2009 Winter Wheat Performance Tests

Shawn Conley, Paul Esker, Mark Martinka John Gaska, and Karen Lackermann

The Wisconsin Winter Wheat Performance Tests are conducted each year with the WI producers needs in mind. Our goal is to give wheat growers information to select varieties that will satisfy their specific goals and are most likely to perform best under his/her management practices. The performance tests are conducted each year at four locations in Wisconsin (Janesville, Lancaster, Chilton, and Arlington,). Trials include released varieties, experimental lines from neighboring states, and lines from private seed companies (Table 3). The primary objective of these trials is to obtain data on how varieties perform at different locations and across years. Growers can use this data to help them chose which varieties to plant and breeders use performance data to determine whether to release a new variety.

Growing conditions for the 2008-2009 Season

Wisconsin saw a 10% decline in winter wheat acres planted (300,000) in the 2008-2009 growing season. The estimated yield for the 2009 crop is 63 bu per acre, down 7 percent from last year. The decline in winter wheat acres was caused by two factors: delayed corn and soybean harvest due to delayed crop maturity and high nitrogen input prices. The wheat crop that was established in a timely manner looked very good to excellent going into winter dormancy, however environmental conditions in February (lack of snow cover and driving arctic winds) led to significant winter injury at our Arlington and Chilton sites. Spring growing conditions were mostly favorable across the state though cooler than normal temperatures in May, June, and July delayed crop maturity, these temperatures also extended the grain fill period for winter wheat.

Winter wheat yields were variable across our testing locations due to variable rainfall events, winterkill, and disease pressure. Wheat yields at the Lancaster and Janesville locations averaged 77 and 62 bu per acre, respectively. Wheat yield at Janesville was reduced due delayed planting and late leaf rust infection. Adjusted wheat yields at Arlington and Chilton averaged 78 and 77 bu per acre, respectively and were affected due to extensive winterkill. Winterkill data is extremely important to Wisconsin growers and is included along with yield data from these sites.

Source: USDA National Agricultural Statistics Service. http://www.nass.usda.gov

Diseases in the 2008-2009 Season

Our disease assessments of the winter wheat variety trials indicated that Septoria leaf blotch and wheat leaf rust were the two most predominant diseases. Other diseases observed in 2009 included powdery mildew, Fusarium head blight, wheat stripe rust, wheat stem rust, and Stagnospora glume blotch, although this varied by location and period of the growing season (Table 5 and 6). There were reports at harvest that some fields had head scab levels testing higher than 2.0 ppm for DON, leading to grain dockage.

Experimental procedures

Cultural practices

The seedbed at each location was prepared by either conventional or conservation tillage methods. All plots were seeded at a uniform seeding rate of 1.5 million viable seeds per acre. Seed treatments of varieties entered into the trials are described in Table 3. Fertilizer was applied as indicated by soil tests and herbicides were applied for weed control when necessary. Agronomic information for each location is summarized in Table 1.

Planting

A grain drill with cone units was used at all locations. Nine-row plots, 25-feet in length were planted at all locations. Each variety was grown in at least four separate plots (replicates) in a randomized complete block design at each location to account for field variability.

Disease incidence and severity assessments

Plant Assessments: Foliar disease assessments were made at all trial locations during June between Feekes 10.5.1 and Feekes 11.2. Six stem samples per plot were obtained from non-harvested rows of the plot. Disease incidence and disease severity were estimated for all foliar diseases noted. Incidence was defined as the number of stems out of six with a specific disease. Disease severity was calculated as:

Disease severity = (4 * severity on flag leaf) + (3 * severity on flag-1 leaf) + (2 * severity on flag-2 leaf) + (severity on flag-3 leaf).

This calculation was used as it emphasizes that the increased disease on the upper leaves that reduces the amount of healthy green tissue is most important for yield.

Harvesting

Yield: The center seven rows were harvested with a self-propelled combine. Plots were weighed and moisture was determined in the field using electronic equipment on the plot harvester. Yields are reported in bushels (60 pounds/bushel) per acre at 13 percent moisture content.

Lodging: Lodging ratings at harvest were collected on each plot. Lodging scores are based on the Belgian Lodging System. Values are rounded to whole numbers (0 = none, 9 = severe).

Test Weight: Test weights were measured using a Dickey-john GAC2100 AGRI.

Presentation of data

Yield results for individual location trials and for multi-location averages are listed in Tables 4 through 8. Yield data for both 2008 and 2009 are provided if the variety was entered previously in the 2008 trials. A two-year average for yield is calculated using location means as replications.

At Arlington and Chilton, severe winterkill affected numerous wheat plots that were a part of the variety trial testing. Therefore, yields were estimated based on an analysis of covariance, where percentage survival (for each plot) was used as a covariate. This approach was used since winter wheat yields and the variation in those yields would be affected by the amount of winterkill observed in a given plot. Therefore, the use of percentage survival helps remove some of the variation in the observed winter wheat yields and improve the sensitivity to test for differences in yields. However, growers are cautioned from using yield data from these two locations as their sole source of information. Utilize the four site mean yield if the variety was new this year or the two year mean if the variety was tested last year.

Least significant difference

Variations in yield and other characteristics occur because of variability in soil and other growing conditions that lower the precision of the results. Statistical analysis makes it possible to determine, with known probabilities of error, whether a difference is real or whether it might have occurred by chance. Growers can use the appropriate LSD (least significant difference) value at the bottom of the tables to determine true statistical differences.

