

Stripe Rust resistance in Michigan wheat varieties

Lee Siler¹, Andrew Wiersma¹, Martin Nagelkirk², Eric Olson¹

¹ *Department of Plant, Soil and Microbial Sciences, Michigan State University*

² *Michigan State University Extension*

In 2016, stripe rust arrived early in the growing season before heading and could potentially cause significant yield loss. Stripe rust is not a common disease in Michigan and significant disease pressure has not been present in variety trial locations. Therefore, accurate assessments of resistance in Michigan wheat varieties have not been possible until 2016.

Stripe rust levels at the Ingham and Tuscola county have been increasing over the past five weeks. Michigan wheat varieties were evaluated according to the 0 to 9 rating scale used by stripe rust researchers across the US (Figure 1). Data was also collected on the percent of leaf area infected by stripe rust. Ratings were made on June 1st and 2nd by a team of researchers including Lee Siler and Andrew Wiersma from MSU Wheat Breeding and Genetics and Martin Nagelkirk of MSU-Extension.

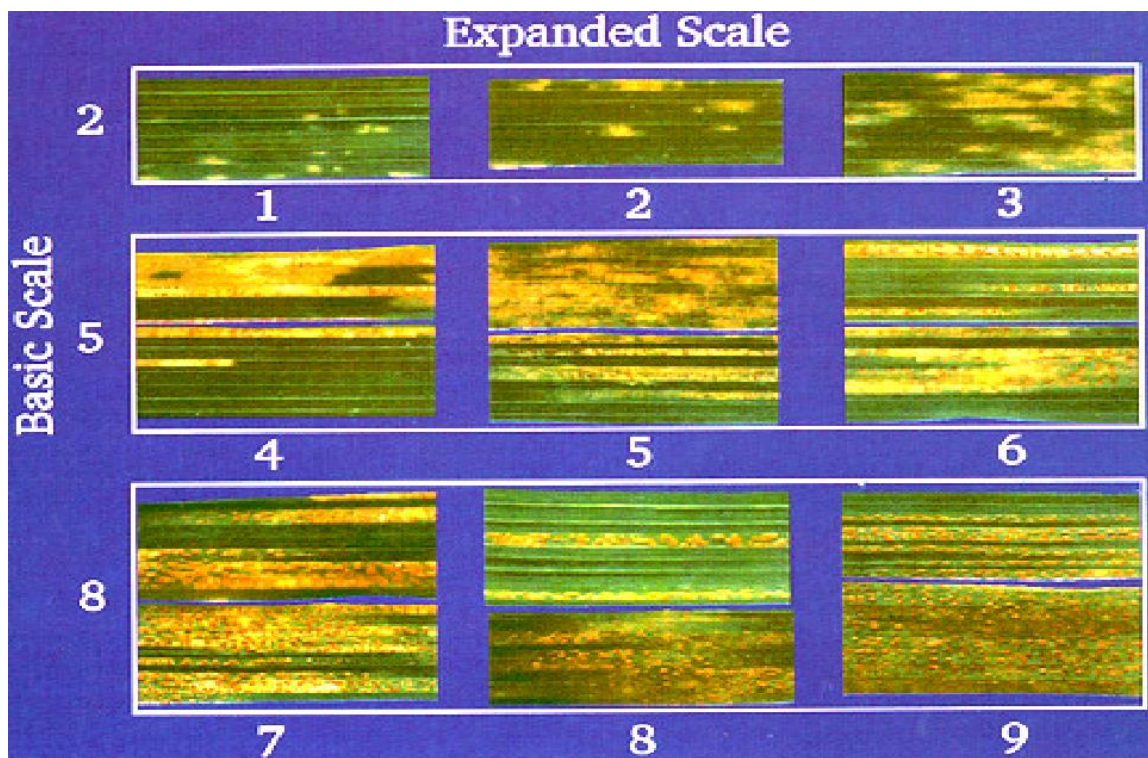


Figure 1. Infection types of stripe rust on leaves of adult-plants. Credit: Dr. Xianming Chen, USDA-ARS, Pullman WA.

A wide range of infection types were found in 59 varieties available to Michigan wheat growers. Varieties were classified as resistant (R), moderately resistant (MR), moderately susceptible (MS) and susceptible (S). Eight varieties were found to be resistant, 19 were moderately resistant, 14 were moderately susceptible and 19 were fully susceptible.

Classification of varieties as R, MR, MS and S have implications for management and potential yield loss due to stripe rust. Resistant varieties retain a large amount of leaf area while more susceptible varieties show a larger percentage of leaf area covered by stripe rust.

Varieties in the R class are highly resistant to stripe rust (Table 1). In R varieties, there is no evidence of sporulation on leaves and flag leaves have retained 95 to 100% of their photosynthetic leaf area.

Varieties in the MR class are moderately resistant, however some degree of sporulation is present on infected leaves (Table 1). MR varieties have retained 60 to 95% of their photosynthetic leaf area and a fungicide may be necessary to preserve yield potential.

Table 1. Varieties resistant and moderately resistant to stripe rust

Variety	Infection Type	% Infection	Class
L 11528	0	2	R
SY 100	1	3	R
AgriMAXX 413	1	1	R
SY 483	1	2	R
DF 105 R	1	2	R
Diener 496W	1	5	R
RS 972	2	4	R
MCIA Venus	2	2	R
Pioneer Brand 25R25	3	5	MR
Pioneer Brand 25R40	3	5	MR
AgriMAXX 438	3	5	MR
Hilliard	3	5	MR
AgriMAXX 444	3	5	MR
DF 112 R	3	5	MR
9552	4	5	MR
LCS 2214	4	6	MR
L-334	4	6	MR
Jupiter	4	16	MR
MCIA Red Devil	4	5	MR
Equity Brand Butler	4	5	MR
MCIA Red Dragon	4	32	MR
9522	5	5	MR
DF 109 R	5	5	MR
W 202	5	11	MR
W 307	5	12	MR
Sunburst	5	14	MR
9242W	5	37	MR

Varieties in the MS class are moderately susceptible and have heavy sporulation and significant damage to flag leaves (Table 2). Yield-limiting levels of disease are possible in MS varieties. A fungicide will be necessary to protect yield.

Varieties in the S class are highly susceptible to stripe rust (Table 2). S varieties have lost 20% to 50% of their photosynthetic area at this point and will incur significant yield loss without a fungicide application.

Table 2. Varieties moderately susceptible and susceptible to stripe rust

Variety	Infection Type	% Infection	Class
SC 1335-15	6	10	MS
TW528-003	6	27	MS
RS 910	6	22	MS
Diener 491W	6	28	MS
Pioneer Brand 25R50	6	8	MS
MCIA Whale	6	6	MS
LCS 3677	6	27	MS
MSU 6012	6	7	MS
SC 1315-15	6	14	MS
AC Mountain	6	19	MS
W 204	6	37	MS
W 303	6	14	MS
HS 284R	6	34	MS
L 11418	6	24	MS
Francis	7	21	S
W 206	7	20	S
Hopewell	7	19	S
Aubrey	7	22	S
Shirley	7	47	S
SC 1325-15	7	42	S
L-241	7	19	S
Ambassador	7	39	S
AgriMAXX 454	7	29	S
Red Ruby	7	50	S
W 304	7	23	S
9692	7	18	S
RS 9XP011	7	37	S
Skeet	7	29	S
SC 13S26	7	38	S
Pioneer Brand 25R46	7	38	S
HS 30.06	8	23	S
DF 111 R	8	52	S
9491W	8	82	S