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Michigan State University Extension Service

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Wheat Variety Performance in Michigan

By R.D. Freed, E.H. Everson, L.O. Copeland, D.W. Fulbright, and J.L. Clayton¹

WHEAT VARIETY PERFORMANCE trials are conducted each year at nine locations throughout Michigan's winter wheat production area. Entries to the trials include Michigan State University experimental lines as well as promising lines from neighboring state experiment stations. Commercial varieties from private seed companies are also included. The primary objective of this program is to provide agronomic data needed for release of new varieties to the public. A second objective is to provide comparative performance data on wheat varieties for Michigan growers.

Recommended and Certified Varieties

Historically, new varieties released from Michigan State University and recommended in Michigan are automatically eligible for certification. Such varieties must demonstrate superior production qualities. Similarly, superior varieties from other states may become eligible for certification. As new varieties are released to the public, old ones with inferior qualities are eventually removed from recommended and certifiable lists.

Some varieties may become eligible for certification without being recommended to Michigan producers. Most varieties in this category are those for which there is a substantial out-of-state market (or sometimes instate) for Michigan produced seed. Such varieties are designated as "acceptable for certification." This designation also includes outstanding varieties with less than three years of performance data in Michigan or those whose performance is competitive, though not necessarily superior.

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Varieties Available to Michigan

Table 1 (outside back cover) shows comparative information on most varieties of wheat available to Michigan growers regardless of their recommendation or certification. This information with the yield data reported in Tables 2 through 10, provides wheat growers with the essential information needed to select the best varieties.

Performance of Varieties

Table 2 shows comparative performance potential of different wheat varieties based on overstate yield trials conducted over several years. These comparisons are based on regression data from a large number of tests and provide a unique way of showing the yield potential of a variety in comparison with the average yield of all varieties at a given location. This system predicts how one variety will yield in comparison with other varieties at different expected yield levels. If the average expected yield at your farm is 75 bushels per acre, Augusta, Frankenmuth, and Hillsdale should produce 82 bushels/acre, whereas Yorkstar, Tecumseh, Ionia, Genesee, Abe, Arthur, S76 and S78 should produce 75, 70, 72, 70, 67, 67, 63 and 67 bushels per acre, respectively.

Tables 3 through 10 show the actual performance data of different varieties at eight locations from 1978 to 1983. Study the data from the test sites nearest your farm.

Production Tips

1. Prepare a smooth, weed-free seedbed free of quackgrass.
2. Have your soil tested by a research-oriented laboratory and apply the recommended amounts of both lime and fertilizer.
3. Select one or more high-performing wheat varieties on the basis of performance trials shown in this bulletin. Consider new varieties; however do not change varieties abruptly. Select one or two

new high-performing varieties and plant up to 25 percent of your acreage to each new variety until you determine how it fits your management scheme.

4. Seed treatment is very important in wheat to protect the germinating seed against soilborne organisms (seed rot and seedling blight fimgi). Chemical treatment is even more critical to protect against loose smut and bunt (stinking smut). Complete information about seed treatment is found in Extension Bulletin E-1199, "Seed Treatment for Field Crops" (free).

5. Plant seed approximately 10 days after the fly free date. Generally, planting late will produce higher yields. If you plant early, diseases can build up in the crop and cause yield reductions.

6. With the varieties Augusta, Frankenmuth and

Tecumseh, top-dress with 60 to 80 pounds of actual N in the spring while ground is still frozen or within three weeks after growth begins. Topdress other varieties with 40 to 60 pounds. If wheat is planted immediately after plowing down a medium stand of legume, nitrogen rates can be reduced to 40 to 60 pounds per acre. Soils with lower yield potential should receive less nitrogen than more productive soils.

7. Spray for broadleaf weeds when crop is fully tillered.

8. Harvest wheat when moisture reaches or drops below 14%. If the moisture forecast is for a wet harvest period, harvest wheat at 14-20% moisture and dry to prevent sprouting.

Table 2—Expected yield of a variety when the average yield level of all varieties in the test was 45, 55, 65, 75, 85, 95 or 105 Bu/Acre.

