

Project Title: Evaluation of spring wheat varieties for resistance to the Orange Wheat Blossom Midge (OWBM) – 2011.

Principal investigator: Bob Stougaard

Project personnel: Luther Talbert and Susan Lanning

Objectives: To evaluate spring wheat varieties for agronomic performance and resistance to the OWBM.

## Results

Germplasm from the Advanced Yield Trial was evaluated for susceptibility to the OWBM in order to determine if alternative resistance mechanisms exist. The previous crop was alfalfa and the field was fertilized with 150-30-120-24 lb/A of N-P-K-S, respectively. The soil type was a Creston silt loam (25-50-25) with an organic matter content of 4%, and a pH of 7.5. Treatments were seeded 1.5 inches deep on May 5, 2011. Individual plots consisted of seven, 6-in wide rows, 15 feet in length with each variety replicated 3 times in a randomized complete block design. Wolverine was applied at 1.7 pt/A on May 25, 2011 for weed control. Heading was recorded when 50 percent of the plants in a plot had half the head exposed. Three wheat heads were collected from each plot in the first replication to determine midge larval numbers. Height measurements were recorded near maturity. The study was harvested September 23, 2011. Grain yield, test weight, protein and grain moisture were then determined.

Midge densities were extremely high, averaging 80 larvae per spike. In comparison, the previous year midge densities averaged 10 larvae per spike. Midge densities ranged from a low of 5 for Brennan to a high of 302 for MT0802. In addition to Brennan, low midge densities (less than 20 per spike) were also found in Reeder, AP604 CL, and SY Soren. The most susceptible cultivars (more than 200 per spike) included MT 0802, as well as MT 1053, MT1030, Thatcher, Fortuna, and MTHW1057.

While midge densities were high, stripe rust also was present. Stripe rust infection averaged 33 percent and ranged from a low of 2% for Rockland and MT 1073 to a high of 99% for AP604 CL. The impact of these two pests resulted in low yields and poor grain quality. Towards that end, yields averaged 26 bu/A, and test weights averaged 52 lb/bu. Yields ranged from 60 bu/A for MT 1072 to a low of 5 bu/A for Thatcher, while test weights ranged from a high of 58 lb/bu for Brennan to a low of 44 lb/bu for Hank.

Overall, the high insect pressure was beneficial in identifying which varieties are least attractive to the orange wheat blossom midge.

Table 1. Agronomic and OWBM data from the advanced yield spring wheat nursery. Kalispell 2011.

Cultivar	Yield (bu/A)	Stripe rust (%)	Protein (%)	Test wt. (lb/bu)	OWBM No/spike
MT 1073	60.76	2.33	16.60	57.30	30.70
BUCKPRONTO	52.56	14.67	17.00	57.30	29.30
MT 1072	50.36	18.67	16.60	54.40	39.30
MTHW1064	47.51	26.67	16.40	54.70	56.00
10FX INC	46.98	25.33	15.20	55.30	38.00
MTHW1065	46.45	17.33	15.90	55.80	123.30
VOLT	45.69	3.00	16.50	54.20	85.30
REEDER	44.19	17.67	16.90	56.10	10.00
MTHW1069	38.48	9.00	16.70	54.90	98.70
WB ROCKLAND	38.23	1.67	18.00	53.70	40.00
BRENNAN	37.63	38.00	15.20	58.40	4.70
CHOTWHT1	36.97	28.33	16.00	51.90	47.30
MT 1049	36.54	18.33	16.80	58.00	46.70
MT 0967	34.69	37.33	16.50	55.80	54.00
AGRIPRO SY605 CL	34.51	48.33	17.10	57.00	21.30
KELBY	33.88	43.33	15.90	57.80	70.70
MT 0802	33.35	13.33	18.10	51.30	302.00
SY SOREN	32.66	40.00	16.30	54.70	18.70
MT 0928	31.45	20.67	17.80	51.20	58.70
AP604 CL	31.09	98.67	14.80	54.00	10.00
DUCLAIR	30.83	11.33	16.60	52.20	74.00
SY TYRA	29.96	71.00	15.70	50.10	23.30
MT 1013	29.64	35.67	17.90	49.20	32.00
MT 1020	29.20	22.67	16.90	49.60	40.70
MTHW1060	28.94	55.33	15.70	52.10	60.70
HANKWHT1	28.17	64.33	15.90	46.80	75.30
MT 1015	27.97	26.67	18.20	53.60	69.30
KUNTZ	26.83	21.33	16.90	55.90	114.00
FORTUNA	25.08	21.67	17.70	55.40	264.00
MCNEAL	24.01	26.33	17.20	50.80	82.00
WB GUNNISON	23.76	22.00	16.80	54.20	73.30
VIDAWHT1	23.49	27.33	17.60	53.50	44.00
MT 1003	22.33	32.67	17.10	48.10	29.30
BREAKER	22.05	14.33	17.60	55.30	70.00
CHOTEAU	21.41	8.33	17.20	50.00	64.00
MT 1007	20.92	47.67	17.00	48.80	23.30
MT 1036	20.37	31.00	17.70	48.70	136.70
MT 1028	19.80	20.67	17.80	49.50	158.00
MT 1030	19.38	17.33	17.90	49.10	217.30
VANTAGE	19.36	22.00	20.20	54.80	103.30

Table 1. Continued

Cultivar	Yield (bu/A)	Stripe rust (%)	Protein (%)	Test wt. (lb/bu)	OWBM No/spike
CORBIN	19.26	37.00	16.70	52.10	84.70
MT 1005	19.18	56.67	16.80	48.10	33.30
IMICHT79	19.13	37.33	18.20	48.20	93.30
MT 1027	19.10	15.67	17.50	49.70	86.00
HANK	18.90	67.67	16.90	44.20	58.70
VIDA	18.88	25.33	17.80	52.80	113.30
MT 1004	18.22	24.00	17.20	48.20	106.00
AGRIPR11	17.99	52.67	18.20	49.20	102.00
MT 1038	17.95	24.00	17.80	49.30	45.30
MT 1011	17.87	60.33	17.50	48.70	59.30
MT 1053	17.12	46.00	17.30	51.30	207.30
MT 1016	17.09	18.00	18.20	49.20	122.00
ONEAL	16.89	52.33	17.80	50.30	100.00
MT 1008	15.33	34.67	17.90	49.50	72.00
MT 1002	15.11	30.00	17.20	49.60	80.70
MOTT	14.64	88.33	18.40	52.40	59.30
MTHW1057	14.17	12.67	17.30	51.20	266.00
MT 0972	13.98	29.00	18.60	51.80	109.30
MT 1035	13.83	18.33	18.20	49.00	52.00
CONAN	13.35	47.00	16.60	50.00	46.00
MT 1010	10.89	48.33	17.10	50.30	36.70
MT 0852	10.19	43.00	17.10	47.80	46.70
JEDD	6.28	88.00	17.00	44.30	28.00
THATCHER	4.73	69.00	18.00	48.70	223.30
MIN	4.73	1.67	14.80	44.20	4.70
MAX	60.76	98.67	20.20	58.40	302.00
MEAN	26.21	33.56	17.14	51.83	80.79
LSD (0.05)	7.88	12.53	NA	NA	NA
CV	18.48	23.10	NA	NA	NA
TRT (pr>f)	0.0001	0.0001	NA	NA	NA