

# Wheat Science News

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## Results of the 2015 Kentucky Wheat Vomitoxin Survey

*Carrie Knott—Department of Plant & Soil Sciences, Princeton*

Deoxynivalenol (DON) is a vomitoxin produced by *Fusarium graminearum*, the causal agent of *Fusarium* head blight (FHB) of wheat. In most years, the visual symptoms of FHB (bleaching of grain heads) will foretell the presence of DON in harvested wheat grain. However, there are years, such as 2014, where DON levels were extraordinarily high without FHB symptoms observed during the growing season.

To better understand seasonal vomitoxin fluctuations an annual survey in Kentucky was initiated in 2015. A total of 40 samples were collected from 14 counties (Figure 1) and sent to the University of Minnesota and analyzed for DON using gas chromatography-mass spectrometry (GC-MS). Of the 40 samples submitted to the survey, 38 had less than 1.0ppm DON concentrations and only one sample exceeded 2.0 ppm (Figure 2). The low DON levels were expected given the low incidence of FHB in 2015.

Twenty-four of the forty samples submitted were tested for DON prior to samples being sent to Minnesota for GC-MS analysis of DON. The DON levels were greater for the GC-MS lab results for 12 of the samples and the DON levels reported by the submitter were greater than the GC-MS results for the other half (Figure 3). Measuring DON is extremely variable due in part to the low detection levels (parts per million) and the inherent variability that exists in every grain sample. Therefore, different DON values for the same grain sample are not unexpected or alarming in most situations.

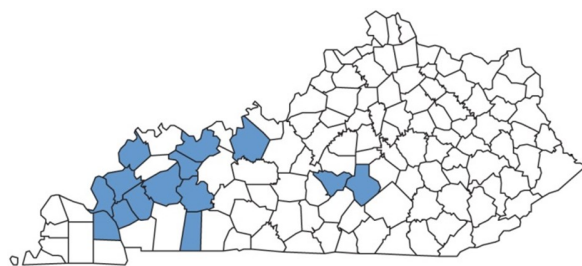
This survey is the first statewide compilation of wheat vomitoxin levels in Kentucky. To develop a better understanding of annual vomitoxin fluctuations additional collections are needed. The Kentucky Wheat Vomitoxin Survey will be completed again in 2016. It is essential to collect samples every year and not just years that FHB is apparent. It is also important to collect from all wheat-producing counties in Kentucky.

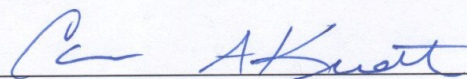
The 2016 Kentucky Wheat Vomitoxin Survey submission form is included. There is no information requested that will allow identification of the source of the sample other than a unique code chosen by the submitter. The submitter will be the only one to know that code, which will be published in an annual report such as this one.

Please submit samples to your local county agent in 2016.

