

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

Objectives: To determine if midge populations would be affected by differences in phenolic content attributed to seed color

Materials and Methods:

Experimental materials derived from crosses between the hard red variety Vida and the hard white variety MTHW0471 were evaluated for resistance to the owbm. This study 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:

Differences between red and white seeded entries were noted for plant height and stripe rust. Red seeded entries were slightly taller and also had a lower incidence of stripe rust. However, seed color had no effect on midge populations. This is in contrast to the previous growing season where midge densities were twice as great in the white seeded entries as compared with red seeded entries. Midge densities averaged 43 larvae per spike in 2009 as compared to 163 per spike in 2010. The effect of seed color may be density dependent where benefits are only realized at low to moderate midge populations. This study should be repeated to better assess the potential interaction between midge density and seed color.

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

entry	Pedigree	color	Heading	Height	Stripe rust	owbm No/spike	owbm No/seed
10	VIDA/MTHW0471	white	196.00	33.07	6.67	223.45	4.29
11	VIDA/MTHW0471	white	198.67	28.48	8.33	212.83	3.44
12	VIDA/MTHW0471	white	198.33	36.75	0.00	147.22	2.69
13	VIDA/MTHW0471	white	192.67	34.38	0.00	112.67	2.00
14	VIDA/MTHW0471	white	202.00	35.43	1.67	97.67	1.55
15	VIDA/MTHW0471	red	198.67	41.21	0.00	219.56	3.98
16	VIDA/MTHW0471	red	199.00	29.79	0.00	196.22	4.95
17	VIDA/MTHW0471	red	198.33	40.16	0.00	135.67	2.57
18	VIDA/MTHW0471	red	199.67	38.85	0.00	116.17	2.20
19	VIDA/MTHW0471	red	198.67	39.90	3.33	175.78	3.42
	Entry	TRT Pr>F	0.0001	0.0001	0.0001	0.2110	0.0696
		CV	0.36	4.94	92.54	40.89	40.60
		LSD	1.23	3.03	3.17	NA	2.16
	Color	TRT Pr>F	0.1645	0.0099	0.0395	0.7150	0.2653
		LSD	NA	3.21	2.52	NA	NA
		white	197.53	33.62	3.33	158.77	2.79
		red	198.86	37.97	0.66	168.68	3.42