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Wheat Variety and Seed Selection

Michigan State University Extension Service

Wheat Facts

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# WHEAT



# FACTS



## WHEAT VARIETY AND SEED SELECTION

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**T**he first step towards profitable wheat production is to identify varieties appropriate for your soil, climatic and market conditions. An increasing number of certified and uncertified public and private varieties are available. Variety selection can easily make a difference of 15 to 20 or more bushels per acre when combined with the best management practices. Varieties also differ widely in agronomic and quality characteristics. Some have better resistance to diseases, others have better milling and baking quality, while others are more resistant to lodging. Thus, it is important to select varieties carefully. The accompanying table shows agronomic characteristics of wheat varieties currently available in Michigan.

Wheat variety performance trials are conducted by Michigan State University (MSU) each year at five to seven locations throughout Michigan's winter wheat production area. Entries to the trials include MSU experimental lines, promising lines from neighboring states and commercial varieties from other universities and private seed companies. The primary objective of this testing program is to provide the agronomic data needed to determine which lines to release as commercial varieties. A second objective is to show Michigan wheat growers which varieties perform best in Michigan. Results from these trials are made available each year through local county Extension offices, and multi-year summaries are published annually (see table inside).

Although wheat producers are always interested in how varieties perform in a given year and location, such data should be used with caution. Performance in one given year and location should *never* be used in selecting a variety to plant. It is best to select a variety on the basis of at least three years

or more of data across several different locations. Such comparisons are more likely to be reliable under a wide range of conditions.

In any given year or at any given site, several varieties will usually fall into the group of 'highest yielding' varieties. The composition of that group, and the identity of the absolute "winner", can and does change from location to location, and year to year. This means that the single best variety cannot be determined in advance for a specific site. What can be done is identify a group of varieties whose past performance and agronomic characteristics indicate that they are most likely to perform best in the upcoming season. It is a good idea to select two or more varieties which increases the chance of having the best adapted variety for the particular conditions that are likely to prevail during the ensuing season. Selecting two varieties can reduce losses from diseases and insects that occur when a given variety's pest resistance is overcome by a change in the pest population.

### Soft White vs. Soft Red Wheat

About 70 to 75 percent of the wheat varieties planted in Michigan are in the soft white class. This class is unique to Michigan, Ontario, New York and the Pacific Northwest and its uses include cookies, crackers, cakes, pastries and soup thickeners. It is generally easier for wheat producers in central and northern Michigan to market soft white varieties because many elevators in this area only purchase white varieties. Soft red varieties are more readily marketed in southern Michigan. Growers should check with their local elevator before planting to make sure that a ready market exists.

