

The background of the entire page is a close-up photograph of several golden wheat stalks. The stalks are arranged vertically, with their heads pointing upwards. The lighting is soft, highlighting the texture of the wheat grains and the fine hairs on the awns. The overall color palette is warm, dominated by shades of yellow and gold.

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service

State Agricultural Experiment Stations, Cooperating

2011 - 2012

UNIFORM EASTERN SOFT RED WINTER WHEAT NURSERY

Report

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This is a joint progress report of cooperative investigations underway in the State Agricultural Experiment Stations and the Agricultural Research Service (ARS) of the U.S. Department of Agriculture containing preliminary data which have not been sufficiently confirmed to justify general release; interpretations may be modified with additional experimentation. ARS expressly does not warrant the validity of the data provided in this report coming from non-ARS sources. The report is primarily a tool for the use of the cooperators and their official staff and those persons having direct and special interest in the development of agricultural research programs.

UESRWWN cooperators may use the following data from this report in registration notices, release requests, and PVP applications: their line, the check entries, the mean of the test, and (with permission from the owners) any other lines that have already been released.

USDA-ARS
National Small Grains Germplasm Research Facility
1691 S. 2700 W.
Aberdeen, ID 83210

December 2012

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**2011-2012 UNIFORM EASTERN SOFT RED WINTER WHEAT NURSERY
LIST OF ENTRIES AND PEDIGREES**

Entry No.	Cultivar/ Designation	Pedigree	Contributor	1st Year in Nursery
1	Branson	Pio2737W/891-4584A (Pike/FL302) (formerly M00-3701)	Check	03-04
2	Bess	MO11769/Madison (formerly MO981020)	Check	02-03
3	Shirley	VA94-52-25 /Coker 9835//VA96-54-234 (formerly VA03W-409)	Check	05-06
4	MO080104	L910097/MO 92-599	Check	09-10
5	IL06-14262	IL00-8530/IL97-1828	Kolb	10-11
6	NC08-23090	NC97-10076/C9704//P26R61	Murphy	11-12
7	NC08-23324	B960164/NC94-7197//McCormick	Murphy	11-12
8	GA021087-10LE33	P26R61/AGS2010	Johnson	11-12
9	KY03C-1237-32	P25R18/KY92C-0010-17//KY96C-0767-1	Van Sanford	11-12
10	KY03C-1002-02	P25W33/P25W60//P25W33/KY90C-042-37-1	Van Sanford	11-12
11	P04606RA1-6	Truman/INW0316	Ohm	11-12
12	P05222A1-7	99840/INW0304//INW0304/INW0316	Ohm	11-12
13	P05247A1-1	99840*2/03726//99794	Ohm	11-12
14	VA08MAS-369	McCormick/GA881130LE5	Griffey	11-12
15	VA09W-73	SS520/VA99W-188(VA91-54-343/Roane'S')//Tribute	Griffey	11-12
16	VA10W-21	Z00-5018(U90-1A//ZX90-2C1/P2580)/VA01W-158(P2643/VA94-54-331)	Griffey	11-12
17	MD03W64-10-3	P26R61/Chesapeake	Costa	11-12
18	MD03W665-09-1	USG3209/Tribute//Chesapeake	Costa	11-12
19	DAS1001	TW006-007/Emmit(TW044-094)	Etienne	11-12
20	DAS1002	Emmit(TW044-094)/TW005-008	Etienne	11-12
21	DAS1003	TW165-065/P25R23	Etienne	11-12
22	KWS001	Totem/M98-2152	Murche	11-12
23	KWS002	TW044-094/Honey	Murche	11-12
24	KWS003	95-3245/Ernie	Murche	11-12
25	IL06-13721	IL00-8530/IL97-3632	Kolb	11-12
26	IL06-23571	IL96-6472/P25W33//IL94-1653	Kolb	11-12
27	MO081652	P2552/MO980829	McKendry	11-12
28	OH07-263-3	OH748/Bravo	Sneller	11-12
29	OH08-180-48	Douglas/McCormick	Sneller	11-12
30	G00120	B980582//T814/L900819	Obert	11-12
31	G09534	ABI89-4584/T814//T814/L900819	Obert	11-12
32	G09528	T814/Boone	Obert	11-12
33	AR02061-1-1	AR910-9-1/Pat	Mason	11-12
34	AR01163-3-1	USG3709/AR800-1-3-1	Mason	11-12
35	ARS07-0525	GA951395-10-7/TX99D4031	Marshall	11-12

LOCATION NOTES

Stuttgart, Arkansas

Cooperators: Esten Mason
University of Arkansas
Planted: November 2, 2011
Harvested: May 18, 2012
Fertilizer: 150 N split application
Notes: Very dry year with less than an inch of rain during March and April. Otherwise, a good test. Heading notes are not the best and were taken on one rep. Height taken on two reps and Septoria on all three reps.

Griffin, Georgia

Cooperators: Jerry Johnson, Dan Bland, S. Sutton, J. Youmans, J. Buck
University of Georgia
Planted: November 1, 2011
Harvested: May 18, 2012
Fertilizer: 80 N

Brownstown, Illinois

Cooperators: Fred Kolb, Eric Brucker
University of Illinois
Planted: October 6, 2011
Harvested: June 8, 2012
Fertilizer: 60 N topdress
Notes: Good stands. Mild winter, very warm March. Extremely early harvest. High yields for this location.

Urbana, Illinois

Cooperators: Fred Kolb, Eric Brucker
University of Illinois
Planted: October 1, 2011
Harvested: June 12, 2012
Fertilizer: 40 N preplant, 55 N topdress
Notes: Good stands, mild winter, very warm March, slight freeze damage in early April to early lines, extremely early harvest.

Centralia, Illinois

Cooperators: Don Obert
Limagrain Cereal Seeds
Planted: October 14, 2011
Harvested: June 8, 2012
Fertilizer: Followed farmer's practice
Notes: Lines with missing heading dates were very late.

Harrisburg, Illinois

Cooperators: Jana Murche
KWS Cereals USA

Planted: October 8, 2011
Harvested: June 2, 2012
Fertilizer: 6 gal. 32%, 200# urea

Battle Ground, Indiana

Cooperators: Don Obert
Limagrain Cereal Seeds
Planted: October 7, 2011
Harvested: June 19, 2012
Fertilizer: 10/5: 30-78-63 in 19 lbs of S; 3/14: 80 N

Lafayette, Indiana

Cooperators: Ben Moreno
WestBred
Notes: Good yields.

West Lafayette, Indiana

Cooperators: Herb Ohm, Andy Linvill
Purdue University
Notes: Frost in early-April damaged some plots 1-5% and some up to 50%, so yields are largely reflected by this frost. Even so, some lines with moderate frost damage are ranked near the top yielders.

West Lafayette, Indiana

Cooperators: Sue Cambron
USDA-ARS, Crop Production & Pest Control Research
Notes: Hessian fly data with multiple biotypes.

Winfield, Kansas

Cooperators: Sid Perry
WestBred
Planted: October 22, 2011
Harvested: June 1, 2012
Fertilizer: 60 N topdress

Lexington, Kentucky

Cooperators: Dave Van Sanford
University of Kentucky
Planted: October 6, 2011
Harvested: June 22, 2012
Notes: Planted early, some spring freeze damage.

Logan Co., Kentucky

Cooperators: Dave Van Sanford
University of Kentucky
Planted: October 12, 2011
Notes: No harvest due to freeze damage.

Clarksville, Maryland

Cooperators: Jose Costa, Aaron Cooper
University of Maryland
Planted: October 7, 2011
Harvested: June 19, 2012
Fertilizer: 80 N; corn was previous crop
Notes: Thin stands. Dry spring.

East Lansing, Michigan

Cooperators: Russ Freed, Lee Siler
Michigan State University
Notes: Inoculated, misted FHB nursery.

Richville, Michigan

Cooperators: Russ Freed, Lee Siler
Michigan State University
Planted: October 7, 2011
Harvested: July 2, 2012
Fertilizer: 90 N

St. Paul, Minnesota

Cooperators: Jim, Kolmer, Yue Jin
USDA-ARS, Cereal Disease Laboratory
Notes: Leaf rust and stem rust data.

Columbia, Missouri

Cooperators: Anne McKendry, David Tague, Julie Solomon
University of Missouri
Planted: October 7, 2011
Harvested: June 22, 2012
Fertilizer: 40 N fall, 80 N spring
Notes: Extremely early season. Heading was about 3 weeks early. Very mild winter. Drought throughout the growing season with essentially ½" of rain from May through harvest. Temperatures were seasonal through heading and got progressively warm through grain fill. Triple digits at harvest, so definitely drought stress and some heat stress.

Lincoln, Nebraska

Cooperators: Stephen Baenziger
University of Nebraska
Planted: October 3, 2011
Fertilizer: Normal for the area

Ithaca, New York

Cooperators: Mark Sorrells
Cornell University
Planted: October 10, 2011
Harvested: July 5, 2012
Fertilizer: 20-40-40 plus 120# am. nitrate topdress

Plymouth, North Carolina

Cooperators: Paul Murphy
North Carolina State University

Harvested: June 8, 2012

Fertilizer: 130 N

Notes: Warm winter. Mild grain filling temperatures. Adequate moisture. Brutal levels of leaf rust. Heading date and powdery mildew recorded on head rows in Raleigh suburbs.

Raleigh, North Carolina

Cooperators: David Livingston, Tan Tuong
USDA-ARS, Plant Science Research

Notes: Controlled environment freeze test. Ten plants per entry were planted in cone-tainers (Livingston et al. 2005, Crop Science, 45:1545-1558). Two replicates. Plants were grown for 5 weeks at 13°C; 12 hours light/dark period; 400µmole light intensity, then hardened in chamber for 3 weeks at 3°C; 12 hours light/dark period; 350µmole light intensity. After 3 weeks, plants were subzero acclimated for 3 days @ -3°C in the dark, frozen @ 1°C/hour to -16°C for 3 hours, then thawed @ 2°C/hour to 3°C. Once removed from testing chambers, plants were watered once with 0.001% (v/v) Vitavax fungicide solution -And allowed to recover for 3 weeks at 13°C in cone-tainers; 12 hours light/dark period; 400µmole light. Plant survival ratings were rated for regrowth after 4 weeks by visually assessing leaves and roots. 0 = Completely dead; 1 = 1 survived (green) shoot or 1 primary root; 2 = 1 or 2 survived (green) shoots or 1 survived shoot and 1 or 2 primary roots; 3 = 1 or 2 survived shoots with developed roots (primary and secondary roots); 4 = 95% survived shoots with well developed roots; 5 = 100% survived with very little or no sign of freeze damage.

Raleigh, North Carolina

Cooperators: Christina Cowger
USDA-ARS, Plant Science Research

Notes: Pm3-markers: '-'=negative, '+'=positive. In North Carolina Pm3d and Pm3e are the only alleles at the Pm3 locus that confer effective resistance in the field. Eastern Septoria Nursery: Stagonospora nodorum blotch (SNB) pressure was strong and uniform in both locations (Kinston and Raleigh, NC). Lines highly susceptible to leaf rust were sometimes hard to rate for SNB. For ratings on leaves, a 5 and below was good to excellent; 6 was borderline, and 7-9 was undesirable.

Custar, Ohio

Cooperators: Clay Sneller
Ohio State University, OARDC

Notes: Considerable water damage in the fall causing 12 plots to be discarded from the analysis. Also, considerable heat after heading.

Napoleon, Ohio

Cooperators: Don Obert
Limagrain Cereal Seeds

Planted: October 10, 2011
Harvested: June 27, 2012
Fertilizer: Followed farmer's practice

Wooster, Ohio

Cooperators: Anthony Karcher
USDA-ARS, Soft Wheat Quality Laboratory
Notes: Milling and baking quality data.

Enid, Oklahoma

Cooperators: Brett Carver
Oklahoma State University
Notes: Our Enid (low pH) site was compromised by severe N deficiency from planting until early February. In many cases, genotypes with confirmed acid-soil tolerance suffered more from the low N-low pH condition than those known to be susceptible to low pH. Acid-tolerant genotypes rushed out of the gate, only to run out of gas and fizzle, with little to recover in the spring, while the susceptible types went pseudo-dormant through the fall and popped with the added N in February (by that time, roots could have penetrated the acidic zone). Even still, the extremely acid-susceptible types never had the chance. Nobody can reasonably interpret the data unless they hold prior knowledge of low pH adaptation. Hence it would be a disservice to someone "on the outside" reading the data now or worse yet, several years from now. We have (regional nursery) data from Enid, but I think we should withhold release, unless individual cooperators want to see it offline.