Least significant differences (LSD's) at the 10% level of probability are shown. Where the difference between two selected varieties within a column is equal to or greater than the LSD value at the bottom of the column, you can be sure in nine out of ten chances that there is a real difference between the two varieties. If the difference is less than the LSD value, the difference may still be real, but the experiment has produced no evidence of real differences. Varieties that were not significantly lower in performance than the highest yielding variety in a particular test are indicated with an asterisk.

Using this data to select top-yielding winter wheat varieties

As with any crop, variety selection is the most important factor to consider in maximizing winter wheat yield and profitability. When choosing a winter wheat variety several factors must be considered. These include winter survival, insect and disease resistance, heading date, lodging, test weight, and most importantly, yield. Since no variety is ideal for every location, it is important to understand the crop environment and pest complex that affects your specific region in order to maximize yield.

Yield is based on the genetic potential and environmental conditions in which the crop is grown. Therefore, by diversifying the genetic pool that is planted, a grower can hedge against crop failure. Select those varieties that perform well not only in your area but across experimental sites and years. This will increase the likelihood that given next years environment (which you cannot control) the variety you selected will perform well.

Test weight is also an important factor to consider when selecting a variety. The minimum test weight to be considered a U.S. #2 Soft Red Winter Wheat is 58 pounds per bushel. Wheat with a test weight lower than 58 pounds will be discounted. Both

environment and pests may greatly affect test weight, therefore, selecting a variety that has a high test weight potential in your region is critical to maximize economic gain.

Select a variety that has the specific insect and disease resistance characteristics that fit your needs. By selecting the appropriate resistant varieties, crop yield loss may be either reduced or avoided without the need of pesticides. Careful management of resistant cultivars, though crop and variety rotation is required to ensure that these characteristics are not lost.

Crop height and lodging potential are also important varietal characteristics that may be affected by your cropping system. If the wheat crop is intended for grain only, it may be important to select a variety that is short in stature and has a low potential for lodging. This may decrease yield loss due to crop spoilage and harvest loss as well as increase harvest rate. However, if the wheat crop is to be used as silage or to be harvested as both grain and straw then selecting a taller variety may be warranted.

Testing agencies
The Wisconsin Winter Wheat Performance Tests were conducted by the Departments of Agronomy and Plant Pathology, College of Agricultural and Life Sciences and the University of Wisconsin-Extension in cooperation and with support from the Wisconsin Crop Improvement Association.

ADDITIONAL INFORMATION
Check the following publications for additional information on small grain production and seed availability. Both are updated annually.

Pest Management in Wisconsin Field Crops (A3646)
—available at learningstore.uwex.edu
The Wisconsin Certified Seed Directory
—available at www.wisc.edu/wcia

For information on seed availability of public varieties, contact the Wisconsin Crop Improvement Association, 554 Moore Hall, 1575 Linden Drive, Madison, WI 53706, (608) 262-1341, www.wisc.edu/wcia.

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Table 1. Location and agronomics of winter wheat performance tests in Wisconsin

Location	Cooperators	Soil type	Row spacing (inches)	Nitrogen applied (lb/a)	Planting Date	Harvest Date
Arlington	M. Martinka, J. Gaska	silt loam	7.5	30*	26-Sep-08	30-Jul-09
Chilton	Kolbe Seeds, B. Larson	red clay	7.5	70	30-Sep-08	05-Aug-09
Janesville	Rock Co. Farm, J. Stute	silt loam	7.5	40*	13-Oct-08	29-Jul-09
Lancaster	T. Wood	silt loam	7.5	20*	26-Sep-08	04-Aug-09

*Nitrogen credited from previous soybean or alfalfa.

Table 2. Companies included in the 2009 performance tests.

Brand	Company Name	Phone	Website
Agripro	Agripro Seeds	(765) 563-3111	www.agriprowheat.com
Diener	Bio-town Seeds	(219) 984-6038	www.dienerseeds.com
Dyna-Gro	Crop Production Services	(937) 644-9467	www.uap.com
Welter	Welter Seed	(563) 455-2762	www.welterseed.com
Growmark	Growmark, Inc.	(309) 557-6399	www.fsseed.com
Jung	Jung Seed Genetics, Inc.	(920) 326-5891	www.jungseedgenetics.com
Kaltenberg	Kaltenberg Seeds	(608) 849-5021 ext 2313	www.kaltenbergseeds.com
Pioneer	Pioneer Hi-Bred International	(507) 344-2006	www.pioneer.com
PIP	Partners in Production	(877) gro-seed	
Pro Seed Genetics	Pro Seed Genetics	(920) 388-2824	
Public	WI Foundation Seeds	(608) 846-9761	www.wisconsinfoundationseeds.wisc.edu/
Public - exp	WI Crop Improvement	(608) 262-0167	wcia.wisc.edu/
Seed-link	Seed-Link Inc.	(705) 324-0544	www.seed-link.ca

Table 3. Wheat class and seed treatment(s) applied to entered varieties.

