2019 Michigan State Wheat Performance Trials

Photo: Mason Research Farm, 2019

MICHIGAN STATE UNIVERSITY | Extension

MICHIGAN WHEAT PROGRAM

2019 Michigan State Wheat Performance Trials

Dennis Pennington, Eric Olson, Sam Martin, Amanda Noble

August 5, 2019

Fall planting conditions were less than ideal with frequent rainfall hampering drybean and soybean harvest, which further delayed wheat planting. Much of the crop in Michigan went into winter dormancy with little or no tillering. Even wheat that was planted in September was lacking in development due to the cold, rainy planting season. As the crop emerged from dormancy, above normal precipitation coupled with below normal temperatures delayed crop development, with flowering time running approximately 2 weeks behind normal. Many fields of planted wheat were destroyed due to water damage. Farmers faced difficulty making nitrogen and herbicide applications with many fields being rutted up from those applications. For fields that weathered the heavy rainfall, the extended cold period resulted in additional tillering and higher yield potential. Disease pressure from septoria, leaf rust, stem rust and bacterial leaf streak were confirmed. Incidence of fusarium head blight appeared high, although farmers reported relatively low vomitoxin levels at harvest. A period of high temperatures occurred late in the wheat growing season after most of the wheat had reach physiological maturity, so there was minimal impact on yield, but test weights were slightly lower. The mean yield across all varieties across all locations was 103.2 bushels per acre, much better than anticipated based on the growing season. The Lenawee County location suffered significant water damage and was dropped early in the spring. Gratiot County had significant water damage a few ranges, which caused us to drop the conventional management comparison for that location. The Gratiot high management trial is reported.

Figure 1. Temperature and rainfall data from Michigan Automated Weather Station Network, MSU for four of the MSU Wheat Variety Trial Locations.

	Pigeon	Richville	MSU
Above 90 F	1	3	3
Above 85 F	14	12	16
April (in)	3.8	2.3	2.9
May (in)	2.8	5.0	3.4
June (in)	3.6	7.0	4.5
July (in)	1.9	2.4	2.3

Choosing Varieties

Variety selection is best made using at least three years of data. Varieties selected using data across all locations will likely perform well under a wide range of conditions. Although, performance of a given variety will vary based on testing location. In selecting varieties for a specific location, it is important to identify varieties that perform well near the location where the variety will be grown. Table 4 provides information on which varieties are top performers in each of the five trial locations in 2016 through 2019. Selection and planting of two or more varieties is recommended. As an example, planting varieties that differ in flowering date can allow for staggering of management applications, specifically, fungicides to control Fusarium head blight. When selecting varieties, look at disease resistance as well as yield potential.

Disclaimer: ***MSU makes no endorsement of any wheat variety or brand.***

Experimental

The 2019 State Wheat Performance Trial entries were planted at seven sites in 6 counties: Gratiot, Ingham, Huron, Lenawee, Sanilac, and Tuscola.. Appendix A (below) presents information on each of these sites. Each plot contained 6 rows with 7.5” row spacing and was planted to a length of 18 feet. Plots were trimmed to a length of 12 feet long in the spring for harvesting purposes. Sites were designed as Alpha Lattice with three replications. All seed was treated, but the chemicals and rates used varied according to the preferences of the originating organization. Seeding rates per linear foot of row were standardized to the rate that would equate with a stand of 2.0 million seeds per acre in a solid stand planted in 7.5” rows. Fall fertilizer application varied with cooperator practice. Spring nitrogen was applied as urea (90 lbs/acre actual N) at green-up and Affinity BroadSpec was used for weed control at all sites.

All sites were coordinated under high management with the exception of an additional conventionally managed trial at Tuscola and Gratiot Counties. Under high management, an additional 30 pounds of nitrogen was applied using streamer nozzles and 28% N. Quilt Excel fungicide was applied at Feekes 9.0 (flag leaf) to control foliar diseases. Prosaro fungicide was applied to control late season fungal diseases with application coinciding with the average flowering date of the trial location.

All plots within a location were harvested on a single day. Yield was calculated using the entire area of the plot including the wheel tracks between plots leading to an underestimation of yield. For data reported on a 0-9 scale 0 is the best possible score.

Six of our experimental sites are on private farmland. We are extremely grateful to those growers for accommodating our work and all of the associated inconveniences. Funding for the high-management trial inputs was provided by the Michigan Wheat Program. Questions and comments regarding the research reported here should be directed to Dennis Pennington at pennin34@msu.edu or (269) 832-0497. This report and previous reports, may also be accessed through the Web at http://www.varietytrials.msu.edu/wheat .

Multi-Year Performance Summary

The full trial included 108 entries (49 of which were experimental lines) from 13 organizations, including Michigan State University, and data analyses were conducted using all of these entries. Attached to this narrative is a list of the names and contact information for those organizations. Each row in these tables has data for a single entry. The columns contain averages for a given trait and time period. Data for all of the entries in this trial are not presented here. However, the averages and statistical parameters in this report are based on the entire set of evaluated materials. **Comparisons among entries are only valid within a column**. Tables 1 and 2 are sorted first by grain color, and then in descending order by yield for 2019. Tables 3, 4 and 5 are sorted in alphabetic order by company and entry name. In some instances (e.g. yield), data columns to the right of the 2019 data columns are multi-year averages. Only data for entries included in all of the relevant years' tests are found here. Not all entries have been tested in all years, so the tables have several blank cells. See the section titled 'Experimental' for details on how the trials were conducted and for more detail on what the data in each column represents.

At the bottom of most columns in the tables is the trial average (mean), LSD (least significant difference), and CV (coefficient of variation) for data in that column. LSD values vary among traits and data sets (combinations of sites and years). Differences between the means for two entries that are greater than the LSD for that column are very likely to reflect a genuine difference between the two varieties. If the difference between two means is smaller than the LSD for that column, one should conclude that there is **no evidence that those entries are different for that trait** in the years and sites considered.

Table 1 contains yield data. This data was acquired electronically on the plot combine at the time of harvest. Yield data is standardized to 13.5% moisture. The 2019 yield data contains the multi-site yield averages of only the high management sites and does not include the conventionally managed yield data from Tuscola and Gratiot County. The conventionally managed data can be found in Table 4 in the conventional vs. high management results.

Table 2 contains test weight and percent moisture for all locations along with the overall average across locations.

Table 3 contains data on resistance to Fusarium Head Blight (FHB, scab). The 2018 deoxynivalenol (DON, VOM) numbers are reported. Scab data were obtained from heavy disease pressure in an inoculated scab screening nursery. FHB infected grain is spread to provide inoculum and artificial misting provides disease-promoting conditions throughout the entire flowering period. 2019 grain samples will be submitted for DON analysis and will be reported later.

FHB Resistance Traits

Severity: The average percent of infected spikelets in each head.
Incidence: The percent of all spikes in a plot showing infection.
FHB index: The overall infection considering severity and incidence.
DON: Levels of mycotoxin (ppm) present in grain. DON data is from the 2018 crop year.

Levels of DON and severity are the most reliable traits to be used in selecting FHB-resistant varieties.

Table 3 also contains data for flowering date and plant height.

The flowering date indicates the average number of days past January 1st that a given entry reached the point where ½ of its heads were flowering. Plant height is reported as the distance in inches from the ground to the tip of average heads in a plot.

High Management vs. Conventional Management Performance

Table 4 provides a comparison of variety performance under intensive management and conventional management practices. Data on yield, test weight, grain moisture at harvest are provided from conventional management and high management trials at Tuscola County. Conventional management received 90 pounds of N per acre only. The high management received an additional 30 pounds of N per acre applied at Feekes 6 plus Quilt Excel fungicide at Feekes 9.0, followed by Prosaro fungicide applied at Feekes 10.5.1. The last two columns presents the yield advantage of high management in bushels per acre as well as a ranking of the response. A positive number indicates a yield response to high management. A negative number indicates the higher management actually produced a lower yield. Overall means were 11.7 bushels per acre higher for the high management treatment.