Nairn, Ontario

Cooperators: Mark Etienne
Dow AgroSciences
Planted: November 2, 2011
Fertilizer: 200# of 6-24-24 in fall; 284# of 40.6-0-0-4.1S in spring
Notes: Planted very late into good fall conditions. An open winter resulted in above average temperatures and very little damage to crop. Crop was about 6-8 days ahead of seasonal average for both heading and harvest. Very little early disease and/or development of Septoria and rusts.

Knoxville, Tennessee

Cooperators: Dennis West
University of Tennessee
Planted: October 26, 2011
Harvested: June 5, 2012
Fertilizer: 30 N fall, 60 N spring
Notes: Poor test. Too wet to plant when we planted. Got wetter for the next two months resulting in some stand loss.

Blacksburg, Virginia

Cooperators: Carl Griffey
Virginia Tech

Planted: September 30, 2011
Harvested: June 23, 2012
Fertilizer: 30-40-60 fall, plus 1T lime

Warsaw, Virginia

Cooperators: Carl Griffey
Virginia Tech
Planted: October 18, 2011
Harvested: June 7, 2012
Fertilizer: 30-80-80-5 fall

Mt. Vernon, Pullman, Walla Walla, Lind, Washington

Cooperators: Xianming Chen
USDA-ARS, Wheat Genetics, Quality, Physiology, & Disease Research
Notes: Adult stripe rust data. Infection Type (IT) was recorded based on the 0-9 scale with ITs 8 and 9 combined as 8 (the most susceptible reaction) in field data. Generally IT 0-3 are considered resistant, 4-6 intermediate, and 7-9 susceptible. Heterogenous reactions of an entry were indicated by two or more ITs separated by "," for most plants with the first IT and few plants with the second IT or connected with "-" for entries containing plants with continuous ITs. Entries with a high IT in the first note, but a low IT in the second note may indicate that they have high-temperature, adult-plant (HTAP) resistance.

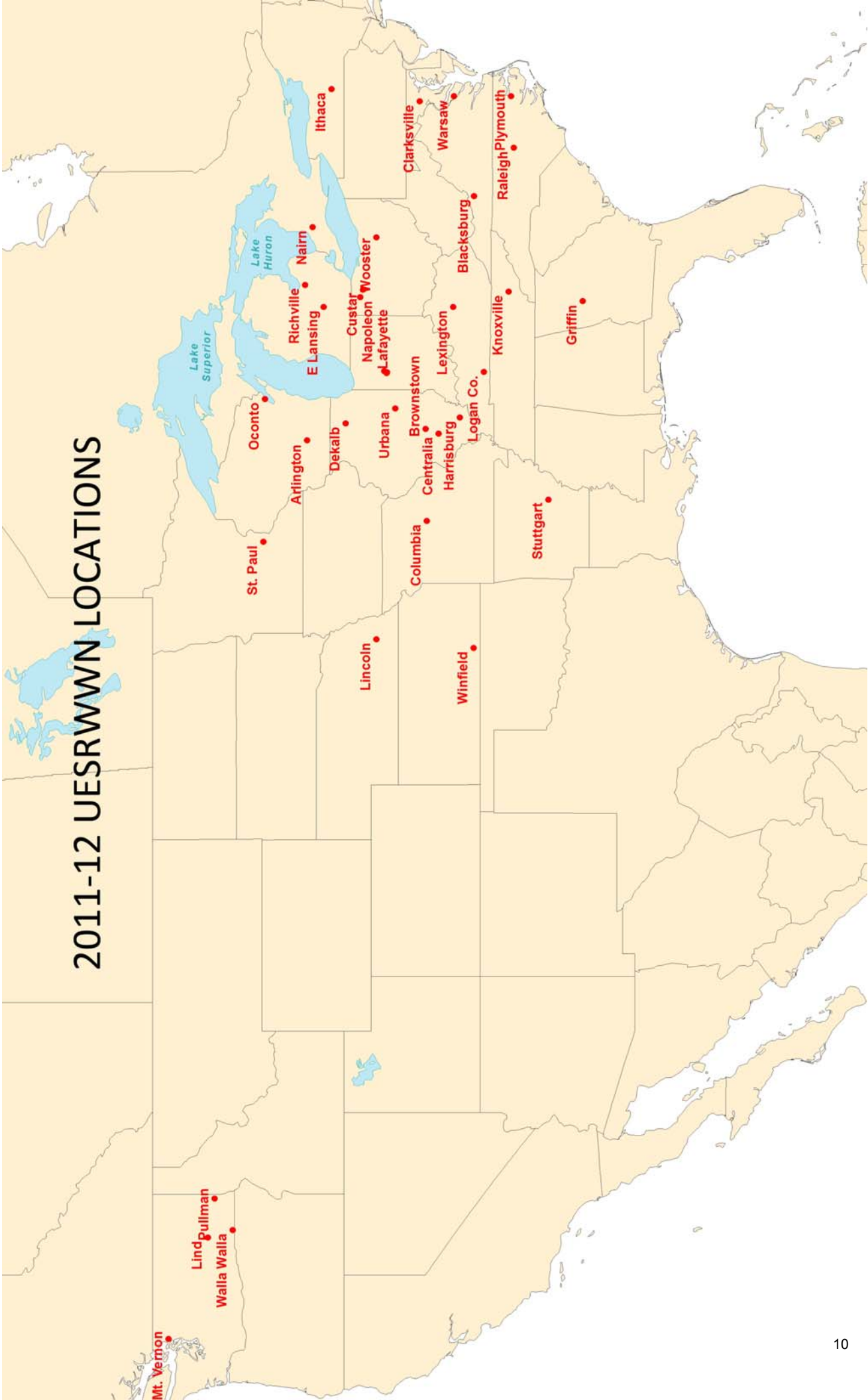
Arlington, Wisconsin

Cooperators: Shawn Conley, Adam Roth
University of Wisconsin
Planted: October 4, 2011
Harvested: July 6, 2012
Fertilizer: 40 N; soybeans were previous crop

Oconto, Wisconsin

Cooperators: Jana Murche
KWS Cereals USA
Planted: October 5, 2011
Harvested: July 14, 2012
Fertilizer: none: followed high manure corn

2011-12 UESRWWN LOCATIONS



YIELD (bu/acre)

	Stuttgart		Griffin		Brownstown		Urbana		Centralia		Harrisburg		
	AR ^b	rank	GA	rank	IL ^{ab}	rank	IL ^{ab}	rank	IL ^a	rank	IL ^a	rank	
	Mason		Johnson		Kolb		Kolb		Obert		Murche		
1	Branson	56.4	31	84.1	7	80.9	12	69.1	15	68.3	11	75.1	15
2	Bess	66.1	4	82.2	8	79.1	17	68.7	17	62.8	26	72.8	19
3	Shirley	66.1	5	35.5	31	76.9	22	76.1	5	64.0	22	76.3	11
4	MO080104	59.7	18	89.8	3	73.1	28	62.5	25	64.8	21	65.7	32
5	IL06-14262	56.8	30	54.1	27	84.9	7	74.7	9	66.4	17	77.3	7
6	NC08-23090	58.3	22	89.1	5	70.6	33	48.7	34	54.9	32	83.8	1
7	NC08-23324	62.2	12	97.9	1	77.5	21	66.1	20	53.2	34	70.3	25
8	GA021087-10LE33	59.6	19	97.2	2	83.1	10	75.5	6	66.9	15	75.6	14
9	KY03C-1237-32	60.2	16	89.7	4	77.8	20	63.1	23	68.1	12	76.8	10
10	KY03C-1002-02	64.7	8	62.6	24	80.3	15	66.0	21	71.4	5	71.5	20
11	P04606RA1-6	56.1	33	62.6	24	86.2	5	75.0	8	51.4	35	71.3	21
12	P05222A1-7	56.1	32	78.9	12	84.3	8	97.6	1	65.5	19	75.7	13
13	P05247A1-1	48.3	35	64.0	22	75.4	25	78.5	3	61.5	28	69.8	27
14	VA08MAS-369	68.7	2	80.5	10	83.2	9	76.3	4	71.2	6	69.1	28
15	VA09W-73	65.8	6	69.0	20	78.2	19	71.0	13	71.0	7	77.9	5
16	VA10W-21	62.3	11	20.7	35	80.9	12	65.2	22	69.2	8	78.9	4
17	MD03W64-10-3	57.0	27	50.4	28	74.2	27	56.4	32	59.6	31	59.6	35
18	MD03W665-09-1	57.7	25	73.0	16	70.4	34	60.9	27	59.8	30	67.9	30
19	DAS1001	50.0	34	34.4	33	71.4	30			62.2	27	64.8	34
20	DAS1002	58.6	21	32.5	34	75.3	26	68.0	18	60.3	29	71.1	22
21	DAS1003	59.0	20	36.7	30	78.7	18	60.3	28	63.5	24	70.4	23
22	KWS001	56.8	29	38.0	29	76.8	23	73.3	10	65.9	18	72.9	18
23	KWS002	61.6	13	34.6	32	71.7	29	62.0	26	68.6	10	74.4	17
24	KWS003	60.3	14	58.7	26	71.4	30	69.3	14	65.2	20	83.0	2
25	IL06-13721	58.1	23	74.3	14	82.9	11	57.8	30	66.4	16	70.1	26
26	IL06-23571	59.9	17	80.3	11	85.1	6	68.8	16	71.8	4	74.8	16
27	MO081652	60.2	15	80.6	9	76.6	24	62.9	24	71.9	3	68.9	29
28	OH07-263-3	62.4	10	63.7	23	80.2	16	75.5	6	68.1	13	70.3	24
29	OH08-180-48	65.7	7	68.9	21	94.1	1	80.7	2	76.2	1	75.7	12
30	G00120	63.6	9	73.8	15	80.7	14	59.1	29	63.5	23	82.3	3
31	G09534	67.1	3	87.1	6	87.1	4	67.6	19	74.2	2	65.2	33
32	G09528	58.0	24	70.1	18	70.8	32	57.4	31	63.0	25	66.2	31
33	AR02061-1-1	57.0	27	71.8	17	63.8	35	56.1	33	53.8	33	77.3	8
34	AR01163-3-1	69.1	1	75.2	13	90.7	2	72.1	11	67.9	14	76.9	9
35	ARS07-0525	57.3	26	69.1	19	89.3	3	71.8	12	69.0	9	77.8	6
LOCATION MEANS		60.2		66.6		79.0		68.1		65.2		73.1	
LSD (.05)		8.6				6.6		6.4		7.9		9.11	
CV %		5.1				5.1		5.7		12		12.17	
REPS		3		1		3		3		3		3	
Harvest Plot Area (sq.ft.)		70		50		34		34		42		70	

YIELD (bu/acre)