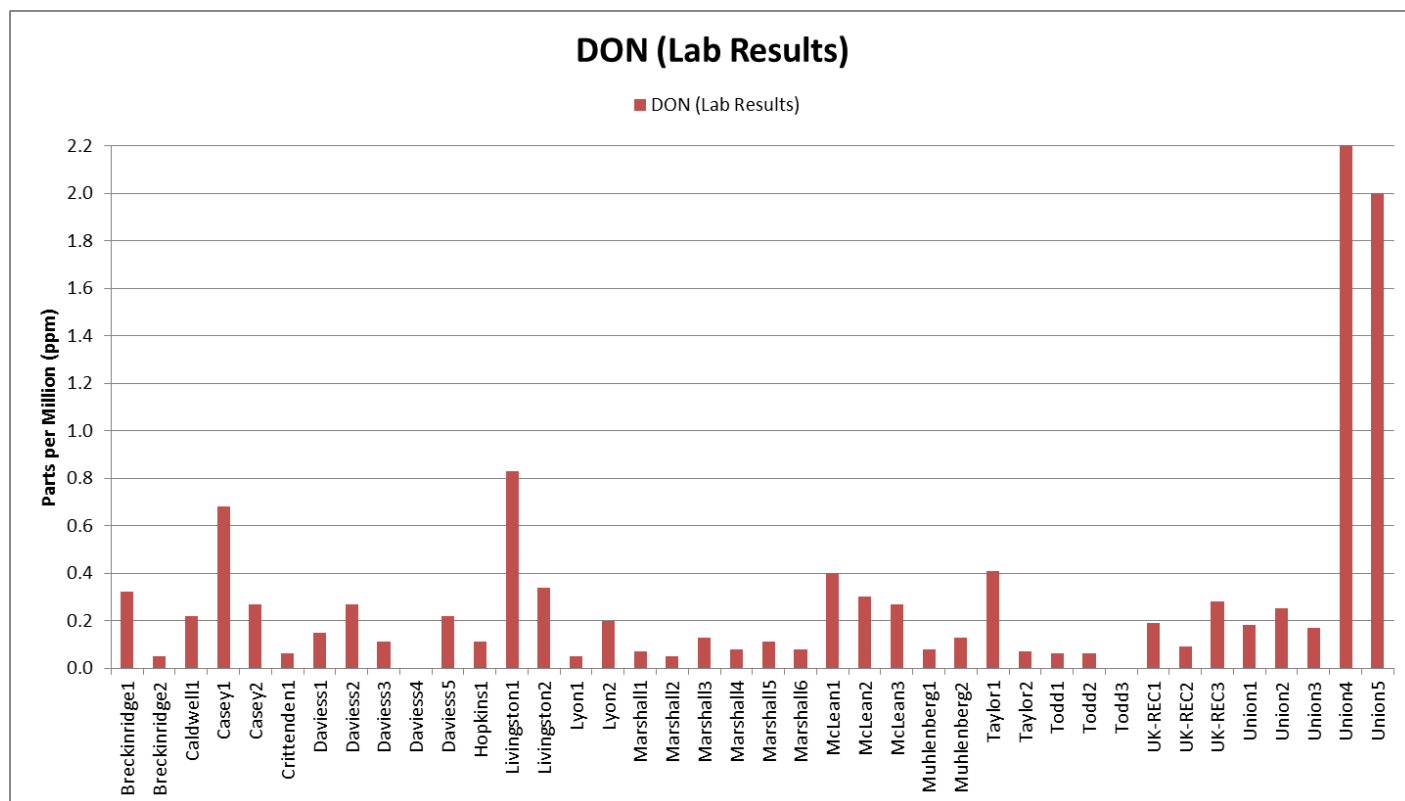
Figure 1:

Counties that participated in the 2015 Kentucky Wheat Vomitoxin Survey: Marshall, Livingston, Crittenden, Lyon, Caldwell, Hopkins, Muhlenberg, Todd, Union, Daviess, McLean, Breckinridge, Taylor, and Casey.

