2015 Wheat and Oat Variety Response to Foliar Diseases

Supplement to: 2015 Small Grains Official Variety Trial Report
College of Agriculture, Auburn University

Method

Disease ratings for the 2014-2015 variety trials for wheat and oats are summarized by region in Tables 1 through 5. Diseases were rated by K.L. Bowen, Professor of Plant Pathology, and Nick Hall, AU Crop, Soil and Environmental Sciences undergraduate. Rust diseases are rated on a severity scale ranging from 0 to 100, indicating the proportion of the flag leaves that are affected across the plot. All other diseases are rated on a scale of 0 to 9, where 0 indicates no disease, 4-5 reflects about half of the plants are moderately affected, and 9 = severe disease affecting all plants in plot. Diseases were rated as close to soft dough as could be scheduled.

Discussion

Only four wheat variety trials were rated this year, primarily due to rainy weather across the state. Trial locations that were rated included Gulf Coast REC, Prattville Ag Research Unit, E.V. Smith Research Center Plant Breeding Unit, and Tennessee Valley REC. Fungicides were applied to wheat variety trials at most locations and did a good job at minimizing foliar diseases. No powdery mildew or stripe rust was found at any location. Leaf rust was noted only at central locations, where it was found at low to trace levels. Due to frequent rains, Fusarium head blight (= scab) and Septoria glume blotch were problematic at Gulf Coast, Prattville and E.V. Smith. A fungicide application can help with scab management, if the open flower is protected. However, because of flowering-time differences among varieties in wheat trials, all varieties could not be appropriately treated. Even at Tennessee Valley, where disease levels were generally low, a few varieties had moderate levels of scab. Weather conditions at Gulf Coast REC allowed disease rating of only a single replication and plants were past soft dough stage at the time.

Fungicide applications were not done at E.V. Smith Research Center. At EVSRC and Prattville, leaf blotch was 5.7 and 0.6, glume blotch was 3.7 and 1.1, and scab was rated at 5.3 and 4.0, respectively. These differences demonstrate the effectiveness of fungicide applications in this year's conditions.

Wheat varieties with consistently lower disease levels across the four sites included Progeny 357, Progeny PGX 13-6, Progeny PGX 14-5, and Terral TV 8848. Progeny 357, Progeny PGX 14-5 and Terral TV8847 had similarly late flowering dates at Gulf Coast, and fungicide application was appropriately timed for protecting these from scab. Progeny PGX 14-5 flowered earlier, about the same time as Baldwin, Progeny 410 and AGS 2027, yet Progeny PGX 14-5 had lower scab intensity suggesting lower susceptibility to this disease. USG 3404 also did well at Prattville, E.V. Smith and Tennessee Valley.

Disease was rated on oats at Prattville, E.V. Smith Plant Breeding Unit and Tennessee Valley. Low level to trace amounts of Helminthosporium leaf spot, but no other diseases, were seen at Prattville and Tennessee Valley (data not included herein). Varieties showed differing response to leaf spot at EVSRC, where some had severe disease. Varieties with the lowest levels of leaf spot were FL720-R6, Gerard 229 and Horizon 201.

Table 1. Wheat disease ratings at TVREC, Belle Mina 2015.