	BattleGround		Lafayette		W Lafayette		Winfield		Lexington		Clarksville		
	IN	a	IN	a	IN	ab	KS	b	KY	ab	MD	ab	
	Obert		Moreno		Ohm		Perry		Van Sanford		Costa		
		rank		rank		rank		rank		rank		rank	
1	Branson	82.7	1	99.3	14	79.3	19	68.8	12	45.9	31	67.7	8
2	Bess	64.8	27	97.5	17	80.8	18	61.8	22	57.0	22	53.9	29
3	Shirley	73.3	11	110.2	4	90.1	11	63.0	19	74.4	3	67.6	9
4	MO080104	75.8	5	94.8	21	72.9	22	69.9	11	55.3	26	66.2	11
5	IL06-14262	78.9	2	103.7	7	94.2	6	46.2	32	78.1	2	73.4	2
6	NC08-23090	74.2	9	60.7	35	33.0	35	44.9	33	13.8	35	53.8	30
7	NC08-23324	78.4	3	79.5	32	42.4	34	43.3	35	57.1	21	60.6	19
8	GA021087-10LE33	62.3	33	102.4	9	72.7	23	72.1	8	42.0	32	68.8	6
9	KY03C-1237-32	71.8	16	67.1	33	58.0	33	80.6	1	35.7	34	55.7	27
10	KY03C-1002-02	67.1	26	80.7	31	71.7	25	75.2	4	53.8	27	58.7	23
11	P04606RA1-6	68.9	21	102.1	10	93.3	7	74.7	5	62.1	15	56.2	26
12	P05222A1-7	72.8	13	118.2	1	92.0	8	60.7	23	74.4	4	70.1	5
13	P05247A1-1	73.1	12	93.9	23	68.3	28	74.5	6	56.5	24	61.9	17
14	VA08MAS-369	67.8	23	99.9	13	61.5	31	65.2	16	58.6	18	66.5	10
15	VA09W-73	56.1	35	94.4	22	89.4	12	60.3	24	71.7	7	70.2	4
16	VA10W-21	75.5	6	93.6	25	67.7	29	54.4	29	72.9	5	77.1	1
17	MD03W64-10-3	74.2	10	85.9	29	60.7	32	63.0	19	52.0	29	53.3	31
18	MD03W665-09-1	63.2	31	98.5	15	68.8	27	67.2	13	56.7	23	63.7	15
19	DAS1001	69.1	19	106.3	5	97.6	2	52.5	30	67.6	11	62.7	16
20	DAS1002	63.1	32	93.7	24	91.2	9	62.5	21	50.6	30	41.8	35
21	DAS1003	72.8	14	100.4	12	85.7	15	56.8	28	57.5	20	46.0	34
22	KWS001	70.7	17	90.7	27	96.1	3	49.6	31	64.6	13	60.7	18
23	KWS002	64.4	30	95.8	20	90.2	10	44.1	34	52.7	28	48.0	33
24	KWS003	58.9	34	96.7	18	88.6	13	64.2	17	61.9	16	57.7	25
25	IL06-13721	67.3	25	83.2	30	70.8	26	58.9	25	55.7	25	59.4	21
26	IL06-23571	69.3	18	86.6	28	72.3	24	70.4	10	58.6	19	72.0	3
27	MO081652	74.5	8	93.1	26	75.5	21	71.7	9	61.8	17	66.1	12
28	OH07-263-3	67.7	24	98.1	16	95.1	5	58.1	26	72.2	6	59.0	22
29	OH08-180-48	69.0	20	111.1	3	104.7	1	78.9	2	82.1	1	68.0	7
30	G00120	64.5	28	101.8	11	87.0	14	63.5	18	68.3	10	63.9	14
31	G09534	76.1	4	103.9	6	83.7	16	75.7	3	69.5	9	65.5	13
32	G09528	71.8	15	103.1	8	95.7	4	72.7	7	69.6	8	58.1	24
33	AR02061-1-1	68.1	22	96.0	19	76.2	20	65.5	15	40.1	33	55.2	28
34	AR01163-3-1	74.5	7	112.3	2	83.2	17	65.9	14	63.8	14	51.6	32
35	ARS07-0525	64.5	28	65.0	34	63.8	30	58.1	26	66.3	12	59.5	20
LOCATION MEANS		69.9		94.9		78.7		63.3		59.5		61.2	
LSD (.05)		10.2				7.84		4.8		10.1		9.3	
CV %		14.5				7.11		5.8		8.1		7.5	
REPS		3		1		4		2		2		2	
Harvest Plot Area (sq.ft.)		40						50		40			

YIELD (bu/acre)

	Richville		Columbia		Lincoln		Ithaca		Plymouth		Custar		
	MI	ab	MO	ab	NE		NY	a	NC	ab	OH	ab	
	Freed		McKendry		Baenziger		Sorrells		Murphy		Sneller		
		rank		rank		rank		rank		rank		rank	
1	Branson	108.2	4	57.0	22	56.8	11	59.7	14	42.5	29	77.0	4
2	Bess	98.9	15	67.3	4	57.0	10	61.5	11	39.3	31	55.3	28
3	Shirley	101.6	11	56.7	23	51.2	18	66.3	4	71.7	2	57.8	26
4	MO080104	93.9	29	53.8	24	55.0	12	64.7	5	51.8	20	64.1	17
5	IL06-14262	103.6	8	66.2	7	54.6	13	58.5	17	46.6	24	60.8	22
6	NC08-23090	99.4	14	52.1	27	37.6	35	57.3	20	64.8	5	55.6	27
7	NC08-23324	94.2	28	47.3	33	44.0	31	46.0	35	73.2	1	58.0	24
8	GA021087-10LE33	98.4	17	49.0	31	61.6	5	47.0	34	66.2	4	64.8	14
9	KY03C-1237-32	91.2	32	61.9	15	47.7	26	61.0	13	44.0	27	55.3	28
10	KY03C-1002-02	91.9	31	60.3	17	48.2	23	56.5	23	47.1	23	64.5	15
11	P04606RA1-6	97.4	20	59.0	19	52.3	16	49.7	33	39.5	30	54.4	31
12	P05222A1-7	95.2	27	79.5	2	71.6	1	50.5	31	52.4	19	50.5	33
13	P05247A1-1	92.0	30	80.0	1	63.0	4	54.2	27	48.6	22	48.7	34
14	VA08MAS-369	110.3	1	63.1	10	61.3	6	62.2	9	63.1	7	84.9	1
15	VA09W-73	106.6	6	66.9	5	63.9	3	58.6	15	63.0	8	70.3	9
16	VA10W-21	103.1	10	59.9	18	48.1	24	58.6	16	69.8	3	71.8	8
17	MD03W64-10-3	96.0	25	51.6	28	47.0	29	54.1	28	54.9	15	47.7	35
18	MD03W665-09-1	84.8	33	46.7	34	54.3	14	56.1	24	46.3	25	61.5	21
19	DAS1001	83.9	34	62.5	13	58.4	7	54.3	26	38.0	32	68.3	11
20	DAS1002	100.3	12	53.5	25	48.3	22	70.6	2	36.9	33	79.5	2
21	DAS1003	108.8	3	44.0	35	42.6	32	71.8	1	24.6	35	78.8	3
22	KWS001	109.3	2	62.1	14	49.2	21	64.0	6	42.8	28	68.1	12
23	KWS002	97.4	20	50.3	30	41.6	34	61.3	12	25.6	34	76.0	5
24	KWS003	103.3	9	65.4	8	53.4	15	58.1	18	46.1	26	63.8	18
25	IL06-13721	97.0	23	62.7	12	46.3	30	50.6	30	51.8	21	64.3	16
26	IL06-23571	80.7	35	60.8	16	41.8	33	50.4	32	55.8	13	58.0	24
27	MO081652	98.3	18	52.3	26	58.3	8	68.0	3	53.1	17	69.0	10
28	OH07-263-3	97.0	23	58.3	21	47.7	26	57.1	22	52.8	18	72.2	7
29	OH08-180-48	104.4	7	69.1	3	69.6	2	62.8	8	64.1	6	65.9	13
30	G00120	98.2	19	58.7	20	51.4	17	52.3	29	56.5	12	60.6	23
31	G09534	98.6	16	65.2	9	58.3	8	54.7	25	62.2	9	72.9	6
32	G09528	96.0	25	51.1	29	50.5	19	63.1	7	57.8	10	61.9	20
33	AR02061-1-1	106.9	5	48.1	32	50.4	20	57.1	21	57.6	11	55.1	30
34	AR01163-3-1	99.6	13	63.1	10	48.0	25	62.0	10	55.5	14	62.9	19
35	ARS07-0525	97.4	20	66.3	6	47.5	28	57.8	19	54.9	16	54.1	32
LOCATION MEANS		98.4		59.2		52.5		58.2		52.0		63.8	
LSD (.05)		5.6		8.6		12.2		10.3		7.9		10.2	
CV %		3.4		8.9		11.44		10.5		7.5		8.1	
REPS		2		3		2		3		2		2	
Harvest Plot Area (sq.ft.)		60		55		50		41		55		50	

YIELD (bu/acre)

	Napoleon		Nairn		Knoxville		Blacksburg		Warsaw		Arlington		
	OH	ab	ON	ab	TN	a	VA	ab	VA	ab	WI	a	
	Obert		Etienne		West		Griffey		Griffey		Roth		
		rank		rank		rank		rank		rank		rank	
1	Branson	77.9	6	95.3	10	36.6	34	72.5	9	87.5	9	115.4	3
2	Bess	74.4	12	92.1	16	52.9	20	61.3	20	69.3	32	112.2	7
3	Shirley	85.7	2	99.3	6	49.1	27	88.8	1	99.1	2	89.4	32
4	MO080104	69.9	27	84.5	31	54.0	18	55.7	26	74.4	26	103.6	13
5	IL06-14262	77.6	7	89.4	22	53.3	19	80.2	4	82.0	15	101.1	21
6	NC08-23090	77.5	8	90.4	20	61.5	8	56.9	25	78.2	22	97.1	25
7	NC08-23324	75.9	10	88.1	26	51.9	22	46.1	33	87.6	8	89.8	31
8	GA021087-10LE33	69.2	30	96.3	9	38.0	33	52.3	31	91.2	4	101.5	20
9	KY03C-1237-32	72.7	20	89.5	21	48.3	28	66.2	13	77.7	23	114.6	4
10	KY03C-1002-02	72.8	19	93.1	13	59.8	11	66.3	12	81.4	18	101.8	18
11	P04606RA1-6	72.0	24	84.2	32	59.0	13	78.2	6	84.4	12	101.9	17
12	P05222A1-7	71.8	25	87.3	27	62.8	6	75.2	7	82.1	14	101.8	18
13	P05247A1-1	68.9	31	82.3	34	59.3	12	68.5	11	82.5	13	106.9	9
14	VA08MAS-369	75.7	11	101.3	5	64.7	5	63.1	18	106.5	1	114.4	5
15	VA09W-73	73.6	16	93.7	12	74.1	1	81.2	2	88.7	5	124.0	1
16	VA10W-21	74.2	15	80.5	35	60.7	9	79.4	5	86.5	10	97.6	24
17	MD03W64-10-3	66.7	33	82.8	33	52.4	21	61.5	19	71.9	30	82.8	34
18	MD03W665-09-1	73.6	16	85.1	29	49.9	26	55.1	29	88.4	6	102.5	16
19	DAS1001	65.7	34	91.2	17	39.7	31	57.1	24	66.4	34	103.0	15
20	DAS1002	78.0	5	96.6	8	32.8	35	38.6	35	64.9	35	95.2	27
21	DAS1003	74.3	14	104.0	2	39.2	32	42.3	34	73.4	29	94.9	29
22	KWS001	72.6	22	102.9	3	43.2	30	58.7	22	81.4	19	105.9	10
23	KWS002	70.4	26	104.6	1	45.7	29	51.9	32	69.7	31	87.6	33
24	KWS003	72.7	21	92.7	14	54.4	17	70.9	10	81.7	17	100.1	22
25	IL06-13721	72.6	23	84.8	30	56.0	16	64.9	15	67.4	33	104.0	12
26	IL06-23571	73.3	18	86.0	28	50.0	25	55.5	27	81.3	20	99.9	23
27	MO081652	76.1	9	88.4	25	51.3	24	57.5	23	74.2	27	105.5	11
28	OH07-263-3	67.5	32	88.8	24	66.9	4	74.7	8	73.7	28	81.3	35
29	OH08-180-48	82.0	3	101.4	4	57.3	14	80.8	3	82.0	15	117.0	2
30	G00120	69.5	29	88.9	23	62.1	7	54.5	30	76.2	24	95.8	26
31	G09534	74.4	13	99.2	7	72.4	2	66.0	14	88.2	7	113.5	6
32	G09528	78.1	4	90.5	19	51.9	22	63.8	16	79.0	21	95.2	27
33	AR02061-1-1	63.1	35	91.1	18	60.6	10	63.7	17	75.3	25	103.5	14
34	AR01163-3-1	69.7	28	93.9	11	56.1	15	55.4	28	93.6	3	94.7	30
35	ARS07-0525	86.2	1	92.6	15	69.7	3	59.5	21	86.2	11	107.6	8
LOCATION MEANS		73.6		91.8		54.2		63.5		81.0		101.8	
LSD (.05)		5.6		6.2		19.9		7.88		10.59		8.2	
CV %		7.6		4.19		22.4		7.34		7.74		10.5	
REPS		3		3		3		2		2		3	
Harvest Plot Area (sq.ft.)		42		44.55		43		45		45		50	

YIELD (bu/acre)