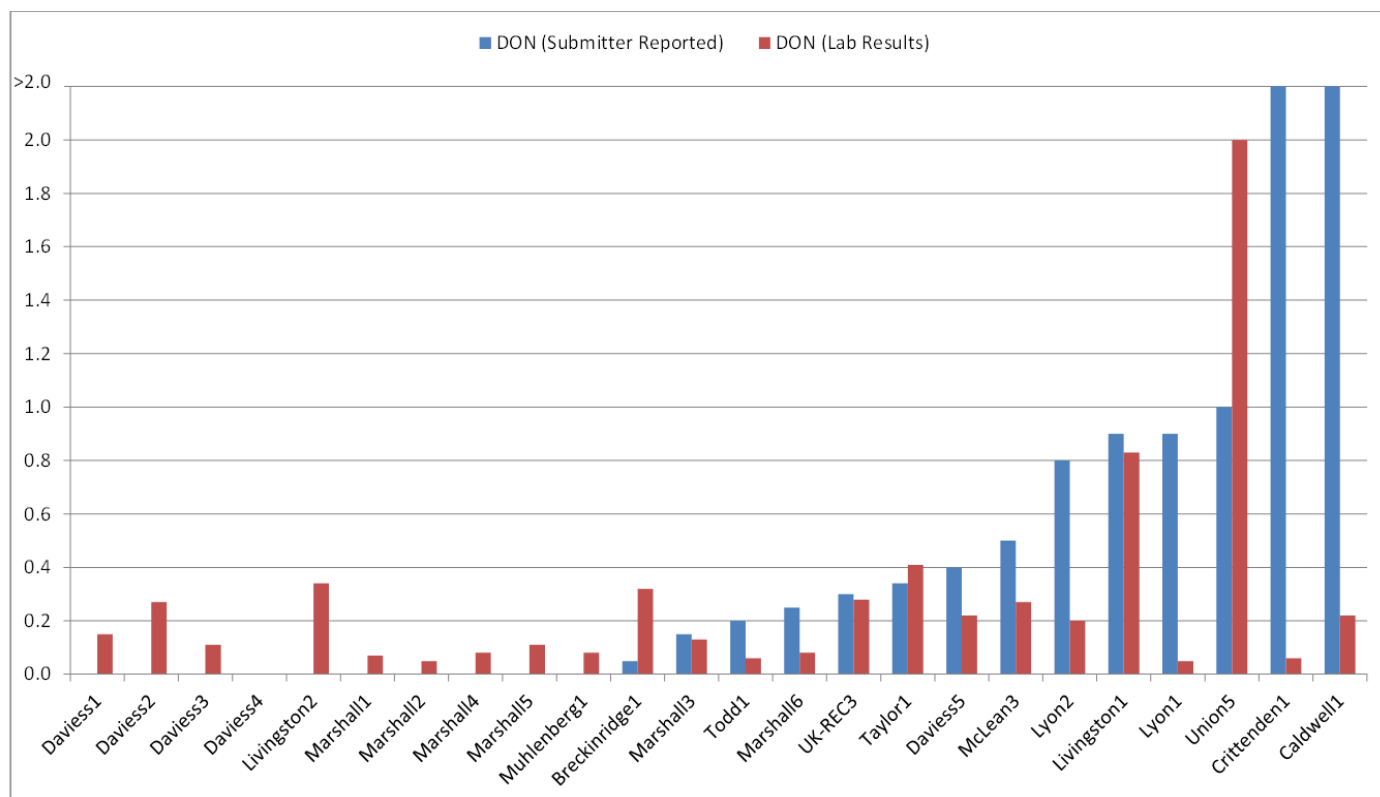


  
Carrie Knott, Extension Grain Crops Specialist

**Figure 2:**  
Deoxynivalenol (DON) levels for the 40 soft red winter wheat samples submitted to the 2015 Kentucky Wheat Vomitoxin Survey



**Figure 3:**  
Deoxynivalenol (DON) levels for soft red winter wheat samples that were reported by the submitter and the results from





## 2016 Kentucky Wheat Vomitoxin Survey

Wheat Sample Information Form



**SAMPLES MUST BE OBTAINED WITHIN 5 DAYS OF DON TESTS**

Submitter Code \_\_\_\_\_ County \_\_\_\_\_

County Agent \_\_\_\_\_ Phone \_\_\_\_\_

To be completed by County Agent

County Sample Number \_\_\_\_\_ Date Agent Received Sample \_\_\_\_\_

### **Agronomic Data**

Variety \_\_\_\_\_ Planting Date \_\_\_\_\_ Harvest Date \_\_\_\_\_

Previous Crop \_\_\_\_\_ Row Width \_\_\_\_\_ Seeding Rate (seeds/area) \_\_\_\_\_

Fall Fertilizer (lb/acre) N \_\_\_\_\_ P<sub>2</sub>O<sub>5</sub> \_\_\_\_\_ K<sub>2</sub>O \_\_\_\_\_ Other \_\_\_\_\_

Winter/Spring Nitrogen (N) Date \_\_\_\_\_ lbs/acre \_\_\_\_\_ Date \_\_\_\_\_ lbs/acre \_\_\_\_\_

Fungicide \_\_\_\_\_ Date Applied \_\_\_\_\_ Growth Stage \_\_\_\_\_

Herbicide \_\_\_\_\_ Date Applied \_\_\_\_\_ Growth Stage \_\_\_\_\_

Insecticide \_\_\_\_\_ Date Applied \_\_\_\_\_ Growth Stage \_\_\_\_\_

### **Post-Harvest Data**

Yield (lb/acre) \_\_\_\_\_ Test Weight (lbs/bu) \_\_\_\_\_ Grain Moisture (%) \_\_\_\_\_