Brand	Variety	Class (1)	Seed treatment
Public	Hopewell	SR	Dividend Extreme
Public	Kaskaskia	SR	Dividend Extreme
Public	Malabar	SR	Raxil/Thiram
Public	Truman	SR	Dividend Extreme
Public	Sunburst	SR	Raxil/Thiram
Dyna-Gro	DG 404	SR	Raxil/Thiram
Dyna-Gro	V 9812	SR	Raxil/Thiram
Dyna-Gro	X 9911	SR	Raxil/Thiram
Diener	D 496W	SR	Dividend Extreme, Nitro-Shield
Diener	D 502 W	SR	Dividend Extreme, Cruiser
Diener	XW 70	SR	Dividend Extreme, Cruiser
Diener	XW 80	SR	Dividend Extreme, Cruiser
Diener	XW 81	SR	Dividend Extreme, Cruiser
FS Seed	FS 628	SR	Dividend Extreme, Cruiser
FS Seed	FS 637	SR	Dividend Extreme, Cruiser
FS Seed	FS 659	SR	Dividend Extreme, Cruiser
Jung	5804	SR	Raxil XT
Jung	5830	SR	Dividend Extreme, Cruiser
Jung	5988	SR	Raxil XT
Kaltenberg	KW 60	SR	Raxil XT
Kaltenberg	KW 62	SR	Raxil XT
Kaltenberg	KW 63	SR	Raxil XT
Kaltenberg	KW 70	SR	Raxil XT
Kaltenberg	KW 75	SR	Raxil XT
Kaltenberg	XW 7409	SR	Dividend Extreme, Cruiser
Pioneer	25R39	SR	Dividend Extreme, Cruiser
Pioneer	25R47	SR	Dividend Extreme, Cruiser
Pioneer	25R51	SR	Dividend Extreme, Cruiser
Pioneer	25R62	SR	Dividend Extreme, Cruiser
PIP	701	SR	Charter
PIP	702	SR	Charter
PIP	710	SR	Charter
PIP	717	SR	Charter
PIP	718	SR	Charter
PIP	720	SR	Charter
PIP	729	SR	Charter
PIP	760	SR	Charter
Pro Seed Genetics	PRO 200	SR	Dividend Extreme
Pro Seed Genetics	PRO 220	SR	Raxil/Thiram
Pro Seed Genetics	PRO 240	SR	Dividend Extreme
Pro Seed Genetics	PRO Ex260	SR	Dividend Extreme
Pro Seed Genetics	PRO Ex280	SR	Dividend Extreme
Pro Seed Genetics	PRO Ex290	SR	Dividend Extreme, Cruiser
Pro Seed Genetics	PRO Ex300	SR	Raxil/Thiram
Seed-Link	ACS 55001	HR	Dividend Extreme
AgriPro	Branson	SR	Dividend Extreme, Cruiser
AgriPro	W 1377	SR	Dividend Extreme, Cruiser
AgriPro	M 04-4566	SR	Dividend Extreme, Cruiser
Excel	Excel 442	SR	Dividend Extreme, Cruiser
Public - exp	IL 01-11934	SR	Dividend Extreme
Public - exp	IL 04-10729	SR	Dividend Extreme
Public - exp	IL 04-24668	SR	Dividend Extreme
Public - exp	P 02444A1-23-9	SR	Dividend Extreme
Public - exp	P 04287A1-10	SR	Dividend Extreme
Public - exp	MO-011126	SR	Dividend Extreme
Public	Merl	SR	Raxil/Thiram
Public	Sisson	SR	Dividend Extreme
Public	McCormick	SR	Dividend Extreme

(1) Class: SR = soft red winter wheat, HR = hard red winter wheat

Table 4. 2009 Winter Wheat Performance Test Results.

Janesville, Lancaster, Chilton, and Arlington, Wisconsin.