		Oconto		ENTRY MEANS	ENTRY MEANS	ENTRY MEANS			
		WI	ab	ALL LOCATIONS	IN-REGION	CV <10%			
		Murche			[a]	[b]			
			rank	rank	rank	rank			
1	Branson	88.6	2	74.1	7	75.5	9	76.5	9
2	Bess	79.5	15	70.7	17	71.5	21	69.7	25
3	Shirley	72.4	30	74.5	6	78.4	3	82.3	2
4	MO080104	89.4	1	70.6	20	71.0	23	69.8	23
5	IL06-14262	78.9	17	73.7	8	77.6	7	78.4	6
6	NC08-23090	75.5	26	63.6	35	64.7	35	64.2	35
7	NC08-23324	66.8	35	66.3	31	67.1	33	69.7	24
8	GA021087-10LE33	84.0	6	71.9	11	71.8	20	74.7	13
9	KY03C-1237-32	86.0	5	68.8	25	68.7	29	68.1	30
10	KY03C-1002-02	84.0	6	70.1	23	71.5	22	72.2	19
11	P04606RA1-6	76.3	24	70.7	18	72.5	17	74.2	16
12	P05222A1-7	82.7	8	76.4	5	78.2	4	78.7	5
13	P05247A1-1	80.7	12	70.4	21	72.0	19	72.4	18
14	VA08MAS-369	78.8	18	76.7	4	78.2	5	81.6	3
15	VA09W-73	87.1	3	77.1	2	79.4	2	80.6	4
16	VA10W-21	72.3	31	71.2	14	76.0	8	77.1	8
17	MD03W64-10-3	74.7	29	63.6	34	65.4	34	65.5	34
18	MD03W665-09-1	75.0	28	67.5	27	68.3	32	69.6	26
19	DAS1001	77.0	22	66.8	29	70.4	25	69.5	27
20	DAS1002	79.9	13	65.7	32	68.7	30	67.8	32
21	DAS1003	76.0	25	66.5	30	69.9	26	68.8	29
22	KWS001	81.1	11	70.3	22	74.5	11	75.8	11
23	KWS002	78.0	19	65.1	33	68.9	28	68.0	31
24	KWS003	82.5	9	71.2	13	73.5	13	74.5	14
25	IL06-13721	77.3	21	68.2	26	69.9	27	69.0	28
26	IL06-23571	72.1	32	69.4	24	70.6	24	71.4	22
27	MO081652	86.7	4	72.1	10	72.9	15	71.7	20
28	OH07-263-3	75.2	27	71.3	12	73.9	12	74.4	15
29	OH08-180-48	76.8	23	80.3	1	82.2	1	82.5	1
30	G00120	70.1	34	70.7	19	72.1	18	71.5	21
31	G09534	77.7	20	77.0	3	78.0	6	78.4	7
32	G09528	81.3	10	71.1	15	72.6	16	73.1	17
33	AR02061-1-1	70.4	33	67.4	28	68.5	31	67.1	33
34	AR01163-3-1	79.8	14	73.5	9	75.2	10	76.4	10
35	ARS07-0525	79.1	16	70.8	16	73.2	14	74.9	12
LOCATION MEANS		78.7		70.7		72.7		73.1	
LSD (.05)									
CV %		8.6							
REPS		3							
Harvest Plot Area (sq.ft.)		60							

TEST WEIGHT (lbs/bu)

	Stuttgart AR Mason	Griffin GA Johnson	Brownstown IL Kolb	Urbana IL Kolb	Harrisburg IL Murche	
1	Branson	61.8	59.1	59.7	59.9	59.1
2	Bess	62.9	60.5	61.3	60.6	59.3
3	Shirley	62.2	50.9	59.0	58.4	59.0
4	MO080104	62.6	62.0	62.5	62.3	59.2
5	IL06-14262	62.9	57.4	61.0	61.3	59.1
6	NC08-23090	61.4	58.9	58.9	60.1	58.8
7	NC08-23324	63.5	61.2	58.6	61.6	60.6
8	GA021087-10LE33	62.6	61.6	60.1	61.0	59.5
9	KY03C-1237-32	63.3	60.7	60.3	60.1	60.0
10	KY03C-1002-02	62.8	56.9	61.5	59.6	59.9
11	P04606RA1-6	61.7	57.9	58.6	61.3	60.1
12	P05222A1-7	63.5	60.6	59.7	62.0	60.3
13	P05247A1-1	61.7	58.9	60.0	59.6	59.3
14	VA08MAS-369	64.3	61.5	58.8	61.8	58.7
15	VA09W-73	64.0	61.8	59.3	61.5	58.6
16	VA10W-21	63.1	48.1	59.5	61.1	58.8
17	MD03W64-10-3	63.9	57.5	60.8	60.9	59.5
18	MD03W665-09-1	64.3	61.2	59.0	61.6	57.3
19	DAS1001	51.8	45.3	49.0		57.4
20	DAS1002	61.0	54.2	60.5	58.9	60.0
21	DAS1003	62.4	55.8	59.9	60.0	59.8
22	KWS001	62.4	52.6	58.1	59.9	59.6
23	KWS002	60.3	51.1	53.3	57.6	59.5
24	KWS003	62.6	57.0	59.4	60.0	60.2
25	IL06-13721	64.2	61.5	62.9	58.9	60.0
26	IL06-23571	63.4	61.3	62.1	61.4	61.1
27	MO081652	63.4	61.1	61.6	61.0	60.5
28	OH07-263-3	63.5	60.4	61.0	60.3	57.4
29	OH08-180-48	63.6	59.9	61.7	61.6	59.3
30	G00120	62.9	59.1	62.2	60.3	59.5
31	G09534	62.9	59.2	61.0	59.4	60.4
32	G09528	62.5	59.0	59.4	59.6	59.9
33	AR02061-1-1	63.2	60.2	60.0	60.6	59.4
34	AR01163-3-1	62.4	57.2	60.4	59.0	58.8
35	ARS07-0525	63.4	59.0	60.5	60.6	58.8
LOCATION MEANS		62.5	58.0	59.8	60.4	59.4

TEST WEIGHT (lbs/bu)

	W Lafayette	Winfield	Lexington	Clarksville	Richville	
	IN	KS	KY	MD	MI	
	Ohm	Perry	Van Sanford	Costa	Freed	
1	Branson	62.0	56.6	57.6	57.5	60.6
2	Bess	62.0	58.9	58.5	58.0	61.6
3	Shirley	60.7	50.7	56.2	58.4	58.6
4	MO080104	62.8	61.0	60.4	60.3	60.9
5	IL06-14262	62.2	57.3	59.2	60.9	59.3
6	NC08-23090	60.9	54.7		59.1	61.0
7	NC08-23324	63.4	51.7	59.6	60.4	62.1
8	GA021087-10LE33	63.1	59.2		59.7	61.2
9	KY03C-1237-32	62.1	59.0		59.0	61.4
10	KY03C-1002-02	62.3	56.2	58.7	58.7	61.8
11	P04606RA1-6	61.8	59.4	58.9	60.3	63.4
12	P05222A1-7	62.1	57.1	59.0	60.5	60.6
13	P05247A1-1	61.6	57.4	56.1	58.1	61.9
14	VA08MAS-369	62.7	61.3	60.6	60.7	60.9
15	VA09W-73	62.9	60.2	59.1	60.5	61.6
16	VA10W-21	63.7	54.5	59.1	61.5	61.6
17	MD03W64-10-3	62.1	58.6	59.5	60.7	61.9
18	MD03W665-09-1	63.0	60.9	61.2	59.8	61.0
19	DAS1001	58.5	51.6	57.4	54.7	55.5
20	DAS1002	60.0	59.0	55.0	55.8	60.2
21	DAS1003	61.0	57.8	57.9	58.6	60.6
22	KWS001	62.7	57.3	58.1	58.6	60.8
23	KWS002	60.0	55.9	56.9	57.3	59.7
24	KWS003	61.3	59.0	57.7	59.8	58.9
25	IL06-13721	63.9	56.9	61.0	60.4	63.2
26	IL06-23571	63.9	59.5	59.7	61.2	61.0
27	MO081652	63.8	61.8	61.4	60.5	61.0
28	OH07-263-3	62.4	56.9	60.4	58.4	60.2
29	OH08-180-48	62.7	59.7	58.5	58.3	60.5
30	G00120	62.8	60.1	59.3	59.2	61.1
31	G09534	61.3	58.9	58.9	58.5	59.0
32	G09528	61.7	59.7	59.2	59.9	60.1
33	AR02061-1-1	62.6	58.3	57.6	59.5	62.9
34	AR01163-3-1	62.6	58.7	59.2	55.8	60.5
35	ARS07-0525	61.2	58.3	58.9	60.4	60.7
LOCATION MEANS	62.1	57.8	58.8	59.2	60.8	

TEST WEIGHT (lbs/bu)

	Columbia MO McKendry	Lincoln NE Baenziger	Ithaca NY Sorrells	Plymouth NC Murphy	Custar OH Sneller	
1	Branson	56.4	56.5	58.0	54.8	56.7
2	Bess	59.2	58.6	59.5	54.5	59.0
3	Shirley	55.5	55.7	58.0	56.2	58.9
4	MO080104	59.2	59.1	59.3	58.1	58.7
5	IL06-14262	58.9	57.8	59.4	57.6	59.8
6	NC08-23090	56.2	58.0	60.3	57.3	58.1
7	NC08-23324	57.8	56.2	61.1	58.4	61.8
8	GA021087-10LE33	59.5	58.4	59.3	57.7	60.4
9	KY03C-1237-32	57.1	56.8	60.0	55.8	60.0
10	KY03C-1002-02	57.3	57.0	57.6	54.7	60.0
11	P04606RA1-6	57.7	58.1	60.6	55.1	58.5
12	P05222A1-7	57.7	56.9	59.5	57.7	60.7
13	P05247A1-1	56.4	57.1	59.1	54.6	57.0
14	VA08MAS-369	59.6	59.0	60.7	58.5	61.2
15	VA09W-73	57.8	56.4	58.8	58.3	59.9
16	VA10W-21	56.4	56.8	60.1	57.2	60.1
17	MD03W64-10-3	56.9	58.5	60.7	57.2	61.0
18	MD03W665-09-1	59.4	59.1	60.5	57.1	61.9
19	DAS1001	57.1	57.8	58.4	54.8	61.1
20	DAS1002	57.3	56.3	59.0	53.3	59.6
21	DAS1003	56.9	56.3	59.6	54.2	60.0
22	KWS001	57.2	55.3	58.6	56.8	58.3
23	KWS002	57.0	54.5	57.7	54.0	59.7
24	KWS003	58.3	58.0	58.2	54.8	60.1
25	IL06-13721	57.9	58.2	60.7	58.6	57.9
26	IL06-23571	58.5	58.0	60.7	58.0	61.8
27	MO081652	59.6	59.3	60.5	58.3	59.9
28	OH07-263-3	57.8	57.1	59.7	56.7	57.0
29	OH08-180-48	57.2	57.8	58.6	56.9	58.3
30	G00120	58.2	58.5	58.4	57.5	58.8
31	G09534	58.3	58.5	58.4	56.9	59.9
32	G09528	57.7	57.8	59.4	57.3	61.6
33	AR02061-1-1	56.8	57.8	58.7	57.9	61.2
34	AR01163-3-1	58.1	55.1	59.0	55.9	59.8
35	ARS07-0525	57.8	55.7	57.4	57.1	56.2
LOCATION MEANS	57.7	57.4	59.3	56.5	59.6	

TEST WEIGHT (lbs/bu)

	Nairn ON Etienne	Knoxville TN West	Blacksburg VA Griffey	Warsaw VA Griffey	Arlington WI Roth	
1	Branson	60.5	55.3	57.0	60.2	61.2
2	Bess	61.8	56.3	58.8	61.1	62.7
3	Shirley	60.8	55.3	56.6	60.6	56.8
4	MO080104	63.1	58.7	59.8	62.2	63.2
5	IL06-14262	61.9	58.1	58.3	61.8	61.2
6	NC08-23090	61.9	57.0	57.0	59.5	62.1
7	NC08-23324	62.6	58.0	58.0	62.5	61.8
8	GA021087-10LE33	61.8	58.6	58.7	62.2	62.2
9	KY03C-1237-32	62.5	57.6	58.5	60.9	63.8
10	KY03C-1002-02	62.1	56.9	58.1	60.6	62.5
11	P04606RA1-6	62.2	57.2	58.4	61.8	62.7
12	P05222A1-7	62.3	58.9	58.3	61.6	61.7
13	P05247A1-1	60.8	54.4	55.3	58.4	61.4
14	VA08MAS-369	63.6	59.7	60.0	62.7	64.0
15	VA09W-73	61.5	58.4	59.2	62.5	63.4
16	VA10W-21	60.2	57.5	59.7	61.5	61.2
17	MD03W64-10-3	62.7	58.0	59.4	61.2	62.5
18	MD03W665-09-1	62.3	58.8	59.7	62.2	63.4
19	DAS1001	60.9	53.7	55.9	57.9	62.2
20	DAS1002	60.3	55.5	49.6	58.9	60.7
21	DAS1003	61.9	54.9	54.7	61.1	60.9
22	KWS001	63.1	57.0	57.6	61.7	61.0
23	KWS002	60.5	57.0	56.0	59.7	58.6
24	KWS003	61.2	56.4	57.8	61.3	61.4
25	IL06-13721	62.9	57.4	59.3	61.4	64.1
26	IL06-23571	63.4	57.4	59.3	62.1	64.7
27	MO081652	63.1	58.7	59.8	62.4	63.0
28	OH07-263-3	62.7	58.8	59.0	61.4	60.5
29	OH08-180-48	62.0	57.4	57.3	62.1	62.9
30	G00120	62.8	58.6	58.9	61.9	62.7
31	G09534	62.4	58.4	58.5	61.6	62.3
32	G09528	61.9	58.5	58.2	61.7	61.0
33	AR02061-1-1	62.3	58.1	57.6	61.9	63.7
34	AR01163-3-1	61.8	55.6	54.2	61.2	60.5
35	ARS07-0525	61.6	58.4	58.5	61.8	62.2
LOCATION MEANS	62.0	57.3	57.8	61.2	62.0	

