

Title: Evaluation of winter wheat lines for stripe rust resistance and agronomic performance.

Objective: To evaluate stripe rust resistance, yield potential and agronomic attributes of experimental winter wheat lines.

Report:

Sixty one experimental winter wheat lines and three check varieties (Yellowstone, Promontory, and Decade) were evaluated for stripe rust resistance in a non-replicated, observation nursery. Overall, the stripe rust pressure was low this year with only four of the 64 cultivars showing symptoms of stripe rust infection. Decade, a known susceptible variety, had the greatest level of infection at 30.0 percent. Septoria pressure was moderate to high this year. Infection levels averaged 29.1% and ranged from 5.0 to 60.0 percent. Powdery mildew levels averaged 4.3% and ranged from 0.0 to 40.0 percent. Yields averaged 162.0 bu/A and ranged from 135.6 bu/A for 09X260cD15 to 189.4 bu/A for 09X108cD12. Protein averaged 13.1% and ranged from 11.8% for Promontory to 14.7% for 09X284cD29. Test weights averaged 60.3 lb/bu ranging from 57.1 lb/bu for 09X260cD15 to 62.6 lb/bu for Promontory and 07X76CF79. Heading dates spanned 10 days and averaged 159 Julian days (June 8). Heights averaged 41.8 inches and ranged from 31.9 inches to 46.1 inches. Lodging was observed in 12 of the 64 varieties with an average of 6.6% ranging from 0.0% to 80.0 percent.

Summary:

Cultivar, 09X108cD12, afforded the highest yield and demonstrated the greatest level of resistance to powdery mildew, stripe rust and septoria.

Table 1. Materials and Methods - Winter Wheat Stripe Rust Screening - 2014

Seeding Date:	10/1/2013	Harvest Date:	8/12/2014
Julian Date:	274	Julian Date:	224
Seeding Rate:	80 lb/A	Soil Type:	Creston SiL
Previous Crop:	Peas	Soil Test:	259-16-172
Tillage:	Conventional	Fertilizer:	9-40-10 / TD 130-0-0
Irrigation:	None	Herbicide:	Rimfire Max 85 g/A, Huskie 11 floz/A and Preference 25%v/v

Table 2. Effect of stripe rust resistance on winter wheat varieties- 2014.

Cultivar	HD Julian	HT in	LOD %	PMD %	SR %	SEP %	YLD bu/A	PRO %	TWT lb/bu
09X108cD12	161	44.9	0.0	0.0	0.0	5.0	189.4	12.9	60.6
07X76cF96	155	38.2	0.0	0.0	0.0	13.0	180.2	12.7	61.8
07X76cF81	162	44.9	30.0	0.0	0.0	45.0	179.4	12.2	59.2
07X76cF83	162	43.3	0.0	0.0	0.0	12.0	178.2	12.4	59.8
07X76cF80	161	44.1	0.0	0.0	0.0	43.0	178.1	12.2	60.5
09X111cD31	160	44.5	15.0	0.0	0.0	15.0	177.7	13.6	61.4
07X76cF24	156	44.1	0.0	0.0	0.0	45.0	176.3	12.0	60.4
Yellowstone	157	41.7	10.0	0.0	0.0	45.0	175.2	12.3	61.7
09X260cD53	159	44.5	0.0	8.0	0.0	30.0	174.3	12.5	59.9
09X257cD13	160	41.7	0.0	0.0	0.0	45.0	174.0	12.9	60.6
09X284cD30	160	38.6	0.0	0.0	0.0	16.0	172.1	14.3	60.2
07X74F13	160	44.9	25.0	0.0	0.0	30.0	171.0	12.4	60.8
07X76cF44	157	39.8	0.0	5.0	0.0	12.0	170.6	12.2	61.3
09X260cD6	162	43.7	30.0	0.0	0.0	20.0	169.2	12.8	60.9
07X76cF55	153	40.9	0.0	0.0	0.0	50.0	169.0	12.0	60.7
09X257cD9	160	37.4	0.0	0.0	0.0	10.0	168.2	13.6	59.4
09X284cD49	157	40.2	0.0	5.0	0.0	25.0	166.9	13.8	59.7
09X260cD75	163	45.7	0.0	10.0	0.0	44.0	166.5	12.9	58.9
07X76cF91	154	39.0	0.0	0.0	0.0	60.0	166.4	12.0	61.6
09X260cD10	160	44.1	0.0	0.0	0.0	24.0	165.2	12.6	59.6
09X284cD66	155	38.2	0.0	0.0	0.0	15.0	164.6	13.8	61.2
09X284cD13	156	40.2	0.0	0.0	0.0	15.0	164.6	14.0	60.6
09X260cD43	160	43.3	0.0	13.0	0.0	38.0	164.3	12.3	59.4
09X257cD33	159	38.6	15.0	0.0	0.0	23.0	164.3	12.7	60.7
09X284cD29	157	40.9	0.0	0.0	0.0	20.0	164.0	14.7	61.2
09X257cD47	159	41.7	0.0	0.0	0.0	50.0	164.0	13.8	60.7
09X260cD82	157	41.7	0.0	20.0	0.0	30.0	163.5	12.6	60.2
09X284cD85	157	38.6	0.0	5.0	0.0	12.0	163.4	14.6	61.1
09X260cD27	160	42.5	0.0	0.0	0.0	38.0	163.3	12.6	59.8
09X257cD45	160	41.7	0.0	0.0	0.0	30.0	162.7	13.7	60.8
09X257cD50	161	42.1	0.0	0.0	0.0	60.0	162.6	13.4	60.4
09X257cD18	159	40.2	0.0	0.0	0.0	40.0	162.4	13.6	59.8
09X260cD48	161	44.1	30.0	15.0	0.0	25.0	161.7	12.9	59.8
Promontory	159	44.1	0.0	5.0	0.0	8.0	161.6	11.8	62.6
09X257cD38	155	38.6	0.0	5.0	0.0	45.0	160.8	13.1	60.7
09X111cD30	157	41.3	0.0	5.0	0.0	27.0	160.5	13.9	61.3
07X76cF78	155	42.1	0.0	0.0	0.0	38.0	160.5	12.9	62.0
09X260cD26	159	44.5	0.0	0.0	0.0	50.0	160.3	12.7	60.5
09X284cD87	157	38.2	0.0	0.0	0.0	18.0	160.1	14.4	60.6
09X111cD28	160	46.1	80.0	20.0	0.0	8.0	159.9	13.1	61.1

