

Title: Evaluation of Winter Wheat Lines for Stripe Rust Resistance - 2016

Objective: To evaluate experimental winter wheat cultivars for resistance to stripe rust and agronomic performance in environments and cropping systems representative of northwestern Montana.

Results:

Stripe rust symptoms developed early in the season, with the initial ratings being recorded on May 24. The average infection level was 4.8%, and no significant differences in infection were detected among wheat lines. Stripe rust infection increased during the growing season, and by June 30 stripe rust infection averaged 35.2% and ranged from 11.5% for MT1694 to 95.0% for Decade. Yellowstone had previously shown excellent resistance to stripe rust. Initially, infection levels were low, but by seasons end Yellowstone had a rating of 91.5%, indicating that a new race of stripe rust may be present.

Winter wheat yields averaged 134.3 bu/A, and ranged from 19.3 bu/A for Decade to 168.1 bu/A for MT16101 (Table 2). Yellowstone yielded 132.7 bu/A, but seven experimental lines produced significantly higher yields. Days to fifty percent heading averaged 149 days (May 28) and ranged from 144 days (May 23) for MT1695 to 152 days (May31) for MT1694. Height averaged 42.1 inches and ranged from 37.4 inches for MT1697 to 46.5 inches for MT1693. No significant differences were observed in percent lodging. Protein averaged 12.33% and ranged from 11.24% for MT1694 to 15.18% for Decade. Test weight averaged 58.3 lb/bu and ranged from 49.8 lb/bu for Decade to 61.6 lb/bu for MT1695.

Summary:

Several of the MSU entries have excellent resistance to stripe rust and are higher yielding than local standard winter wheat varieties.

Table 1. Materials and Methods.

Seeding Date: 10/1/2015	Harvest Date: 8/15/2016
Julian Date: 274	Julian Date: 228
Seeding Rate: 80 lb/A	Soil Type: Creston SiL
Previous Crop: Spring Wheat	Soil Test: 209-32-244-34
Tillage: Conventional	Fertilizer: 9-40-40, TD: 75-0-40
Herbicide: Huskie 11oz/A + Axial 16.4 oz/A + NIS 1qt/100gal + UAN 28% 1qt/A	

Table 2. Evaluation of Montana State University experimental lines, Kalispell, MT - 2016.

Entry	HD	Percent Stripe Rust			HT	LOD	YLD ¹	PRO ²	TWT ¹
	Julian	5/24	6/9	6/30	in.	%	bu/A	%	lb/bu
MT16101	148	2.5	6.0	14.5	43.1	30.0	168.1	12.52	60.6
MT1694	152	25.0	6.5	11.5	44.7	0.0	167.6	11.24	60.3
MT1696	151	4.5	9.5	14.0	45.9	5.0	165.6	11.36	60.4
MT1695	144	0.0	16.0	55.0	42.5	2.5	164.7	11.45	61.6
MT16106	151	1.5	16.0	19.5	43.1	5.0	163.0	11.81	59.1
MT1693	151	1.5	7.0	16.5	46.5	0.0	160.5	11.42	60.3
MT16105	149	0.0	10.0	37.5	42.5	5.0	158.5	11.54	60.3
MT16102	148	15.0	23.5	28.5	43.1	2.5	152.8	11.55	60.2
MT1687	147	11.5	19.5	25.0	43.7	16.0	152.1	13.19	60.7
MT16104	150	0.0	29.5	45.0	43.3	2.5	148.0	11.85	59.7
MT1688	148	2.5	9.0	20.0	43.1	9.0	147.8	13.07	60.3
MT16103	147	2.5	27.5	30.0	40.2	7.5	145.7	12.10	60.2
MT1699	147	1.0	17.5	40.0	38.0	0.0	143.8	12.57	59.4
MT1690	143	2.5	14.0	25.0	43.1	33.0	142.8	14.05	59.3
MT16100	150	3.5	22.0	44.0	39.6	0.0	142.3	12.22	57.0
MT1697	148	25.0	18.0	35.0	37.4	0.0	139.1	12.22	59.3
MT1698	149	1.5	20.0	24.0	38.2	0.0	137.0	12.49	57.3
Judee	151	2.0	32.0	16.5	42.7	29.0	134.3	11.87	60.4
Yellowstone	151	7.0	47.5	91.5	44.1	15.5	132.7	11.74	55.7
MT1691	150	4.0	17.5	15.0	41.1	9.0	131.4	12.22	57.0
MT1692	150	2.0	25.0	24.0	42.5	42.5	126.1	12.80	57.3
MT1689	150	2.5	22.5	26.0	38.6	0.0	111.3	13.49	55.9
SY Wolf	147	0.0	37.5	42.5	42.3	11.5	107.3	13.09	53.4
Promontory	151	1.0	16.0	85.0	45.3	0.0	78.4	11.30	51.9
Decade	151	1.5	95.0	95.0	38.8	32.5	19.3	15.18	49.8
Mean	149	4.8	22.6	35.2	42.1	10.3	134.3	12.33	58.3
CV	0.9	200.8	26.2	21.8	2.5	127.9	8.6	2.48	2.1
LSD	2.6	ns	12.2	15.9	2.2	ns	23.9	0.63	2.5
Pr>F	0.0001	0.4462	0.0001	0.0001	0.0001	0.0613	0.0001	0.0001	0.0001

HD: heading, HT: height, LOD: lodging, YLD: yield, PRO: protein, TWT: test weight,
 ns: nonsignificant.

¹ adjusted to 13% moisture.

² adjusted to 12% moisture.