		2009 Means		Janesville		Lancaster		Chilton			Arlington			7-Test
Brand	Entry	Yield	Test Wt.	Yield	Test Wt.	Yield	Test Wt.	Adjusted Yield(1)	Winter Survival	Test Wt.	Adjusted Yield(1)	Winter Survival	Test Wt.	Mean Yield
		bu/a	lb/bu	bu/a	lb/bu	bu/a	lb/bu	bu/a	%	lb/bu	bu/a	%	lb/bu	bu/a
Public	Hopewell	73	55.3	63	53.0	71	53.3	* 81	44	58.7	76	65	56.2	69
Public	Kaskaskia	74	57.8	58	58.6	78	55.6	* 85	16	58.7	76	57	58.4	73
Public	Malabar	65	55.7	52	56.0	63	52.8	* 79	35	58.1	67	60	55.9	67
Public	Truman	68	56.6	56	58.3	76	54.4	66	11	56.2	72	46	57.6	68
Public	Sunburst	73	57.2	64	57.2	* 90	56.5	75	54	59.5	64	31	55.5	76
Dyna-Gro	DG 404	75	55.6	* 66	56.0	81	52.6	73	35	58.0	81	39	55.7	77
Dyna-Gro	V 9812	74	55.1	64	55.9	80	51.8	* 79	45	55.9	72	45	56.7	
Dyna-Gro	X 9911	* 78	57.5	62	58.1	* 89	54.2	* 80	43	59.5	82	51	58.1	
Diener	D 496W	71	53.7	61	54.7	66	49.1	77	46	56.4	79	32	54.4	
Diener	D 502 W	* 76	55.5	56	55.2	74	51.9	* 91	35	58.1	* 83	47	56.8	* 79
Diener	XW 70	74	57.1	63	57.5	70	54.8	* 88	59	58.5	75	47	57.7	77
Diener	XW 80	* 80	56.4	* 71	57.5	75	53.1	* 78	39	57.0	* 96	47	58.2	
Diener	XW 81	* 79	55.7	* 67	56.4	78	52.3	* 83	44	56.5	* 89	41	57.7	
Growmark	FS 628	* 78	55.8	63	55.8	82	52.4	* 82	28	58.1	* 84	41	57.1	* 78
Growmark	FS 637	* 76	55.6	62	55.5	76	52.3	* 88	54	57.7	77	39	57.1	* 78
Growmark	FS 659	70	54.6	58	55.4	71	51.7	67	16	54.9	* 84	45	56.6	73
Jung	5804	* 76	56.8	* 66	57.8	80	53.1	* 92	21	58.7	67	32	57.4	* 78
Jung	5830	* 82	57.4	62	57.5	* 93	54.7	* 83	59	59.3	* 91	54	58.1	
Jung	5988	* 81	57.1	65	57.6	83	54.9	* 86	64	58.4	* 90	37	57.3	* 84
Kaltenberg	KW 60	* 80	56.8	* 66	56.5	* 88	54.8	* 80	69	58.2	* 86	54	57.7	* 82
Kaltenberg	KW 62	71	55.6	62	56.3	62	52.2	77	34	58.5	81	34	55.4	74
Kaltenberg	KW 63	72	55.1	64	56.5	71	50.9	* 85	39	57.8	67	47	55.2	74
Kaltenberg	KW 70	* 77	56.4	64	55.6	84	54.4	* 86	48	58.9	74	46	56.9	* 79
Kaltenberg	KW 75	69	54.8	62	53.9	65	52.0	70	53	57.5	77	40	55.8	
Kaltenberg	XW 7409	73	56.9	60	55.6	* 87	55.1	66	44	59.2	78	67	57.9	
Pioneer	25R39	* 77	56.2	* 69	57.2	79	53.8	* 82	35	57.6	78	30	56.1	
Pioneer	25R47	* 79	54.8	* 74	56.1	81	52.1	* 81	45	56.0	81	47	55.1	* 82
Pioneer	25R51	75	54.8	63	56.1	* 87	53.0	70	39	56.3	80	39	53.9	* 80
Pioneer	25R62	72	54.2	62	54.8	74	51.2	77	33	56.5	73	29	54.3	* 78
PIP	701	75	55.7	* 70	55.8	78	52.6	70	40	57.7	80	42	56.6	75
PIP	702	68	53.8	65	54.9	63	51.1	* 80	45	56.6	65	14	52.5	
PIP	710	* 78	57.0	59	58.5	86	55.6	* 81	60	58.8	* 86	35	55.2	
PIP	717	* 78	57.2	58	55.7	80	55.9	* 85	59	59.3	* 90	22	57.9	
PIP	718	71	56.2	63	57.3	71	52.0	76	49	57.7	75	59	57.7	
PIP	720	69	54.3	* 66	55.1	79	51.7	62	39	54.8	69	49	55.8	74
PIP	729	* 81	57.1	* 73	58.4	81	53.4	* 87	61	58.1	* 84	70	58.4	
PIP	760	* 84	56.9	* 66	57.3	* 95	54.2	* 88	61	58.2	* 87	68	57.9	* 84
Pro Seed Genetics	PRO 200	75	56.8	64	57.4	73	53.5	* 79	49	58.0	* 84	80	58.2	77
Pro Seed Genetics	PRO 220	74	57.7	60	58.4	81	56.3	* 78	55	57.2	75	60	59.0	71
Pro Seed Genetics	PRO 240	* 77	55.4	65	54.6	77	52.5	* 80	56	57.8	* 84	46	56.7	77
Pro Seed Genetics	PRO Ex260	* 77	56.8	* 67	57.8	78	53.7	* 90	50	58.5	74	61	57.1	76
Pro Seed Genetics	PRO Ex280	* 76	57.6	59	58.4	73	55.4	* 88	40	59.5	* 84	32	57.2	77
Pro Seed Genetics	PRO Ex290	* 76	56.2	60	57.1	78	53.4	* 81	35	57.6	* 86	41	56.8	
Pro Seed Genetics	PRO Ex300	* 76	55.8	58	55.6	82	53.9	* 83	35	58.9	82	44	55.0	
Seed-Link	ACS 55001	65	55.7	55	56.7	70	53.3	69	50	57.9	64	26	54.7	67
AgriPro	Branson	75	56.0	63	56.5	76	53.1	77	26	57.8	* 84	27	56.7	* 78
AgriPro	W 1377	74	58.2	57	59.3	83	55.7	* 78	54	58.3	79	40	59.6	75
AgriPro	M 04-4566	74	55.0	57	55.9	67	50.4	* 92	44	57.5	78	73	56.2	
Welter	Excel 442	* 83	56.3	* 66	56.2	* 95	53.6	* 82	46	58.3	* 90	48	57.2	* 83
Public - exp	IL 01-11934	* 78	57.0	61	56.7	* 88	55.2	* 82	46	59.2	82	39	56.9	* 80
Public - exp	IL 04-10729	72	58.1	60	58.9	75	55.5	69	46	59.1	* 84	39	59.0	
Public - exp	IL 04-24668	* 76	58.1	62	58.2	84	56.0	76	58	59.2	80	64	59.0	
Public - exp	P 02444A1-23-9	63	55.4	48	55.1	54	52.6	74	44	58.1	77	51	55.8	
Public - exp	P 04287A1-10	74	56.0	57	56.0	75	54.0	76	34	58.3	* 86	31	55.9	
Public - exp	MO-011126	73	56.1	61	57.0	68	53.4	* 83	50	58.3	81	37	55.6	
Public	Merl	66	57.6	60	58.6	59	53.4	70	36	59.7	75	40	58.5	
Public	Sisson	69	55.6	58	56.9	74	53.1	71	30	56.5	74	41	55.9	
Public	McCormick	70	57.4	58	57.9	74	54.8	76	41	58.9	71	42	58.0	
Mean		74	56.2	62	56.6	77	53.4	78	43	57.9	79	44	56.7	76
LSD(.10)		8	1.0	8	1.5	8	1.7	14	27	2.0	13	21	2.8	6