TEST WEIGHT (lbs/bu)

		Oconto	ENTRY MEANS	
		WI	ALL LOCATIONS	
		Murche		rank
1	Branson	56.4	58.4	30
2	Bess	58.8	59.7	16
3	Shirley	52.4	57.2	34
4	MO080104	60.3	60.7	4
5	IL06-14262	57.4	59.6	19
6	NC08-23090	57.0	58.9	26
7	NC08-23324	56.5	59.9	13
8	GA021087-10LE33	56.9	60.2	8
9	KY03C-1237-32	57.8	59.8	14
10	KY03C-1002-02	56.0	59.1	24
11	P04606RA1-6	58.4	59.7	15
12	P05222A1-7	58.2	59.9	11
13	P05247A1-1	55.9	58.3	31
14	VA08MAS-369	60.5	61.0	2
15	VA09W-73	58.5	60.2	7
16	VA10W-21	58.4	59.0	25
17	MD03W64-10-3	59.1	60.1	9
18	MD03W665-09-1	60.8	60.7	5
19	DAS1001	58.4	56.0	35
20	DAS1002	57.8	57.7	32
21	DAS1003	56.6	58.6	29
22	KWS001	57.5	58.8	27
23	KWS002	57.1	57.3	33
24	KWS003	58.8	59.1	23
25	IL06-13721	59.0	60.5	6
26	IL06-23571	57.6	60.8	3
27	MO081652	60.2	61.0	1
28	OH07-263-3	58.8	59.5	21
29	OH08-180-48	57.4	59.7	17
30	G00120	57.6	60.0	10
31	G09534	58.1	59.7	18
32	G09528	56.3	59.6	20
33	AR02061-1-1	57.5	59.9	12
34	AR01163-3-1	55.7	58.6	28
35	ARS07-0525	56.4	59.3	22
LOCATION MEANS		57.7	59.4	

HEADING DATE (Julian days)

	Stuttgart AR Mason	Griffin GA Johnson	Urbana IL Kolb	Centralia IL Obert	BattleGround IN Obert	
1	Branson	88	92	115	107.0	116.3
2	Bess	89	91	116	109.0	121.7
3	Shirley	89	94	117	107.3	119.3
4	MO080104	87	87	117	109.0	117.0
5	IL06-14262	95	99	118	109.0	118.7
6	NC08-23090	85	80	110	101.7	114.0
7	NC08-23324	85	88	113	104.7	116.0
8	GA021087-10LE33	85	88	113	104.7	116.3
9	KY03C-1237-32	85	89	113	104.7	115.0
10	KY03C-1002-02	85	90	114	105.3	115.0
11	P04606RA1-6	90	100	118		122.3
12	P05222A1-7	90	95	118	110.0	121.0
13	P05247A1-1	88	88	113	105.7	116.0
14	VA08MAS-369	89	88	112	105.3	119.3
15	VA09W-73	62	87	117	110.0	120.0
16	VA10W-21	89	94	114	109.0	116.7
17	MD03W64-10-3	85	94	116	106.7	117.0
18	MD03W665-09-1	87	91	116	108.3	118.3
19	DAS1001	95	100	130		127.7
20	DAS1002	95	100	123		123.0
21	DAS1003	95	100	121		123.0
22	KWS001	95	89	118	110.0	122.3
23	KWS002	95	97	119		122.7
24	KWS003	90	96	120		121.7
25	IL06-13721	89	94	112	105.7	115.0
26	IL06-23571	87	91	113	105.3	116.3
27	MO081652	85	91	115	104.7	116.3
28	OH07-263-3	89	91	116	108.0	117.7
29	OH08-180-48	90	95	120	111.0	121.3
30	G00120	88	87	114	107.3	116.7
31	G09534	89	94	117	109.0	119.3
32	G09528	90	96	118	110.0	122.3
33	AR02061-1-1	87	90	117	107.7	119.3
34	AR01163-3-1	87	91	113	105.0	116.3
35	ARS07-0525	87	97	116	108.0	117.7
LOCATION MEANS	88.2	92.4	116.3	107.2	118.8	

HEADING DATE (Julian days)

	Lafayette IN Moreno	W Lafayette IN Ohm	Lexington KY Van Sanford	Clarksville MD Costa	Richville MI Freed	
1	Branson	115	115	109.2	119.5	158.1
2	Bess	118	116	112.5	121.5	158.3
3	Shirley	121	116	113.4	121.5	158.7
4	MO080104	116	115	111.3	120.0	156.4
5	IL06-14262	118	116	113.3	122.0	157.8
6	NC08-23090	109	113	100.3	113.0	156.3
7	NC08-23324	111	114	109.4	117.5	157.4
8	GA021087-10LE33	112	115	106.6	116.5	158.2
9	KY03C-1237-32	112	115	109.6	118.5	156.5
10	KY03C-1002-02	112	115	108.8	119.0	157.8
11	P04606RA1-6	121	119	119.5	120.5	159.6
12	P05222A1-7	119	118	116.5	123.0	161.3
13	P05247A1-1	111	115	108.5	118.5	157.3
14	VA08MAS-369	117	115	109.1	118.5	157.3
15	VA09W-73	117	116	111.3	120.0	158.6
16	VA10W-21	115	116	108.4	119.0	156.8
17	MD03W64-10-3	116	116	110.3	121.5	159.2
18	MD03W665-09-1	118	116	109.7	120.0	159.1
19	DAS1001	131	127	121.6	123.0	163.2
20	DAS1002	125	122	118.6	123.5	160.2
21	DAS1003	123	121	117.1	123.0	159.5
22	KWS001	121	119	116.1	123.0	160.6
23	KWS002	121	119	116.3	122.0	159.5
24	KWS003	122	121	117.8	123.0	160.6
25	IL06-13721	112	115	107.5	116.0	155.9
26	IL06-23571	112	115	108.1	117.0	155.9
27	MO081652	116	115	108.5	121.0	156.3
28	OH07-263-3	118	116	111.3	120.0	158.1
29	OH08-180-48	122	119	115.6	123.0	159.6
30	G00120	115	114	109.8	118.5	156.2
31	G09534	117	116	112.2	121.5	157.8
32	G09528	121	118	115.6	123.0	159.1
33	AR02061-1-1	118	116	109.9	119.5	157.0
34	AR01163-3-1	112	114	106.6	117.0	158.3
35	ARS07-0525	118	116	110.3	119.5	158.4
LOCATION MEANS	117.2	116.7	111.7	120.1	158.3	

HEADING DATE (Julian days)

	Lincoln NE Baenziger	Ithaca NY Sorrells	Raleigh NC Murphy	Custar OH Sneller	Nairn ON Etienne	
1	Branson	117.0	140.0	98	129	143.0
2	Bess	118.5	140.3	97	130	145.0
3	Shirley	119.0	140.7	98	131	144.7
4	MO080104	118.5	140.0	97	130	144.7
5	IL06-14262	119.0	139.3	105	129	144.0
6	NC08-23090	118.0	138.3	90	129	143.7
7	NC08-23324	117.5	140.7	98	131	145.3
8	GA021087-10LE33	119.0	142.3	93	131	145.7
9	KY03C-1237-32	116.5	138.3	94	130	144.0
10	KY03C-1002-02	117.5	139.3	97	129	144.0
11	P04606RA1-6	121.5	140.7	105	132	144.7
12	P05222A1-7	120.0	143.0	104	133	145.7
13	P05247A1-1	118.0	137.7	94	130	142.0
14	VA08MAS-369	119.0	141.3	92	129	143.3
15	VA09W-73	123.0	143.3	96	132	145.3
16	VA10W-21	118.0	141.7	92	131	144.3
17	MD03W64-10-3	118.5	141.0	98	134	145.0
18	MD03W665-09-1	119.0	141.7	96	132	146.3
19	DAS1001	125.0	145.0	108	136	149.7
20	DAS1002	119.5	143.0	107	134	145.3
21	DAS1003	121.5	141.7	107	131	144.3
22	KWS001	120.0	141.7	98	132	145.0
23	KWS002	119.5	141.7	106	132	145.0
24	KWS003	120.0	142.0	104	132	145.0
25	IL06-13721	115.5	135.0	98	127	142.3
26	IL06-23571	115.5	136.7	96	127	142.3
27	MO081652	116.5	138.0	96	129	144.0
28	OH07-263-3	117.5	139.7	98	130	144.3
29	OH08-180-48	119.5	141.7	103	132	146.0
30	G00120	117.0	136.7	97	128	142.7
31	G09534	118.5	140.7	94	131	145.3
32	G09528	120.0	142.7	98	133	145.3
33	AR02061-1-1	118.5	140.0	96	130	143.3
34	AR01163-3-1	118.0	139.3	94	131	144.0
35	ARS07-0525	120.5	140.3	101	131	145.0
LOCATION MEANS	118.9	140.4	98.4	130.8	144.6	

HEADING DATE (Julian days)

		Knoxville TN West	Blacksburg VA Griffey	Warsaw VA Griffey	ENTRY MEANS ALL LOCATIONS	rank
1	Branson	102	114.0	105.0	115.7	13
2	Bess	102	114.0	107.5	117.1	20
3	Shirley	104	116.0	108.0	117.7	24
4	MO080104	102	116.0	106.0	116.1	16
5	IL06-14262	107	118.5	109.5	118.8	25
6	NC08-23090	94	109.5	98.5	111.3	1
7	NC08-23324	103	113.5	106.0	115.1	10
8	GA021087-10LE33	101	113.0	105.0	114.7	7
9	KY03C-1237-32	101	112.0	103.5	114.3	3
10	KY03C-1002-02	100	115.5	104.0	114.9	8
11	P04606RA1-6	110	115.0	111.5	120.6	30
12	P05222A1-7	108	121.0	110.0	119.8	29
13	P05247A1-1	101	114.0	104.0	114.5	5
14	VA08MAS-369	102	112.0	103.0	115.1	11
15	VA09W-73	103	115.0	108.0	115.8	14
16	VA10W-21	100	116.0	107.0	116.0	15
17	MD03W64-10-3	104	118.0	107.5	117.1	21
18	MD03W665-09-1	101	114.0	106.0	116.6	18
19	DAS1001	121	125.0	121.0	126.4	35
20	DAS1002	111	124.0	113.0	122.8	34
21	DAS1003	111	124.0	112.0	122.1	33
22	KWS001	109	119.5	110.0	119.4	27
23	KWS002	109	120.5	111.0	120.9	32
24	KWS003	109	119.5	109.0	120.7	31
25	IL06-13721	101	111.0	105.0	114.3	2
26	IL06-23571	101	114.5	105.0	114.4	4
27	MO081652	103	115.0	106.0	115.4	12
28	OH07-263-3	104	117.0	106.5	116.8	19
29	OH08-180-48	107	120.0	110.5	119.8	28
30	G00120	103	113.0	106.5	115.0	9
31	G09534	103	116.5	108.0	117.2	23
32	G09528	108	118.5	108.5	119.3	26
33	AR02061-1-1	102	114.5	106.5	116.2	17
34	AR01163-3-1	102	111.5	104.0	114.7	6
35	ARS07-0525	103	114.5	106.0	117.2	22
LOCATION MEANS		104.3	116.2	107.4	117.3	

HEIGHT (inches)

	Stuttgart AR Mason	Griffin GA Johnson	Brownstown IL Kolb	Urbana IL Kolb	Harrisburg IL Murche	
1	Branson	28.5	32	37	39	29.6
2	Bess	30.0	36	42	42	32.8
3	Shirley	25.0	28	37	38	28.8
4	MO080104	29.5	36	41	42	31.5
5	IL06-14262	28.5	35	41	40	35.7
6	NC08-23090	24.0	28	37	36	29.5
7	NC08-23324	28.5	31	36	36	32.3
8	GA021087-10LE33	27.0	31	34	36	33.4
9	KY03C-1237-32	27.0	27	34	36	29.4
10	KY03C-1002-02	26.5	30	36	38	31.2
11	P04606RA1-6	30.5	34	38	42	38.3
12	P05222A1-7	30.5	32	39	40	33.2
13	P05247A1-1	24.0	29	32	33	28.3
14	VA08MAS-369	26.5	31	37	38	35.5
15	VA09W-73	28.0	32	38	39	31.5
16	VA10W-21	28.0	32	38	39	33.3
17	MD03W64-10-3	30.5	35	40	42	34.4
18	MD03W665-09-1	28.0	33	37	38	30.3
19	DAS1001	31.5	36	39	38	30.9
20	DAS1002	27.0	39	41	39	33.0
21	DAS1003	32.0	43	44	45	38.0
22	KWS001	25.0	36	38	37	31.8
23	KWS002	30.0	36	41	41	32.9
24	KWS003	27.5	36	39	38	30.8
25	IL06-13721	29.0	35	40	38	30.7
26	IL06-23571	28.5	34	41	43	33.8
27	MO081652	29.0	35	42	41	33.8
28	OH07-263-3	32.5	39	44	42	32.6
29	OH08-180-48	29.0	33	40	36	34.7
30	G00120	27.0	36	39	36	33.6
31	G09534	26.5	36	39	37	33.1
32	G09528	26.5	33	40	39	32.2
33	AR02061-1-1	31.0	33	42	44	35.2
34	AR01163-3-1	31.0	33	41	41	32.0
35	ARS07-0525	26.5	32	37	38	32.1
LOCATION MEANS	28.3	33.6	38.9	39.1	32.6	