*(Continued on back page)*

# 1994 State Wheat Variety Trial Multi-Year Performance Summary

## All County Sites Included

Variety Name	Single Year Multi-site Average Yields (Bushels/acre)						Across Year Averages (bu./acre)					Test Weight (lbs/bu.)		Grain Color	94 Disease Scores (0-9,0=none)			94 Miscellaneous Data				1993 Quality		
	1989	1990	1991	1992	1993	1994	2 YR 93-94	3 YR 92-94	4 YR 91-94	5 YR 90-94	6 YR 89-94	93	94		PM	WSSV	LR	Lodge Score (0-9)	50% Pollen (DOY)	Ht (in)	Sprout Score	Chaff/Awns	Mill	Bake
	Wakefield (va)	.	79.2	77.0	91.3	68.7	76.7	72.7	78.9	78.4	78.5	.	58.7		58.2	R	0.7	2.4	6.0	5.3	158	31	0.5	W/N
Mendon (lsi)	.	78.0	76.3	105.0	67.8	75.7	71.7	82.8	81.2	80.5	.	55.8	55.3	R	0.7	1.4	6.0	5.3	158	34	1.0	W/N	101	102
Pioneer 2510	.	.	.	114.8	68.2	72.7	70.4	85.2	.	.	.	57.3	59.0	R	7.7	1.4	1.0	0.2	159	29	0.5	W/N	98	86
Pioneer 2545	.	.	.	98.2	67.4	72.3	69.8	79.3	.	.	.	56.3	56.3	R	1.7	2.2	5.0	2.4	158	28	0.5	W/N	88	93
Pioneer 2552	.	.	.	.	.	71.9	.	.	.	.	.	.	59.1	R	0.7	1.2	3.0	0.6	157	28	0.5	W/N	.	.
Madison (va)	.	74.4	75.0	91.5	66.7	71.1	68.9	76.4	76.0	75.7	.	57.2	56.9	R	0.3	0.9	6.0	4.1	157	32	0.5	W/N	101	104
Lowell (msu)	.	74.9	76.6	103.9	66.5	71.1	68.8	80.5	79.5	78.6	.	54.9	54.5	W	1.0	1.2	5.0	5.3	158	32	5.5	W/N	103	92
Beck 109	.	.	.	.	.	70.6	.	.	.	.	.	.	60.4	R	3.7	3.4	6.0	2.0	158	35	0.5	W/N	.	.
Freedom (ohio)	.	.	.	.	69.3	70.0	69.6	.	.	.	.	56.5	56.7	R	1.7	2.4	2.0	2.8	159	34	1.0	W/N	89	98
Terra Sr204	.	.	.	.	63.5	69.9	66.7	.	.	.	.	60.3	60.6	R	3.3	3.0	6.0	1.6	158	34	1.0	W/Y	99	77
Agra Gr863	.	.	.	92.4	61.9	68.8	65.3	74.3	.	.	.	57.3	56.7	R	2.7	3.7	3.0	1.2	156	32	0.0	B/Y	88	70
Harus (canada)	65.9	69.0	71.1	101.7	65.6	68.1	66.8	78.4	76.6	75.1	73.5	57.3	56.5	W	3.0	3.2	6.0	2.1	159	37	4.5	B/N	89	94
Cardinal (ohio)	62.8	69.5	70.2	98.6	65.5	68.0	66.7	77.3	75.5	74.3	72.4	57.2	57.7	R	7.0	3.2	5.0	3.2	159	33	2.5	W/N	103	97
Augusta (msu)	58.6	71.1	61.1	102.8	58.6	67.9	63.2	76.4	72.6	72.3	70.0	53.8	56.3	W	4.3	7.9	6.0	2.8	162	35	2.5	W/N	98	110
Rupp Rs927	.	.	.	88.3	60.7	67.5	64.1	72.1	.	.	.	59.6	59.4	R	5.3	3.0	1.0	2.6	156	34	3.5	W/N	.	.
Chelsea (msu)	70.5	75.0	66.9	103.9	66.4	66.6	66.5	78.9	75.9	75.7	74.8	56.9	57.7	W	0.7	1.4	4.0	3.8	162	34	5.5	B/Y	100	100
Batavia (ny)	.	.	.	.	.	66.5	.	.	.	.	.	.	56.5	W	2.7	4.9	6.0	3.2	160	35	2.5	W/N	97	100
Hillsdale (lsi)	60.2	64.8	60.3	97.2	56.1	66.2	61.1	73.1	69.9	68.9	67.4	56.1	58.4	R	3.3	5.7	8.0	2.5	159	36	0.5	B/N	91	100
Agra Gr915	.	.	.	.	58.6	66.1	62.3	.	.	.	.	53.4	55.7	R	1.0	1.5	2.0	0.8	158	26	0.0	W/O	93	93
Susquehanna (ny/md)	.	.	.	.	62.9	65.7	64.3	.	.	.	.	55.9	57.2	R	1.0	1.4	7.0	2.8	160	36	0.0	W/N	95	92
Agra Gr933	.	.	.	.	.	64.6	.	.	.	.	.	.	55.9	R	5.7	2.7	4.0	1.8	157	33	1.0	W/N	.	.
Frankenmuth (msu)	59.0	66.8	61.9	98.1	58.0	64.4	61.2	73.5	70.6	69.8	68.0	55.4	58.4	W	4.3	6.0	8.0	4.9	162	37	4.0	B/N	93	99
Genesee	.	.	.	.	55.4	64.3	59.8	.	.	.	.	57.5	56.4	W	5.7	4.7	5.0	2.2	162	37	2.0	W/N	95	73
Agripro Hickory	.	.	.	.	.	64.0	.	.	.	.	.	.	57.6	R	1.3	2.9	3.0	5.3	157	31	1.0	W/N	.	.
Pioneer 2737w	.	.	.	105.7	60.0	64.0	62.0	76.5	.	.	.	54.3	55.6	W	4.7	2.0	5.0	0.8	158	29	4.0	W/N	91	90
Pioneer 2548	66.7	75.9	75.6	97.2	64.9	63.9	64.4	75.3	75.4	75.5	74.0	57.2	56.4	R	1.3	6.0	3.0	1.0	159	24	0.0	W/Y	93	74