(1) Reported wheat yields were adjusted based on a MIXED model statistical analysis that include the percent survival as a covariate to estimate the effect of winterkill on wheat productivity. * Yields preceeded by a '*' are not significantly different (0.10 level) than the highest yielding cultivar.

Table 5. 2009 Winter Wheat Performance Test Results.

Janesville, Wisconsin.

Brand	Entry		Yield	Winter Survival	Test Wt.	Height	Lodging	Septoria (1)	Leaf(1) Rust		2008 Yield		2-Year Mean Yield
			bu/a	%	lb/bu	in	(0-9)	(1-6.9)	(1-6.9)		bu/a		bu/a
Public	Hopewell		63	100	53.0	30	0	3.9	3.4		65		64
Public	Kaskaskia		58	100	58.6	33	0	4.4	3.3		85		72
Public	Malabar		52	100	56.0	30	0	3.8	3.8		66		59
Public	Truman		56	100	58.3	32	0	3.7	3.5		69		63
Public	Sunburst		64	100	57.2	26	0	5.1	3.7		77		71
Dyna-Gro	DG 404	*	66	100	56.0	30	0	2.7	2.9		76		71
Dyna-Gro	V 9812		64	100	55.9	28	0	3.5	2.7				
Dyna-Gro	X 9911		62	100	58.1	27	0	2.8	3.6				
Diener	D 496W		61	100	54.7	28	0	3.3	3.3				
Diener	D 502 W		56	100	55.2	30	0	3.4	2.9		81		69
Diener	XW 70		63	100	57.5	30	0	3.0	3.0		82		73
Diener	XW 80	*	71	100	57.5	30	0	1.8	2.9				
Diener	XW 81	*	67	100	56.4	29	0	3.5	3.9				
Growmark	FS 628		63	100	55.8	31	0	1.7	2.9		79		71
Growmark	FS 637		62	100	55.5	28	0	3.1	2.6		70		66
Growmark	FS 659		58	100	55.4	29	0	2.4	3.1		72		65
Jung	5804	*	66	100	57.8	29	0	3.6	3.6		84	*	75
Jung	5830		62	100	57.5	27	0	3.4	3.5				
Jung	5988		65	100	57.6	31	0	3.1	4.2	*	98	*	82
Kaltenberg	KW 60	*	66	100	56.5	32	0	4.1	4.2	*	98	*	82
Kaltenberg	KW 62		62	100	56.3	31	0	3.6	3.0		79		71
Kaltenberg	KW 63		64	100	56.5	29	0	3.0	3.7		72		68
Kaltenberg	KW 70		64	100	55.6	29	0	2.8	3.0		85	*	75
Kaltenberg	KW 75		62	100	53.9	27	0	3.0	3.0				
Kaltenberg	XW 7409		60	100	55.6	28	0	1.9	2.6				
Pioneer	25R39	*	69	100	57.2	30	0	2.7	4.0				
Pioneer	25R47	*	74	100	56.1	27	0	3.1	3.0		87	*	81
Pioneer	25R51		63	100	56.1	29	0	3.4	2.5		88	*	76
Pioneer	25R62		62	100	54.8	28	0	2.5	3.2		74		68
PIP	701	*	70	100	55.8	32	0	2.4	3.4		77		74
PIP	702		65	100	54.9	27	0	1.9	3.6				
PIP	710		59	100	58.5	29	0	2.9	3.4				
PIP	717		58	100	55.7	27	0	4.3	4.6				
PIP	718		63	100	57.3	32	0	3.4	1.3				
PIP	720	*	66	100	55.1	28	0	3.9	2.8		71		69
PIP	729	*	73	100	58.4	31	0	2.1	3.4				
PIP	760	*	66	100	57.3	30	1	2.9	3.6	*	94	*	80
Pro Seed Genetics	PRO 200		64	100	57.4	30	0	3.5	3.6		84		74
Pro Seed Genetics	PRO 220		60	100	58.4	30	0	3.0	3.8		75		68
Pro Seed Genetics	PRO 240		65	100	54.6	34	0	3.3	3.5		74		70
Pro Seed Genetics	PRO Ex260	*	67	100	57.8	31	0	2.6	3.0		75		71
Pro Seed Genetics	PRO Ex280		59	100	58.4	31	0	2.3	2.8		86		73
Pro Seed Genetics	PRO Ex290		60	100	57.1	29	0	3.5	3.4				
Pro Seed Genetics	PRO Ex300		58	100	55.6	29	0	3.6	3.2				
Seed-Link	ACS 55001		55	100	56.7	31	0	4.3	2.7		75		65
AgriPro	Branson		63	100	56.5	28	0	2.7	3.0		80		72
AgriPro	W 1377		57	100	59.3	30	0	2.9	2.7		72		65
AgriPro	M 04-4566		57	100	55.9	32	0	3.8	2.8				
Welter	Excel 442	*	66	100	56.2	32	0	3.0	3.4		83	*	75
Public - exp	IL 01-11934		61	100	56.7	26	0	4.4	4.3		88	*	75
Public - exp	IL 04-10729		60	100	58.9	31	0	4.3	3.2				
Public - exp	IL 04-24668		62	100	58.2	29	0	2.9	3.7				
Public - exp	P 02444A1-23-9		48	100	55.1	30	0	1.8	4.1				
Public - exp	P 04287A1-10		57	100	56.0	31	0	3.1	3.7				
Public - exp	MO-011126		61	100	57.0	28	0	2.4	3.0				
Public	Merl		60	100	58.6	27	0	3.6	3.3				
Public	Sisson		58	100	56.9	26	0	3.7	4.2				
Public	McCormick		58	100	57.9	26	0	2.7	3.4				
Mean			62	100	56.6	29	0	3.2	3.3		78		71
LSD(.10)			8	ns	1.5	2	0.2	1.3	1.0		8		7