Variety	Leaf Blotch	Glume Blotch	Scab	Yellow Dwarf
AGS 2027	1.0	0.0	1.7	0.0
AGS 2035	0.8	1.0	0.7	0.0
AGS 2038	0.0	0.0	0.0	0.0
AGS 2040	1.7	0.8	1.2	0.0
AR00343-5-1	0.5	0.0	0.0	0.0
AR01040-4-1	0.3	0.3	0.0	0.3
ARGA04510-11LE24	1.0	0.3	0.0	0.0
Baldwin	0.5	0.5	0.0	0.0
Dixie DXEX 13-3	0.7	3.0	0.0	0.0
Dixie DXEX 15-1	0.0	0.0	0.2	0.0
Dixie DXEX 15-2	0.0	0.0	0.0	0.0
Dixie Extreme	0.0	0.0	0.0	0.0
Dixie Kelsey	0.3	0.5	0.3	0.3
Dixie McAlister	2.3	0.3	0.3	1.0
Dyna Gro 9522	0.4	0.4	0.0	0.0
Dyna Gro 9552	0.7	0.4	0.0	0.7
GA-03564-12E6	0.8	0.7	2.3	0.0
GA-04417-12E33	0.0	0.5	2.5	0.0
GA-04434-12LE28	0.0	0.0	0.4	0.0
GA-07163-12LE9	0.3	0.0	0.0	0.0
Hilliard	0.5	1.0	0.0	0.0
Jamestown	1.0	1.0	0.5	0.0
Oakes	0.0	0.7	0.0	0.0
Progeny 125	1.0	1.7	0.0	0.0
Progeny 357	0.7	0.0	0.0	0.0
Progeny 410	0.7	0.0	0.3	0.0
Progeny 870	2.0	0.1	0.0	0.3
Progeny PGX 13-6	0.0	0.0	0.0	0.5
Progeny PGX 14-3	0.0	0.0	0.0	0.0
Progeny PGX 14-5	0.3	0.3	0.0	0.0
Savoy	1.0	0.5	2.7	2.0
SY Harrison	0.7	0.3	0.0	0.5
Syngenta SX 104	0.5	1.0	0.4	0.0
Terral LA 754	1.2	0.5	2.7	0.0
Terral LA 841	1.0	1.0	3.5	0.0
Terral TV 8848	0.0	0.0	0.0	0.0
Terral TV 8861	0.4	0.0	0.0	0.0
USG 3013	0.0	0.0	0.0	0.0
USG 3201	0.0	0.0	0.0	0.0
USG 3251	0.7	0.0	0.0	0.0
USG 3404	0.5	0.5	0.0	0.0
USG 3756	0.0	0.0	0.0	0.0
USG 3833	0.0	0.5	0.0	0.0
VA 10W-96	0.7	0.0	1.8	0.0
VA 11W-106	0.7	0.4	0.0	0.0
LSD (0.05)	2.6	2.6	2.6	NS
Pr>F	< 0.0001	< 0.0001	< 0.0001	0.3682

Table 2. Wheat disease ratings at PARU, Prattville 2015.

Variety	Leaf Rust	Leaf Blotch	Glume Blotch	Scab	Yellow Dwarf
AGS 2027	0	0.2	0.4	6.3	0.0
AGS 2035	0	0.9	1.1	5.0	0.0
AGS 2038	0	0.5	1.0	7.5	0.0
AGS 2040	0	1.5	0.4	4.0	0.0
AR00343-5-1	0	0.7	1.7	3.3	0.0
AR01040-4-1	0	0.8	1.4	4.7	0.0
ARGA04510-11LE24	0	0.5	0.1	8.0	0.0
Baldwin	0	1.0	0.0	4.3	0.0
GA-03564-12E6	0	0.7	2.1	4.4	0.0
GA-04417-12E33	0	0.6	2.0	7.0	0.0
GA-04434-12LE28	0	0.7	1.7	5.3	0.0
GA-07163-12LE9	0	0.5	0.1	5.3	0.0
Hilliard	0	0.2	2.0	3.6	0.0
Jamestown	0	0.8	2.0	2.5	0.0
Oglethorpe	0	0.9	1.1	4.3	1.0
Progeny 125	0.51	0.8	1.3	2.8	0.0
Progeny 357	3	0.5	0.4	2.0	0.0
Progeny 410	0	0.5	0.7	3.0	0.0
Progeny 870	0	0.2	2.3	2.6	1.3
Progeny PGX 13-6	0.02	0.2	1.0	1.0	0.0
Progeny PGX 14-3	0	0.9	1.7	2.8	0.0
Progeny PGX 14-5	0.02	0.0	0.7	1.5	0.0
Savoy	0	0.5	1.0	3.6	2.3
Terral LA 754	0	0.7	0.2	4.0	1.7
Terral LA 841	0	1.5	1.7	5.6	0.0
Terral TV 8848	0.33	0.5	2.1	1.7	0.0
Terral TV 8861	0.02	0.2	1.0	2.5	0.3
USG 3120	0	1.2	0.7	3.6	0.0
USG 3251	0.02	0.5	1.1	2.4	0.3
USG 3404	0	0.9	1.7	2.4	0.0
VA 10W-96	0	0.2	0.4	6.3	0.0
VA 11W-106	0	0.2	2.3	2.6	0.0
LSD (0.05)	3.02	2.9	3.0	3.0	NA
Pr>F	0.016	0.4331	< 0.0001	< 0.0001	0.3948

*Rust rated as % severity on flag and flag-1 leaves; disease ratings done on 5 May 2015.