Milling and Baking Quality

Table 5 contains data for milling and baking quality. Quality data are from the 2018 harvest season and prior. Data were generated by the USDA Eastern Soft Wheat Quality Laboratory in Wooster, Ohio on grain harvested from the Michigan State Variety trial each year. Flour yield is the ratio of the weight of extractable flour to the weight of milled grain, expressed as a percentage. Percent protein in flour is adjusted at 14% moisture. Softness equivalent percent is the softness of the flour, with higher values indicating softer grained wheat. For cookie diameter, a larger diameter is better. Whole grain protein (%) and whole grain hardness are being reported with 0-100, and higher values indicating harder wheat. The quality lab test weight is not identical to the test weight at harvest due to grain drying and grain cleaning prior to quality laboratory test weight evaluation. Solvent Retention Capacity (SRC) can be conducted on flour using several different solvents and reflects different characteristics of flour quality. Soft wheat flour for cookies typically have a target of 95% or less when used by the US baking industry for biscuits and crackers. Sodium carbonate SRC increases as starch damage due to milling increases. Normal values for good milling soft varieties are 68% or less. Lactic acid measures gluten strength with “weak” soft varieties having values below 85% and strong gluten soft varieties having values, typically, above 105% or 110%.

2019 Michigan State University Wheat Performance Trials

Appendix A. Trial Site Descriptions for 2019 MSU Wheat Performance Trials.

	FUSARIUM HEAD	HURON	Gratiot COUNTY		LENAWEE	SANILAC	TUSCOLA COUNTY		MASON
	BLIGHT NURSERY	COUNTY	CONV. MANAGED	HIGH MANAGED	COUNTY	COUNTY	CONV. MANAGED	HIGH MANAGED	
COOPERATOR	Michigan State University	Darwin Sneller	Crumbaugh Legacy Inc.		Woods Seed Farm	JGDM Farms	Stuart Bierlein		Michigan State University
NEAREST CITY	Lansing	Seabwing	St. Louis		Britton	Sandusky	Reese		Meridian TWP
PLANTING DATE	10/17/18	10/17/18	10/19/18		10/22/18	10/14/18	10/13/18		10/15/18
HARVEST DATE	N/A	July 31, 2019	07/26/19		N/A	August 1, 2019	July 22, 2019		July 24, 2019
SOIL TYPE	Capac loam, 0 to 4 percent slopes & Colwood-Brookston loams	Shebeon loam, 0 to 2 percent slopes	Parkhill loam, 0 to 1 percent slopes		Lenawee silty clay loam, 0 to 1 percent slopes	Parkhill loam and clay loam, 0 to 1 percent slopes	Tappan-Londo loams, 0 to 3 percent slopes		Capac loam, 0 to 4 percent slopes & Colwood-Brookston loams
PRE-PLANT FERTILIZER	None	50# Urea + 50# AMS + 50#MESZ + 50# White Potash	190# 8-20-26-5 + 168# Potash		300# 9-23-30	250# 6-20-24 .5% Zn 2.7% Mn 6.2% S	250# 14%-8-23 7% S 0.1% 0.5% Mn 0.8% Zn		350# 10-19-18-7.7% S
COMMENTS	Inoculated / Misted Fusarium Head Blight Screening Nursery.	Additional 30 lbs. Nitrogen and Fungicides were applied	90 lbs. Nitrogen and no Fungicides were applied	Additional 30 lbs. Nitrogen and Fungicides were applied	Dropped Site due to severe winter kill damage	Additional 30 lbs. Nitrogen and Fungicides were applied	90 lbs. Nitrogen and no Fungicides were applied	Additional 30 lbs. Nitrogen and Fungicides were applied	Additional 30 lbs. Nitrogen and Fungicides were applied
AVERAGE YIELD (BUSHELS / ACRE)	N/A	110.8	92.7	96.5	N/A	94.5	104.7	116.4	91.1
AVERAGE TEST WEIGHT (LBS. / BUSHEL)	N/A	59.2	59.2	59.6	N/A	57.4	58.4	59.1	55.3
AVERAGE PERCENT GRAIN MOISTURE AT HARVEST	N/A	15.1	12.2	12.2	N/A	17.7	15.1	13.7	17.1
2019 DATA RECORDED (NUMBER OF REPS)	N/A	3	3	3	N/A	3	3	3	3
FUNGICIDE APPLICATION DATE	N/A	5/31/19 & 6/18/19	N/A	6/4/2019 & 6/18/19	N/A	5/31/2019 & 6/18/19	N/A	5/24/2019 & 6/11/19	5/26/2019 & 6/12/19
GREEN-UP FERTILIZER	90lbs Nitrogen	90lbs Nitrogen	90lbs Nitrogen	90lbs Nitrogen	N/A	90lbs Nitrogen	90lbs Nitrogen	90lbs Nitrogen	90lbs Nitrogen

2019 Michigan State University Wheat Performance Trials

Table 1 : Multi-Year Performance Summary (Note: Tables sorted by 2019 High Management Yield, white wheat's grouped before red)

Line	Color	Awns	Chaff Color	Yield (Bu/A adjusted to 13.5% Moisture) 2019	Rank	2 Yr Avg 18-19	3 Yr Avg 17-19	Gratiot Bu/A	Rank	Ingham Bu/A	Rank	Huron Bu/A	Rank	Sanilac Bu/A	Rank	Tuscola Bu/A	Rank
Whitetail	White	Awnless	White	110.3	1	102.2	101.2	100.5	7	89.8	12	122.2	1	107.9	2	116.9	4
Dyna-Gro 9242W	White	Awnless	White	110.3	2	98.7	98.6	106.4	2	99.0	2	111.7	8	98.9	7	120.7	1
MI16W0133	White	Awned	White	109.2	3	---	---	111.6	1	94.1	4	115.3	6	103.5	4	116.7	5
Ambassador	White	Awnless	White	108.5	4	98.3	99.4	103.1	5	92.0	7	117.6	3	112.9	1	112.5	13
Jupiter	White	Awnless	Bronze	106.8	5	100.5	100.1	99.4	10	88.6	14	111.6	9	106.8	3	116.5	6
MI16W0522	White	Awnless	White	106.3	6	---	---	95.3	13	86.9	15	115.9	4	95.5	10	117.1	3
MI16W0528	White	Awnless	White	105.8	7	---	---	104.1	4	89.0	13	111.9	7	100.8	6	119.2	2
Dyna-Gro WX19799W	White	Awned	White	105.8	8	---	---	96.5	12	99.9	1	115.7	5	102.8	5	116.3	7
HS EX 20W	White	Awned	White	103.9	9	94.4	---	104.2	3	93.7	6	118.6	2	84.9	17	110.3	14
HS EX 22W	White	Awnletted	White	103.8	9	---	---	97.3	11	89.9	11	107.0	14	92.1	13	114.8	10
MI14W1039	White	Awnless	White	103.3	10	96.8	---	102.4	6	90.3	10	109.7	13	96.2	8	115.1	9
Dyna-Gro 9362W	White	Awnless	White	100.6	11	95.4	96.4	89.0	15	97.9	3	111.0	10	88.9	15	110.2	15
AC Mountain	White	Awnless	White	100.3	12	96.0	95.5	100.5	8	81.5	18	104.1	16	90.4	14	114.3	12
DF 218 W	White	Awnletted	White	99.2	13	92.2	---	87.4	16	90.4	9	109.9	11	95.8	9	114.7	11
KWS258	White	Awnletted	White	99.0	14	---	---	85.2	17	94.0	5	105.7	15	82.1	19	115.7	8
MI14W0190	White	Awnless	Bronze	98.6	15	93.0	94.8	100.1	9	90.5	8	103.3	18	92.8	11	108.4	18
E6012	White	Awned	White	98.0	16	91.9	92.9	94.4	14	85.1	17	109.7	12	82.1	18	109.8	17
SY 912	White	Awnless	White	93.5	17	86.4	---	71.4	19	86.1	16	103.5	17	92.1	12	102.9	19
MCIA Venus	White	Awned	White	91.9	18	87.3	88.2	82.9	18	79.4	19	96.5	19	87.3	16	110.0	16
DF 119 R	Red	Awnless	White	113.1	1	---	---	106.8	12	99.4	8	120.8	4	111.9	1	118.9	25
Viking 207	Red	Awnless	White	112.6	2	---	---	108.9	6	99.4	7	107.8	49	109.8	2	124.6	7
RS 902	Red	Awned	White	112.3	3	102.1	98.2	109.6	3	94.5	24	118.8	8	104.1	12	125.4	5
Viking 191	Red	Awned	White	111.3	4	---	---	108.6	7	100.8	6	110.1	40	107.1	4	121.8	13
SY 100	Red	Awnless	White	110.1	5	101.2	101.8	94.9	40	103.0	1	120.9	3	103.1	13	126.4	3
DF 112 R	Red	Awned	White	109.8	6	99.1	101.7	106.0	13	90.8	43	118.8	11	99.9	18	122.0	12
KWS19X09	Red	Awned	White	109.7	7	---	---	102.7	21	98.3	11	118.8	9	97.7	25	126.4	4
MCIA 18003	Red	Awnletted	White	109.3	8	---	---	102.9	20	94.7	23	114.2	24	105.9	9	128.5	1
AgriMAXX Exp 1905	Red	Awnless	White	109.1	9	---	---	107.0	11	96.6	16	118.3	12	93.3	40	121.0	16
DF 109 R	Red	Awnless	White	108.7	10	100.0	99.1	107.5	10	98.4	10	113.9	26	106.2	8	114.0	43
DF 129 R	Red	Awned	White	108.5	11	---	---	112.3	2	102.1	4	112.2	34	98.9	22	112.2	55
W 305	Red	Awnless	White	107.8	12	98.6	98.7	96.3	37	98.5	9	112.2	33	95.4	35	116.0	38
RS 9xp967	Red	Awned	White	107.8	13	---	---	112.9	1	91.2	40	115.6	18	90.3	50	125.1	6
MCIA Jonah	Red	Awnless	White	107.7	14	---	---	101.3	27	95.6	21	119.7	6	104.2	11	118.3	29
AgriMAXX 438	Red	Awnless	White	107.6	15	99.4	97.4	105.4	17	103.0	2	112.0	35	87.4	56	119.2	24
MCIA 18002	Red	Awned	White	107.5	16	---	---	93.8	42	83.3	62	119.6	7	105.1	10	122.2	11
MI16R0898	Red	Awnless	White	107.2	17	---	---	105.7	16	93.1	30	108.4	46	109.6	3	112.1	56
W 304	Red	Awned	White	107.1	18	98.8	97.4	107.6	9	93.3	28	118.1	13	91.5	44	120.1	21
MCIA L 18-2	Red	Awnless	White	106.7	19	---	---	93.0	44	101.5	5	114.8	21	106.3	7	119.5	23
MI16R0592	Red	Awnless	White	106.5	20	---	---	101.6	26	98.3	12	121.9	2	106.7	6	113.3	46
RS 961	Red	Awnless	White	106.2	21	96.1	---	105.9	15	102.8	3	109.9	41	96.0	30	114.7	41
Dyna-Gro 9070	Red	Awned	White	106.2	22	---	---	107.9	8	92.8	33	112.4	32	93.0	41	118.8	26
Dyna-Gro 9002	Red	Awned	White	106.1	23	---	---	102.5	22	90.0	44	115.6	19	99.5	19	120.2	20
ISF 718	Red	Awnletted	White	106.0	24	98.9	---	109.4	4	92.1	36	101.4	61	101.7	14	114.6	42
HS 338 R	Red	Awnless	White	105.9	25	99.5	---	106.0	14	95.9	19	103.1	58	106.9	5	115.2	40
Dyna-Gro WX19711	Red	Awned	White	105.6	26	---	---	98.7	33	94.4	26	114.4	23	95.9	32	120.7	19
MCIA Flipper	Red	Awnless	White	105.2	27	98.5	---	102.1	24	87.5	54	123.2	1	99.2	20	116.6	36
RS 9xp964	Red	Awned	White	105.0	28	---	---	93.1	43	87.3	55	120.2	5	101.2	16	119.8	22
Dyna-Gro 9941	Red	Awned	White	104.9	29	97.7	---	95.3	39	94.4	25	110.5	39	101.4	15	121.3	15
Dyna-Gro 9862	Red	Awnless	White	104.7	30	94.4	---	103.6	18	96.1	17	112.6	28	92.5	42	108.1	65
AgriMAXX 485	Red	Awnless	White	104.7	31	95.8	---	102.3	23	91.7	39	112.4	31	95.5	34	110.7	60

