

Project Title: Evaluation of Advanced Spring Wheat Experimental Lines - 2011

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Objectives: To evaluate spring wheat varieties and experimental lines for agronomic performance, as well as disease and insect resistance in environments and cropping systems representative of northwestern Montana.

Materials and Methods:

The previous crop was alfalfa and the field was fertilized with 150-30-120-24 lb/A of N-P-K-S, respectively, on April 27. 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. 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 for weed control. Stripe rust (SR) and height measurements were recorded on July 20. Orange wheat blossom midge (OWBM) populations were assessed on August 4 by randomly harvesting three spikes from each plot in the first replication. The spikes were dissected and the midge larvae numbers were determined. The study was harvested September 23. Grain yield, test weight, moisture, protein, and falling numbers (FN) were then determined.

Results:

Plant heights averaged 31 inches. Fortuna was the tallest variety (39 inches) and Jedd was the shortest (23 inches). Lodging was not detected. Stripe rust was evident throughout the nursery with an average infection rate at 33 percent. Rockland demonstrated the greatest resistance at 1.6% while AP604 CL was the most susceptible variety with a rating of 98.6 percent. Stripe rust infection had a negative effect on yield and protein. However, OWBM populations were extreme, and the associated feeding damage also negatively impacted yields. OWBM populations varied from a low of 4.7/spike for Brennan to a high of 302/spike for MT 0802! The combined effect of these two "orange pests" on grain yield and quality depended on the level of resistance/tolerance expressed by the individual varieties. Yields averaged 26 Bu/A, and ranged from a high of 60 Bu/A for MT 1073 to a low of 4 Bu/A for Thatcher. Protein content averaged 17 percent. Vantage had the highest protein (20.20) while AP604 CL had the lowest protein (14.80). Test weights were also negatively affected by stripe rust and OWBM damage. Test weights averaged 51.8 lb/Bu, and range from 44.2 lb/Bu for Hank to 58.40 lb/Bu for Brennan. Falling numbers averaged 232 and ranged from a high of 458 for AGRIPRO SY605 CL to a low of 62 for MT 0802.

Summary

Grain yield and quality was strongly affected by stripe rust resistance and OWBM tolerance. Buckpronto, Volt and Reeder were the top yielding commercial varieties, followed closely by Rockland and Brennan.

