The Efficacy of Spraying Organic Fungicides to Control Fusarium Head Blight Infection in Spring Wheat

Dr. Heather Darby, UVM Extension Agronomist
Erica Cummings, UVM Extension Crops and Soils Coordinator
(802) 524-6501

Va90 gP 129 Tss 0 0 l1 0 0 1 306.05 207.39 Tm 1 g8 SCrg09oI

THE EFFICACY OF SPRAYING ORGANIC FUNGICIDES TO CONTROL FUSARIUM HEAD BLIGHT INFECTION IN SPRING WHEAT

Dr. Heather Darby, University of Vermont Extension
Heather.Darby[at]uvm.edu

There is a high demand for locally grown wheat for baking purposes throughout the Northeast. One major obstacle for growers is *Fusarium* head blight (FHB) infection of grain. This disease is currently the most important disease facing organic and conventional grain growers in the Northeast, resulting in loss of yield, shriveled grain, and most importantly, mycotoxin contamination. A vomitoxin called
d

SONATA® (EPA# 69592-13) fungicide provides excellent control of powdery mildews and rusts. Based on a patented strain of Bacillus pumilus (QST 2808), SONATA is an excellent fit for integrated disease management programs. SONATA contains a unique, patented strain of Bacillus pumilus (QST 2808) that produces an antifungal amino sugar compound that inhibits cell metabolism. SONATA also creates a zone of inhibition on plant surfaces, preventing pathogens from establishing on the plant.

Table 2. Treatments-fungicide application dates and rates.

Treatments	Flowering application	5 days after flowering application	Application rate
	date	date	
Control	28-Jun	3-Jul	Water
Fusarium graminearum	28-Jun (3 hours after flowering application)		40,000 spores/ml
Actinovate	28-Jun	3-Jul	6 fl oz ac^{-1}
ChampION	28-Jun	3-Jul	1.5 lbs ac^{-1}
Champ WG	28-Jun	3-Jul	1 lbs ac^{-1}
Regalia	28-Jun	3-Jul	1 qt. ac^{-1}
SONATA	28-Jun	3-Jul	2 qt. ac^{-1}

When the wheat

10% level of probability are shown. Where the difference between two varieties within a column is equal to or greater than the LSD value at the bottom of the column, you can be sure in 9 out of 10 chances that there is a real difference between the two varieties. In the following example, variety A is significantly different from variety C, but not from variety B. The difference between A and B is equal to 725, which is less than the LSD value of 889. This means that these varieties did not differ in yield. The difference between A and C is equal to 1454, which is greater than the LSD value of 889. This means that the yields of these varieties were significantly different from one another. The asterisk indicates that variety B was not significantly lower than the top yielding variety.

RESULTS

Seasonal precipitation and temperature recorded at weather stations in close proximity to the 2017 site are shown in Table 3. The growing season this year was marked by higher than normal temperatures in April and lower than average temperatures in May, June, July, and August. Rainfall amounts were higher than average throughout the growing season resulting in 7.39 inches of precipitation more than normal. From April to August, there was an accumulation of 4440 Growing Degree Days (GDDs), 50.9 GDDs below the 30-year average.

Table 3. Temperature and precipitation summary for Alburgh, VT, 2017.

Table 5. The impact application timing and fungicide on spring wheat yield and quality.

Treatment	Harvest moisture	Test weight	Yield @13.5% moisture	DON
	%	lbs bu^{-1}	lbs ac^{-1}	ppm
Non-sprayed, non-inoculated control	17.0	57.2	**2385**	**3.74**

Impact of Variety:

There were no significant differences in the average FHB plot severity, FHB infected head severity, and incidence of FHB infection between spring wheat varieties (Table 6).

Table 6. The impact of spring w

Figure 2. Impact of variety on spring wheat yields and DON concentrations.
Treatments with the same letter did not differ significantly.

DISCUSSION

Overall, the 2017 growing season was challenging for growing spring wheat. The cooler than average temperatures along with the higher than normal rainfall in throughout much of the growing season created the ideal conditions for Fusarium growth. This is evident in the high DON concentrations in both varieties.

The untreated control had the lowest DON concentrations; this could be attributed to these plots not being

ACKNOWLEDGEMENTS

The UVM Extension Northwest Crops and Soils Team would like to thank the Borderview Research Farm for their generous help with the trials, as well as acknowledge the U.S. Wheat and Barley Scab Initiative program for their financial support. We would like to acknowledge Kelly Drollette, Hillary Emick, Abha Gupta, Freddy Morin, Lindsey Ruhl, Matt Sanders, Stuart Wolff-Goodrich and Sara Ziegler for their assistance with data collection and entry. This information is presented with the understanding that no product discrimination is intended and neither endorsement of any product mentioned, nor criticism of unnamed products, is implied.

UVM Extension helps individuals and communities put research-based knowledge to work.