2019 Michigan State University Wheat Performance Trials

Table 1 : Multi-Year Performance Summary (Note: Tables sorted by 2019 High Management Yield, white wheat's grouped before red)

Line	Color	Awns	Chaff Color	Yield (Bu/A adjusted to 13.5% Moisture) 2019	Rank	2 Yr Avg 18-19	3 Yr Avg 17-19	Gratiot Bu/A	Rank	Ingham Bu/A	Rank	Huron Bu/A	Rank	Sanilac Bu/A	Rank	Tuscola Bu/A	Rank
DF 105 R	Red	Awned	White	104.3	32	97.2	99.4	94.4	41	94.8	22	102.4	59	99.0	21	118.2	30
MCIA Red Dragon	Red	Awnless	White	104.2	33	96.8	94.6	96.5	36	78.3	64	117.4	14	88.2	53	121.6	14
SY Viper	Red	Awnletted	White	103.9	34	---	---	99.6	30	82.8	63	116.0	17	94.7	38	117.1	33
Dyna-Gro 9552	Red	Awned	White	103.8	35	95.8	97.6	81.6	62	96.9	15	116.6	16	88.2	54	120.9	18
MCIA Red Devil	Red	Awned	White	103.7	36	94.3	94.6	109.1	5	87.1	56	99.2	64	94.8	37	123.7	9
HS EX 340R	Red	Awned	White	103.6	37	---	---	101.9	25	85.3	58	114.6	22	98.2	24	118.4	28
AgriMAXX 495	Red	Awned	White	103.2	38	---	---	96.7	35	92.8	34	112.0	36	94.6	39	116.2	37
6771 EXP	Red	Awnless	White	103.2	39	94.3	---	92.0	48	96.9	14	112.5	29	95.6	33	112.7	50
MI14R1140	Red	Awnletted	White	102.8	40	96.5	---	103.3	19	88.0	50	113.2	27	96.9	27	112.6	52
DF 118 R	Red	Awned	White	102.4	41	94.5	---	95.7	38	93.3	27	109.0	44	98.3	23	113.5	44
MI15R0388	Red	Awnletted	White	101.9	42	95.4	---	91.1	50	89.5	46	109.4	42	101.1	17	113.4	45
Dyna-Gro 9701	Red	Awned	White	101.8	43	95.1	96.5	90.1	52	92.1	37	118.8	10	90.6	47	117.2	32
MCIA Harpoon	Red	Awnless	White	101.7	44	94.0	95.8	100.3	29	92.0	38	103.8	56	90.9	46	118.5	27
RS 968	Red	Awned	White	100.9	45	---	---	92.2	46	87.8	52	110.7	38	95.0	36	110.3	61
W 302	Red	Awned	White	100.8	46	95.1	95.1	97.9	34	97.6	13	101.4	60	95.9	31	110.8	59
SY 547	Red	Awnless	White	100.7	47	93.9	95.1	88.4	56	92.6	35	106.2	50	96.6	28	116.8	34
W 314	Red	Awned	White	100.5	48	---	---	99.4	32	87.8	53	100.0	62	88.3	52	120.9	17
WX 909	Red	Awned	White	100.3	49	---	---	91.2	49	96.0	18	108.2	48	75.0	64	126.4	2
Agrimaxx Exp 1902	Red	Awned	White	100.3	50	---	---	74.7	64	90.9	42	112.4	30	92.5	43	117.9	31
Dyna-Gro 9932	Red	Awned	White	100.2	51	92.1	---	88.0	57	88.1	49	104.8	54	90.4	48	122.5	10
SY 576	Red	Awned	White	99.8	52	---	---	92.6	45	88.6	48	105.0	53	97.4	26	123.9	8
Diener 505W	Red	Awned	White	99.3	53	---	---	99.5	31	93.0	31	99.8	63	83.4	62	112.4	54
MI16R1172	Red	Awnless	White	99.2	54	---	---	89.7	53	84.8	59	115.0	20	90.3	49	109.6	63
AgriMAXX 413	Red	Awned	White	99.1	55	94.1	96.2	90.8	51	89.4	47	103.8	57	91.4	45	112.6	51
W 312	Red	Awned	White	99.0	56	93.6	---	89.1	55	88.0	51	117.1	15	87.9	55	112.8	49
AgriMAXX 473	Red	Awned	White	97.7	57	92.0	---	83.7	60	93.2	29	114.2	25	85.4	59	111.7	57
MCIA Whale	Red	Awnless	White	97.6	58	91.7	92.1	73.8	65	95.9	20	109.3	43	96.3	29	112.9	48
MI16R0798	Red	Awnless	White	97.0	59	---	---	92.1	47	84.4	60	105.6	51	90.0	51	113.2	47
MCIA 1801-3	Red	Awned	White	97.0	60	---	---	82.1	61	76.1	65	105.4	52	83.9	61	116.8	35
LCS3334	Red	Awnless	White	96.5	61	---	---	89.3	54	83.6	61	111.0	37	87.3	57	112.5	53
KWS19X07	Red	Awned	White	96.3	62	---	---	85.7	58	92.9	32	108.2	47	87.0	58	115.6	39
Starburst	Red	Awnless	White	95.2	63	88.6	92.2	84.5	59	91.1	41	104.6	55	85.2	60	111.2	58
AgriMAXX 486	Red	Awned	White	93.7	64	89.5	---	79.0	63	86.0	57	108.4	45	80.4	63	109.9	62
W 316	Red	Awned	White	93.0	65	89.2	---	100.4	28	89.6	45	93.4	65	73.6	65	108.4	64
			Mean	103.2	-	95.5	96.7	96.5	-	91.1	-	110.8	-	94.5	-	116.4	-
			CV	3.4	-	4.5	4.4	10.6	-	2.6	-	5.7	-	1.1	-	1.8	-
			LSD	2.5	-	4.3	3.6	11.6	-	3.9	-	10.1	-	1.7	-	3.4	-

2019 Michigan State University Wheat Performance Trials

Table 2. Multi-Location Performance Summary for Test Weight and Percent Moisture.