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

| Cultivar | Heading (Julian) | Height (inches) | Yield (bu/A) | SR (%) | Protein (%) | Test wt. (lb/bu) | OWBM No/spike | FN (sec) |
|------------------|---------------------|--------------------|-----------------|-----------|----------------|---------------------|------------------|-------------|
| MT 1073 | 190.00 | 32.68 | 60.76 | 2.33 | 16.60 | 57.30 | 30.70 | 145 |
| BUCKPRONTO | 187.00 | 33.99 | 52.56 | 14.67 | 17.00 | 57.30 | 29.30 | 341 |
| MT 1072 | 190.33 | 30.45 | 50.36 | 18.67 | 16.60 | 54.40 | 39.30 | 122 |
| MTHW1064 | 190.33 | 34.12 | 47.51 | 26.67 | 16.40 | 54.70 | 56.00 | 155 |
| 10FX INC | 189.00 | 30.18 | 46.98 | 25.33 | 15.20 | 55.30 | 38.00 | 283 |
| MTHW1065 | 189.33 | 32.41 | 46.45 | 17.33 | 15.90 | 55.80 | 123.30 | 180 |
| VOLT | 194.00 | 30.71 | 45.69 | 3.00 | 16.50 | 54.20 | 85.30 | 169 |
| REEDER | 190.67 | 33.33 | 44.19 | 17.67 | 16.90 | 56.10 | 10.00 | 210 |
| MTHW1069 | 190.67 | 29.92 | 38.48 | 9.00 | 16.70 | 54.90 | 98.70 | 277 |
| WB ROCKLAND | 190.33 | 25.85 | 38.23 | 1.67 | 18.00 | 53.70 | 40.00 | 170 |
| BRENNAN | 190.33 | 28.22 | 37.63 | 38.00 | 15.20 | 58.40 | 4.70 | 243 |
| CHOTWHT1 | 189.33 | 32.02 | 36.97 | 28.33 | 16.00 | 51.90 | 47.30 | 274 |
| MT 1049 | 190.67 | 30.97 | 36.54 | 18.33 | 16.80 | 58.00 | 46.70 | 239 |
| MT 0967 | 189.33 | 31.10 | 34.69 | 37.33 | 16.50 | 55.80 | 54.00 | 138 |
| AGRIPRO SY605 CI | 189.00 | 33.20 | 34.51 | 48.33 | 17.10 | 57.00 | 21.30 | 458 |
| KELBY | 189.67 | 31.36 | 33.88 | 43.33 | 15.90 | 57.80 | 70.70 | 220 |
| MT 0802 | 192.33 | 35.83 | 33.35 | 13.33 | 18.10 | 51.30 | 302.00 | 62 |
| SY SOREN | 190.67 | 27.82 | 32.66 | 40.00 | 16.30 | 54.70 | 18.70 | 324 |
| MT 0928 | 191.00 | 34.51 | 31.45 | 20.67 | 17.80 | 51.20 | 58.70 | 335 |
| AP604 CL | 189.33 | 31.50 | 31.09 | 98.67 | 14.80 | 54.00 | 10.00 | 371 |
| DUCLAIR | 189.33 | 33.07 | 30.83 | 11.33 | 16.60 | 52.20 | 74.00 | 273 |
| SY TYRA | 192.00 | 28.74 | 29.96 | 71.00 | 15.70 | 50.10 | 23.30 | 205 |
| MT 1013 | 190.67 | 31.76 | 29.64 | 35.67 | 17.90 | 49.20 | 32.00 | 201 |
| MT 1020 | 191.33 | 30.84 | 29.20 | 22.67 | 16.90 | 49.60 | 40.70 | 285 |
| MTHW1060 | 188.33 | 28.61 | 28.94 | 55.33 | 15.70 | 52.10 | 60.70 | 178 |
| HANKWHT1 | 189.67 | 27.82 | 28.17 | 64.33 | 15.90 | 46.80 | 75.30 | 147 |
| MT 1015 | 191.67 | 32.15 | 27.97 | 26.67 | 18.20 | 53.60 | 69.30 | 317 |
| KUNTZ | 191.67 | 29.66 | 26.83 | 21.33 | 16.90 | 55.90 | 114.00 | 315 |
| FORTUNA | 192.00 | 38.85 | 25.08 | 21.67 | 17.70 | 55.40 | 264.00 | 232 |
| MCNEAL | 191.67 | 32.68 | 24.01 | 26.33 | 17.20 | 50.80 | 82.00 | 342 |
| WB GUNNISON | 191.00 | 30.58 | 23.76 | 22.00 | 16.80 | 54.20 | 73.30 | 139 |
| VIDAWHT1 | 191.33 | 30.84 | 23.49 | 27.33 | 17.60 | 53.50 | 44.00 | 96 |
| MT 1003 | 190.67 | 31.36 | 22.33 | 32.67 | 17.10 | 48.10 | 29.30 | . |
| BREAKER | 191.67 | 32.15 | 22.05 | 14.33 | 17.60 | 55.30 | 70.00 | 264 |
| CHOTEAU | 191.00 | 31.76 | 21.41 | 8.33 | 17.20 | 50.00 | 64.00 | 288 |
| MT 1007 | 191.00 | 30.84 | 20.92 | 47.67 | 17.00 | 48.80 | 23.30 | 343 |
| MT 1036 | 192.00 | 32.02 | 20.37 | 31.00 | 17.70 | 48.70 | 136.70 | . |
| MT 1028 | 191.67 | 32.68 | 19.80 | 20.67 | 17.80 | 49.50 | 158.00 | 244 |
| MT 1030 | 191.67 | 32.94 | 19.38 | 17.33 | 17.90 | 49.10 | 217.30 | . |
| VANTAGE | 196.00 | 32.94 | 19.36 | 22.00 | 20.20 | 54.80 | 103.30 | 191 |

