

Title: Spring Wheat Cultivar Response to Insecticide and Fungicide Applications - 2014

Objective: To determine the response of commercial spring wheat varieties to insecticide and fungicide inputs.

Results:

Stripe rust and the Orange Wheat Blossom Midge (OWBM) are two pests in spring wheat which have a negative impact on grain yield and quality. This study was conducted to evaluate the level of plant resistance present in common spring wheat varieties, and to determine the agronomic response of these materials when treated for the control of both pests. Sixteen varieties were planted as a split plot, randomized complete block design. The main-plot was pesticide treatment and the sub-plot was variety. Headline was applied on June 20th at flag leaf for the control of stripe rust, and Lorsban Advanced was applied on June 30th at heading, for control of the OWBM.

Orange Wheat Blossom Midge pressure was uncommonly low this year. The average number of larvae per spike, regardless of treatment, was 0.4 this year compared to 9.0 in 2013. Similarly, stripe rust pressure also was low this year. Stripe rust infection only averaged 5.7% in the non-treated check varieties compared to 31.7% infection in 2013. Despite the low level of stripe rust infection, significant differences were observed among varieties. Duclair, Oneal and Hank were most susceptible, having infection levels above 15 percent. The effect of fungicide input treatment was significant for Hank and Oneal, but had no impact on Duclair. Pesticide inputs impacted thousand kernel weights. On average, TKW's were 38.8 and 40.1 for non-treated and treated varieties, with Hank and Corbin showing the greatest benefit.

The lack of pest pressure resulted in excellent yields and grain quality. Yields averaged 109.2 bu/A with Cabernet, Duclair, Vida and Volt producing yields in excess of 114 bu/A. Protein averaged 14.7 percent, with Egan having the highest protein at 16.2 percent and Volt the lowest at 13.8 percent. There were no differences among varieties for test weight, which averaged 59.9 lb/bu. Falling number averaged 308.6 seconds, and ranged from a low of 216.7 for Vida to a high of 398.1 for McNeal.

Overall, low pest pressure prevented an assessment of varietal differences to stripe rust and OWBM and negated any benefit associated with either insecticide or fungicide treatment.

Table 1. Materials and Methods - Spring Wheat Cultivar Response to Insecticide and Fungicide Applications - 2014.

Seeding Date:	4/30/2014	Harvest Date:	9/8/2014
Julian Date:	120	Julian Date:	251
Seeding Rate:	80 lb/A	Soil Type:	Creston Sil
Previous Crop:	Alfalfa	Soil Test:	163-14-138
Tillage:	Conventional	Fertilizer:	200-30-100
Irrigation:	None	Herbicide:	Huskie 11 floz/A and Axial XL 16.4 floz/A

Table 2. Agronomic response of spring wheat varieties to fungicide and insecticide inputs. Kalispell, 2014.

Cultivar	Heading (Julian)			Height (in)			Lodging (%)			Stripe rust (%) July 23		
	check	treated	avg.	check	treated	avg.	check	treated	avg.	check	treated	avg.
Brennan	177	177	177	33.3	32.3	32.8	0.0	0.0	0.0	1.3	0.0	0.7
Buckpronto	176	175	176	34.7	36.0	35.3	0.0	0.0	0.0	6.0	6.7	6.3
Cabernet	178	178	178	31.0	29.0	30.0	0.0	0.7	0.3	4.7	3.3	4.0
Choteau	179	178	179	35.0	35.0	35.0	0.0	0.0	0.0	6.0	6.7	6.3
Corbin	178	178	178	36.3	35.3	35.8	5.0	0.0	2.5	3.3	4.3	3.8
Duclair	177	177	177	38.3	35.7	37.0	3.3	0.0	1.7	16.3	13.7	15.0
Egan	183	182	183	36.3	36.0	36.2	0.0	0.0	0.0	2.0	1.3	1.7
Hank	177	176	177	35.7	30.7	33.2	0.0	1.3	0.7	15.7	4.3	10.0
McNeal	182	183	183	35.0	38.0	36.5	0.0	0.7	0.3	3.0	1.0	2.0
Mott	184	183	183	40.0	42.0	41.0	0.0	1.3	0.7	8.3	1.7	5.0
Oneal	182	181	182	37.0	35.7	36.3	3.3	0.0	1.7	18.0	7.7	12.8
Reeder	178	180	179	37.0	38.7	37.8	0.0	0.0	0.0	2.7	1.3	2.0
Solano	180	178	179	33.0	30.3	31.7	0.0	1.0	0.5	2.7	2.3	2.5
SY Tyra	178	179	179	34.0	33.0	33.5	0.0	0.0	0.0	0.0	0.7	0.3
Vida	182	180	181	35.7	36.7	36.2	0.0	0.0	0.0	0.0	3.0	1.5
Volt	184	184	184	34.7	35.3	35.0	0.0	0.0	0.0	1.7	4.0	2.8
Mean	180	179	179	35.4	35.0	35.2	0.7	0.3	0.5	5.7	3.9	4.8
LSD	ns		1.1	ns		3.0	ns		ns	4.6		3.3
Pr>F	0.0945		0.0001	0.5350		0.0001	0.4262		0.7363	0.0007		0.0001