		Overall		Gratiot		Ingham		Huron		Sanilac		Tuscola	
Line	**Color**	% Moist	TW	% Moist	TW	% Moist	TW	% Moist	TW	% Moist	TW	% Moist	TW
Whitetail	White	13.3	57.4	9.6	58.6	16.7	54.7	14.7	58.6	14.0	57.1	12.5	57.9
Dyna-Gro 9242W	White	14.7	58.5	11.4	61.1	17.2	55.6	15.6	59.4	16.8	58.9	12.9	57.6
MI16W0133	White	13.6	57.5	11.0	59.2	16.7	54.1	13.4	58.0	13.7	57.7	13.1	58.3
Ambassador	White	12.9	57.6	9.9	59.5	16.1	55.3	13.5	58.4	12.8	56.7	12.3	58.3
Jupiter	White	14.1	57.7	10.5	59.4	16.8	54.1	14.4	57.8	14.8	58.6	13.2	58.6
MI16W0522	White	14.9	58.2	11.8	60.3	16.9	53.8	15.1	59.7	17.0	57.2	13.9	60.1
MI16W0528	White	14.4	57.9	11.1	59.6	16.7	53.2	14.4	59.7	17.3	57.8	13.3	59.1
Dyna-Gro WX19799W	White	14.4	57.9	11.9	58.9	16.8	55.3	14.2	58.7	15.7	57.5	13.4	59.2
HS EX 20W	White	14.4	58.8	11.7	61.0	16.9	56.4	14.4	59.4	15.7	57.8	13.4	59.5
HS EX 22W	White	14.9	59.2	11.9	61.7	17.0	57.2	14.7	59.3	16.6	58.2	14.3	59.5
MI14W1039	White	13.0	57.2	10.2	58.5	16.0	55.2	13.0	58.0	13.7	56.9	12.5	57.4
Dyna-Gro 9362W	White	15.2	59.7	12.7	60.9	16.8	57.2	15.3	60.2	16.7	59.5	14.5	60.8
AC Mountain	White	13.7	58.2	10.5	59.6	16.2	55.6	13.5	59.4	16.5	57.2	12.6	59.1
DF 218 W	White	16.0	58.0	14.8	59.2	16.9	55.8	15.4	59.4	17.9	56.3	15.0	59.4
KWS258	White	16.4	59.1	13.4	60.3	17.2	57.0	16.3	60.4	20.4	57.5	14.8	59.9
MI14W0190	White	16.0	58.4	12.7	61.4	17.6	55.3	15.6	60.0	19.9	55.3	14.1	59.8
E6012	White	13.8	57.9	10.6	59.3	16.5	55.4	13.5	58.8	15.7	58.0	13.0	58.3
SY 912	White	16.1	58.8	13.9	60.9	17.6	55.8	16.4	60.1	18.4	57.6	14.8	59.2
MCIA Venus	White	14.3	57.0	11.8	57.4	16.3	54.5	13.6	58.3	16.1	57.3	13.2	57.8
DF 119 R	Red	14.7	59.0	11.9	60.7	17.3	56.3	15.2	60.0	15.2	59.1	14.0	59.0
Viking 207	Red	14.7	57.9	11.3	60.0	17.2	55.1	15.1	58.0	17.1	57.5	13.3	58.6
RS 902	Red	15.4	58.7	11.5	60.8	17.7	55.9	16.1	59.6	18.5	57.8	14.1	59.2
Viking 191	Red	15.0	57.3	11.4	59.5	17.1	54.0	15.5	58.5	18.0	56.6	13.0	57.6
SY 100	Red	15.4	56.0	13.8	56.1	17.1	53.7	15.2	58.0	17.9	54.5	13.1	58.1
DF 112 R	Red	13.7	57.4	10.6	58.9	16.3	55.0	13.4	57.5	15.9	57.0	12.4	58.1
KWS19X09	Red	15.8	58.2	14.9	58.7	17.1	55.4	14.9	59.7	18.7	58.2	13.3	59.1
MCIA 18003	Red	13.9	57.1	11.9	57.2	16.2	54.9	13.3	58.4	15.6	57.6	11.7	57.9
AgriMAXX Exp 1905	Red	16.1	57.6	12.6	59.7	17.3	54.0	15.9	59.6	19.6	56.5	14.3	58.9
DF 109 R	Red	15.8	58.2	11.4	60.4	17.4	54.5	15.9	59.6	18.8	57.7	15.0	58.7
DF 129 R	Red	14.2	58.8	10.9	60.7	16.6	56.9	14.3	59.2	15.9	58.2	13.4	59.2
W 305	Red	15.1	58.7	12.0	58.4	17.2	56.0	15.2	59.9	16.2	58.3	14.5	60.8
RS 9xp967	Red	14.2	57.5	10.7	58.8	16.2	56.2	13.4	58.0	17.7	56.6	12.8	58.1
MCIA Jonah	Red	16.0	57.8	14.2	58.6	17.3	54.1	16.3	59.3	18.2	57.6	14.5	59.0
AgriMAXX 438	Red	17.3	57.4	13.5	59.8	17.6	54.4	16.8	59.6	23.7	54.2	14.6	59.0
MCIA 18002	Red	15.2	57.1	11.9	58.9	17.1	52.9	15.3	58.9	17.5	57.1	13.6	58.0
MI16R0898	Red	15.8	59.0	12.3	60.6	17.5	55.6	16.3	60.1	18.6	58.9	14.6	59.7
W 304	Red	15.6	58.5	11.7	60.2	17.7	55.7	16.1	59.7	18.5	58.0	14.8	58.6
MCIA L 18-2	Red	14.3	58.0	11.6	58.5	16.3	56.2	13.6	58.7	16.4	57.5	13.1	59.3
MI16R0592	Red	14.1	57.5	11.9	57.7	16.7	56.0	14.1	58.2	15.2	57.4	12.7	57.9
RS 961	Red	15.5	59.0	13.2	60.7	17.4	56.1	15.6	59.6	16.9	57.5	14.3	60.8
Dyna-Gro 9070	Red	15.2	58.7	11.3	60.5	17.0	56.2	14.8	58.6	18.7	57.9	14.4	60.2
Dyna-Gro 9002	Red	15.2	58.4	12.3	59.3	17.2	54.9	15.5	59.8	17.9	58.8	13.8	59.0
ISF 718	Red	14.8	59.6	12.0	60.9	16.7	57.4	15.2	59.9	16.0	59.3	14.6	60.3
HS 338 R	Red	14.9	59.2	12.2	60.2	17.1	56.0	15.4	60.0	15.7	59.3	13.7	60.2
Dyna-Gro WX19711	Red	15.9	59.0	15.2	59.2	17.5	56.5	16.2	59.8	16.9	58.9	14.4	60.6
MCIA Flipper	Red	14.5	58.5	10.6	60.2	16.8	55.8	15.1	59.5	16.6	57.8	14.0	59.2

2019 Michigan State University Wheat Performance Trials

Table 2. Multi-Location Performance Summary for Test Weight and Percent Moisture.

