

WHEAT (*Triticum aestivum*)  
 Fusarium head blight (scab); *Fusarium graminearum*  
 Powdery mildew; *Blumeria graminis* f.sp. *tritici*  
 Leaf rust; *Puccinia triticina*  
 Septoria blotch; *Zymoseptoria tritici*  
 Stagonospora blotch; *Parastagonospora nodorum*

M.R. Fulcher, J.A. Cummings, G.C. Bergstrom, Section of Plant Pathology and Plant-Microbe Biology, D. Benschler, and M.E. Sorrells, Plant Breeding and Genetics Section, School of Integrative Plant Sciences, Cornell University, Ithaca, NY 14850.

### Evaluation of foliar and spike diseases on winter wheat varieties and breeding lines conducted in New York, 2015

Soft red and white winter wheat variety trials were completed in three counties in central and western New York (Tompkins, Livingston, Monroe). Each trial was split into white and red varieties and planted in randomized complete blocks with every plot reproduced in triplicate. Each replicate was a six row plot measuring 13.12 ft by 4.13 ft. In the fall, 200 lb/A 10-20-20 fertilizer (10 lb/A of N) was broadcast over fields, and a top-dressing of 150 lb/A 34-0-0 (51 lb/A of N) was applied in the spring. Maestro 2EC + Harmony Extra SG with a surfactant was applied in early April to control weeds. Seed was sown at 180 lb/A between 2-9 Oct. No inoculum or fungicides were applied. Data was collected in Livingston and Monroe counties on 24 Jun. Ratings were taken at the Tompkins County site on 1 Jul. Disease severity was measured on flag leaves or spikes and averaged across entire plots. The fusarium head blight index (FHB Index) is a composite measure of disease incidence and severity (percent infected plants \* percent spike severity / 100). Variety means from each location were separately subjected to ANOVA, and significant differences were identified using Tukey's HSD test ( $P=0.05$ ).

Disease pressure was relatively low at all locations. Scab was rated at all three sites, but powdery mildew, leaf rust, leaf blotch, and glume blotch were each rated at only those sites where noticeable levels of disease were present. Of the white wheats, Cayuga had the highest levels of powdery mildew, and Houser had the highest level of leaf rust. Glume and leaf blotch levels were uniformly low for both the white and red wheats. The red wheat LCS 0215 was the only variety with significantly greater amounts of powdery mildew at both locations where this disease was present, and OH05-200-74-628 was the only variety with a high incidence of leaf rust. At the Tompkins county site, there were significant differences in FHB index among the red wheats. Although disease pressure was low, many of the trialed breeding lines show promise.

White Wheat Variety / Location	FHB Index		Mildew		Leaf Rust		Leaf Blotch		Glume Blotch			
	T <sup>z</sup>	L	M	M	L	M	T	M				
09079-6-07-1114	0.18	b <sup>y</sup>	0.09	0.08	1.00 <sup>x</sup>	b	0.67	1.00	b	2.00	1.00	b
Caledonia	2.10	b	0.79	0.17	1.00	b	5.00	1.00	b	3.00	1.00	b
Cayuga	0.40	b	1.40	0.18	8.67	a	7.33	1.00	b	4.00	1.00	b
Hopkins	0.33	b	0.37	0.18	3.67	ab	5.00	1.00	b	1.00	1.00	b
Houser	2.25	b	3.01	0.07	1.00	b	9.00	1.00	b	1.00	1.00	b
Medina	2.20	b	0.17	0.20	2.33	ab	0.67	1.67	ab	4.00	1.67	ab
NY01016-AN	1.00	b	0.00	0.18	1.00	b	0.00	1.00	b	2.00	1.00	b
NY01019-1187	0.25	b	0.43	0.20	1.00	b	0.67	5.00	a	4.00	5.00	a
NY02003-1202	6.00	a	0.00	0.19	1.00	b	0.00	1.00	b	1.00	1.00	b
NY02008-813	0.33	b	0.39	0.26	8.33	a	3.00	1.00	b	2.00	1.00	b
NY05152-821	0.27	b	0.11	0.24	1.00	b	1.00	2.33	ab	1.00	1.00	b
NY05158-833	0.33	b	0.03	0.31	1.00	b	0.33	2.33	ab	2.00	5.00	a
NY05158-841	0.09	b	0.00	0.13	1.00	b	0.00	2.33	ab	1.00	3.00	ab
NY05158-842	0.40	b	0.00	0.14	1.67	ab	0.00	1.00	b	2.00	3.00	ab
NY05158-846	0.21	b	0.00	0.13	2.33	ab	0.00	1.00	b	1.00	1.00	b
NY05158-857	0.29	b	0.00	0.14	5.00	ab	0.00	2.33	ab	1.00	2.33	ab
NY05158-859	0.08	b	0.00	0.10	1.00	b	0.00	1.00	b	1.00	1.00	b
NY05158-864	0.07	b	0.00	0.07	1.00	b	0.00	1.33	ab	2.00	1.00	b
NY07078-876	0.90	b	0.93	0.18	4.33	ab	4.67	2.33	ab	2.00	3.67	ab
NY09090-2-901	0.34	b	1.50	0.16	1.67	ab	4.33	1.67	ab	2.00	1.00	b
NY10127-10-36-1307	1.25	b	2.90	0.16	2.33	ab	2.67	1.00	b	2.00	1.00	b
NY94025-136	1.60	b	1.23	0.17	1.00	b	5.00	3.67	ab	4.00	3.67	ab
NY94052-207	0.27	b	0.00	0.16	2.33	ab	0.00	1.00	b	1.00	1.00	b
NY94052-6090B-1074	0.18	b	0.04	0.14	1.00	b	0.33	1.00	b	2.00	2.33	ab
NY96153-167	2.20	b	0.27	0.25	1.00	b	0.67	2.33	ab	1.00	1.00	b
NY99056-161	0.24	b	1.42	0.09	1.00	b	6.00	1.00	b	2.00	1.00	b
NY99059-249	0.54	b	0.39	0.20	1.67	ab	2.67	1.00	b	1.00	2.33	ab
NY99069-249	0.37	b	0.68	0.14	1.00	b	5.67	1.00	b	1.00	1.00	b
NY99069-352	1.50	b	0.67	0.08	1.00	b	4.67	1.00	b	1.00	1.00	b
Otsego	0.56	b	0.00	0.17	5.67	ab	0.00	1.00	b	2.00	1.00	b
HSD ( $P=0.05$ )	3.34		4.54	0.35	7.33		13.16	3.73		4.76		3.52
CV (%)	91		252	67	102		177	75		62		63