ns: non-significant

Table 2. continued

Cultivar	Septoria (%)			Yield (bu/A)			Protein (%)			Test weight (lb/bu)		
	check	treated	avg.	check	treated	avg.	check	treated	avg.	check	treated	avg.
Brennan	33.3	28.3	30.8	98.4	100.6	99.5	15.1	15.3	15.2	59.9	60.1	60.0
Buckpronto	55.0	26.7	40.8	103.9	96.0	100.0	15.2	15.1	15.2	59.2	60.4	59.8
Cabernet	61.7	36.7	49.2	114.3	116.4	115.3	14.2	14.3	14.3	58.9	59.6	59.3
Choteau	56.7	28.3	42.5	106.5	110.0	108.2	14.9	14.7	14.8	59.6	60.4	60.0
Corbin	35.0	6.7	20.8	105.9	104.7	105.3	14.6	14.6	14.6	60.2	60.8	60.5
Duclair	51.7	17.7	34.7	117.9	110.4	114.1	14.7	14.7	14.7	59.0	59.2	59.1
Egan	40.0	36.7	38.3	111.8	106.9	109.3	16.1	16.4	16.2	60.1	60.4	60.3
Hank	40.0	15.0	27.5	103.8	115.8	109.8	14.1	14.4	14.2	58.3	59.6	59.0
McNeal	25.0	21.7	23.3	103.0	110.8	106.9	14.9	14.9	14.9	60.1	61.0	60.6
Mott	33.3	25.0	29.2	105.0	116.7	110.9	14.1	14.6	14.3	59.5	60.1	59.8
Oneal	28.3	6.0	17.2	96.1	108.6	102.3	14.4	14.9	14.7	59.8	60.5	60.1
Reeder	16.7	3.3	10.0	114.1	110.6	112.3	14.7	15.0	14.9	60.6	60.9	60.7
Solano	40.0	11.7	25.8	106.1	100.2	103.1	15.2	15.0	15.1	59.4	59.9	59.6
SY Tyra	38.3	11.7	25.0	104.9	108.9	106.9	14.3	14.3	14.3	59.6	60.7	60.2
Vida	21.7	7.7	14.7	124.5	117.6	121.0	14.9	14.6	14.7	59.1	60.2	59.6
Volt	27.7	11.3	19.5	119.3	124.3	121.8	13.8	13.7	13.8	61.2	58.8	60.0
Mean	37.8	18.4	28.1	108.5	109.9	109.2	14.7	14.8	14.7	59.7	60.2	59.9
LSD	ns		17.4	ns		8.5	ns		0.4	ns		ns
Pr>F	0.7787		0.0009	0.1707		0.0001	0.5975		0.0001	0.4857		0.1978

ns: non-significant

Table 2. continued

Cultivar	TKW (g)			Falling number (sec)			OWBM (no/spike)		
	check	treated	avg.	check	treated	avg.	check	treated	avg.
Brennan	35.8	37.7	36.8	258.7	258.4	258.5	0.3	0.0	0.2
Buckpronto	43.2	45.2	44.2	345.1	364.9	355.0	0.1	0.2	0.2
Cabernet	41.5	39.9	40.7	326.8	329.9	328.3	0.0	0.1	0.1
Choteau	36.7	38.4	37.6	287.7	331.5	309.6	0.4	0.1	0.3
Corbin	42.7	47.9	45.3	288.7	344.4	316.6	0.0	0.1	0.1
Duclair	38.0	38.8	38.4	230.5	279.1	254.8	0.1	0.0	0.1
Egan	36.0	37.2	36.6	377.5	371.2	374.4	0.2	0.0	0.1
Hank	42.1	47.5	44.8	289.6	314.1	301.8	0.3	0.2	0.3
McNeal	39.4	40.5	40.0	370.3	426.0	398.1	2.8	0.0	1.4
Mott	33.8	35.0	34.4	295.9	290.4	293.2	1.6	0.3	0.9
Oneal	35.4	38.4	36.9	344.9	372.2	358.6	1.4	0.4	0.9
Reeder	41.8	39.0	40.4	306.1	343.1	324.6	0.0	0.0	0.0
Solano	43.3	41.7	42.5	239.0	280.3	259.7	2.1	0.0	1.1
SY Tyra	36.2	39.0	37.6	210.2	228.2	219.2	0.8	0.0	0.4
Vida	37.8	38.9	38.3	176.6	256.7	216.7	0.4	0.0	0.2
Volt	36.7	36.8	36.8	350.2	387.0	368.6	0.3	0.4	0.4
Mean	38.8	40.1	39.4	293.6	323.6	308.6	0.7	0.1	0.4
LSD	3.1		2.2	ns		27.4	ns		ns
Pr>F	0.0276		0.0001	0.0971		0.0001	0.4628		0.4333

TKW: thousand kernel weight, OWBM: orange wheat blossom midge (number per spike),
ns: non-significant