		Overall		Gratiot		Ingham		Huron		Sanilac		Tuscola	
Line	**Color**	% Moist	TW	% Moist	TW	% Moist	TW	% Moist	TW	% Moist	TW	% Moist	TW
RS 9xp964	Red	16.0	59.3	13.1	60.4	17.5	56.2	16.3	60.0	18.6	59.2	14.7	60.7
Dyna-Gro 9941	Red	14.2	57.1	11.4	58.1	17.2	55.0	13.6	57.8	15.3	56.8	13.3	58.0
Dyna-Gro 9862	Red	15.1	58.9	11.5	61.2	17.3	56.2	15.1	59.7	17.2	58.0	14.4	59.2
AgriMAXX 485	Red	15.8	58.8	11.9	61.8	17.5	54.5	15.3	60.0	20.0	56.9	14.6	60.7
DF 105 R	Red	13.5	58.2	10.9	59.3	16.3	55.7	13.9	58.9	14.2	57.9	12.0	59.0
MCIA Red Dragon	Red	14.6	57.6	11.2	59.2	16.7	53.9	14.5	58.9	16.5	57.8	13.3	58.2
SY Viper	Red	17.2	58.3	13.1	59.2	17.6	55.3	16.2	60.6	23.4	56.2	15.5	60.1
Dyna-Gro 9552	Red	15.7	59.0	13.2	59.8	17.0	56.5	16.0	60.3	18.5	58.4	13.8	60.1
MCIA Red Devil	Red	14.9	59.5	12.3	61.4	17.6	56.9	15.6	60.5	17.2	59.8	12.9	59.1
HS EX 340R	Red	15.4	58.6	12.4	60.4	17.3	56.2	15.3	59.3	18.0	57.4	14.2	59.7
AgriMAXX 495	Red	16.3	59.6	13.6	61.1	17.8	56.6	16.3	60.7	18.5	59.1	15.2	60.4
6771 EXP	Red	15.0	58.8	12.8	59.6	16.9	56.6	15.1	59.5	16.6	58.5	13.8	59.9
MI14R1140	Red	14.6	58.6	10.9	60.2	17.0	56.4	15.2	59.2	16.2	58.0	13.8	58.9
DF 118 R	Red	15.0	58.4	13.4	59.7	16.8	56.0	13.9	59.2	16.6	57.8	13.8	59.6
MI15R0388	Red	15.1	58.2	11.5	59.6	17.3	55.6	15.7	59.2	17.2	57.6	14.4	58.9
Dyna-Gro 9701	Red	15.4	58.3	12.4	59.5	17.0	55.9	15.9	59.9	18.9	57.8	12.3	58.6
MCIA Harpoon	Red	14.7	57.7	11.2	59.0	17.1	54.9	14.8	58.3	16.8	57.4	13.2	59.3
RS 968	Red	14.5	58.9	11.1	60.4	16.8	56.3	14.9	59.6	16.4	58.0	13.2	59.8
W 302	Red	14.8	58.4	11.9	59.9	17.3	55.8	14.6	58.8	16.4	58.2	14.1	59.3
SY 547	Red	15.3	58.6	13.5	59.5	17.1	55.7	15.6	59.9	16.1	58.2	14.1	59.2
W 314	Red	15.7	59.4	12.1	61.6	17.4	56.4	15.9	59.9	18.1	58.7	14.9	60.3
WX 909	Red	14.7	60.3	12.7	62.0	17.0	57.8	15.4	61.3	15.9	59.6	12.9	60.7
Agrimaxx Exp 1902	Red	15.6	57.6	14.4	57.8	17.2	55.5	15.0	58.3	18.0	56.5	13.3	59.5
Dyna-Gro 9932	Red	15.8	59.2	13.5	60.7	17.5	56.9	15.9	60.1	19.2	59.0	12.8	59.5
SY 576	Red	14.6	57.5	12.1	58.0	16.7	54.5	14.0	59.3	17.3	56.6	13.5	59.1
Diener 505W	Red	15.5	58.5	11.5	60.4	17.6	54.9	15.3	59.5	19.0	57.5	13.4	60.2
MI16R1172	Red	16.1	59.5	12.8	60.9	17.6	57.0	16.3	60.2	18.9	58.9	15.0	60.3
AgriMAXX 413	Red	14.5	57.6	10.3	59.1	16.8	54.8	14.5	58.8	16.6	57.2	13.9	58.1
W 312	Red	14.6	56.8	11.3	58.1	17.1	53.6	14.4	58.0	15.9	56.3	12.9	58.3
AgriMAXX 473	Red	17.2	57.6	13.8	58.3	17.4	55.7	16.5	60.2	24.8	54.8	13.5	59.2
MCIA Whale	Red	16.3	56.9	15.0	56.0	17.3	55.0	16.0	58.2	19.9	56.9	14.0	58.6
MI16R0798	Red	13.9	56.1	11.7	56.0	15.9	53.0	14.5	57.4	15.1	55.9	12.7	58.3
MCIA 1801-3	Red	14.4	57.2	10.8	58.7	17.1	54.9	13.8	57.6	17.6	56.4	13.1	58.3
LCS3334	Red	16.2	59.2	13.5	60.6	17.5	55.3	16.0	60.9	19.6	58.6	15.0	60.3
KWS19X07	Red	16.5	58.5	17.3	56.9	17.3	57.2	15.5	60.2	18.8	59.8	13.7	58.6
Starburst	Red	16.8	60.1	13.9	61.4	17.5	56.8	16.8	61.5	20.4	59.7	15.5	61.1
AgriMAXX 486	Red	15.6	58.4	14.8	58.7	17.5	55.6	15.0	59.8	18.1	58.0	13.5	60.1
W 316	Red	15.9	57.8	13.5	59.1	17.3	55.4	15.4	59.2	19.3	56.6	13.5	59.0
	Mean	58.1	15.1	12.2	59.6	17.1	55.3	15.1	59.2	17.7	57.4	13.7	59.1
	CV	2.7	6.3	5.0	0.7	1.9	1.2	2.8	0.6	3.6	0.9	4.7	0.9
	LSD	1.1	0.7	1.0	0.6	0.4	1.1	0.7	0.6	2.8	1.9	1.0	0.9

2019 Michigan State University Wheat Performance Trials

Table 3. Fusarium Head Blight Resistance, plant height and flowering data.

		Fusarium Head Blight						
		Severity	Incidence	Index	DON ppm	FHB	Plant Height	Flowering Date
Line	Color	2019	2019	2019	2018	Rating*	(inches)	Days past Jan. 1
6771 EXP	Red	47.5	67.8	34.3	3.6	MS	32.0	162
AC Mountain	White	94.3	82.6	70.1	5.9	S	38.3	162
AgriMAXX 413	Red	64.7	70.7	46.0	6.6	S	29.3	159
AgriMAXX 438	Red	41.8	69.9	29.7	6.0	S	34.7	161
AgriMAXX 473	Red	30.5	69.2	22.6	2.5	MR	35.3	161
AgriMAXX 485	Red	45.3	75.0	33.0	2.1	MR	31.5	162
AgriMAXX 486	Red	38.7	65.0	24.2	3.4	S	32.0	162
AgriMAXX 495	Red	31.8	72.4	23.1	---	---	32.0	161
Agrimaxx Exp 1902	Red	47.1	62.7	28.5	---	---	30.3	160
AgriMAXX Exp 1905	Red	57.0	53.3	31.0	---	---	35.3	162
Ambassador	White	84.7	64.0	56.0	10.7	VS	34.0	159
DF 105 R	Red	51.4	80.7	43.0	6.6	S	30.0	159
DF 109 R	Red	70.1	65.8	45.0	4.3	S	35.3	160
DF 112 R	Red	34.5	68.1	24.1	5.9	S	32.0	159
DF 118 R	Red	54.4	77.0	41.8	6.9	S	32.7	161
DF 119 R	Red	32.6	72.2	23.8	---	---	32.7	159
DF 129 R	Red	61.9	76.8	50.0	---	---	31.0	158
DF 218 W	White	43.5	79.1	34.3	---	---	31.3	161
Diener 505W	Red	37.7	67.0	24.4	3.5	MS	33.0	162
Dyna-Gro 9002	Red	55.4	56.0	31.2	---	---	32.7	159
Dyna-Gro 9070	Red	45.2	51.8	22.3	---	---	32.0	158
Dyna-Gro 9242W	White	37.1	82.7	31.4	5.6	S	32.3	159
Dyna-Gro 9362W	White	70.5	79.2	53.3	7.1	VS	33.0	161
Dyna-Gro 9552	Red	74.2	77.8	58.3	4.8	S	31.0	161
Dyna-Gro 9701	Red	39.2	88.8	33.8	5.0	S	35.2	161
Dyna-Gro 9862	Red	42.2	97.5	39.6	1.9	MR	32.3	161
Dyna-Gro 9932	Red	27.3	68.6	18.8	---	---	30.7	160
Dyna-Gro 9941	Red	42.1	76.0	32.5	---	---	31.3	159
Dyna-Gro WX19711	Red	39.5	73.1	29.0	---	---	29.3	159
Dyna-Gro WX19799W	White	38.7	52.7	19.9	---	---	30.7	160
E6012	White	77.3	28.6	23.4	5.7	---	31.0	161
HS 338 R	Red	48.3	77.6	39.9	2.9	MR	32.3	158
HS EX 20W	White	13.5	71.4	10.1	6.3	MS	32.7	160
HS EX 22W	White	66.8	72.4	50.6	---	---	32.0	160
HS EX 340R	Red	60.4	69.4	43.5	---	---	29.0	159
ISF 718	Red	60.0	66.0	41.9	4.2	MS	32.7	158
Jupiter	White	80.1	80.8	62.8	6.5	VS	31.0	161
KWS19X07	Red	69.9	74.9	52.4	---	---	32.3	160
KWS19X09	Red	50.4	59.4	29.5	---	---	32.3	159
KWS258	White	83.2	65.5	50.7	---	---	33.0	161
LCS3334	Red	6.8	64.8	3.2	---	---	33.0	160
MCIA 18002	Red	44.0	80.3	35.4	---	---	30.3	159
MCIA 18003	Red	56.4	80.7	46.3	---	---	26.7	159
MCIA 1801-3	Red	45.6	60.3	29.8	---	---	29.0	160
MCIA Flipper	Red	72.6	58.9	45.5	9.8	VS	32.0	159
MCIA Harpoon	Red	7.0	61.9	3.5	3.4	MR	30.3	160