Variety	Number of Tests	Environmental Productive Index (Bu/Acre) (Average Expected Yield at Your Location)						
		45	55	65	75	85	95	105
Frankenmuth	50	48	58	69	82	90	101	111
Augusta	50	48	58	69	82	90	101	111
Yorkstar	50	45	55	65	75	85	95	106
Tecumseh	50	42	51	60	70	79	88	97
Ionia	50	43	53	63	72	82	91	101
Genesee	50	42	51	60	70	79	88	97
Hillsdale	30	48	58	69	82	90	101	111
Abe	50	40	49	58	67	76	85	94
Arthur	50	40	49	58	67	76	85	93
Pioneer S-76	10	38	46	55	63	71	80	88
Pioneer S-78	10	40	49	58	67	76	85	93
Houser	10	47	57	68	78	88	99	109
Arrow	10	40	49	58	67	76	85	93

Table 3 — Ingham County soft winter wheat variety comparison (yield-Bu/Acre) trial, 1978-1983.

Variety	1978	1979	1980	1981	1982	1983	6-Year Average	Percent Of Index
Augusta	70.3	86.1	70.4	89.3	46.4	71.8	72.4	109
Frankenmuth	65.7	87.9	85.8	87.1	51.3	67.6	74.2	112
Houser	57.2	84.8	56.2	83.4	41.4	69.2	65.4	99
Fredrick	69.6	77.3	72.3	74.9	46.4	67.7	68.0	103
Yorkstar	59.1	83.7	58.8	78.3	40.4	73.3	65.6	99
Genesee	56.9	73.7	62.9	71.5	39.1	59.9	60.7	92
Ionia	62.9	72.2	72.4	64.9	39.8	59.8	62.0	94
Tecumseh	59.4	68.3	60.3	64.8	27.9	60.4	56.9	86
Hillsdale	67.6	85.1	82.3	93.1	42.6	71.4	73.7	111
Titan	--	83.1	65.3	75.0	31.8	74.5	65.9	99
S76	--	--	62.5	77.7	32.0	--	57.4	87
Arthur	57.5	60.7	63.3	68.8	34.7	59.6	57.4	87
Abe	57.2	54.9	51.2	58.4	34.6	49.6	51.0	77
Auburn	--	--	--	75.8	42.0	59.6	59.1	89
Environmental Index (Average yield of 30 varieties)	62.2	78.8	67.8	80.9	41.0	66.8	66.3	
LSD .05					5.7	6.5		

Table 4 — Ionia County soft winter wheat variety comparison (yield-Bu/Acre) trial, 1978-1983.

Variety	1978	1979	1980	1981	1982	1983	6-Year Average	Percent Of Index
Augusta	46.0	78.9	78.8	64.7	61.4	58.0	64.6	108
Frankenmuth	42.7	77.7	84.2	62.5	54.6	53.0	62.5	105
Houser	47.1	75.2	74.3	64.4	47.1	49.6	59.6	100
Fredrick	52.2	75.2	73.3	68.0	56.1	53.6	63.0	105
Yorkstar	32.4	70.0	70.0	65.3	51.4	56.9	57.7	96
Genesee	40.2	61.7	70.0	56.9	52.8	52.6	55.7	93
Ionia	47.4	69.8	78.2	57.2	42.0	51.8	57.7	96
Tecumseh	42.1	62.3	60.7	48.0	33.3	39.9	47.7	80
Hillsdale	--	82.5	80.6	70.9	57.8	49.7	68.3	115
Titan	--	81.4	75.6	69.6	48.9	48.9	55.2	92
S76	--	--	73.2	54.5	45.6	--	57.8	97
Arthur	41.3	48.9	67.1	55.0	42.6	34.5	48.2	81
Abe	44.3	57.2	66.3	52.8	39.6	29.3	48.3	81
Auburn	--	--	--	57.0	--	33.8	45.4	76
Environmental Index (Average yield of 30 varieties)	42.6	73.7	76.0	63.0	52.0	51.4	59.8	
LSD .05					7.5	8.9		

Table 5 — Tuscola County soft winter wheat variety comparison (yield-Bu/Acre) trial, 1978-1983.

