

Project Title: Evaluation of hard and soft NILs for resistance to the Orange Wheat Blossom Midge

Objectives: To determine if midge populations would be affected by differences in grain hardness

Materials and Methods:

Grain hardness has been shown to impact resistance to certain fungal diseases. This study evaluated the effect of grain hardness for resistance to the owbm by comparing experimental white wheat lines that varied in grain texture. This experiment was established in a field which had been in spring wheat for the previous five years and had a history of moderate to high midge densities. The study was conducted using conventional tillage and was fertilized with 97-30-120-24 lb/A of N-P-K-S. The nursery was plant on May 17 as a randomized complete block design with three replications. Plots consisted of 10 seeds per entry planted in individual hills. Heading was recorded when 50 percent of the plants in a plot had half the spike exposed. Plant height measurements and stripe rust disease ratings were taken the first week of August. Three spikes were sampled from each plot on August 9. Each spike was dissected and the number of larvae and seeds counted.

Results:

Midge densities varied from approximately 300 to 112 larvae per spike (Table 1). While midge densities varied statistically among entries, grain hardness had no effect on OWBM populations. Likewise, differences among varieties were noted for stripe rust infection, but grain hardness had no effect on disease susceptibility.

Table 1. Effect of seed texture on OWBM densities. Kalispell, MT 2010.

entry	Pedigree	Texture	Heading	Height	Stripe rust	owbm No/spike	owbm No/seed
23	WQL2GAM329S	soft	199.33	29.92	11.67	143.11	3.18
24	WQL2GAM503S	soft	196.67	33.86	11.67	299.89	6.57
29	WQL3H-F077S	soft	197.67	33.86	20.00	153.78	3.43
30	WQL3H-F254S	soft	200.00	32.02	13.33	111.45	2.42
25	WQL2GAM329H	hard	197.67	30.05	6.67	132.11	2.65
26	WQL2GAM909H	hard	198.00	34.38	10.00	121.22	2.44
27	WQL3H-F254H	hard	199.00	30.84	10.00	232.44	4.62
28	WQL3H-F077H	hard	197.00	33.99	18.33	146.78	2.81
	Entry	TRT Pr>F	0.1836	0.3818	0.0113	0.0184	0.0008
		CV	0.77	9.36	29.74	35.03	25.83
		LSD	NA	NA	6.62	102.81	1.59
	Texture	TRT Pr>F	NS	NS	NS	NS	NS
		soft	198.41	32.41	14.16	177.06	3.89
		hard	197.91	32.31	11.25	158.14	3.13