Date Delivered to Elevator/Mill/Other \_\_\_\_\_

DON (vomitoxin) ppm \_\_\_\_\_ Dockage for DON: ☐ No ☐ Yes discount \_\_\_\_\_

**ATTACH COPY OF WEIGHT TICKET HERE**

Send completed forms and grain samples to:

Your local county agent

## **2016 Kentucky Wheat Vomitoxin Survey**

- I. **Objectives:** The objectives of the Kentucky Wheat Vomitoxin Survey are to gain an understanding of annual variations in wheat vomitoxins (DON; deoxynivalenol) and the economic impact of wheat vomitoxins for Kentucky producers.
- II. **Identification of Participants:** Anyone can submit a sample. The submitter must agree to share the requested agronomic and post-harvest information. Each submission will be uniquely identified by the "Submitter Code" that is chosen by the submitter. All information will be coded and remain anonymous when presented or discussed at meetings or any other venue. County level information will be used only to summarize geographical trends of the data collected.
- III. **Sample Collection:** Cooperating producers will request a sub-sample of the grain samples collected by the elevator/mill/or other distribution point that collects samples and tests for DON (vomitoxin). Fill a one quart Freezer Zip-loc type bag HALF FULL and label bag with:
  - Submitter Code
  - County Sample Number
  - Date Tested at Elevator
  - Date Received by County Agent

**KEEP the remaining sample you obtain for your own records.**
- IV. **Sample Storage:** Samples need to be stored indoors that is air-conditioned at room-temperature. Please do not leave in a vehicle or outdoors where fluctuating temperatures occur.
- V. **Sample Submission:** Samples must be submitted to the county agent **within 5 days** of the vomitoxin (DON) test at the elevator/mill/other distribution point. AGENTS: keep samples stored in climate controlled offices and send to Carrie Knott (UK-REC, 1205 Hopkinsville St, Princeton, KY 42445) no later than **August 15, 2016.** If for some reason producers cannot make this deadline please make arrangements with your local county agent.
- VI. **Sample Results:** All county agents will receive a copy of the sample results. Producers will need to remember their Submitter Code; neither the county agent nor Carrie Knott will know the origin of any sample beyond county origin. Results of the laboratory test will be published as soon as possible, but may take several months for processing and analyses. The results will be placed in the Wheat Science Newsletter as soon as they are available: <http://wheatscience.ca.uky.edu>.

**Wheat Outlook and Profitability Potential**  
**Todd Davis—Department of Ag Economics, Princeton**

### 2015-2016 Wheat Market Outlook

The December World Agricultural Supply and Demand Estimates (WASDE) report, released December 9, provided an update for the 2015-16 marketing-year wheat price potential and forecasted ending-stocks.

Table 1 shows the wheat balance sheets for the 2012 through 2015 marketing-years. Wheat planted area was down 2.2 million acres in 2015 from last year but harvested area actually increased by 700 thousand acres as the lingering drought in the Southern Plains states was broken. The U.S. average wheat yield, for all classes of wheat, is projected at 43.6 bushels/acre which is slightly lower than last year's yield. The 2015 U.S. wheat crop is projected to be 2.05 billion bushels which is 26 million bushels more than last year's crop.

When you factor in the larger carry-in from 2014-15 of 753 million bushels plus the 2.05 billion bushel wheat crop, the total supply of wheat in the marketing channel is 2.93 billion bushel up 164 million bushels from 2014.

Table 1 shows that use is not projected to keep pace with this increase in supply. Food demand is not very price responsive and is projected to increase with population growth by 9 million bushel to 967 million. Feed use is projected to increase by 60 million bushels from last year. This estimate will be pressured by the abundance of cheap corn as a feedstuff.