Variety	1978	1979	1980	1981	1982	1983	6-Year Average	Percent Of Index
Augusta	71.5	69.7	89.1	64.7	66.4	85.2	74.4	107
Frankenmuth	66.2	68.1	90.4	62.5	67.1	79.5	72.3	103
Houser	59.7	66.2	83.7	62.8	54.1	78.7	67.5	96
Fredrick	66.1	62.7	91.1	66.1	69.8	73.0	71.5	102
Yorkstar	57.8	62.4	83.1	54.2	53.6	79.5	65.1	93
Genesee	54.6	57.4	77.5	67.1	56.4	60.7	62.3	89
Ionia	59.6	60.6	85.3	62.1	53.9	71.8	65.6	94
Tecumseh	59.9	56.3	80.5	66.7	49.7	72.0	64.2	92
Hillsdale	68.1	68.5	86.9	83.6	60.0	84.6	72.3	103
Titan	--	62.4	84.9	52.1	63.1	80.8	68.7	98
S76	--	--	79.7	57.7	65.2	--	67.5	96
Arthur	60.1	47.6	86.7	61.9	56.0	70.4	63.8	91
Abe	56.8	55.6	88.9	60.2	55.0	63.1	63.8	91
Auburn	--	--	--	66.7	--	60.1	63.4	91
Environmental Index (Average yield of 30 varieties)	60.8	64.6	87.6	67.7	60.0	78.4	70.0	
LSD .05					10.0	11.0		

Table 6 — Huron County soft winter wheat variety comparison (yield-Bu/Acre) trial, 1978-1983.*

Variety	1978	1979	1980	1981	1983	5-Year Average	Percent Of Index
Augusta	90.2	86.2	91.9	98.9	90.5	91.5	108
Frankenmuth	84.3	89.1	91.2	96.8	88.7	90.0	106
Houser	--	87.0	76.3	94.1	79.4	84.2	100
Fredrick	73.5	76.9	76.4	98.2	82.6	81.5	96
Yorkstar	76.8	83.4	71.2	88.3	89.5	81.8	97
Genesee	75.6	75.6	73.8	77.3	75.7	75.6	89
Ionia	75.4	79.2	77.7	71.4	84.9	77.7	92
Tecumseh	74.4	80.5	78.1	78.7	75.7	77.5	92
Hillsdale	--	87.1	94.1	99.7	88.3	92.3	109
Titan	--	84.8	86.7	94.2	84.1	87.5	103
S76	69.5	--	83.6	85.3	--	79.5	94
Arthur	72.7	68.7	70.5	81.9	71.8	73.1	86
Abe	80.4	65.7	67.9	81.1	72.0	69.3	82
Auburn	--	--	--	83.9	79.3	81.6	96
Environmental Index (Average yield of 30 varieties)		82.6	80.1	90.6	84.9	84.6	
LSD .05					13.4		

*Nursery was winterkilled in 1982.

Table 7 — Monroe County soft winter wheat variety comparison (yield-Bu/Acre) trial, 1979-1982.

Variety	1979	1980	1981	1982	4-Year Average	Percent Of Index
Augusta	86.4	84.3	63.4	75.9	77.5	113
Frankenmuth	85.0	83.3	61.3	58.3	71.9	105
Houser	79.8	72.8	58.9	46.3	64.4	94
Fredrick	80.5	87.1	52.9	60.6	70.3	103
Yorkstar	68.8	72.6	47.0	37.5	56.5	83
Genesee	70.2	84.0	52.4	58.1	66.2	97
Ionia	68.8	88.7	57.1	66.7	70.3	103
Tecumseh	70.9	75.9	49.1	34.2	57.5	84
Hillsdale	87.0	94.6	55.3	63.2	75.0	110
Titan	65.5	90.1	56.3	43.4	63.8	93
S76	--	84.2	62.9	57.1	66.1	97
Arthur	72.6	86.0	67.2	55.8	70.4	103
Abe	65.6	82.6	53.4	53.9	63.9	93
Auburn	--	--	69.1	--	69.1	101
Environmental Index (Average yield of 30 varieties)	75.4	82.9	60.8	54.7	68.4	
LSD .05				25.0		

Table 8 — Lenawee County soft winter wheat variety comparison (yield-Bu/Acre) trial, 1978-1983.