(1) Both Septoria and Leaf Rust are based on a weighted disease severity score as:Severity = (4 * flag leaf severity) + (3 * flag-1 leaf severity + (2 * flag-2 leaf severity) + (flag-3 leaf severity); and used a natural log transformation.: * Yields preceeded by a '*' are not significantly different (0.10 level) than the highest yielding cultivar.

Table 6. 2009 Winter Wheat Performance Test Results.
Lancaster, Wisconsin.

Brand	Entry		Yield	Winter Survival	Test Wt.	Height	Lodging	Septoria (1)	Leaf(1) Rust	2008 Yield		2-Year Mean Yield
			bu/a	%	lb/bu	in	(0-9)	(1-6.9)	(1-6.9)	bu/a		bu/a
Public	Hopewell		71	100	53.3	37	0	2.1	3.4	54		63
Public	Kaskaskia		78	100	55.6	36	3	3.1	3.1	63		71
Public	Malabar		63	100	52.8	40	2	3.4	4.1	63		63
Public	Truman		76	100	54.4	38	1	2.5	3.7	55		66
Public	Sunburst	*	90	100	56.5	34	0	2.9	4.2	69	*	80
Dyna-Gro	DG 404		81	100	52.6	38	0	2.2	3.0	59		70
Dyna-Gro	V 9812		80	100	51.8	36	0	2.6	1.4			
Dyna-Gro	X 9911	*	89	100	54.2	36	1	2.0	2.7			
Diener	D 496W		66	100	49.1	36	0	2.6	3.1			
Diener	D 502 W		74	100	51.9	38	0	2.9	2.3	65		70
Diener	XW 70		70	100	54.8	36	0	1.0	2.6	67		69
Diener	XW 80		75	100	53.1	36	1	1.5	2.3			
Diener	XW 81		78	100	52.3	36	0	2.4	2.7			
Growmark	FS 628		82	100	52.4	38	0	2.5	2.0	65		74
Growmark	FS 637		76	100	52.3	37	0	1.7	3.0	68		72
Growmark	FS 659		71	100	51.7	36	2	2.7	2.8	63		67
Jung	5804		80	100	53.1	36	1	2.5	3.3	67		74
Jung	5830	*	93	100	54.7	34	2	2.3	3.0			
Jung	5988		83	100	54.9	37	1	3.3	2.4	62		73
Kaltenberg	KW 60	*	88	100	54.8	38	2	1.8	2.8	63		76
Kaltenberg	KW 62		62	100	52.2	37	0	2.5	1.8	60		61
Kaltenberg	KW 63		71	100	50.9	34	0	1.6	1.9	69		70
Kaltenberg	KW 70		84	100	54.4	35	0	2.1	2.9	69		77
Kaltenberg	KW 75		65	100	52.0	35	1	2.2	2.8			
Kaltenberg	XW 7409	*	87	100	55.1	36	0	2.9	3.4			
Pioneer	25R39		79	100	53.8	36	0	1.7	3.8			
Pioneer	25R47		81	100	52.1	33	0	2.3	2.5	72		77
Pioneer	25R51	*	87	100	53.0	33	0	1.9	2.2	* 79	*	83
Pioneer	25R62		74	100	51.2	34	3	2.6	2.5	71		73
PIP	701		78	100	52.6	38	0	2.3	2.4	61		70
PIP	702		63	100	51.1	34	1	2.8	4.4			
PIP	710		86	100	55.6	35	1	0.9	2.4			
PIP	717		80	100	55.9	34	2	2.5	3.8			
PIP	718		71	100	52.0	38	1	1.9	2.4			
PIP	720		79	100	51.7	37	0	2.3	2.8	* 76	*	78
PIP	729		81	100	53.4	36	0	1.5	3.0			
PIP	760	*	95	100	54.2	39	1	2.2	3.4	67	*	81
Pro Seed Genetics	PRO 200		73	100	53.5	38	3	3.2	3.9	62		68
Pro Seed Genetics	PRO 220		81	100	56.3	36	1	2.4	2.9	56		69
Pro Seed Genetics	PRO 240		77	100	52.5	38	0	2.2	2.6	66		72
Pro Seed Genetics	PRO Ex260		78	100	53.7	39	0	1.4	3.3	63		71
Pro Seed Genetics	PRO Ex280		73	100	55.4	35	0	0.6	2.7	68		71
Pro Seed Genetics	PRO Ex290		78	100	53.4	35	0	2.4	4.1			
Pro Seed Genetics	PRO Ex300		82	100	53.9	36	0	2.4	3.2			
Seed-Link	ACS 55001		70	100	53.3	35	1	4.5	2.9	62		66
AgriPro	Branson		76	100	53.1	34	0	2.7	2.6	70		73
AgriPro	W 1377		83	100	55.7	35	2	1.5	3.0	65		74
AgriPro	M 04-4566		67	100	50.4	42	0	3.3	2.3			
Welter	Excel 442	*	95	100	53.6	41	1	2.6	3.0	* 73	*	84
Public - exp	IL 01-11934	*	88	100	55.2	35	2	3.1	3.9	70	*	79
Public - exp	IL 04-10729		75	100	55.5	36	2	2.7	3.0			
Public - exp	IL 04-24668		84	100	56.0	36	1	1.1	3.1			
Public - exp	P 02444A1-23-9		54	100	52.6	37	2	3.8	4.7			
Public - exp	P 04287A1-10		75	100	54.0	36	0	2.1	3.2			
Public - exp	MO-011126		68	100	53.4	35	2	2.5	3.3			
Public	Merl		59	100	53.4	34	0	2.5	3.2			
Public	Sisson		74	100	53.1	32	1	1.9	3.5			
Public	McCormick		74	100	54.8	34	6	2.5	3.8			
Mean			77	100	53.4	36	1	2.3	3.0	66		72
LSD(.10)			8	ns	1.7	3	1	1.1	0.9	6		6