<b>Table 1. U.S. Wheat Supply and Use</b>					
	2012-13	2013-14	2014-15 Estimated	2015-16 Projected	Change from 2014-15
Planted Acres (million)	55.3	56.2	56.8	54.6	-2.2
Harvested Acres (million)	48.8	45.3	46.4	47.1	+0.7
Yield (bushels/acre)	46.2	47.1	43.7	43.6	-0.1
	----- Million Bushels -----				
Beginning Stocks	743	718	590	753	+163.0
Production	2,252	2,135	2,026	2,052	+26.0
Imports	123	169	149	125	-24.0
Total Supply	3,118	3,021	2,766	2,930	+164.0
Food	945	952	958	967	+9.0
Seed	73	77	81	72	-9.0
Feed and Residual	370	226	120	180	+60.0
Exports	1,012	1,176	854	800	-54.0
Total Use	2,400	2,431	2,013	2,019	+6.0
Ending Stocks	718	590	753	911	+158.0
Stocks/Use	29.9%	24.3%	37.4%	45.1%	+7.7%
Days of Stocks	109	89	137	165	+28.2
U.S. Marketing-Year Average Price (\$/bu)	\$7.77	\$6.87	\$5.99	\$5.00	-\$0.99

Source: December 2015 WASDE - USDA:  
 WAOB.

Wheat exports have been under pressure since 2013 due to strong competition from the Black Sea region, Southern Hemisphere countries, Canada and the European Union. The strong U.S. dollar makes foreign wheat more price competitive for foreign buyers. The current projected exports at 800 million bushels, if realized, will be the smallest amount exported since the 1971-72 marketing-year.

Ending-stocks are projected to increase to 911 million bushels which is an increase of 158 million bushels from last year. This is projected to push the stocks-use ratio, the measure of relative excess supply, to over 45%. Stocks at 911 million can be thought of as a 165 day supply of wheat on hand on June 1, 2016 before the 2016 wheat crop is harvested. This volume is weighing on the market with the U.S. marketing-year average price projected at \$5.00 per bushel which is about a dollar lower than last year's price.

## 2016 Profitability Potential and Break-Even Prices

The profitability potential for wheat and double-crop soybeans are shown in the following table. The University of Kentucky budgets are based on wheat yields of 75 bushels/acre. Sensitivity analysis on yields is included with wheat yields at 90 and 60 bushels per acre. The double-crop soybean enterprise budget assumes a yield of 35 bushels/acre. Table 2 includes double-crop yields of 50 and 20 bushels per acre. Prices are for Western Kentucky based on June 2016 cash-forward contract bids as posted on the DTN website on December 8, 2015.

Table 2 distributes the costs in the enterprise budgets into cash and non-cash components. Cash costs are inputs (seed, fertilizer, chemicals, fuel/oil, repairs, crop insurance, other costs). The total cash variable and fixed costs per acre for wheat are budgeted at \$266/acre (line 1). From an accountant's perspective on owned land, wheat should be able to pay for the costs of inputs even at 60 bushel/acre yield and a price of \$4.85/bushel.

Table 2. Budgeted Returns for 2016 Wheat and Double-Crop Soybeans for Varying Yields						
	Wheat			Double-Crop Soybeans		
Yield	90	75	60	50	35	20
Price	<u>\$4.85</u>	<u>\$4.85</u>	<u>\$4.85</u>	<u>\$8.75</u>	<u>\$8.75</u>	<u>\$8.75</u>
Revenue	\$437	\$364	\$291	\$438	\$306	\$175
Total Cash Variable + Fixed Costs	<u>\$266</u>	<u>\$266</u>	<u>\$266</u>	<u>\$202</u>	<u>\$202</u>	<u>\$202</u>
Return over Total Cash Costs	\$171	\$98	\$25	\$236	\$104	-\$27
Land Cost	<u>\$200</u>	<u>\$200</u>	<u>\$200</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>
Return over Cash Costs + Land	-\$29	-\$102	-\$175	\$236	\$104	-\$27
Non-Cash Costs	<u>\$79</u>	<u>\$79</u>	<u>\$79</u>	<u>\$51</u>	<u>\$51</u>	<u>\$51</u>
Total Economic Return	-\$108	-\$181	-\$254	\$184	\$53	-\$78
Break-Even Prices (\$/bu.) to Cover:						
Total Cash Variable + Fixed Costs	\$2.95	\$3.54	\$4.43	\$4.04	\$5.77	\$10.10
Total Cash Costs + Land Rent	\$5.18	\$6.21	\$7.76	\$4.04	\$5.77	\$10.10
Total Economic Costs	\$6.05	\$7.26	\$9.08	\$5.06	\$7.23	\$12.66

Source: University of Kentucky Enterprise budgets for 2016 Wheat.