Variety	1978	1979	1980	1981	1982	1983	6-Year Average	Percent Of Index
Augusta	58.7	67.8	76.6	49.9	77.8	64.2	65.8	114
Frankenmuth	61.1	63.6	73.5	56.0	63.7	56.0	62.3	108
Houser	--	57.3	73.1	56.9	58.3	60.0	61.1	106
Fredrick	53.5	53.6	68.4	50.4	60.3	59.6	57.6	100
Yorkstar	57.8	57.0	69.5	43.8	52.9	48.0	54.8	95
Genesee	52.9	58.2	66.7	49.3	57.0	52.7	56.1	97
Ionia	52.5	54.4	62.7	47.6	59.4	53.4	55.0	95
Tecumseh	49.6	47.1	68.3	40.3	41.1	52.0	49.7	86
Hillsdale	--	66.7	81.8	61.3	55.6	41.4	61.4	106
Titan	--	55.1	75.2	49.5	59.2	61.1	60.0	104
S76	41.9	--	69.1	50.8	52.0	--	53.5	93
Arthur	47.8	44.5	64.0	46.0	53.8	51.4	51.3	89
Abe	49.8	37.2	66.0	48.2	58.8	38.4	49.7	86
Auburn	--	--	--	55.8	--	52.4	54.1	94
Environmental Index (Average yield of 30 varieties)	52.6	56.3	71.7	52.9	57.6	55.5	57.8	
LSD .05					15.8	12.8		

Table 9 — Kalamazoo County soft winter wheat variety comparison (yield-Bu/Acre) trial, 1978-1983.

Variety	1978	1979	1980	1981	1982	1983	6-Year Average	Percent Of Index
Augusta	44.3	76.9	48.4	66.1	32.3	49.6	52.9	109
Frankenmuth	37.8	68.9	54.6	64.0	24.6	53.0	50.5	104
Houser	42.8	67.3	56.4	56.5	22.4	48.6	49.0	101
Fredrick	47.9	67.3	56.4	63.3	25.8	49.4	51.7	107
Yorkstar	39.4	69.2	47.3	59.2	22.4	52.1	48.3	100
Genesee	38.0	59.8	48.0	49.8	26.6	49.4	45.3	94
Ionia	41.3	55.3	59.7	56.0	25.9	51.2	48.2	100
Tecumseh	38.8	52.0	42.9	51.4	22.4	39.7	41.2	85
Hillsdale	--	69.5	61.4	63.4	29.2	52.3	55.2	114
Titan	--	69.1	58.6	64.9	23.8	50.5	53.4	110
S76	--	--	55.2	62.1	27.7	--	48.3	100
Arthur	38.5	54.2	44.9	54.8	25.0	41.2	43.1	89
Abe	42.8	47.4	53.1	50.0	21.3	38.9	42.3	87
Auburn	--	--	--	60.1	--	43.0	51.6	105
Environmental Index (Average yield of 30 varieties)	38.9	65.6	52.7	59.6	25.0	48.8	48.4	
LSD .05					6.6	7.5		

Table 10 — St. Joseph County soft winter wheat variety comparison (yield-Bu/Acre) trial, 1978-1983.