Variety Name	Single Year Multi-site Average Yields (Bushels/acre)					Across Year Averages (bu./acre)					Test Weight (lbs/bu.)		Grain Color	94 Disease Scores (0-9, 0=none)			94 Miscellaneous Data				1993 Quality			
	1989	1990	1991	1992	1993	1994	2 YR 93-94	3 YR 92-94	4 YR 91-94	5 YR 90-94	6 YR 89-94	93		94	PM	WSSV	LR	Lodge Score (0-9)	50% Pollen (DOY)	Ht (in)	Sprout Score	Chaff/Ams	Mill	Bake
Terra Sr205	.	.	.	.	66.0	63.7	64.8	.	.	.	.	56.2	55.4	R	5.0	2.5	4.0	1.3	157	31	1.0	W/Y	.	.
Karena (andersons)	.	.	66.4	107.3	59.0	63.2	61.1	76.5	73.9	.	.	54.9	57.0	W	2.0	6.2	5.0	2.6	162	36	2.5	W/N	96	98
Jackson	.	.	.	.	.	62.9	.	.	.	.	.	.	57.1	R	0.7	1.2	4.0	4.3	157	30	1.0	W/N	.	.
Dynasty (ohio)	66.9	70.5	62.5	95.7	64.9	62.9	63.9	74.5	71.5	71.3	70.5	58.3	57.4	R	5.3	2.5	4.0	2.0	156	34	1.0	W/Y	104	102
Agra Gr876	67.7	73.2	71.5	92.6	55.8	62.6	59.2	70.3	70.6	71.1	70.5	57.1	58.4	R	4.7	1.7	1.0	0.7	161	31	1.0	W/Y	90	73
Beck 105	.	.	.	.	.	62.5	.	.	.	.	.	.	55.6	R	7.3	2.4	3.0	1.4	158	32	2.5	W/N	.	.
Rupp Rs917	.	.	.	.	.	62.5	.	.	.	.	.	.	55.6	R	4.7	2.2	3.0	1.7	157	31	1.0	W/N	.	.
Agripro Sawyer	.	.	67.5	91.4	64.7	61.4	63.0	72.5	71.2	.	.	57.3	56.1	R	2.0	1.2	3.0	3.2	156	31	1.0	W/N	96	95
Grant (in)	.	.	.	.	.	60.1	.	.	.	.	.	.	55.9	R	4.3	2.5	2.0	1.1	159	30	1.0	W/N	.	.
Pioneer 2571	.	.	.	.	66.0	57.8	61.9	.	.	.	.	57.8	55.6	R	1.0	2.9	1.0	1.2	157	28	1.0	W/Y	95	85
Agripro Iwain	68.3	77.3	71.8	88.3	66.1	57.7	61.9	70.7	70.9	72.2	71.5	58.9	59.8	R	6.0	3.2	3.0	3.4	157	34	1.0	W/N	92	79
Agripro Pontiac	.	.	.	.	.	57.6	.	.	.	.	.	.	57.7	R	5.7	3.0	2.0	3.1	156	32	1.0	W/N	.	.
Mean	64.6	72.8	69.4	98.3	63.4	66.1	65.1	76.3	74.3	74.2	71.3	56.7	57.1		3.2	2.9	4.1	2.5	158.3	32.2	1.5			
# of sites	7	7	7	7	5	7	12	19	26	33	40	5	7		3	2	1	5	1	1	1			
l.s.d.				8.2	5.3	7.7							0.8		2.3	2.9	2.2	1.7	1.1	3.4	2.1			
c.v.				6.9	6.9	11.1							1.5											