Table 1. Continued

| Cultivar | Heading (Julian) | Height (inches) | Yield (bu/A) | SR (%) | Protein (%) | Test wt. (lb/bu) | OWBM No/spike | FN (sec) |
|------------|---------------------|--------------------|-----------------|-----------|----------------|---------------------|------------------|-------------|
| CORBIN | 190.33 | 30.32 | 19.26 | 37.00 | 16.70 | 52.10 | 84.70 | 249 |
| MT 1005 | 190.33 | 30.32 | 19.18 | 56.67 | 16.80 | 48.10 | 33.30 | 375 |
| IMICHT79 | 191.33 | 30.71 | 19.13 | 37.33 | 18.20 | 48.20 | 93.30 | . |
| MT 1027 | 191.67 | 30.71 | 19.10 | 15.67 | 17.50 | 49.70 | 86.00 | . |
| HANK | 190.33 | 29.00 | 18.90 | 67.67 | 16.90 | 44.20 | 58.70 | 196 |
| VIDA | 191.33 | 33.07 | 18.88 | 25.33 | 17.80 | 52.80 | 113.30 | 138 |
| MT 1004 | 191.33 | 30.84 | 18.22 | 24.00 | 17.20 | 48.20 | 106.00 | . |
| AGRIPR11 | 192.67 | 28.35 | 17.99 | 52.67 | 18.20 | 49.20 | 102.00 | 287 |
| MT 1038 | 192.00 | 32.68 | 17.95 | 24.00 | 17.80 | 49.30 | 45.30 | . |
| MT 1011 | 191.33 | 29.13 | 17.87 | 60.33 | 17.50 | 48.70 | 59.30 | 283 |
| MT 1053 | 191.67 | 29.40 | 17.12 | 46.00 | 17.30 | 51.30 | 207.30 | 155 |
| MT 1016 | 191.33 | 32.02 | 17.09 | 18.00 | 18.20 | 49.20 | 122.00 | . |
| ONEAL | 192.33 | 29.66 | 16.89 | 52.33 | 17.80 | 50.30 | 100.00 | 299 |
| MT 1008 | 193.00 | 32.55 | 15.33 | 34.67 | 17.90 | 49.50 | 72.00 | 214 |
| MT 1002 | 192.33 | 32.41 | 15.11 | 30.00 | 17.20 | 49.60 | 80.70 | 339 |
| MOTT | 194.33 | 32.02 | 14.64 | 88.33 | 18.40 | 52.40 | 59.30 | 205 |
| MTHW1057 | 192.33 | 30.05 | 14.17 | 12.67 | 17.30 | 51.20 | 266.00 | 77 |
| MT 0972 | 190.67 | 31.10 | 13.98 | 29.00 | 18.60 | 51.80 | 109.30 | 80 |
| MT 1035 | 192.00 | 30.97 | 13.83 | 18.33 | 18.20 | 49.00 | 52.00 | . |
| CONAN | 191.00 | 28.74 | 13.35 | 47.00 | 16.60 | 50.00 | 46.00 | 218 |
| MT 1010 | 192.00 | 32.15 | 10.89 | 48.33 | 17.10 | 50.30 | 36.70 | 280 |
| MT 0852 | 192.00 | 30.97 | 10.19 | 43.00 | 17.10 | 47.80 | 46.70 | 140 |
| JEDD | 190.00 | 23.36 | 6.28 | 88.00 | 17.00 | 44.30 | 28.00 | . |
| THATCHER | 196.33 | 37.01 | 4.73 | 69.00 | 18.00 | 48.70 | 223.30 | . |
| MIN | 187.00 | 23.36 | 4.73 | 1.67 | 14.80 | 44.20 | 4.70 | 62 |
| MAX | 196.33 | 38.85 | 60.76 | 98.67 | 20.20 | 58.40 | 302.00 | 458 |
| MEAN | 191.15 | 31.25 | 26.21 | 33.56 | 17.14 | 51.83 | 80.79 | 232 |
| LSD (0.05) | 1.11 | 2.98 | 7.88 | 12.53 | NA | NA | NA | NA |
| CV | 0.36 | 5.90 | 18.48 | 23.10 | NA | NA | NA | NA |
| TRT (pr>f) | 0.0001 | 0.0001 | 0.0001 | 0.0001 | NA | NA | NA | NA |