

# WHEAT VARIETAL DIFFERENCES AND DISEASE REACTION

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Information on grain yield potential is the primary component sought after when using results from state variety testing programs. Productivity and profitability are directly related to grain yield and varietal selection is recognized as the simplest, most cost effective way to maximize production profitability. Secondary characteristics, such as test weight, straw yield potential, plant height, stem strength, maturity and disease reaction are also important in wheat variety selection decisions.

Varietal disease reaction can be directly related to yield and profitability. A variety's susceptibility or resistance to a given pathogen can dramatically affect yield and grain quality. The University of Kentucky Small Grains Variety Testing Program annually evaluates the disease reaction among wheat varieties. The types of disease rated can vary annually depending on which pathogen is active in a given growing season/environment. In 2016, disease ratings were recorded for Stripe Rust, Leaf Rust, Septoria Leaf Blotch, and Powdery Mildew (Table 1).

Disease ratings data can be of value in variety selection decisions, but also in terms of disease management decisions during the growing season. No variety is resistant to all diseases, and it is important to know which varieties are susceptible to a particular disease during an unexpected outbreak. For example in 2016, there was a Stripe Rust outbreak in several regions of Kentucky. Stripe Rust is a pathogen that can rapidly destroy the foliage and dramatically affect grain yield. Growers can utilize variety test disease rating data to determine whether to spray or not spray. For example, in Table 1, CROPLAN 9201 was rated

8.3 (highly susceptible) to Stripe Rust and a foliar fungicide would likely be essential for areas with reported infection. CROPLAN 9203, on the other hand, was rated 1.7 (very resistant) and a fungicide would likely not be needed for this disease.

The decision to spray fungicide can affect production profitability, certainly in terms of protecting a susceptible variety, but also in terms of savings associated with withholding unneeded fungicide applications and eliminating application costs such as chemical, labor, equipment wear, as well as any environmental effects.

In Kentucky, Head Scab pressure in 2016 was minimal and visual field ratings were not taken. Varieties tested in the UK wheat variety testing program are also evaluated in the UK Fusarium Head Scab Nursery, where the research plots are inoculated with Head Scab pathogen and grown under mist irrigation to favor heavy infection pressure. Results indicating varietal susceptibility and resistance, as well as differences in vomotoxin (DON) levels are available online at the variety testing website ([www.uky.edu/Ag/WheatVarietyTest](http://www.uky.edu/Ag/WheatVarietyTest)). The devastating effects of Head Scab in wheat production is understood, and utilization of varieties with some level of resistance coupled with fungicide application during flowering is recognized as the best way to minimize yield loss and protect grain quality when environmental conditions favor Head Scab infection.

Results from the University of Kentucky Small Grains Variety Testing program are available online and printed annual reports are available at Kentucky county extension offices.

**Table 1. 2016 Kentucky Wheat Disease Ratings.**

<b>VARIETY</b>	<b>Stripe Rust</b>	<b>Leaf Rust</b>	<b>Leaf Blotch</b>	<b>Powdery Mildew</b>
Ag 2650	1.7	2.7	4.5	8.5
AgriMAXX 415	2.3	3.7	4.5	5.0
AgriMAXX 438	1.7	5.7	6.5	7.8
AgriMAXX 444	3.0	2.7	4.5	5.3
AgriMAXX 446	3.3	4.3	4.8	6.8
AgriMAXX 452	8.3	1.3	4.5	6.5
AgriMAXX 454	7.7	3.3	4.5	7.5
AgriMAXX 463	2.3	2.7	4.0	5.5
AgriMAXX 490	7.0	1.3	4.5	4.8
AgriMAXX Exp. 1670	8.7	7.0	4.8	7.3
AgriMAXX Exp. 1674	3.7	3.3	3.0	2.8
ARMOR ARW1513	7.0	4.3	3.8	7.3
ARMOR ARW1516	1.3	3.0	4.8	6.8
ARMOR ARW1521	1.7	1.7	4.8	5.5
ARMOR ARW1551	1.3	1.0	3.8	1.5
ARMOR INFERNO	2.0	5.0	6.3	7.0
ARMOR RUMBLE	3.0	1.3	4.3	6.8
BECK 114	6.0	2.0	4.5	6.3
BECK 120	1.0	3.3	4.8	4.3
BECK 123	5.0	3.7	3.3	4.3
BECK 125	5.7	1.3	5.3	5.5
BECK 128	7.7	4.3	4.3	7.8
Clark	5.7	5.7	8.3	7.5
CROPLAN 9101	3.7	1.0	6.3	5.8
CROPLAN 9201	8.3	3.0	5.0	3.3
CROPLAN 9203	1.7	4.7	6.5	8.5
CROPLAN SRW 9415	3.0	4.3	5.3	7.0
Dyna-Gro 9223	2.0	5.7	6.3	7.8
Dyna-Gro 9522	2.0	3.7	5.0	5.3
Dyna-Gro 9591	3.3	1.7	6.0	5.8
Dyna-Gro 9600	7.0	1.7	4.5	3.3
Dyna-Gro 9692	7.0	4.3	4.3	7.0
Dyna-Gro WX15742	4.7	1.0	6.3	4.3
Dyna-Gro WX16771	2.0	1.7	5.8	5.8
Equity Brand Butler	3.0	1.0	4.0	6.0
EXP DEI 16098	5.3	2.7	4.5	4.8
EXP1052	4.3	4.0	5.8	3.0
EXP1053	4.3	1.3	7.0	4.3
EXP1060	8.3	3.0	4.3	4.3