2019 Michigan State University Wheat Performance Trials

Table 3. Fusarium Head Blight Resistance, plant height and flowering data.

		Fusarium Head Blight						
		Severity	Incidence	Index	DON ppm	FHB	Plant Height	Flowering Date
Line	Color	2019	2019	2019	2018	Rating*	(inches)	Days past Jan. 1
MCIA Jonah	Red	68.5	62.4	40.8	5.1	S	34.7	161
MCIA L 18-2	Red	40.6	55.3	21.9	---	---	32.5	159
MCIA Red Devil	Red	70.4	72.7	53.2	5.4	S	35.3	159
MCIA Red Dragon	Red	67.3	68.6	46.8	3.3	MS	36.7	160
MCIA Venus	White	67.1	47.7	33.7	---	S	33.7	159
MCIA Whale	Red	73.5	69.1	49.1	4.8	MS	34.0	161
MI14R1140	Red	68.5	68.5	49.9	4.9	MS	33.8	157
MI14W0190	White	30.3	76.6	23.4	2.9	MR	34.7	161
MI14W1039	White	60.4	72.7	45.2	6.8	S	33.3	159
MI15R0388	Red	33.7	72.7	24.2	4.3	MS	31.7	160
MI16R0592	Red	71.1	74.8	55.4	9.5	---	30.7	158
MI16R0798	Red	79.5	78.1	64.4	8.4	---	29.7	160
MI16R0898	Red	57.5	67.8	38.8	2.8	---	34.3	161
MI16R1172	Red	16.4	74.0	12.6	2.4	---	40.3	158
MI16W0133	White	60.6	61.9	35.8	10.6	---	33.0	159
MI16W0522	White	67.3	75.3	51.8	10.0	---	33.3	161
MI16W0528	White	59.0	55.3	31.8	5.3	---	33.0	162
RS 902	Red	25.6	75.3	19.4	3.8	S	31.7	159
RS 961	Red	37.7	80.4	30.1	2.3	S	32.3	161
RS 968	Red	24.3	79.9	19.4	5.5	MS	32.7	161
RS 9xp964	Red	29.5	58.1	14.7	---	---	30.7	159
RS 9xp967	Red	12.2	86.5	10.8	---	---	30.0	160
Starburst	Red	48.2	91.8	43.6	2.3	MR	27.5	162
SY 100	Red	56.6	69.9	40.6	6.8	S	32.0	161
SY 547	Red	67.5	76.1	52.1	7.3	S	35.0	159
SY 576	Red	32.7	87.0	28.6	---	---	31.7	161
SY 912	White	7.7	47.7	1.7	4.4	MR	33.7	160
SY Viper	Red	57.1	46.0	27.5	---	---	33.3	159
Viking 191	Red	57.3	45.3	20.5	---	---	31.5	158
Viking 207	Red	82.2	74.2	56.9	---	---	28.0	161
W 302	Red	37.8	78.1	30.2	4.6	S	32.0	159
W 304	Red	26.4	57.3	15.0	3.4	MS	31.7	159
W 305	Red	44.6	91.2	40.3	2.7	MR	31.3	161
W 312	Red	30.2	60.2	18.0	5.9	S	30.0	158
W 314	Red	6.1	54.8	1.4	---	---	31.3	158
W 316	Red	36.0	80.7	28.2	4.4	MS	31.8	162
Whitetail	White	53.7	61.0	34.0	4.8	MS	32.3	158
WX 909	Red	26.4	80.7	21.6	---	---	32.0	160
	LSD	23.8	26.4	22.8				

* R=Resistant, MR=Moderately Resistant, MS=Moderately Susceptible, S=Susceptible, VS=Very Susceptible.

2019 Michigan State University Wheat Performance Trials

Table 4. Conventional (Conv.) vs High Management (HM) Yield Resul

Line	Color	Tuscola High Management			Tuscola Conventional Management			Tuscola HM - Conv.	
		Bu/A	% Moist	TW	Bu/A	% Moist	TW	Difference	Rank
6771 EXP	Red	112.7	13.8	59.9	104.3	14.0	58.6	8.4	64
AC Mountain	White	114.3	12.6	59.1	100.2	13.0	57.7	14.1	24
AgriMAXX 413	Red	112.6	13.9	58.1	108.3	12.0	57.7	4.3	79
AgriMAXX 438	Red	119.2	14.6	59.0	108.6	13.4	57.6	10.7	50
AgriMAXX 473	Red	111.7	13.5	59.2	98.6	14.7	57.5	13.1	30
AgriMAXX 485	Red	110.7	14.6	60.7	103.3	14.8	60.4	7.4	69
AgriMAXX 486	Red	109.9	13.5	60.1	108.3	13.6	59.7	1.6	83
AgriMAXX 495	Red	116.2	15.2	60.4	103.6	15.0	60.1	12.6	34
Agrimaxx Exp 1902	Red	117.9	13.3	59.5	108.1	13.7	58.7	9.8	53
AgriMAXX Exp 1905	Red	121.0	14.3	58.9	109.1	13.9	57.7	12.0	39
Ambassador	White	112.5	12.3	58.3	98.9	12.3	57.3	13.6	26
DF 105 R	Red	118.2	12.0	59.0	106.8	13.5	58.0	11.5	43
DF 109 R	Red	114.0	15.0	58.7	107.9	15.0	58.0	6.2	75
DF 112 R	Red	122.0	12.4	58.1	108.6	12.3	57.6	13.4	28
DF 118 R	Red	113.5	13.8	59.6	106.1	13.7	59.7	7.4	68
DF 119 R	Red	118.9	14.0	59.0	109.5	14.7	59.6	9.5	58
DF 129 R	Red	112.2	13.4	59.2	108.0	13.5	58.4	4.2	80
DF 218 W	White	114.7	15.0	59.4	100.5	14.7	58.9	14.2	21
Diener 505W	Red	112.4	13.4	60.2	105.4	13.5	59.5	6.9	71
Dyna-Gro 9002	Red	120.2	13.8	59.0	110.3	13.2	58.4	9.8	52
Dyna-Gro 9070	Red	118.8	14.4	60.2	108.0	14.4	59.4	10.8	48
Dyna-Gro 9242W	White	120.7	12.9	57.6	108.7	14.0	58.1	12.0	37
Dyna-Gro 9362W	White	110.2	14.5	60.8	99.0	14.3	58.7	11.2	45
Dyna-Gro 9552	Red	120.9	13.8	60.1	108.0	12.2	57.7	12.9	33
Dyna-Gro 9701	Red	117.2	12.3	58.6	104.0	13.8	58.2	13.2	29
Dyna-Gro 9862	Red	108.1	14.4	59.2	99.3	14.2	59.5	8.8	62
Dyna-Gro 9932	Red	122.5	12.8	59.5	103.9	15.0	60.0	18.7	8
Dyna-Gro 9941	Red	121.3	13.3	58.0	100.3	13.4	57.0	21.0	5
Dyna-Gro WX19711	Red	120.7	14.4	60.6	106.3	14.4	60.2	14.5	19
Dyna-Gro WX19799W	White	116.3	13.4	59.2	99.8	12.7	58.1	16.5	13
E6012	White	109.8	13.0	58.3	100.2	13.5	59.0	9.6	56
HS 338 R	Red	115.2	13.7	60.2	108.4	14.6	59.1	6.8	72
HS EX 20W	White	110.3	13.4	59.5	98.4	13.6	58.5	11.9	40
HS EX 22W	White	114.8	14.3	59.5	94.5	14.5	58.2	20.3	6
HS EX 340R	Red	118.4	14.2	59.7	105.9	14.2	58.9	12.6	35
ISF 718	Red	114.6	14.6	60.3	112.9	14.2	59.4	1.6	84
Jupiter	White	116.5	13.2	58.6	100.4	13.8	56.6	16.1	14

