Project Title:	Effect of fungicide rate and time of application on stripe rust control in spring wheat – 2012 (4W4147).
Principal Investigator:	Bob Stougaard
Project Personnel:	Brooke Bohannon
Objective:	To evaluate the effect of Stratego rate and application timing for stripe rust control in spring wheat.

Results:

The factorial treatment design consisted of Stratego applied at six rates and three application timings. Stratego rates included 0.125, 0.25., 0.50, 0.75, and 1.0X of the labeled rate (10 oz/A) as well as a non-treated control. Application timings consisted of tillering, flag leaf, and tillering plus flag leaf. The tillering treatments were applied on June 11 and the flag leaf treatments were applied on June 25 when the crop was 11 and 20 inches in height, respectively. At the same time, stripe rust infection levels were 5 and 35 percent. Stratego was applied with a backpack sprayer in 20 GPA of water to individual plots which measured 10 by 15 feet. The experimental design was a randomized complete block with three replications.

Stripe rust infection levels ranged from a high of 80% in the non-treated control to a low of 14% when the 0.50X rate was applied at tillering plus flag leaf growth stages. Strip rust control did not increase much at rates above 0.50X. Indeed, application timing was more important than use rate in terms of the level of control. The poorest control was obtained when Stratego was applied at tillering. There was no difference in control between applications made at flag leaf compared to the sequential applications made at tiller plus flag leaf. These results demonstrate that applications made at flag leaf were most critical in terms of controlling strip rust. More to the point, applications made at the tillering stage were ineffective.

The tillering applications were ineffective due to rapid plant growth and the corresponding dilution effect on fungicide concentration. Crop heights increased from 11 to 20 inches within the 14 day period that separated the tillering and flag leaf application stages, respectively. The newly formed, non-treated tissue was vulnerable to infection and the corresponding negative effects on plant growth and development. The effect of application timing also was evident for grain yield, test weight, and thousand kernel weight. Stratego rate and timing had no effect on protein or falling numbers.

Summary: Optimum stripe rust control resulted when fungicide treatments were made at the flag leaf stage. There was little to no benefit from applications made at tillering.

Funding Summary: Budget information to be provided by OSP. No other grant support for this project.

MWBC FY 2013 Grant Submission Plans: Resubmittal is not planned.

Table1. Material and Methods - Effect of fungcide rate and time of application on stripe rust in spring wheat - 2012

Seeding Date:	05/04/2012	Soil Type:	Creston SiL	Insecticide:	1 pt/A Lorsban
Seeding Rate:	80 lb/A	Soil Test:	292-34-228	Harvest Date:	09/04/2012
Previous Crop:	Spring Wheat	Fertilizer:	12-40-30-10-1		
Tillage:	Conventional	Herbicide:	1.7 pt/A Wolverine		
Irrigation:	0.4" on 5/9 & 5/16				

Table 2. Effect of Stratego rate and timing on stripe rust control in spring wheat, 2012.

Application timing	Rate oz/A	SR %	Yield bu/A	Protein %	TWT lb/bu	TKW g	FN sec
Control	0.00	80	48	13.40	57	37	330
Tiller	1.25	71	55	13.14	57	36	341
Flag	1.25	42	57	13.34	58	41	319
Tiller plus flag	1.25	24	62	13.14	58	43	330
Tiller	2.50	60	60	13.14	58	42	333
Flag	2.50	19	68	13.46	59	45	302
Tiller plus flag	2.50	32	64	13.03	58	46	334
Tiller	5.00	49	60	13.31	57	37	308
Flag	5.00	19	66	13.80	59	43	317
Tiller plus flag	5.00	14	75	13.49	59	45	330
Tiller	7.50	49	63	13.29	57	38	331
Flag	7.50	28	65	13.46	58	44	325
Tiller plus flag	7.50	16	70	13.83	59	44	321
Tiller	10.00	51	56	13.06	57	39	321
Flag	10.00	18	60	13.23	59	45	310
Tiller plus flag	10.00	20	67	13.34	59	44	322
	Mean	37	62.26	13.34	57.92	41.85	323.29
	CV	26	11.75	3.06	1.7	5.41	7.19
	LSD (P=.05)	16.24	12.2	0.681	1.645	3.776	38.777
	Pr>F	0.0001	0.0222	0.4991	0.0481	0.0001	0.848

SR: stripe rust, TWT: test weight, TKW: thousand kernel weight, FN: falling number