Those growing wheat on rented land will not be able to pay \$200/acre cash rent solely by the profits generated by wheat. Without double-crop soybeans, the return over cash costs plus cash rent range from -\$29 to -\$175 per acre given the production, price and cost assumptions (line 4). If double-crop soybeans in 2016 yield 50 bushels/acre or better, then the wheat followed by double-crop soybean enterprise can cover production costs and land rent. However, if double-crop soybeans yield 20 bushels/acre, then losses would increase by \$27/acre (line 4).

The economic non-cash costs are shown on line 5 of table 2. These costs include the cost of the operator's labor, interest cost on inputs and machinery depreciation expense. Total budgeted economic costs will be covered if either a) both wheat and double-crop soybean yields are higher than budgeted; or b) higher prices are obtained than budgeted. Total economic returns for wheat followed by double-crop soybeans, on average, are expected to be -\$128/acre (line 6).

Table 2 also shows the break-even prices needed to cover the various costs. The break-even price needed to cover total cash costs plus cash rent at a yield of 75 bushels/acre is \$6.21/bushel. If the harvested wheat yield is 60 bushels/acre, the break-even is \$7.76/bushel. This type of analysis, using your own costs and yield potential, is helpful in guiding marketing-decisions as you think about forward-contracting wheat or soybeans prior to harvest.



# 2016 UK WINTER WHEAT MEETING

1/5/16

9AM - 3PM (CDT)



REGISTRATION: 8:30AM

JAMES E. BRUCE CONVENTION CENTER  
303 CONFERENCE CENTER DRIVE  
HOPKINSVILLE KY 42240

LUNCH PROVIDED BY:



- **Welcome: Dr. Rick Bennett**  
Associate Dean for Research and  
Director of the UK  
Agricultural Experiment Station
- **Fusarium Head Blight of Wheat:  
Risk and Management**  
Dr. Carl Bradley, UK Extension  
Plant Pathologist
- **KY's Statewide Vomitoxin Survey**  
Dr. Carrie Knott, UK Extension  
Grain Crop Specialist
- **Cereal Rye Variety Trial**  
Bill Bruening, UK Small Grain Vari-  
ety Specialist
- **Wheat Market Outlook and Risk  
Management for 2016**  
Dr. Todd Davis, UK Extension Grain  
Marketing Specialist
- **Plant Growth Regulators:  
Another Tool for Intensive  
Wheat Production?**  
Dr. Carrie Knott, UK Extension  
Grain Crop Specialist
- **Kentucky Climate Outlooks and  
Monitoring**  
Dr. Stuart Foster, State Climatolo-  
gist for Kentucky, WKU
- **Nitrogen Management**  
Dr. Edwin Ritchey, UK Extension  
Soil Specialist
- **No-Till Wheat: History, Manage-  
ment and Benefits**  
Dr. Lloyd Murdock, UK Extension  
Soil Specialist

*For more information contact:  
Colette Laurent, Grain Crop Coordinator  
(270) 365-7541 ext 264 [claurent@uky.edu](mailto:claurent@uky.edu)*

**CCA Credits:** NM 1.0, SW 1.0, PM 1.5, CM 0.5, PD 0.5

**Pesticide Credits:** requested

## SMALL GRAIN DISEASE MANAGEMENT WORKSHOP

Feb 5, 2016—UK Research and Education Center, Princeton, KY

Topics will include growth staging small grain crops, identification and management of foliar and head diseases of small grain crops, fungicide application basics, and others. This meeting is being sponsored by the KYSGGA.

*More information will be forthcoming – check the UK Wheat Science Group website (<http://wheatscience.ca.uky.edu/>) or the UK Grain Crops blog (<http://graincrops.blogspot.com/>).*



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***PO Box 469***  
***Princeton, KY 42445-0469***



## ***UPCOMING EVENTS***

### ***UK Winter Wheat Meeting***

**Date: January 5, 2016**

### ***Small Grain Disease Management* *Workshop***

**Date: February 5, 2016**

### ***UK Wheat Field Day***

**Date: May 10, 2016**