2019 Michigan State University Wheat Performance Trials

Table 4. Conventional (Conv.) vs High Management (HM) Yield Resul

Line	Color	Tuscola High Management			Tuscola Conventional Management			Tuscola HM - Conv.	
		Bu/A	% Moist	TW	Bu/A	% Moist	TW	Difference	Rank
KWS19X07	Red	115.6	13.7	58.6	113.6	14.4	59.2	2.0	82
KWS19X09	Red	126.4	13.3	59.1	113.5	14.2	59.0	12.9	32
KWS258	White	115.7	14.8	59.9	106.7	14.4	59.2	9.0	61
LCS3334	Red	112.5	15.0	60.3	105.9	13.4	59.6	6.5	73
MCIA 18002	Red	122.2	13.6	58.0	108.1	13.4	57.3	14.1	23
MCIA 18003	Red	128.5	11.7	57.9	107.3	12.1	57.4	21.2	3
MCIA 1801-3	Red	116.8	13.1	58.3	104.7	14.0	58.0	12.1	36
MCIA Flipper	Red	116.6	14.0	59.2	108.5	14.3	58.8	8.1	65
MCIA Harpoon	Red	118.5	13.2	59.3	108.9	13.2	57.9	9.6	54
MCIA Jonah	Red	118.3	14.5	59.0	108.3	14.4	58.5	9.9	51
MCIA L 18-2	Red	119.5	13.1	59.3	109.9	14.1	57.7	9.6	55
MCIA Red Devil	Red	123.7	12.9	59.1	94.4	14.5	58.1	29.3	1
MCIA Red Dragon	Red	121.6	13.3	58.2	112.5	12.2	56.5	9.1	60
MCIA Venus	White	110.0	13.2	57.8	107.6	12.7	58.4	2.4	81
MCIA Whale	Red	112.9	14.0	58.6	104.4	14.1	58.6	8.4	63
MI14R1140	Red	112.6	13.8	58.9	103.1	14.3	58.2	9.5	57
MI14W0190	White	108.4	14.1	59.8	89.8	14.0	58.0	18.6	9
MI14W1039	White	115.1	12.5	57.4	93.9	11.9	57.0	21.1	4
MI15R0388	Red	113.4	14.4	58.9	99.5	14.4	58.7	13.9	25
MI16R0592	Red	113.3	12.7	57.9	98.4	11.7	56.8	14.9	18
MI16R0798	Red	113.2	12.7	58.3	103.8	13.4	55.9	9.4	59
MI16R0898	Red	112.1	14.6	59.7	96.8	14.7	59.1	15.4	16
MI16R1172	Red	109.6	15.0	60.3	101.8	15.4	60.0	7.8	67
MI16W0133	White	116.7	13.1	58.3	105.6	12.5	57.6	11.1	47
MI16W0522	White	117.1	13.9	60.1	101.9	14.3	59.2	15.2	17
MI16W0528	White	119.2	13.3	59.1	105.0	13.2	59.1	14.2	22
RS 902	Red	125.4	14.1	59.2	108.7	14.2	57.9	16.8	12
RS 961	Red	114.7	14.3	60.8	91.6	15.3	59.4	23.1	2
RS 968	Red	110.3	13.2	59.8	98.6	13.6	59.2	11.7	41
RS 9xp964	Red	119.8	14.7	60.7	111.8	14.6	60.0	8.0	66
RS 9xp967	Red	125.1	12.8	58.1	113.4	13.0	57.4	11.7	42
Starburst	Red	111.2	15.5	61.1	92.8	13.7	60.1	18.5	10
SY 100	Red	126.4	13.1	58.1	107.7	13.7	57.2	18.8	7
SY 547	Red	116.8	14.1	59.2	105.7	14.0	59.1	11.1	46
SY 576	Red	123.9	13.5	59.1	110.9	13.3	59.1	13.0	31
SY 912	White	102.9	14.8	59.2	95.9	14.6	58.8	7.0	70
SY Viper	Red	117.1	15.5	60.1	111.0	15.4	59.1	6.0	76

2019 Michigan State University Wheat Performance Trials

Table 4. Conventional (Conv.) vs High Management (HM) Yield Resul

Line	Color	Tuscola High Management Bu/A	% Moist	TW	Tuscola Conventional Management Bu/A	% Moist	TW	Tuscola HM - Conv. Difference	Rank
Viking 191	Red	121.8	13.0	57.6	110.5	14.0	58.2	11.3	44
Viking 207	Red	124.6	13.3	58.6	110.2	13.8	58.2	14.4	20
W 302	Red	110.8	14.1	59.3	106.3	14.6	58.7	4.6	78
W 304	Red	120.1	14.8	58.6	109.4	14.8	58.1	10.7	49
W 305	Red	116.0	14.5	60.8	102.4	15.0	58.6	13.5	27
W 312	Red	112.8	12.9	58.3	106.6	13.2	57.9	6.3	74
W 314	Red	120.9	14.9	60.3	108.9	14.9	60.1	12.0	38
W 316	Red	108.4	13.5	59.0	102.5	13.4	59.9	6.0	77
Whitetail	White	116.9	12.5	57.9	100.8	12.6	57.3	16.1	15
WX 909	Red	126.4	12.9	60.7	108.8	15.1	58.5	17.6	11
	Mean	116.4	13.7	59.1	104.7	13.9	58.4	11.7	
	CV	1.8	4.7	0.9	2.5	4.2	1.4	3.2	
	LSD	3.4	1.0	0.9	4.1	1.1	1.4	0.1	

2019 Michigan State University Wheat Performance Trials

Table 5. Milling and baking qualities.