HEIGHT (inches)

	Battle Ground IN Obert	Lafayette IN Moreno	W Lafayette IN Ohm	Lexington KY Van Sanford	Clarksville MD Costa	
1	Branson	34.0	34	28.5	27.2	35.5
2	Bess	35.3	39	34.0	32.1	36.0
3	Shirley	32.0	34	27.0	26.4	31.5
4	MO080104	34.3	38	30.5	30.7	38.0
5	IL06-14262	35.3	36	32.0	33.5	37.5
6	NC08-23090	33.0	35	29.0	26.0	34.0
7	NC08-23324	31.7	36	28.0	25.3	30.5
8	GA021087-10LE33	30.3	34	29.5	24.0	31.0
9	KY03C-1237-32	30.3	33	28.0	23.6	30.0
10	KY03C-1002-02	32.0	33	28.5	28.6	30.5
11	P04606RA1-6	38.0	42	35.5	35.8	35.0
12	P05222A1-7	33.3	38	32.0	35.5	35.0
13	P05247A1-1	29.0	35	26.0	25.8	29.0
14	VA08MAS-369	32.3	38	27.5	29.8	33.0
15	VA09W-73	32.3	36	32.0	33.1	34.5
16	VA10W-21	34.0	34	29.5	27.9	35.0
17	MD03W64-10-3	35.0	39	33.0	30.8	35.5
18	MD03W665-09-1	32.0	36	28.5	29.0	34.5
19	DAS1001	35.0	39	36.0	34.7	39.0
20	DAS1002	34.3	39	34.0	29.3	37.0
21	DAS1003	39.0	42	36.0	31.9	41.5
22	KWS001	33.0	32	30.0	24.9	33.5
23	KWS002	35.3	41	36.5	32.7	32.0
24	KWS003	33.7	37	32.0	32.3	34.0
25	IL06-13721	35.7	35	33.0	30.9	34.0
26	IL06-23571	37.0	43	33.0	33.8	37.0
27	MO081652	36.0	40	31.5	31.9	38.0
28	OH07-263-3	37.3	39	33.0	31.8	39.0
29	OH08-180-48	31.3	34	31.0	31.1	33.5
30	G00120	33.3	36	30.0	32.6	32.0
31	G09534	33.7	34	31.0	28.2	32.0
32	G09528	33.3	37	32.0	32.6	33.5
33	AR02061-1-1	38.3	41	33.0	34.5	37.5
34	AR01163-3-1	37.7	37	32.0	29.3	35.5
35	ARS07-0525	32.3	25	28.5	31.8	33.0
LOCATION MEANS	34.0	36.6	31.2	30.3	34.5	

HEIGHT (inches)

		Richville MI Freed	Columbia MO McKendry	Ithaca NY Sorrells	Nairn ON Etienne	Blacksburg VA Griffey
1	Branson	29.5	37.7	29.5	29.1	36.0
2	Bess	32.0	39.7	29.5	29.4	38.0
3	Shirley	29.8	35.3	25.6	26.9	35.5
4	MO080104	31.5	40.3	29.5	28.6	40.5
5	IL06-14262	32.7	41.3	29.5	31.1	36.5
6	NC08-23090	30.0	38.7	29.5	27.0	33.5
7	NC08-23324	30.5	36.7	27.6	27.8	31.0
8	GA021087-10LE33	28.6	37.3	25.6	28.3	30.0
9	KY03C-1237-32	26.1	35.7	25.6	24.7	35.0
10	KY03C-1002-02	27.3	39.7	27.6	27.0	35.0
11	P04606RA1-6	31.0	43.3	27.6	31.1	39.5
12	P05222A1-7	30.2	40.7	25.6	29.8	36.5
13	P05247A1-1	25.5	35.3	25.6	23.5	30.5
14	VA08MAS-369	28.4	39.7	27.6	27.8	35.0
15	VA09W-73	29.8	39.3	23.6	26.8	34.5
16	VA10W-21	31.3	39.7	27.6	27.4	36.5
17	MD03W64-10-3	32.6	42.3	25.6	28.9	40.5
18	MD03W665-09-1	28.6	39.0	27.6	27.3	37.0
19	DAS1001	31.6	41.0	29.5	33.7	38.5
20	DAS1002	32.0	40.7	27.6	30.7	37.5
21	DAS1003	38.7	42.7	33.5	35.2	37.5
22	KWS001	28.9	38.7	29.5	28.1	32.5
23	KWS002	34.1	41.7	31.5	31.4	40.5
24	KWS003	30.6	40.7	27.6	27.6	36.5
25	IL06-13721	30.4	40.7	27.6	29.3	37.5
26	IL06-23571	32.5	42.3	27.6	31.2	40.0
27	MO081652	32.2	42.7	27.6	29.8	41.5
28	OH07-263-3	35.8	42.0	31.5	31.8	40.5
29	OH08-180-48	28.8	39.7	25.6	28.3	35.5
30	G00120	27.6	37.3	27.6	28.0	35.5
31	G09534	33.0	41.3	25.6	29.9	37.0
32	G09528	31.5	40.3	29.5	29.5	39.0
33	AR02061-1-1	35.6	40.7	31.5	34.1	42.0
34	AR01163-3-1	33.1	42.0	29.5	31.8	38.0
35	ARS07-0525	28.3	41.0	25.6	26.2	34.0
LOCATION MEANS		30.9	39.9	28.0	29.1	36.7

HEIGHT (inches)

		Warsaw VA Griffey	Arlington WI Roth	ENTRY MEANS ALL LOCATIONS	rank
1	Branson	31.5	35.0	32.6	24
2	Bess	33.0	37.3	35.2	9
3	Shirley	29.5	32.3	30.7	33
4	MO080104	31.5	40.3	34.9	13
5	IL06-14262	33.0	37.3	35.1	12
6	NC08-23090	31.0	33.0	31.4	31
7	NC08-23324	30.5	36.3	31.5	30
8	GA021087-10LE33	29.5	34.7	30.8	32
9	KY03C-1237-32	30.0	35.7	30.1	34
10	KY03C-1002-02	33.5	36.3	31.8	28
11	P04606RA1-6	37.0	38.3	36.3	4
12	P05222A1-7	31.5	35.7	34.0	15
13	P05247A1-1	27.0	29.7	28.7	35
14	VA08MAS-369	31.5	31.7	32.4	25
15	VA09W-73	31.0	35.0	32.7	23
16	VA10W-21	31.0	36.0	32.9	21
17	MD03W64-10-3	34.5	37.0	35.1	10
18	MD03W665-09-1	31.0	33.3	32.4	26
19	DAS1001	35.0	37.7	35.7	8
20	DAS1002	32.5	34.3	34.6	14
21	DAS1003	39.0	42.0	38.9	1
22	KWS001	30.0	35.7	32.0	27
23	KWS002	36.0	38.0	36.0	6
24	KWS003	31.5	36.3	33.6	18
25	IL06-13721	33.0	35.3	33.8	17
26	IL06-23571	36.0	38.7	36.0	5
27	MO081652	33.0	41.3	35.7	7
28	OH07-263-3	36.0	43.3	37.1	2
29	OH08-180-48	32.5	36.7	33.0	20
30	G00120	30.0	36.7	32.8	22
31	G09534	30.0	35.7	33.1	19
32	G09528	32.5	34.7	33.9	16
33	AR02061-1-1	35.0	40.3	37.0	3
34	AR01163-3-1	34.5	38.0	35.1	11
35	ARS07-0525	31.0	35.3	31.6	29
LOCATION MEANS		32.4	36.4	33.7	

LODGING

	Griffin GA Johnson %	W Lafayette IN Ohm Straw Score 0-9	Columbia MO McKendry 0-9	Ithaca NY Sorrells 0-9	Nairn ON Etienne 0-9	
1	Branson	0	5	1.0	1.0	0.3
2	Bess	5	5	1.0	1.7	0.7
3	Shirley	5	4	0.7	0.3	0.0
4	MO080104	0	4	0.0	0.0	0.3
5	IL06-14262	80	5	0.3	0.0	1.3
6	NC08-23090	5	4	0.7	0.0	0.0
7	NC08-23324	0	4	2.7	0.0	0.3
8	GA021087-10LE33	0	4	0.0	0.0	0.0
9	KY03C-1237-32	0	3	0.0	0.0	0.0
10	KY03C-1002-02	0	4	0.0	0.0	0.0
11	P04606RA1-6	0	5	0.3	0.7	0.0
12	P05222A1-7	0	4	0.0	0.3	0.0
13	P05247A1-1	0	3	0.0	0.0	0.0
14	VA08MAS-369	0	3	0.0	0.7	0.0
15	VA09W-73	0	4	0.3	0.0	0.0
16	VA10W-21	10	4	0.3	0.3	0.0
17	MD03W64-10-3	0	4	0.3	0.7	0.0
18	MD03W665-09-1	0	4	0.3	0.0	0.0
19	DAS1001	0	5	0.0	0.7	0.3
20	DAS1002	45	5	0.3	1.3	1.3
21	DAS1003	10	5	1.7	3.0	0.0
22	KWS001	10	4	0.0	1.7	0.0
23	KWS002	0	5	0.0	0.3	0.7
24	KWS003	0	4	1.0	0.3	0.3
25	IL06-13721	0	4	0.7	0.0	0.7
26	IL06-23571	0	4	1.0	1.3	1.0
27	MO081652	0	4	0.3	0.3	0.0
28	OH07-263-3	0	4	1.3	3.7	0.0
29	OH08-180-48	0	5	0.0	0.7	0.7
30	G00120	0	4	0.3	0.3	0.7
31	G09534	0	5	1.0	0.7	0.7
32	G09528	0	5	0.7	0.7	0.7
33	AR02061-1-1	0	4	0.3	2.0	0.7
34	AR01163-3-1	5	4	0.3	0.7	0.0
35	ARS07-0525	0	3	0.0	0.0	0.0
LOCATION MEANS	5.0	4.2	0.5	0.7	0.3	

LODGING

		Blacksburg	Warsaw	Arlington
		VA	VA	WI
		Griffey	Griffey	Roth
		0-9	0-9	0-9
1	Branson	0.0	1.0	0.2
2	Bess	2.0	1.5	0.2
3	Shirley	1.0	1.5	0.2
4	MO080104	0.0	0.5	0.2
5	IL06-14262	4.5	1.5	0.2
6	NC08-23090	3.0	1.0	0.2
7	NC08-23324	3.5	1.0	0.2
8	GA021087-10LE33	3.5	1.0	0.2
9	KY03C-1237-32	0.0	1.0	0.2
10	KY03C-1002-02	0.0	0.5	0.2
11	P04606RA1-6	0.0	1.0	0.2
12	P05222A1-7	0.0	1.0	0.2
13	P05247A1-1	0.0	1.0	0.2
14	VA08MAS-369	3.0	1.0	0.2
15	VA09W-73	4.0	1.0	0.2
16	VA10W-21	3.5	1.0	0.2
17	MD03W64-10-3	0.5	1.0	0.2
18	MD03W665-09-1	3.0	1.0	0.2
19	DAS1001	5.0	0.5	0.2
20	DAS1002	6.5	1.5	0.2
21	DAS1003	7.0	1.5	0.2
22	KWS001	0.5	0.5	0.2
23	KWS002	1.5	1.0	0.2
24	KWS003	2.0	2.0	0.2
25	IL06-13721	1.0	1.0	0.2
26	IL06-23571	2.5	1.0	0.2
27	MO081652	1.5	0.5	0.2
28	OH07-263-3	1.0	0.5	0.2
29	OH08-180-48	5.0	1.0	0.2
30	G00120	1.5	1.0	0.2
31	G09534	0.5	2.0	0.2
32	G09528	3.5	2.0	0.2
33	AR02061-1-1	0.0	1.0	0.2
34	AR01163-3-1	5.0	1.0	0.2
35	ARS07-0525	3.5	1.0	0.2
	LOCATION MEANS	2.3	1.1	0.2

