

Project Title: On-Farm Comparison of Varietal Preference to Egg-laying by Orange Wheat Blossom Midge.

Project Participants: Heritage Custom Farming, Chris Fritz, Karl Schrade, and NWARC staff.

Objective: To compare the attractiveness of two commercially available spring wheat varieties for egg-laying preference by the OWBM.

Results:

Previous studies conducted at NWARC have demonstrated that certain spring wheat varieties attract the adult egg-laying wheat midge, while other varieties deter egg-laying. To test this apparent preference trend under a field scale basis, Reeder (non-attractive) and Solano (attractive), were seeded at four on-farm locations in Flathead County. Field size ranged from 5 to 10 acres per variety. The locations selected had a previous history of substantial OWBM pressure.

Fields were seeded at 100 lb/A (Reeder) and 135 lb/A (Solano) to achieve a target population of 35 plants per square foot. Planting was delayed until approximately May 1, to insure that heading coincided with peak oviposition (Table 1).

Reeder, a taller variety and therefore prone to lodging, was treated with Palisade, a plant growth regulator, at jointing to all fields except the Schrade and Fritz locations. The insecticide, Warrior II, was applied if OWBM populations reached economic threshold levels and the wheat crop was at the vulnerable growth stage of 50% heading through 70% anthesis (Table 1).

Adult midge peak emergence time varied across the four locations. The peak population at Heritage Custom Farming (HCF) occurred during the last week of June compared to the middle of July at Schrade's. The midge emergence at HCF occurred while the crop was susceptible which resulted in the need for an insecticide application. However, peak emergence at Schrade's occurred after the vulnerable stage and no insecticide treatment was warranted.

Despite the variation in midge populations and insecticide usage across locations, no significant difference was observed in yield, general grain quality or number of OWBM per spike (Table 2). This highlights the importance of crop staging in determining the need to treat for OWBM.

Statistically there was no difference in the number of OWBM per spike regardless of variety. This is contradictory to what has been observed in the small plot research conducted at NWARC. These results emphasize the importance of scaling-up experiments in order to validate preliminary research findings.

Table 1. Cultural data for the on-farm comparison of varietal preference to egg-laying by OWBM 2014

Location	Seeding	Harvest	OWBM			
	Date	Date	Palisade	Insecticide	Peak Emergence #/ trap	Date
NWARC	5/13	9/8	6/23	NA	213	7/5
HCF	5/13	9/13	NA	7/10	3015	6/24-7/1
Fritz	5/5	9/19	NA	7/9	219	7/1-7/8
Schrade	4/29	9/5	NA	NA	2553	7/10-7/17

Table 2. Agronomic data from the on-farm comparison of varietal preference to egg-laying by OWBM

Location	Height inches		Yield bu/A		Protein %		Test Weight lb/bu	
	Reeder	Solano	Reeder	Solano	Reeder	Solano	Reeder	Solano
NWARC	34.6	28.5	72.5	59.4	14.9	13.4	58.6	57.6
HCF	26.9	22.6	37.6	53.6	16.4	16.4	54.7	53.2
Fritz	33.9	27.0	60.9	83.3	15.4	13.7	52.5	53.6
Schrade	35.9	27.9	76.3	74.9	11.8	12.3	57.5	57.2
Mean	32.8	26.5	61.8	67.8	14.6	13.9	55.8	55.4
CV	3.7		17.7		5.4		1.4	
LSD	2.5		ns		ns		ns	
Pr>F	0.0039		0.5145		0.3038		0.5086	

Table 2. continued

Location	TKW g		Fna seconds		FNb seconds		OWBM number/spike	
	Reeder	Solano	Reeder	Solano	Reeder	Solano	Reeder	Solano
NWARC	34.4	34.9	180.1	218.4	205.0	321.0	1.6	10.2
HCF	28.6	29.8	460.0	337.0	423.0	404.0	6.8	25.8
Fritz	25.8	30.4	397.1	383.6	.	.	0.0	4.8
Schrade	32.2	37.8	399.8	360.7	447.0	411.0	0.0	0.0
Mean	30.3	33.2	359.2	324.9	358.3	378.7	2.1	10.2
CV	5.6		8.6		16.0		92.8	
LSD	ns		ns		ns		ns	
Pr>F	0.0979		0.8499		0.7135		0.1385	

Fna: falling numbers tested at NWARC, FNb: falling numbers tested at the National Quality Inspection Lab, TKW: thousand kernel weight, OWBM: orange wheat blossom midge

ns: non-significant