Variety	1978	1979	1980	1981	1982	1983	6-Year Average	Percent Of Index
Augusta	36.2	55.1	68.3	65.5	44.2	62.0	55.2	105
Frankenmuth	35.6	54.4	67.3	63.4	39.4	64.6	54.1	103
Houser	39.5	56.0	56.0	62.9	31.6	59.1	50.9	97
Fredrick	35.1	43.3	65.9	66.1	47.8	55.5	52.3	99
Yorkstar	36.9	47.3	64.0	64.3	35.9	64.4	52.1	99
Genesee	35.2	46.8	56.6	63.6	39.4	62.8	50.7	96
Ionia	33.4	47.5	58.0	60.6	48.2	63.3	51.8	98
Tecumseh	34.7	39.8	54.5	47.1	38.3	51.5	44.3	84
Hillsdale	--	58.5	64.7	75.5	46.0	65.5	62.0	118
Titan	--	49.4	68.0	65.7	42.0	62.2	57.5	109
S76	--	--	61.9	55.5	37.9	--	51.8	96
Arthur	29.6	45.4	49.6	53.2	36.6	51.9	44.4	84
Abe	29.4	45.6	56.1	44.7	44.5	54.6	45.8	87
Auburn	--	--	--	54.4	--	51.9	53.2	101
Environmental Index (Average yield of 30 varieties)	35.6	50.4	63.0	67.3	40.0	59.6	52.7	
LSD .05					15.2	6.3		

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Table 1—Wheat variety comparisons.

Variety	Origin	Chaff Color	Straw Height (in)	Test Weight (lb)	Hessian Fly Resistance	Winter Hardiness	Lodging Resistance	Leaf Rust Resistance	Powdery Mildew Resistance
Soft White Wheat Varieties									
Arrow	New York	bronze	36	59.0	none	good	very good	susceptible	susceptible
Augusta	Michigan	white	39	57.7	none	good	very good	resistant	susceptible
Favor	CIBA-GEIGY	bronze	39	57.5	unknown	good	very good	susceptible	resistant
Frankenmuth	Michigan	brown	40	59.4	Races A & C	good	very good	resistant	resistant
Fredrick	Canada	white	39	59.5	Races A & C	good	good	resistant	susceptible
Genesee	New York	bronze	45	59.5	none	good	good	susceptible	susceptible
Houser	New York	white	34	57.7	none	good	very good	resistant	resistant
Ionia	Michigan	brown	42	59.7	Races A & C	good	good	resistant	susceptible
Tecumseh	Michigan	white	37	61.1	Races A & C	very good	very good	resistant	resistant
Yorkstar	New York	bronze	39	57.5	none	good	very good	susceptible	susceptible
Soft Red Wheat Varieties									
Abe	Indiana	white	34	60.4	all known races	very good	very good	resistant	resistant
Argee	Wisconsin	white	35	58.5	reaction unknown	very good	very good	resistant	resistant
Arthur	Indiana	white	36	60.5	all known races	very good	very good	resistant	resistant
Arthur 71	Indiana	white	36	60.5	all known races	very good	very good	resistant	resistant
Auburn	Indiana	white	36	59.8	all known races	very good	very good	resistant	resistant
Caldwell	Indiana	white	35	57.5	all known races	good	very good	resistant	resistant
Fillmore	Indiana	white	37	59.8	Race B	very good	very good	resistant	resistant
Hart	Indiana	white	33	58.8	none	good	very good	susceptible	susceptible
Hillsdale	Michigan	bronze	42	59.2	none	good	good	resistant	resistant
Hybrex 3008	Rohn & Haas Co.	bronze	40	58.0	unknown	very good	very good	resistant	resistant
Pike	Missouri	white	35	59.4	Races A & C	good	good	resistant	susceptible
Pioneer S-76	Pioneer	white	33	58.8	none	good	very good	susceptible	susceptible
Pro-20	Pro Seeds, Inc.	white	39	61.0	unknown	good	good	resistant	resistant
Roland	Illinois	white	34	58.2	reaction unknown	very good	very good	resistant	resistant
Scotty	Illinois	white	35	59.0	Race A	good	good	very good	resistant
Sullivan	Indiana	white	40	58.5	all known races	good	good	resistant	resistant
Titan	Ohio	white	39	59.0	Race A	very good	very good	resistant	resistant
Tyler	Ohio	white	40	58.1	none	good	good	susceptible	resistant