(1) Both Septoria and Leaf Rust are based on a weighted disease severity score as:Severity = (4 * flag leaf severity) + (3 * flag-1 leaf severity) + (2 * flag-2 leaf severity) + (flag-3 leaf severity); and used a natural log transformation. * Yields preceeded by a '*' are not significantly different (0.10 level than the highest yielding cultivar.

Table 7. 2009 Winter Wheat Performance Test Results. Chilton, Wisconsin.

Brand	Entry	2009 Means					2008	2-Year
		Adjusted Yield(1)	Winter Survival	Test Wt.	Height	Lodg-ing	Yield	Mean Yield
		bu/a	%	lb/bu	in	(0-9)	bu/a	bu/a
Public	Hopewell	* 81	44	58.7	32	0	76	79
Public	Kaskaskia	* 85	16	58.7	30	0	69	77
Public	Malabar	* 79	35	58.1	34	0	77	78
Public	Truman	66	11	56.2	32	0	84	75
Public	Sunburst	75	54	59.5	26	0	* 96	* 86
Dyna-Gro	DG 404	73	35	58.0	31	0	* 102	* 88
Dyna-Gro	V 9812	* 79	45	55.9	30	0		
Dyna-Gro	X 9911	* 80	43	59.5	29	0		
Diener	D 496W	77	46	56.4	31	0		
Diener	D 502 W	* 91	35	58.1	35	0	* 100	* 96
Diener	XW 70	* 88	59	58.5	28	0	93	* 91
Diener	XW 80	* 78	39	57.0	29	0		
Diener	XW 81	* 83	44	56.5	30	0		
Growmark	FS 628	* 82	28	58.1	32	0	88	* 85
Growmark	FS 637	* 88	54	57.7	30	0	* 106	* 97
Growmark	FS 659	67	16	54.9	30	0	* 97	82
Jung	5804	* 92	21	58.7	29	0	93	* 93
Jung	5830	* 83	59	59.3	29	0		
Jung	5988	* 86	64	58.4	32	0	* 104	* 95
Kaltenberg	KW 60	* 80	69	58.2	32	0	93	* 87
Kaltenberg	KW 62	77	34	58.5	33	0	* 98	* 88
Kaltenberg	KW 63	* 85	39	57.8	29	0	90	* 88
Kaltenberg	KW 70	* 86	48	58.9	29	0	88	* 87
Kaltenberg	KW 75	70	53	57.5	28	0		
Kaltenberg	XW 7409	66	44	59.2	27	0		
Pioneer	25R39	* 82	35	57.6	30	0		
Pioneer	25R47	* 81	45	56.0	26	0	* 99	* 90
Pioneer	25R51	70	39	56.3	28	0	* 96	83
Pioneer	25R62	77	33	56.5	28	0	* 112	* 95
PIP	701	70	40	57.7	31	0	92	81
PIP	702	* 80	45	56.6	28	0		
PIP	710	* 81	60	58.8	29	0		
PIP	717	* 85	59	59.3	29	0		
PIP	718	76	49	57.7	32	0		
PIP	720	62	39	54.8	30	0	94	78
PIP	729	* 87	61	58.1	32	0		
PIP	760	* 88	61	58.2	34	0	94	* 91
Pro Seed Genetics	PRO 200	* 79	49	58.0	31	0	91	* 85
Pro Seed Genetics	PRO 220	* 78	55	57.2	32	0	74	76
Pro Seed Genetics	PRO 240	* 80	56	57.8	32	0	92	* 86
Pro Seed Genetics	PRO Ex260	* 90	50	58.5	32	0	88	* 89
Pro Seed Genetics	PRO Ex280	* 88	40	59.5	29	0	84	* 86
Pro Seed Genetics	PRO Ex290	* 81	35	57.6	29	0	94	* 88
Pro Seed Genetics	PRO Ex300	* 83	35	58.9	30	0	93	* 88
Seed-Link	ACS 55001	69	50	57.9	33	0	77	73
AgriPro	Branson	77	26	57.8	28	0	* 98	* 88
AgriPro	W 1377	* 78	54	58.3	28	0	94	* 86
AgriPro	M 04-4566	* 92	44	57.5	34	0		
Welter	Excel 442	* 82	46	58.3	31	0	92	* 87
Public - exp	IL 01-11934	* 82	46	59.2	28	0	92	* 87
Public - exp	IL 04-10729	69	46	59.1	28	0		
Public - exp	IL 04-24668	76	58	59.2	31	0		
Public - exp	P 02444A1-23-9	74	44	58.1	31	0		
Public - exp	P 04287A1-10	76	34	58.3	32	0		
Public - exp	MO-011126	* 83	50	58.3	29	0		
Public	Merl	70	36	59.7	30	0		
Public	Sisson	71	30	56.5	25	0		
Public	McCormick	76	41	58.9	27	0		
Mean		78	43	57.9	30	0	89	86
LSD(.10)		14	27	2.0	2	ns	16	12