WINTER DAMAGE

		Battle Ground	W Lafayette	Columbia	
		IN	IN	MO	
		Obert	Ohm	McKendry	
		Freeze Damage 0-9	Frost Damage %	0-9	survival %
1	Branson	0.3	2	2.4	76
2	Bess	0.0	2	1.8	82
3	Shirley	0.0	2	2.3	77
4	MO080104	0.0	10	2.9	71
5	IL06-14262	0.0	1	4.2	58
6	NC08-23090	2.0	45	1.4	86
7	NC08-23324	0.3	45	0.8	92
8	GA021087-10LE33	0.0	20	2.1	79
9	KY03C-1237-32	0.7	20	2.3	77
10	KY03C-1002-02	0.0	15	1.7	83
11	P04606RA1-6	0.0	2	1.7	83
12	P05222A1-7	0.7	2	3.6	64
13	P05247A1-1	1.0	5	2.5	75
14	VA08MAS-369	0.3	25	1.8	82
15	VA09W-73	0.0	5	2.0	80
16	VA10W-21	0.0	10	1.9	81
17	MD03W64-10-3	0.0	5	1.9	81
18	MD03W665-09-1	0.3	5	2.6	74
19	DAS1001	0.0	1	3.0	70
20	DAS1002	0.0	2	3.1	69
21	DAS1003	0.0	2	2.5	75
22	KWS001	0.0	2	2.8	72
23	KWS002	0.3	2	4.6	54
24	KWS003	0.0	5	3.0	70
25	IL06-13721	2.3	10	2.9	71
26	IL06-23571	0.7	10	2.2	78
27	MO081652	0.7	15	2.2	78
28	OH07-263-3	0.0	10	1.8	82
29	OH08-180-48	0.0	2	4.1	59
30	G00120	0.0	5	2.9	71
31	G09534	0.0	10	2.7	73
32	G09528	0.0	2	2.9	71
33	AR02061-1-1	0.0	5	2.3	77
34	AR01163-3-1	1.0	15	2.8	72
35	ARS07-0525	0.3	20	2.2	78
LOCATION MEANS		0.3	9.7	2.5	74.9
GROWTH STAGE / DATE		April 30	early April		

WINTER DAMAGE

		Nairn ON Etienne	
		0-9	Frost damage 0-9
1	Branson	0.3	1.0
2	Bess	0.3	0.7
3	Shirley	0.3	0.5
4	MO080104	0.4	1.0
5	IL06-14262	0.4	0.7
6	NC08-23090	0.4	0.7
7	NC08-23324	0.4	2.5
8	GA021087-10LE33	0.3	1.3
9	KY03C-1237-32	0.4	0.5
10	KY03C-1002-02	0.3	0.7
11	P04606RA1-6	0.4	0.5
12	P05222A1-7	0.4	0.5
13	P05247A1-1	0.3	0.5
14	VA08MAS-369	0.3	0.7
15	VA09W-73	0.3	0.7
16	VA10W-21	0.3	0.8
17	MD03W64-10-3	0.3	0.8
18	MD03W665-09-1	0.3	0.7
19	DAS1001	0.3	0.5
20	DAS1002	0.3	1.0
21	DAS1003	0.3	0.5
22	KWS001	0.4	0.7
23	KWS002	0.3	0.5
24	KWS003	0.3	0.8
25	IL06-13721	0.3	1.3
26	IL06-23571	0.3	0.5
27	MO081652	0.4	1.0
28	OH07-263-3	0.4	0.5
29	OH08-180-48	0.3	0.8
30	G00120	0.3	0.5
31	G09534	0.3	0.5
32	G09528	0.3	0.5
33	AR02061-1-1	0.3	0.7
34	AR01163-3-1	0.3	0.7
35	ARS07-0525	0.3	1.3
LOCATION MEANS		0.3	0.8
GROWTH STAGE / DATE			

LEAF RUST

		Harrisburg	BattleGround W	Lafayette	Lexington	Richville
		IL	IN	IN	KY	MI
		Murche	Obert	Ohm	Van Sanford	Freed
		0-9	0-9	0-9	0-9	0-9
1	Branson	6	4.5	2		0.8
2	Bess	7	5.0	3	4.0	1.2
3	Shirley	4	0.0	2	0.0	0.1
4	MO080104	8	3.5	5	3.5	0.3
5	IL06-14262	3	6.5	5	3.5	0.7
6	NC08-23090	1	0.0	2	3.0	0.6
7	NC08-23324	1	0.0	2	0.0	0.3
8	GA021087-10LE33	3	0.5	1	2.0	0.3
9	KY03C-1237-32	6	3.5	4	5.0	2.5
10	KY03C-1002-02	5	3.5	4	4.5	0.9
11	P04606RA1-6	1	2.0	1	3.0	1.1
12	P05222A1-7	1	1.5	1	0.0	0.5
13	P05247A1-1	2	2.7	6	2.5	0.0
14	VA08MAS-369	1	2.0	3	0.5	0.1
15	VA09W-73	5	4.0	1	1.0	0.0
16	VA10W-21	5	0.5	2	2.0	2.0
17	MD03W64-10-3	8	0.5	2	2.5	0.9
18	MD03W665-09-1	2	2.0	2	1.0	0.4
19	DAS1001	2	1.0	2	0.5	0.0
20	DAS1002	4	8.5	7	7.0	1.4
21	DAS1003	1	5.0	7	5.5	1.6
22	KWS001	3	3.5	3	1.0	0.5
23	KWS002	2	7.5	4	6.5	1.7
24	KWS003	3	4.5	4	1.0	0.2
25	IL06-13721	7	4.0	5	5.5	0.2
26	IL06-23571	1	2.0	2	1.5	0.0
27	MO081652	6	4.5	3	3.0	0.7
28	OH07-263-3	1	5.5	3	1.5	0.7
29	OH08-180-48	2	0.0	1	0.0	0.0
30	G00120	1	3.0	3	3.0	0.6
31	G09534	4	4.0	3	2.0	0.8
32	G09528	6	4.5	3	2.5	1.0
33	AR02061-1-1	3	4.0	2	1.0	1.0
34	AR01163-3-1	3	3.0	2	2.5	0.8
35	ARS07-0525	2	2.5	2	0.0	0.0
LOCATION MEANS		3.4	3.1	3.0	2.4	0.7
GROWTH STAGE / DATE			May 24			10.5.4

LEAF RUST

		Plymouth	Nairn	Warsaw	ENTRY MEANS ALL LOCATIONS
		NC Murphy 0-9	ON Etienne 0-9	VA Griffey 0-9	
1	Branson	2.5	2.7	8.0	3.8
2	Bess	6.5	4.3	8.0	4.9
3	Shirley	0.0	0.8	1.0	1.0
4	MO080104	3.0	3.0	8.0	4.3
5	IL06-14262	3.5	5.0	5.5	4.1
6	NC08-23090	2.0	2.3	5.0	2.0
7	NC08-23324	0.0	1.8	1.0	0.8
8	GA021087-10LE33	0.5	1.2	1.0	1.2
9	KY03C-1237-32	8.0	6.3	7.0	5.3
10	KY03C-1002-02	8.0	4.0	8.5	4.8
11	P04606RA1-6	5.5	2.0	1.5	2.1
12	P05222A1-7	4.1	1.0	1.0	1.3
13	P05247A1-1	1.5	1.3	0.5	2.1
14	VA08MAS-369	0.0	2.3	3.5	1.6
15	VA09W-73	0.0	3.3	2.5	2.1
16	VA10W-21	3.5	5.0	6.0	3.3
17	MD03W64-10-3	2.5	1.3	4.0	2.7
18	MD03W665-09-1	4.0	2.7	4.0	2.3
19	DAS1001	1.5	3.3	1.5	1.5
20	DAS1002	6.0	5.7	9.0	6.1
21	DAS1003	9.0	4.7	9.0	5.3
22	KWS001	1.0	1.2	4.0	2.1
23	KWS002	6.5	4.0	8.5	5.1
24	KWS003	2.5	4.3	2.5	2.8
25	IL06-13721	4.0	4.0	8.0	4.7
26	IL06-23571	1.5	2.3	1.0	1.4
27	MO081652	4.5	3.0	7.5	4.0
28	OH07-263-3	6.0	3.3	7.5	3.6
29	OH08-180-48	0.5	1.3	3.0	1.0
30	G00120	5.5	4.0	6.0	3.3
31	G09534	4.0	2.7	6.5	3.4
32	G09528	3.0	2.7	7.0	3.7
33	AR02061-1-1	5.0	4.0	2.0	2.8
34	AR01163-3-1	2.0	3.3	2.5	2.4
35	ARS07-0525	1.5	2.3	1.0	1.4
LOCATION MEANS		3.4	3.0	4.6	3.0
GROWTH STAGE / DATE					

**LEAF RUST (seedling)
Kolmer, St. Paul, MN**

		Lr gene postulation	LEAF RUST RACES									
			KFBJ	MLDS	TCTSB	TFBJ	TCRKG	TDBGG	TNRJ	MCDS	TBBGJ	MCTNB
1	Branson	?	3 ⁺	;	3 ⁺	3 ⁺	3 ⁺	3 ⁺	3 ⁺	;	3 ⁺	;
2	Bess	---	3 ⁺	3 ⁺	3 ⁺	3 ⁺	3 ⁺	3 ⁺	3 ⁺	3 ⁺	3 ⁺	3 ⁺
3	Shirley	Lr26	;	0;	;	;	;1 ⁻	;	;	;	;	0;
4	MO080104	Lr10,Lr11	;	;12 ⁻	3 ⁺	;1 ⁻	3 ⁺	;	3 ⁺	;23	;	3 ⁺
5	IL06-14262	Lr1	;	3 ⁺	3 ⁺	3 ⁺	3 ⁺	3 ⁺	3 ⁺	3 ⁺	3 ⁺	3 ⁺
6	NC08-23090	+	;	;	;	;	;	;1	;	;	;	;
7	NC08-23324	Lr9, Lr11	;	;	0;	0;	0;	0;	3 ⁺	;	;	;
8	GA021087-10LE33	Lr18	;	;	;	;1 ⁻	32 ⁺	;	;1 ⁻	;	;	;
9	KY03C-1237-32	Lr11	;	;2 ⁻	3 ⁺	;1 ⁻	3 ⁺	;	3 ⁺	;23	;	3 ⁺
10	KY03C-1002-02	Lr10, Lr11	2 ⁻	;2 ⁻	3 ⁺	;22 ⁻	3 ⁺	;	3 ⁺	;2	;1 ⁺	;
11	PO4606RA1-6	Lr26	22 ⁺	;	22 ⁻	32 ⁺	;12	;	;22 ⁺	;12 ⁻	;	1 ⁺ 2
12	PO5222A1-7	Lr26	;	;	23	;	;1	;	;1 ⁻	;2 ⁻	;	;
13	PO5247A1-1	Lr26	3 ⁺	;	3 ⁺	32 ⁺	;1	;	;	3 ⁺	;	3 ⁺
14	VA08MAS-369	Lr24	3 ⁺	;	0;	3 ⁺	;	3 ⁺	3 ⁺ 2 ⁺	;	;1 ⁻	;
15	VA09W-73	+	;/3 ⁺	;12 ⁻	;2 ⁻	0;	;	;	;12 ⁻	;	;	;
16	VA10W-21	Lr11	;/2	;	3 ⁺	;2 ⁻	3 ⁺	22 ⁺	3 ⁺	;	3	0;
17	MD03W64-10-3	Lr26	2 ⁺	;	3 ⁺ 2 ⁺	;	;12 ⁻	;	32 ⁺	;23	;	2 ⁺ 3
18	MD03W665-09-1	Lr26	3 ⁺	;	3 ⁺	32 ⁺	;1 ⁻	;	32 ⁺	3 ⁺	;	3 ⁺
19	DAS1001	Lr2a	32 ⁺	0;	3 ⁺	3 ⁺ 2 ⁺	3 ⁺	3 ⁺	32 ⁺	;	3 ⁺ 2 ⁺	;
20	DAS1002	Lr2a	3 ⁺	;	3 ⁺	3 ⁺ 2 ⁺	3 ⁺	;2 ⁻	3 ⁺	;	;2 ⁻	;
21	DAS1003	Lr11, Lr26	;2	;	3 ⁺	3 ⁺ 2 ⁺	2 ⁺ 3	;	3 ⁺ 2 ⁺	2	;	3 ⁺ 2 ⁺
22	KWS001	Lr26	2	;	;2 ⁻	;	;12 ⁻	;	;12 ⁻	2	;	;
23	KWS002	?	;	3 ⁺	3 ⁺	;2 ⁻	3 ⁺	;2	3 ⁺	3 ⁺	22 ⁺	3 ⁺
24	KWS003	?	;	2 ⁺	2	;2 ⁻	2 ⁺	;12	;1	3 ⁺	;	2 ⁺ 3
25	IL06-13721	Lr1	;	3 ⁺	3 ⁺	3 ⁺	3 ⁺	3 ⁺	3 ⁺	3 ⁺	3 ⁺	3 ⁺
26	IL06-23571	Lr10, Lr11	;2	0;	3 ⁺	;2 ⁻	3 ⁺	;	2 ⁺ 3	;	;	0;
27	MO081652	Lr11	;1 ⁻	;2	3 ⁺	;2 ⁻	3 ⁺	;	3 ⁺	22 ⁺ 3	;	3 ⁺
28	OH07-263-3	Lr26	3 ⁺	;2	;/3 ⁺	;	3 ⁺	;13 ⁺	;1 ⁻	3 ⁺ 2 ⁺	;	;/3 ⁺
29	OH08-180-48	Lr11, Lr24	;	;	;	;	;	2 ⁻	2 ⁺ 3	;	;	;
30	G00120	Lr9	;	3 ⁺	0;	;2 ⁻	;	;1 ⁻	3 ⁺	;/3 ⁺	;	3 ⁺
31	G09534	Lr10, Lr14a	3 ⁺	3 ⁺	3 ⁺	2 ⁺ 3	3 ⁺	;2 ⁻	2 ⁺	;2	;	;
32	G09528	?	3 ⁺	;	3 ⁺	;12 ⁻	3 ⁺	;1 ⁻	32 ⁺	;2 ⁻	;2 ⁻	0;
33	AR02061-1-1	?	;	;	3 ⁺	;	3 ⁺ 2 ⁺	;	;12	;3	;	3 ⁺
34	AR01163-3-1	---	3 ⁺	22 ⁺	3 ⁺	3 ⁺	3 ⁺	3 ⁺	3 ⁺ 2 ⁺	3 ⁺	3 ⁺	3 ⁺
35	ARS07-0525	Lr26	3 ⁺	;	3 ⁺	2 ⁺ 3	;1 ⁻	;	;1 ⁻	3 ⁺	;	3 ⁺
Races:	Virulences- Lr genes	Key:										
KFBJG	2a,2c,3,24,26,10,14a,28	--- = no Lr genes										
MLDSB	1,3,9,17,B,10,14a,	+ = all low infection types										
MCTNB	1,3,26,3ka,11,17,30,B,14a	= not able to postulate Lr gene										
MCDSB	1,3,26,17,B,10,14a,											
TCTSB	a,2c,3,26,3ka,11,17,30,B,10,14a											
TFBJQ	1,2a,2c,3,24,26,10,14a,21,28											
TCRKG	a,2c,3,26,3ka,11,30,10,14a,18,28											
TDBGG	1,2a,2c,3,24,10,28											
TNRJJ	,2c,3,9,24,3ka,11,30,10,14a,28,39											
TBBGJ	1,2a,2c,3,10,28,39											