Yield was calculated using the entire area of the plot including the wheel tracks between plots. Test weights are estimated using 1 pint samples for each harvested plot. Yield comparisons are only valid within a column. Disease abbreviations are: PM = powdery mildew, WSSV = wheat spindle streak mosaic virus, and LR = leaf rust. All scores are based on a 0-9 scale, where 0 is the best possible score. Data for 50% pollen shed indicate the number of days past January 1st before that variety reached the point where one-half of its heads were flowering. This is highly related to

differences in harvest date. Plant height was measured at the tip of average heads in a plot. Sprouting score data based on visual score (0-9, 0 = none) of sprouting visible in 10 heads (2 replications) exposed for 36 hours to high moisture germinating conditions. Mill and Bake scores are based on a composite sample of 1993 yield trial samples. A score of 100 means the cultivar was equivalent to Chelsea. MSU makes no endorsement of any wheat variety or brand.

## Spring vs. Winter Wheat

Spring wheats are preferred only in areas of the country where winter wheat cannot survive local winter conditions. In lower Michigan and other areas where winter wheat can survive the winter, its jump on spring growth gives it an unbeatable yield advantage over spring wheat. Spring wheat's comparatively delayed development also prolongs and accentuates its exposure to performance-threatening diseases and pests such as leaf rust, barley yellow dwarf virus and aphids. For these reasons, wheat breeders at MSU and adjoining states have not developed spring wheat varieties. Consequently, most spring wheat varieties are poorly adapted to lower Michigan conditions. Furthermore, marketing and storage facilities are generally not available in Michigan.

## Source and Quality of Seed

Both certified and uncertified seed are available from local elevators, individual certified seed producers and seed companies throughout Michigan. Certified seed has the benefit of a third-party affirmation of the varietal purity and seed quality. However, uncertified seed may also represent high quality and varietal purity, depending on the seed suppliers and their credibility.

Seed lots should be selected on the basis of germination, purity and freedom from inert matter. High quality wheat seed should normally germinate

between 95 and 100 percent in most years. Seed lots which *show any evidence of sprouting* should be avoided. Otherwise, storability and emergence potential may be affected, even though immediate germination is strong.

Pure seed content of high quality wheat will appear on the label and should be near 100 percent. Lots containing restricted noxious weed seed and more than two seeds per pound of common weeds should be avoided.

## Seed Treatment

Seed treatment is one of the most important and least expensive measures you can take to avoid problems from seed-borne diseases. Wheat seed should be uniformly treated with an effective systemic fungicide and a broad-spectrum fungicide to control seed rot, seedling blight, loose smut, common bunt (stinking smut) and other seed-borne fungal diseases. Seed purchased from a certified seed grower or from other reputable seed sources will normally be treated as part of the conditioning process. If not, it should be taken to a local elevator or to a seed conditioning plant for treatment. You may use drill box treatment as a last resort, but be careful to obtain complete and uniform seed coverage. For additional information on seed treatment and specific recommendations, see Extension bulletin E-1199, "Seed Treatment for Field Crops" (70¢).

This bulletin is part of a series that is being prepared for Michigan wheat producers. Check with your local MSU Extension Office for availability.

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