**Other diseases rated on scale of 0 to 9, where 9 indicates that plant was dead from disease.

Table 3. Wheat disease ratings at Plant Breeding Unit, Shorter 2015.

Variety	Leaf Rust	Leaf Blotch	Glume Blotch	Scab
AGS 2027	0	9.4	4.7	6.3
AGS 2035	0	5.5	3.5	5.7
AGS 2038	0	4.0	1.5	5.2
AGS 2040	0.13	8.6	2.4	8.1
AR00343-5-1	0	8.0	7.0	4.0
AR01040-4-1	0	9.4	6.8	5.5
ARGA04510-11LE24	0.1	2.8	1.7	4.8
Baldwin	0	6.0	2.7	4.0
GA-03564-12E6	0.13	7.6	4.4	5.1
GA-04417-12E33	0.13	7.6	7.4	7.1
GA-04434-12LE28	0	8.5	3.8	6.0
GA-07163-12LE9	0	8.4	1.7	4.3
Hilliard	0.6	3.0	4.0	4.6
Jamestown	0	8.9	4.7	6.3
Oglethorpe	0.13	5.6	7.4	4.1
Progeny 125	0.06	3.0	1.0	6.6
Progeny 357	0	1.7	2.6	2.5
Progeny 410	0.13	4.6	3.4	4.1
Progeny 870	0.6	4.0	4.0	3.6
Progeny PGX 13-6	0	3.0	2.3	2.5
Progeny PGX 14-3	14.8	2.4	6.6	2.3
Progeny PGX 14-5	0.13	1.6	0.4	2.1
Savoy	0.13	8.6	7.4	8.1
Terral LA 754	0.1	6.3	0.7	6.3
Terral LA 841	0.1	8.6	7.2	8.1
Terral TV 8848	0	3.7	2.3	2.7
Terral TV 8861	3.97	1.8	4.0	3.5
USG 3120	1.67	8.0	2.3	7.3
USG 3251	0.06	4.0	3.0	2.6
USG 3404	0.1	1.3	2.2	2.3
VA 10W-96	0	7.2	0.8	4.0
VA 11W-106	0	5.2	3.3	3.5
LSD (0.05)	4.43	2.7	1.9	1.9
Pr>F	<0.0001	0.0047	0.0003	0.0007

*Rust rated as % severity on flag and flag-1 leaves; diseases rated on 28 Apr 2015.

**Other diseases rated on scale of 0 to 9, where 9 indicates that plant was dead from disease.

Table 4. Wheat disease ratings at Gulf Coast REC, Fairhope 2015.

Variety	Leaf Blotch	Glume Blotch	Scab
AGS 2027	7	3	4
AGS 2035	4	4	7
AGS 2038	1	5	6
AGS 2040	8	5	9
AR00343-5-1	5	8	.
AR01040-4-1	7	9	3
ARGA04510-11LE24	1	1	5
Baldwin	3	3	3
GA-03564-12E6	7	3	4
GA-04417-12E33	7	7	3
GA-04434-12LE28	6	5	8
GA-07163-12LE9	5	3	5
Hilliard	3	5	2
Jamestown	1	7	2
Limagrain LCS 2564	4	6	2
Oglethorpe	3	7	3
Progeny 125	3	6	3
Progeny 357	7	6	1
Progeny 410	4	6	4
Progeny 870	3	3	2
Progeny PGX 13-6	2	3	4
Progeny PGX 14-3	4	5	1
Progeny PGX 14-5	4	3	1
Savoy	3	8	8
Terral LA 754	4	3	8
Terral LA 841	8	5	8
Terral TV 8848	8	2	1
Terral TV 8861	7	2	3
USG 3120	4	.	8
VA 10W-96	2	1	4
VA 11W-106	2	2	2

*All diseases rated on a scale of 0 to 9, where 0 = no disease and 9 = plants apparently dead from disease.

**Diseases rated on 27 Apr 2015; only one replicaton rated due to rainfall.

Table 5. Oat disease ratings at Plant Breeding Unit, Shorter 2015.

Variety	Helminthosporium leaf spot
FL03254 L1	7.0
FL0772-R3	5.7
FL720-R6	2.7
Gerard 224	5.3
Gerard 229	2.3
Horizon 201	2.0
Horizon 270	7.0
Horizon 306	4.7
LA 07007SBSBSB-18	6.3
LA 07007SBSBSB-24	8.0
LSD (0.05)	3.7
Pr>F	< 0.0001