<b>VARIETY</b>	<b>Stripe Rust</b>	<b>Leaf Rust</b>	<b>Leaf Blotch</b>	<b>Powdery Mildew</b>
EXP1072	5.7	2.0	5.5	2.8
EXP1074	6.0	1.7	6.0	3.5
EXP1078	3.7	1.7	4.3	5.0
EXP1081	6.7	2.3	6.3	2.8
EXP1083	7.3	3.0	4.3	2.0
HILLIARD	2.7	1.0	4.0	1.5
KAS Liberty IV	2.3	8.7	7.5	3.8
KAS Lowery	8.3	1.0	5.0	6.3
KAS S1200	1.3	2.7	4.8	5.3
KAS S2500	8.0	3.7	4.3	7.0
KY06C-1178-16-10-3	7.0	2.7	4.3	2.8
L11419	6.0	4.7	4.5	4.0
L11425	8.3	3.3	4.3	5.8
L11541	1.3	1.0	2.8	1.3
PEMBROKE 2008	3.0	3.7	8.5	3.0
PEMBROKE 2014	1.3	4.7	5.5	2.0
PEMBROKE 2016	5.3	1.7	4.8	4.8
Pioneer variety 25R32	1.0	3.0	4.3	3.3
Pioneer variety 26R10	3.0	6.0	6.5	5.5
Pioneer variety 26R41	1.0	1.7	5.3	4.5
Pioneer variety 26R53	1.3	2.0	4.3	5.0
Pioneer variety 26R59	2.3	4.3	3.8	1.8
Pioneer variety XW13W	2.7	1.3	4.3	8.3
PROGENY P 243	6.0	3.3	3.0	5.5
PROGENY P 357	4.0	5.0	5.5	7.0
PROGENY P 870	1.3	2.7	4.8	5.3
PROGENY PGX 15-10	1.3	1.7	4.0	3.5
PROGENY PGX 15-12	3.3	1.3	3.5	3.5
PROGENY PGX 15-14	3.3	4.0	3.0	3.0
PROGENY PGX 15-16	1.7	1.0	4.3	2.8
SC 1315-15™	5.0	1.7	6.0	6.0
SC 1325-15™	7.0	2.3	5.0	6.3
SC 1335-15™	6.0	1.3	6.0	5.3
SC 13S26™	8.3	4.0	4.5	8.5
SC EXP102™	1.7	3.7	4.5	6.3
SC EXP142™	5.0	1.0	5.8	4.5
SS 8340	2.3	5.0	4.5	5.8
SS 8360	2.3	4.7	4.8	6.8
SS 8513	2.3	6.0	3.3	2.0

<b>VARIETY</b>	<b>Stripe Rust</b>	<b>Leaf Rust</b>	<b>Leaf Blotch</b>	<b>Powdery Mildew</b>
SS 8530	4.3	1.3	3.3	4.0
SS 8700	3.3	4.7	3.8	3.3
STEYER EVANS	1.7	3.7	5.0	5.5
STEYER MORRIN	2.7	2.0	3.5	7.5
STEYER STex141	7.3	4.3	4.5	7.5
STEYER STex142	5.3	2.0	7.3	4.5
STEYER STex155	1.0	3.0	5.0	6.0
SYNGENTA BRANSON	3.3	2.3	5.3	3.5
SYNGENTA SY 007	2.0	3.0	8.3	3.0
SYNGENTA SY 483	3.0	3.3	5.0	2.5
SYNGENTA SY 547	4.7	1.7	3.3	2.0
SYNGENTA SY HARRISON	3.0	5.7	4.3	7.0
SYNGENTA VIPER	1.7	4.7	4.0	5.0
TN1102	8.7	2.0	6.5	2.8
Truman	3.0	3.3	7.3	4.8
USG 3013	1.0	6.3	7.0	8.5
USG 3197	5.7	1.0	7.0	5.3
USG 3404	2.7	3.3	4.8	5.0
USG 3895	1.0	1.0	5.5	4.8
VA 12W-72	1.0	1.0	4.0	1.5
<b>AVERAGE</b>	<b>4.0</b>	<b>3.0</b>	<b>5.0</b>	<b>5.0</b>

Powdery Mildew rated at Woodford Co. location; Septoria Leaf Blotch, Leaf and Stripe Rust rated at Logan Co. Disease Rating scale: 1 = resistant; 9 = susceptible.