1,375 and 1,475 rpms and shutter opening to 90 mm (3.5 inches) resulted in the lowest discounts that would have been received at the elevator due to low test weight, % damaged kernels, and level of the mycotoxin deoxynivalenol (DON; vomitoxin) present in the harvested grain (Salgado et al., 2011).

If you suspect your wheat is infected with vomitoxin, contact your crop insurance agent immediately to go over your options in sampling your wheat.

If keeping wheat for seed, make sure you thoroughly clean and treat the seed with a fungicide seed treatment. The seed treatments will not prevent Fusarium Head Blight (Scab) next year but will help in control seed rots and seedling blights caused by the *Fusarium*.

Below are links to web sites with more information. Also I have included an excellent article from Purdue University on frequently asked questions on Fusarium Head Blight (Scab).

University of Kentucky

Guide on harvesting wheat

Harvesting Drying and Storing Wheat

Prepare Bins for Wheat Storage

Drying the 2014 Wheat Crop

Kentucky - Wheat Management in Kentucky (PDF)

INSECTICIDE RECOMMENDATIONS FOR SMALL GRAINS - 2014 –

Page 4, **Products for Control of Insect Pests in Stored Small Grains**

CONTROLLING INSECTS IN STORED GRAIN

South Dakota State University

Guide on feeding scabby wheat to livestock

University of Missouri

MU Extension publication M171, 2013 Missouri Pest Management Guide: (PDF)

Page 130 is the list of seed treatment fungicides labeled for use on winter wheat. For control of control seed rots and seedling blights caused by the *Fusarium* choose fungicides with the active ingredients Difencconazole, Tebuconazole, Thibendazole, Tritconazole, Prothionazole, Fludioxnil, Ipconazole,

Evaluation Winter Wheat Seed Quality Prior to Planting (PDF)

Purdue University

Dealing With DON in Wheat

Fusarium head blight of wheat (Scab)

Dealing With DON in Wheat – (*Kiersten Wise and Charles Woloshuk*) – Purdue University

Wheat harvest will begin soon in southern Indiana and some fields have high levels of Fusarium head blight (scab). It is important to be aware of the impacts of the mycotoxin deoxynivalenol, also known as DON or vomitoxin. DON is produced by the fungus that causes Fusarium head blight, and it is

especially toxic to swine, but consumption of high levels of the toxin can impact the health of many animals. Reports vary on the disease and DON levels in wheat, but buyers may dock grain when contamination levels reach 2 ppm DON.

If wheat fields have not been harvested yet, check fields to determine if scabby grain is present. If the disease is present, increasing the fan speed on the combine at harvest can blow out the lighter scab-infected kernels, which contain most of the DON. There are many questions about how to handle and market scabby grain with high levels of DON, and we have attempted to answer the most frequently asked questions in this article.

1. What is DON or vomitoxin?

DON is a toxin produced by the fungus that causes scab. The toxin is referred to as deoxynivalenol and vomitoxin. The occurrence of scab does NOT automatically mean that DON is present, but high levels of scabby kernels in the harvested grain should be suspect. Conversely, high levels of DON can occur even when disease levels are low. DON can affect the health of animals that consume contaminated grain. DON also can affect flavors in foods and baking quality.

2. How does DON affect livestock?

DON causes feed refusal and poor weight gain in livestock. Hogs are most sensitive to DON, even at one part per million (1 ppm) contamination of hog feed. Cattle, sheep and poultry are more tolerant of DON. Diluting scabby wheat with normal quality grain may be a logical method of feeding wheat safely to on farm livestock.

3. What are safe levels of DON?

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

- 1 part per million for finished grain products for human consumption.
- 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).

4. How can I determine if grain has DON?

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. Testing facilities in Indiana that analyze grain for DON are listed in the Extension bulletin: Diseases of wheat: Fusarium head blight

<<http://www.extension.purdue.edu/extmedia/BP/BP-33-W.pdf>>.

5. Will drying and/or storage reduce scab or DON levels in grain?

NO. DON is a stable mycotoxin and drying and/or storage will not reduce DON levels in the infected grain. If handled properly, DON levels will NOT increase once grain is harvested and stored. The fungus requires 22 to 25 percent moisture content to grow. At moisture levels below 18 percent, the scab fungus will not continue to grow. Moisture content of scabby grain going into storage should be below 13 percent. There is no evidence of DON from scabby grain continuing to increase, if grain is stored at appropriately low moisture.

6. How should DON-contaminated grain be stored?

When storing scabby grain, try not to mix it with good quality wheat. The light, thin kernels caused by scab tend to accumulate in the center of a storage bin, and hot spots may occur if higher moisture fine material is present in the core as well. Using a cleaner to remove fines from the wheat before binning and a grain spreader to distribute scabby kernels more evenly will minimize spoilage risks. If a cleaner and a spreader are not available, the wheat should be cored as soon after binning as possible.

Fields being double cropped with soybeans could be at higher moistures at harvest than in normal years. If the grain is being dried in-bin with unheated air, the grain moisture at harvest should be below 18 percent. With scabby grain, it may be necessary to increase the rate of air flow to decrease the drying time. This can be achieved by reducing the depth of grain in the drying bin below normal levels. For example, a grain depth reduction by

25% from 12 ft to 9 ft will increase the airflow through wheat from a 10 HP fan by 50%. If the harvest moisture is above 20 percent, it will be necessary to use heated air in either bin or column dryers.