Red Wheat Variety / Location	FHB Index		Powdery Mildew		Leaf Rust		Leaf Blotch		Glume Blotch	
	T	L	M	L	M	L	M	T	L	
Branson	1.30 a	0.94 d	0.24	0.00 b	0.33 b	0.00 b	1.67	1.00	1.00	
Erie	0.24 bcd	0.67 d	0.18	0.00 b	0.00 b	0.00 b	1.00	1.00	1.00	
IL04-8445-440	0.12 cd	2.03 cd	0.18	0.00 b	0.67 b	0.00 b	1.00	1.00	2.33	
KWS008	0.11 cd	0.16 d	0.14	0.00 b	0.00 b	0.67 b	2.33	2.00	1.00	
KWS009	0.75 abc	0.22 d	0.29	0.00 b	0.00 b	0.00 b	1.00	1.00	1.00	
KWS023	0.35 bcd	0.44 d	0.20	0.00 b	0.33 b	0.33 b	1.00	1.00	1.67	
KY03C-1237-12	0.24 bcd	0.27 d	0.10	0.00 b	0.33 b	0.00 b	2.33	2.00	3.00	
KY03C-1237-39	0.58 bcd	0.14 d	0.12	0.00 b	0.67 b	0.00 b	1.00	1.00	1.00	
LCS 0215	0.07 d	0.10 d	0.08	8.33 a	3.00 a	3.33 b	3.00	1.00	1.00	
LCS 3334	0.12 cd	1.20 cd	0.12	0.00 b	0.00 b	0.33 b	1.00	2.00	1.00	
MO080104	0.09 d	0.20 d	0.04	0.00 b	0.33 b	0.00 b	1.00	3.00	0.67	
MO081652	0.21 bcd	0.12 d	0.12	0.00 b	0.67 b	0.33 b	1.00	2.00	1.00	
MO110799	0.75 abc	0.34 d	0.14	0.00 b	0.00 b	0.33 b	1.67	2.00	1.00	
NY03143-1218	0.05 d	6.05 ab	0.18	0.00 b	1.00 b	0.00 b	1.00	1.00	3.00	
NY05152-818	0.21 bcd	0.58 d	0.20	0.00 b	0.33 b	0.67 b	2.33	2.00	2.33	
NY09067-2-69-1097	0.21 bcd	0.66 d	0.18	0.00 b	0.33 b	1.33 b	1.67	2.00	1.00	
OH05-200-74-628	0.03 d	1.09 cd	0.22	0.00 b	0.33 b	18.33 a	1.00	1.00	1.00	
OH05-248-38-444	0.16 bcd	6.27 a	0.16	0.00 b	0.00 b	3.33 b	1.67	1.00	1.00	
OH07-264-35	0.77 ab	0.08 d	0.16	0.00 b	0.33 b	0.00 b	1.00	2.00	2.33	
OH12-242-4	0.07 d	0.06 d	0.10	0.00 b	0.00 b	0.00 b	1.00	1.00	1.00	
OH12-297-15	0.32 bcd	0.16 d	0.16	0.00 b	1.00 b	0.33 b	1.00	3.00	1.67	
OH12-299-41	0.27 bcd	0.13 d	0.20	0.00 b	0.67 b	2.00 b	1.67	2.00	1.00	
Otsego	0.39 bcd	3.57 bc	0.22	1.67 b	1.00 b	0.33 b	2.33	1.00	1.67	
P0762A1-2-8	0.14 bcd	0.12 d	0.16	0.00 b	0.67 b	0.00 b	1.00	2.00	1.00	
Pioneer 25R25	0.11 cd	0.20 d	0.22	0.00 b	0.00 b	0.33 b	1.00	2.00	1.00	
Pioneer 25R40	0.04 d	2.23 cd	0.14	0.00 b	0.00 b	0.00 b	4.67	1.00	1.00	
Pioneer 25R46	0.21 bcd	0.10 d	0.08	0.00 b	0.33 b	0.00 b	3.67	1.00	1.00	
Pioneer 25R50	0.12 cd	0.31 d	0.22	0.00 b	0.33 b	0.00 b	0.67	1.00	1.67	
VA11W-106	0.24 bcd	0.44 d	0.12	0.00 b	0.00 b	0.00 b	1.67	1.00	1.00	
VA11W-108	0.43 bcd	0.16 d	0.14	0.00 b	0.00 b	0.00 b	1.67	2.00	1.00	
HSD (P=0.05)	0.64	2.69	0.27	2.52	1.76	8.45	4.64	3.69	2.98	
CV (%)	54	82	52	222	130	233	90	58	69	

<sup>z</sup> Counties abbreviated: T = Tompkins, L = Livingston, M = Monroe

<sup>y</sup> Numbers within a column followed by the same letter are not significantly different from each other according to Tukey's HSD Test ( $P=0.05$ )

<sup>x</sup> All ratings are percent incidence with the exception of FHB Index