HD: heading, HT: height, LOD: lodging, PM: Powdery Mildew Disease, SR: stripe rust, SEP: septoria, YLD: yield, PRO: protein, TWT: test weight.

Table 2. continued

Cultivar	HD Julian	HT in	LOD %	PMD %	SR %	SEP %	YLD bu/A	PRO %	TWT lb/bu
09X260cD29	159	44.1	0.0	0.0	0.0	20.0	159.7	12.8	59.8
09X260cD76	161	44.1	0.0	30.0	0.0	40.0	159.3	12.8	58.0
09X111cD27	163	46.1	0.0	0.0	0.0	15.0	159.1	13.9	59.8
09X260cD2	160	43.3	0.0	0.0	0.0	13.0	158.7	12.7	60.4
09X260cD19	161	44.1	65.0	5.0	0.0	12.0	158.5	12.6	61.6
09X260cD85	160	41.7	0.0	0.0	0.0	23.0	157.9	12.7	59.6
09X257cD28	160	40.2	0.0	0.0	0.0	30.0	157.5	12.9	59.2
09X284cD32	155	40.2	0.0	0.0	10.0	25.0	157.5	14.5	60.8
09X257cD55	163	41.7	0.0	0.0	0.0	22.0	154.3	14.0	61.0
07X76cF87	157	35.4	0.0	0.0	0.0	20.0	153.9	13.1	62.4
09X260cD74	162	45.3	60.0	10.0	0.0	38.0	153.4	12.7	60.1
09X260cD28	158	44.5	0.0	0.0	0.0	15.0	152.8	12.9	59.7
07X76cF79	155	39.8	0.0	0.0	0.0	60.0	152.4	12.8	62.6
09X108cD4	160	40.2	0.0	10.0	0.0	20.0	151.4	14.0	60.4
09X257cD34	157	40.2	0.0	0.0	0.0	60.0	151.4	12.7	58.6
09X111cD24	160	43.3	0.0	5.0	0.0	15.0	150.9	13.3	60.1
09X108cD1	157	41.3	0.0	10.0	15.0	15.0	150.9	14.1	60.5
09X260cD80	160	44.1	0.0	40.0	0.0	45.0	149.7	12.4	58.5
Decade	156	40.6	0.0	20.0	30.0	20.0	149.5	12.7	60.9
09X260cD77	163	44.5	55.0	20.0	0.0	45.0	149.4	12.9	59.5
09X111cD38	163	44.1	5.0	5.0	0.0	25.0	148.4	13.9	59.7
09X257cD1	160	39.8	0.0	5.0	0.0	50.0	145.9	13.4	59.0
09X260cD15	160	31.9	0.0	0.0	10.0	50.0	135.6	12.8	57.1
Mean	159	41.8	6.6	4.3	1.0	29.1	162.0	13.1	60.3
Min	153	31.9	0.0	0.0	0.0	5.0	135.6	11.8	57.1
Max	163	46.1	80.0	40.0	30.0	60.0	189.4	14.7	62.6

HD: heading, HT: height, LOD: lodging, PMD: Powdery Mildew Disease, SR: stripe rust, SEP: septoria, YLD: yield, PRO: protein, TWT: test weight.