(1)Reported wheat yields were adjusted based on a MIXED model statistical analysis that include the percent survival as a covariate to estimate the effect of winterkill on wheat productivity. * Yields preceeded by a '*' are not significantly different (0.10 level) than the highest yielding cultivar.

Table 8. 2009 Winter Wheat Variety Trial Results. Arlington, Wisconsin.

Brand	Entry		2009 Means Adjusted Yield(1)	Winter Survival	Test Wt.	Height	Lodging
			bu/a	%	lb/bu	in	(0-9)
Public	Hopewell		76	65	56.2	35	0
Public	Kaskaskia		76	57	58.4	37	0
Public	Malabar		67	60	55.9	35	0
Public	Truman		72	46	57.6	34	0
Public	Sunburst		64	31	55.5	29	0
Dyna-Gro	DG 404		81	39	55.7	35	0
Dyna-Gro	V 9812		72	45	56.7	31	0
Dyna-Gro	X 9911		82	51	58.1	34	0
Diener	D 496W		79	32	54.4	31	0
Diener	D 502 W	*	83	47	56.8	36	0
Diener	XW 70		75	47	57.7	33	0
Diener	XW 80	*	96	47	58.2	33	0
Diener	XW 81	*	89	41	57.7	34	0
Growmark	FS 628	*	84	41	57.1	36	0
Growmark	FS 637		77	39	57.1	31	0
Growmark	FS 659	*	84	45	56.6	32	0
Jung	5804		67	32	57.4	30	0
Jung	5830	*	91	54	58.1	34	0
Jung	5988	*	90	37	57.3	39	0
Kaltenberg	KW 60	*	86	54	57.7	38	0
Kaltenberg	KW 62		81	34	55.4	32	0
Kaltenberg	KW 63		67	47	55.2	31	0
Kaltenberg	KW 70		74	46	56.9	31	0
Kaltenberg	KW 75		77	40	55.8	30	0
Kaltenberg	XW 7409		78	67	57.9	32	0
Pioneer	25R39		78	30	56.1	32	0
Pioneer	25R47		81	47	55.1	29	0
Pioneer	25R51		80	39	53.9	33	0
Pioneer	25R62		73	29	54.3	30	0
PIP	701		80	42	56.6	35	0
PIP	702		65	14	52.5	31	0
PIP	710	*	86	35	55.2	31	0
PIP	717	*	90	22	57.9	31	0
PIP	718		75	59	57.7	35	0
PIP	720		69	49	55.8	31	0
PIP	729	*	84	70	58.4	34	0
PIP	760	*	87	68	57.9	37	0
Pro Seed Genetics	PRO 200	*	84	80	58.2	36	0
Pro Seed Genetics	PRO 220		75	60	59.0	37	0
Pro Seed Genetics	PRO 240	*	84	46	56.7	36	0
Pro Seed Genetics	PRO Ex260		74	61	57.1	36	0
Pro Seed Genetics	PRO Ex280	*	84	32	57.2	32	0
Pro Seed Genetics	PRO Ex290	*	86	41	56.8	33	0
Pro Seed Genetics	PRO Ex300		82	44	55.0	31	0
Seed-Link	ACS 55001		64	26	54.7	35	0
AgriPro	Branson	*	84	27	56.7	29	0
AgriPro	W 1377		79	40	59.6	32	0
AgriPro	M 04-4566		78	73	56.2	39	0
Welter	Excel 442	*	90	48	57.2	36	0
Public - exp	IL 01-11934		82	39	56.9	31	0
Public - exp	IL 04-10729	*	84	39	59.0	34	0
Public - exp	IL 04-24668		80	64	59.0	34	0
Public - exp	P 02444A1-23-9		77	51	55.8	34	0
Public - exp	P 04287A1-10	*	86	31	55.9	33	0
Public - exp	MO-011126		81	37	55.6	32	0
Public	Merl		75	40	58.5	33	0
Public	Sisson		74	41	55.9	28	0
Public	McCormick		71	42	58.0	31	0
Mean			79	44	56.7	33	0
LSD(.10)			13	21	2.8	3	ns

(1) Reported wheat yields were adjusted based on a MIXED model statistical analysis that include the percent survival as a covariate to estimate the effect of winterkill on wheat productivity. * Yields preceeded by a '*' are not significantly different (0.10 level) than the highest yielding cultivar.