



# THE EFFICACY OF FUNGICIDE APPLICATION TO CONTROL FUSARIUM HEAD BLIGHT INFECTION IN SPRING WHEAT

Dr. Heather Darby, University of Vermont Extension

[Heather.Darby@uvm.edu](mailto:Heather.Darby@uvm.edu)

There is a high demand for locally grown wheat for baking purposes throughout the Northeast. Currently, there is not enough grown in the region to meet this demand. One major obstacle for growers is *Fusarium* head blight (FHB) infection of grain. This disease is currently the most important disease facing grain growers in the Northeast, resulting in loss of yield, shriveled grain, and most importantly, harmful mycotoxin contamination. A vomitoxin called Deoxynivalenol (DON) is considered the primary mycotoxin associated with FHB. The spores are usually transported by air currents and can infect plants at flowering through grain fill. Eating contaminated grain greater than 1ppm poses a health risk to both humans and livestock. Fungicide applications have proven to be relatively effective at controlling FHB in other spring wheat growing regions. Limited work has been done in this region on fungicide application to spring wheat specifically to minimize FHB and ultimately reduce DON mycotoxin production. In April of 2016, the UVM Extension Northwest Crops and Soils Program initiated a spring wheat fungicide trial to determine the efficacy of a conventional fungicide application to reduce FHB infection on cultivars with varying degrees of disease susceptibility.

## MATERIALS AND METHODS

A field experiment was established at the Borderview Research Farm located in Alburgh, VT on 28-Apr to investigate the effects of cultivar resistance, conventional fungicide efficacy on FHB and DON infection in spring wheat. The experimental design was a randomized complete block, with a split-plot arrangement and 4 replicates. Cultivar was the main plot and fungicide vs. no fungicide treatment was the sub-plots. The cultivars planted, seed source, and FHB resistance rating are listed in Table 1.

**Table 1. 2016 varieties planted, seed source and FHB resistance rating.**

Variety	Seed Source	FHB resistance
Glenn	Albert Lea Seed. MN	Resistant
Magog Prosper	Semican Atlantic Inc., Canada	Susceptible





## RESULTS

Seasonal precipitation and temperature recorded at weather stations in close proximity to the 2016 site are shown in Table 3. The growing season this year was marked by lower than normal temperatures in April, and higher than average temperatures in May and August. Rainfall amounts were below average throughout the growing season resulting in 5.52 inches below seasonal norms. From April to August, there was an accumulation of 4536 Growing Degree Days (GDDs) in Alburgh which is 43.7 GDDs above the 30 year average.

**Table 3. Temperature and precipitation summary for Alburgh, VT, 2016.**

<b>Alburgh, VT</b>	<b>April</b>	<b>May</b>	<b>June</b>	<b>July</b>	<b>August</b>
Average temperature (°F)	39.8	58.1	65.8	70.7	71.6
Departure from normal	-4.92	1.84	0.01	0.13	2.85
Precipitation (inches)	2.56	1.53	2.81	1.79	2.98
Departure from normal	-0.26	-1.92	-0.88	-2.37	-0.93
Growing Degree Days (32-95°F)	291	803	1017	1201	1224
Departure from normal	-97.9	49.5	3.20	4.45	84.4

Historical averages are for 30 years of data provided by the NOAA (1981-2010) for Burlington, VT. Alburgh precipitation data from 8/17/16-10/31/16 was missing and was replaced by data provided by the NOAA for Highgate, VT.

### *Impact of Fungicide*

There were no significant differences in the average FHB severity 998 ref\*287.33 516.55ref\*d

**Figure 1. Incidence of FHB infected heads in the Prosaro applied plots compared to the non-sprayed control.**

**Figure 2. The impact of fungicide vs. non-sprayed control on spring wheat DON concentrations, Alburgh, VT.** *Treatments with the same letter did not differ significantly.*

***Impact of Variety***

There were no significant differences in the average FHB plot severity, infected head severity, and incidence of FHB infected heads between spring wheat varieties (Table 6). Overall, disease severity and incidence was low regardless of variety.

**Table 6. The impact of malting barley variety of FHB incidence and severity.**

Variety	Average FHB severity
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Spring wheat varieties did not differ statistically for harvest moisture, test weight, or yield. The spring wheat varieties differed significantly in DON concentrations (Table 7, Figure 3). Glenn had the lowest DON concentration at (0.03 ppm). All of the varieties had DON concentrations below the FDA recommendation of 1 ppm. As expected resistant varieties had lower levels of DON concentrations.

**Table 7. The impact of malting barley variety of quality and yield.**

Variety	Harvest moisture yield.
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## **DISCUSSION**

Overall, the 2016 season was ideal for growing spring wheat. The warmer than average temperatures, along with below normal rainfall throughout much of the growing season,