Line	Color	Percent Flour Yield	Percent Protein In Flour (at 14%)	Softness Equivalent Percent	Sodium Carbonate SRC (%)	Lactic Acid SRC (%)	Cookie Diameter (cm)	NIR Kernel Protein	SKCS Kernel Hard
6771 EXP	Red	---	---	---	---	---	---	---	---
AC Mountain	White	69.6	8.0	54.0	63.3	79.6	19.0	9.5	18.9
AgriMAXX 413	Red	70.2	8.2	53.9	64.5	80.7	19.1	9.8	30.9
AgriMAXX 438	Red	71.1	7.4	63.6	63.8	103.1	19.3	9.0	11.0
AgriMAXX 473	Red	---	---	---	---	---	---	---	---
AgriMAXX 485	Red	---	---	---	---	---	---	---	---
AgriMAXX 486	Red	---	---	---	---	---	---	---	---
AgriMAXX 495	Red	---	---	---	---	---	---	---	---
Agrimaxx Exp 1902	Red	---	---	---	---	---	---	---	---
AgriMAXX Exp 1905	Red	---	---	---	---	---	---	---	---
Ambassador	White	71.1	7.5	58.6	62.8	86.8	19.0	9.5	6.1
DF 105 R	Red	69.6	8.2	53.2	64.6	80.4	19.0	10.0	28.4
DF 109 R	Red	70.6	7.9	62.5	64.5	107.0	19.4	9.5	13.4
DF 112 R	Red	69.7	7.7	54.4	65.8	84.7	18.8	9.3	25.9
DF 118 R	Red	---	---	---	---	---	---	---	---
DF 119 R	Red	---	---	---	---	---	---	---	---
DF 129 R	Red	---	---	---	---	---	---	---	---
DF 218 W	White	---	---	---	---	---	---	---	---
Diener 505W	Red	---	---	---	---	---	---	---	---
Dyna-Gro 9002	Red	---	---	---	---	---	---	---	---
Dyna-Gro 9070	Red	---	---	---	---	---	---	---	---
Dyna-Gro 9242W	White	67.9	7.8	57.2	65.7	87.0	19.0	9.7	21.5
Dyna-Gro 9362W	White	---	---	---	---	---	---	---	---
Dyna-Gro 9552	Red	69.1	7.8	61.6	67.4	99.5	18.6	9.8	12.6
Dyna-Gro 9701	Red	---	---	---	---	---	---	---	---
Dyna-Gro 9862	Red	---	---	---	---	---	---	---	---
Dyna-Gro 9932	Red	---	---	---	---	---	---	---	---
Dyna-Gro 9941	Red	---	---	---	---	---	---	---	---
Dyna-Gro WX19711	Red	---	---	---	---	---	---	---	---
Dyna-Gro WX19799W	White	---	---	---	---	---	---	---	---
E6012	White	---	---	---	---	---	---	---	---
HS 338 R	Red	---	---	---	---	---	---	---	---
HS EX 20W	White	---	---	---	---	---	---	---	---
HS EX 22W	White	---	---	---	---	---	---	---	---
HS EX 340R	Red	---	---	---	---	---	---	---	---
ISF 718	Red	---	---	---	---	---	---	---	---
Jupiter	White	69.2	7.8	57.3	67.3	90.6	18.8	9.7	18.3
KWS19X07	Red	---	---	---	---	---	---	---	---
KWS19X09	Red	---	---	---	---	---	---	---	---
KWS258	White	---	---	---	---	---	---	---	---
LCS3334	Red	---	---	---	---	---	---	---	---
MCIA 18002	Red	---	---	---	---	---	---	---	---
MCIA 18003	Red	---	---	---	---	---	---	---	---
MCIA 1801-3	Red	---	---	---	---	---	---	---	---
MCIA Flipper	Red	---	---	---	---	---	---	---	---
MCIA Harpoon	Red	65.7	8.4	55.4	68.5	99.4	18.7	9.7	22.4
MCIA Jonah	Red	---	---	---	---	---	---	---	---

2019 Michigan State University Wheat Performance Trials

Table 5. Milling and baking qualities.

Line	Color	Percent Flour Yield	Percent Protein In Flour (at 14%)	Softness Equivalent Percent	Sodium Carbonate SRC (%)	Lactic Acid SRC (%)	Cookie Diameter (cm)	NIR Kernel Protein	SKCS Kernel Hard
MCIA L 18-2	Red	---	---	---	---	---	---	---	---
MCIA Red Devil	Red	66.9	8.6	57.4	69.5	93.1	18.7	10.3	31.8
MCIA Red Dragon	Red	69.7	7.9	58.7	65.4	110.8	19.0	9.6	8.4
MCIA Venus	White	71.1	7.6	57.4	67.6	87.7	18.3	9.1	22.9
MCIA Whale	Red	68.1	7.8	56.9	69.3	96.5	18.8	9.7	24.5
MI14R1140	Red	---	---	---	---	---	---	---	---
MI14W0190	White	69.1	7.5	53.7	64.8	88.0	18.8	9.3	28.3
MI14W1039	White	---	---	---	---	---	---	---	---
MI15R0388	Red	---	---	---	---	---	---	---	---
MI16R0592	Red	---	---	---	---	---	---	---	---
MI16R0798	Red	---	---	---	---	---	---	---	---
MI16R0898	Red	---	---	---	---	---	---	---	---
MI16R1172	Red	---	---	---	---	---	---	---	---
MI16W0133	White	---	---	---	---	---	---	---	---
MI16W0522	White	---	---	---	---	---	---	---	---
MI16W0528	White	---	---	---	---	---	---	---	---
RS 902	Red	---	---	---	---	---	---	---	---
RS 961	Red	---	---	---	---	---	---	---	---
RS 968	Red	---	---	---	---	---	---	---	---
RS 9xp964	Red	---	---	---	---	---	---	---	---
RS 9xp967	Red	---	---	---	---	---	---	---	---
Starburst	Red	---	---	---	---	---	---	---	---
SY 100	Red	70.0	7.1	59.3	63.8	80.6	19.5	9.2	8.9
SY 547	Red	---	---	---	---	---	---	---	---
SY 576	Red	---	---	---	---	---	---	---	---
SY 912	White	---	---	---	---	---	---	---	---
SY Viper	Red	---	---	---	---	---	---	---	---
Viking 191	Red	---	---	---	---	---	---	---	---
Viking 207	Red	---	---	---	---	---	---	---	---
W 302	Red	---	---	---	---	---	---	---	---
W 304	Red	70.6	7.2	64.4	63.8	84.4	19.9	9.2	6.7
W 305	Red	---	---	---	---	---	---	---	---
W 312	Red	---	---	---	---	---	---	---	---
W 314	Red	---	---	---	---	---	---	---	---
W 316	Red	---	---	---	---	---	---	---	---
Whitetail	White	---	---	---	---	---	---	---	---
WX 909	Red	---	---	---	---	---	---	---	---

Commercially Available Varieties entered in the 2019 Michigan State University Wheat Performance Trials

AgriMAXX Wheat Company
AgriMAXX 413
AgriMAXX 438
AgriMAXX 473
AgriMAXX 485
AgriMAXX 486
AgriMAXX 495

Albert Lea Seeds
LCS3334
Viking 191
Viking 207

Biotown Seeds
Diener 505W

DF Seeds Inc.
Ambassador
DF 105 R
DF 109 R
DF 112 R
DF 118 R
DF 218 W
DF EX 1901 R
DF EX 1902 R
DF EX 1903 R
DF EX 1907 R

Dyna-Gro Seed
Dyna-Gro 9242W
Dyna-Gro 9362W
Dyna-Gro 9552
Dyna-Gro 9701
W 316
Dyna-Gro 9862
Dyna-Gro 9932
Dyna-Gro 9941

Harrington Seeds Inc.
HS 338 R
HS EX 20W
HS EX 22W
HS EX 340R

Irrer Seed Farm
6771 EXP
ISF 450
ISF 707
ISF 718
ISF 727

Michigan Crop Improvement Association
AC Mountain
E-6012
Jupiter
MCIA Flipper
MCIA Harpoon
MCIA Jonah
MCIA Red Devil
MCIA Red Dragon
MCIA Whale
Whitetail

Michigan State University
MI14R1140
MI14W0190
MI14W1039
MI15R0388
MI16R0592
MI16R0798
MI16R0898
MI16R1172
MI16W0133
MI16W0522
MI16W0528

Rupp Seeds Inc.
RS 902
RS 961
RS 968

Syngenta - AgriPro
SY 100
SY 547
SY 912
SY Viper

Wellman Seeds Inc.
Starburst
W 302
W 304
W 305
W 312
W 314
W 316
WX 909

Organizations Participating in the 2018 Michigan State University Wheat Performance Trials

AgriMAXX Wheat Company
7167 Highbanks Road
Mascoutah, IL 62258
Phone: 855-629-9432

Albert Lea Seed
1414 W. Main
PO Box 127
Albert Lea, MN 56007
Phone: 800-352-5247

BioTown Seeds
P.O. Box 299
Reynolds, IN 47980
Phone: 219-984-6038

D.F. Seeds, Inc.
P.O. Box 159
905 S. Jackson St.
Dansville, MI 48819
Phone: 517-623-6161

Dyna-Gro Seed
4648 S Garfield Rd
Auburn, MI 48611
Phone: 989-662-0000

Harrington Seeds, Inc.
2586 Bradleyville Road
Reese, MI 48757
Phone: 989-868-4750

Irrer Seed Farm
9621 Dexter Trail
Fowler, MI 48835
Phone: 517-719-5710

KWS Cereals
4101 Colleen Drive
Champaign, IL 61822
Phone: 330-439-3341

Michigan Crop Improvement Association
2905 Jolly Road
Okemos, MI 48864
Phone: 517-332-3546

Rupp Seeds, Inc.
17919 Co Rd. B
Wauseon, OH 43567
Phone: 419-337-1841

Syngenta
14031 Trestle Road
Highland, IL 64229
Phone: 765-412-5420

Wellman Seeds, Inc.
23778 Delphos Jennings Road
Delphos, OH 45833
Phone: 800-717-7333