

## Effect of fungicides on the performance of winter wheat, 2013

Martin Nagelkirk, Michigan State University Extension

A field trial was conducted to measure the effect of various fungicide products on wheat performance and disease severity. A randomized complete block design with four replications was superimposed on a commercial stand of Ambassador soft white winter wheat. The variety is known to be susceptible to Septoria leaf spot, stagonospora leaf blotch and Fusarium head blight.

The fungicide products included Aproach and Aproach Prima by DuPont, and Stratego, Prosaro and Sonata by Bayer CropScience. The rates and timing for each product are provided in the table below. The fungicides were applied using a tractor mounted boom sprayer. The treatments that contained Prosaro and Stratego included a nonionic surfactant (0.125%). The T1 application timing (Feekes growth stage 6) was made on May 9 with 13 gallons of water per acre through TT11002 nozzles at 45 psi. The same configuration was used on the second application timing (T2; growth stage 9) on May 25. The early flower treatment timing (T3; growth stage 10.51) was applied on June 7 using TT Duo body with 11001 nozzles, 14 gallons of water per acre, and 45 psi.

Other than a trace of Septoria leafspot, leaf diseases were nearly nonexistent throughout April and May. However, following flowering, Septoria tritici aggressively spread to the number 2 leaf and flag leaf. Its severity was rated on both June 26 and 28 at the soft dough stage. Tan spot could also be found on the flag leaf but to a much lesser extent. The trial was harvested on July 9 using an International 2144 combine equipped with a Juniper HarvestMaster system that provided grain yield, test weight, and moisture. Grain samples were collected to test for DON levels. Statistical analysis was performed by the Statistical Consulting Center at MSU.

All results are provided in the table (page 2). The use of individual fungicide products improved yields by 12 to 21 bushels per acre and decreased the severity of leaf spot on the flag leaves by 73 to 90 percent. There was a relatively strong correlation ( $R = 0.81$ ) between leaf spot severity and grain yield.

The products containing Aproach were applied at flag leaf emergence weeks before Septoria's aggressive spread to the flag leaf. Nevertheless, significant yield improvements were realized. Aproach Prima reduced Septoria levels significantly more than where Aproach was used alone. The Aproach treatments tended to elevate DON levels.

Treatments that included Prosaro at early flowering reduced DON levels by nearly 50 percent. They also tended to increase harvest moisture levels and lower test weight. When compared to Prosaro used alone, the Prosaro tank-mixed with Sonata resulted in comparable grain yield and

Location:	JGDM McConnachie Fms Deckerville, MI
Collaborators:	Dupont, & Bayer
Soil Type	Parkhill silt loam
Soil pH:	6.5
Previous crop:	soybeans
Variety:	Ambassador
Nitrogen rate:	125 lbs/ac
Plot design:	RCB
Replications:	four
Plot area:	20 x 75 ft
Treatment area:	17 x 75 ft
Harvest area:	16.5 x 70 ft
Planting date:	Oct 7, 2012
Seeding rate:	1.8 m/ac
Harvest date:	July 18, 2013
Herbicide:	none
Insecticide:	none



Figure 1: Septoria leaf spot on untreated wheat

suppression of Septoria and DON, but lower test weight . There was no adverse effect on the performance of Prosaro when tank-mixed with the insecticide Baythroid XL. Stratego YLD (4 oz/ac) applied at flag leaf performed as well as Prosaro applied at flowering relative to Septoria suppression and grain yield . The double fungicide application consisting of only 2 oz. of Stratego at growth stage 6 followed by Prosaro at flowering resulted in the trial's greatest Septoria suppression and grain yield.

**Table 1: Effect of fungicides on the performance of winter wheat, Sandusky, MI 2013**

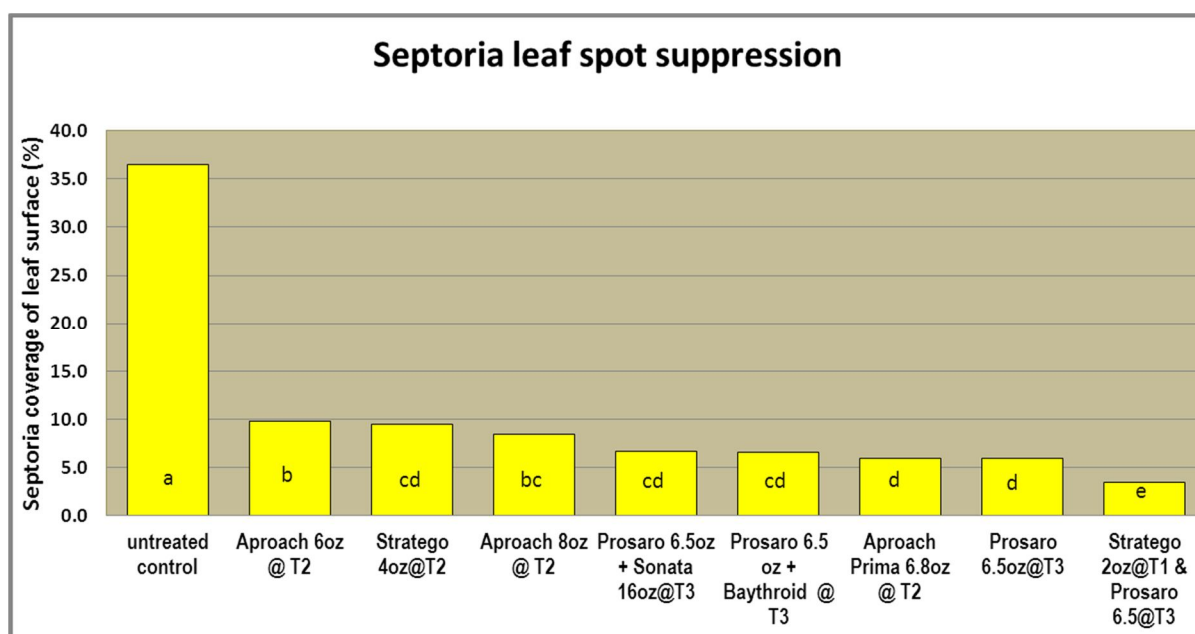
Products and rates per acre	Timing <sup>1</sup>			Yield <sup>2</sup> 13% M (bu/ac)	Harv <sup>2</sup> moist (%)	Test <sup>2</sup> weight (lbs)	Septoria <sup>2,3</sup> leaf spot %	Head <sup>2,4</sup> scab index	D.O.N. <sup>2</sup> ppm
	T1	T2	T3						
untreated control	-	-	-	87.8 a	13.9 ab	60.8 a	36.5 a	32 abc	3.7 c
Approach, 6 oz.		x		100.5 bcd	14.8 bc	60.4 ab	9.8 b	41 a	4.4 ab
Approach, 8 oz.		x		99.4 bc	15.5 cd	60.0 bc	8.4 bc	29 abc	4.9 a
Approach Prima, 6.8 oz		x		101.9 de	15.5 cd	60.0 bc	6.0 d	38 ab	4.7 ab
Stratego YLD, 4 oz		x		103.9 e	13.8 a	60.0 bc	9.5 cd	33 abc	4.1 bc
Prosaro 421 SC, 6.5oz.			x	104.5 e	16.2 d	59.6 bc	6.0 d	9 c	1.7 de
Prosaro 421, 6,5 oz + Sonata ASO, 16.5 oz.			x	103.8 e	17.1 de	59.2 de	6.7 cd	8 c	1.9 de
Stratego YLD, 2 oz fb Prosaro 421 SC, 6.5 oz.	x		x	109.2 f	17.9 e	58.9 e	3.5 e	3 d	1.4 e
Prosaro 421, 6.5 oz. + Baythroid XL, 1 oz			x	103.2 de	16.4 de	59.5 cde	6.6 cd	4 d	2.3 d

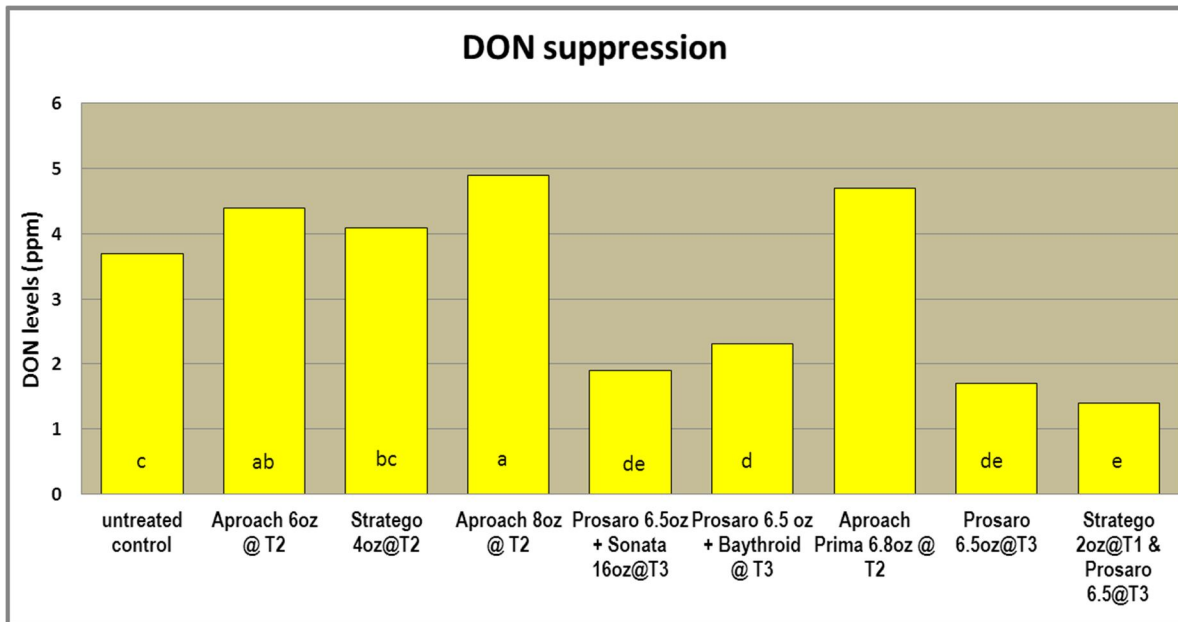
<sup>1</sup> T1 application: May 9, Feekes g.s.(fully tillered); T2 application: May 25, Feekes g.s.9 (flag leaf); T3 application: June 18, Feekes g.s. 10.51 (early flower).

<sup>2</sup> Means with the same letter are not significantly different; P≥0.05.

<sup>3</sup> Severity of Septoria on the flag leaf expressed as percent of leaf area exhibiting disease.

<sup>4</sup> Index derived from multiplying incidence and severity of scab





*Fungicide trial, 2013.*