STEM RUST (seedling)

Jin, St. Paul, MN

		QCSC	QTHJC	MCCFC	RCRSC	RKQQC	TPMKC	TTTTF	SCCSC	QCCSM	TRTTF	RRTTF	TTKSK	TTKSK	TTKSK	TTKST	TTTSK		2011-12 field nursery, St Paul				
CDL		06ND76C	75ND177C	59KS19	77ND82A	99KS76A-1	74MN1409	01MN84A-1-2	09ID73-2	75WA165-2A	06YEM34-1	10PAK05-1	04KEN156/04	06KEN19V3	04KEN156/0	06KEN19V3	07KEN24-4		Field-X-13	Field-Buckthorn			
11/12 #	Nursery	Line											Rep1	Rep2	REPEAT	REPEAT	REPEAT	Note	6/21/2012	6/25/2012	NOTES		
83	Local ck 1	McNair 701	4	4	4	4	4	4	4	4	4	4	3+	4	4					90S	100S		
84	Local ck 2	Red Chief	2+3-/2-/1-	4	4/1	3-/22+/1	4/2+3	4	4	3	23/13-	4/2-	4	2+3/3	2+	2+	2+	2+		90S	100S		
85	UESR 1	Branson	2	4	2	3	4	4	4	2	2	4	4	3	4	3+	4	3/2-		40MS-S	100S		
86	UESR 2	Bess	3-	3	4	3	3	4	4	4	4	4	3+	3+	4	3+	3+	4		70S	100S		
87	UESR 3	Shirley	0;	0	0;	2-	2-	1-	2-;	;	0/;	2-	2	;	1	3	0;	3	Sr36	5MR	10MR		
88	UESR 4	MO080104	4	4	4	4	4	4	4	4	4	4	3+	4	4					80S	90S		
89	UESR 5	IL06-14262	4	4	;	3	4	4	4	4	4	4	4	2+3	3	2+3	3	3		70S	100S		
90	UESR 6	NC08-23090	2-/0;	2-	2-/4	2-;	2-	2	2-;	2-	2-/2	2	2	;	2-	2-	2-	2-;		20MR	40MR		
91	UESR 7	NC08-23324	2	2	2	2	2	2	2-	2-	2	2	2	;	2-	2-	2-	2-/4		40MR	40MR		
92	UESR 8	GA021087-10	0;	0	0;	31/23	4/1-	4	42	0;	0;	3+	3+	0	0;	0	0	4	Sr36	20MR	5MR		
93	UESR 9	KY03C-1237	4	4	4	4	4	4	4	-	4	4	3+	4	4					80S	100S		
94	UESR 10	KY03C-1002	4	4	4/2-	4/2-	4/2	4	4	4	4/2-	4	4	4	4					90S	100S		
95	UESR 11	P04606RA1-6	2-/0	2	2-/4	2-	2;	2-	0/22+	2-;	2-/4	2-/4	2/4	4	4					5R	20MR		
96	UESR 12	P05222A1-7	;	0;	2/0;	;	0;	1-	0/2-;	-	0;	2	2-	3	4					0	TR		
97	UESR 13	P05247A1-1	0	0	0	0	0	0;	0;	0	0	2-	2-	0	0	0	0	4	Sr36	0	TR		
98	UESR 14	VA08MAS-3	2-	2	2	2	2-/1;	2	2	2	2	2-/4	2-	2-	2	1	2	2-		20R-MR	40MR		
99	UESR 15	VA09W-73	4	4	4	4/2	1C	4	4	4	4	4	4	3+	4					90S	90S		
100	UESR 16	VA10W-21	4	4	4	4	4	4	4	4	4	4	4	3+	4					90S	90S		
101	UESR 17	MD03W64-1	2	2	2	2	2	2	2	2-	2	2-	2-	4	4					20MR	40MR		
102	UESR 18	MD03W665-	0	0	0	2-	2-	2-	2-	0	0	2-/3	2-	0;	0	0	0;	4	Sr36	5MR	5MR	BIN, PBC	
103	UESR 19	DAS1001	4	4	4	4	2C	4	4	4	4	4	4	3+	3					90S	90S		
104	UESR 20	DAS1002	2	4	2	4	4	2	4	2	2	4	4	3+	4					80S	90S		
105	UESR 21	DAS1003	2	2	2	2	-	2	2	2	2	2-	2-	3+	4					30MR	40MR		
106	UESR 22	KWS001	2-	2	2-	2-	2-	1-	2-	2-	2-	2-	;	3+	3+					20R-MR	30MR		
107	UESR 23	KWS002	2	4/2	2/4	4/2	1C/4	2/4	4	2/4	2	4	3	4	3+					80S	90S		
108	UESR 24	KWS003	2+3	2+3	4	4	4	4	4	4	4	4	4	3	4					80S	90S		
109	UESR 25	IL06-13721	4	4	2+3	4	4	4	4	3	4	4	3+	3	4					70S	90S		
110	UESR 26	IL06-23571	2	4	2-	4	3	2	4	2-	2	4	3+	4	4					90S	90S		
111	UESR 27	MO081652	4	4	4	4	4	4	4	4	4/2	4	4	4	4					70S	90S		
112	UESR 28	OH07-263-3	2/4	2	4/2	2-/4	4	4/2	4/2-	4	4/2-	3+	2	4	4					90S	90S		
113	UESR 29	OH08-180-48	2-	2-	2-	2-	2/1	4	2	2-	4	2-	2-	2-	2-	2-	2+3	2-	Sr24	40MR	40MR		
114	UESR 30	G00120	2-	1LIF	11+;	2+3-	4	4	4	;	1LIF	3	3	3+	2	2+3	2	3-	3		40MS	30MS	
115	UESR 31	G09534	0	0/4	0	3	4	4	4	0	0	3	3+	0;	0;	0	0/2	4	Sr36	10MS	20MS	BIN	
116	UESR 32	G09528	4	4	4	4	4	4	4	4	4	4	3	3+	4					100S	100S		
117	UESR 33	AR02061-1-1	2/4	4	2	4	1C	2	4	2	2-	4	4	4	4					80S	100S		
118	UESR 34	AR01163-3-1	5/2	4	4	4	13-C	4	4	4	4	4	4	3+	4					80S	-		
119	UESR 35	ARS07-0525	2	4/0	2	4	1C/4	2	4	2	2	2/4	3+/2	;	1	0	0;	4	Sr36	5MR	-	BIN	

STEM RUST (seedling)

Jin, St. Paul, MN

Notes and explanations for seedling testing:										Notes and explanations for adult testing:																																																						
<p>Races Common US race panel: MCCFC, QFCSC, QTHJC, RCRSC, RKQQC, TPMKC, TTTTF 2 US races with unique virulence: SCCSC (virulent to Sr9e, Sr13), QCCSM (virulent to Sr24) For updated race nomenclature, please refer to: Jin et al. 2008 Plant Dis. 92:923-926.</p>										<p>Races bulked: QFCSC, QTHJC, RCRSC, RKQQC, TPMKC Inoculation was done by injection and spray inoculation Lines were planted in dash-row (1 ft in length) A second replicate was planted in a different field</p>																																																						
<p>Rating: Infection type (IT) 3 or 4 are considered susceptible "/" denotes heterogeneous, the predominant type given first. "LIF" denotes low infection frequency, or fewer number of pustules. "C" stands for excessive chlorosis "N" stands for excessive necrosis</p>										<p>BIN=Black internode, PBC=Pseudo black chaff Either or both may indicate the presence of Sr2</p>																																																						
<p>Gene postulations are tentative and done for genes effective against TTKSK (Ug99) only. No attempt was made to postulate other Sr genes. Users are advised to confirm with available markers. "Sr2 mosaic" was referred to seedling chlorosis, similar to Sr2 expression in seedling under certain environments</p>										<p>Potential planting error.</p>																																																						
<p>Repeated screening was done based on preliminary screening with race TTKSK (rep 1). Lines missing or suspected to be resistant were repeated with 3 races of the TTKS lineage: TTKSK (Ug99), TTKST (Sr24 virulence), and TTTSK (Sr36 virulence). TRTTF (a race with 1A.1R virulence from Yemen, not in the TTKS lineage) and RRTTF (from Pakistan) were also used</p>																																																																
<p>Avirulence/virulence formula of stem rust races used in screening:</p> <table border="1"> <thead> <tr> <th>race</th> <th>Avirulence</th> <th>Virulence</th> </tr> </thead> <tbody> <tr> <td>MCCFC</td> <td>6 8a 9b 9d 9e 11 24 30 31 36 38</td> <td>5 7b 9a 9g 10 17 Tmp McN</td> </tr> <tr> <td>QCCSM</td> <td>6 7b 8a 9b 9e 11 30 31 36 38 Tmp</td> <td>5 9a 9d 9g 10 17 21 24 McN</td> </tr> <tr> <td>QFCSC</td> <td>6 7b 9b 9e 11 24 30 31 36 38 Tmp</td> <td>5 8a 9a 9d 9g 10 17 21 McN</td> </tr> <tr> <td>QTHJC</td> <td>7b 9a 9e 24 30 31 36 Tmp</td> <td>5 6 8a 9b 9d 9g 10 11 17 21 38 McN</td> </tr> <tr> <td>RCRSC</td> <td>6 8a 9e 11 24 30 31 Tmp</td> <td>5 7b 9a 9b 9d 9g 10 17 21 38 McN</td> </tr> <tr> <td>RKQQC</td> <td>9e 10 11 17 24 30 31 38 Tmp</td> <td>5 6 7b 8a 9a 9b 9d 9g 21 McN</td> </tr> <tr> <td>SCCSC</td> <td>6 7b 8a 9b 11 24 30 31 36 38 Tmp</td> <td>5 9a 9d 9e 9g 10 17 21 McN</td> </tr> <tr> <td>TPMKC</td> <td>6 9a 9b 24 30 31 38</td> <td>5 7b 8a 9a 9d 9e 9g 10 11 17 21 36 Tmp McN</td> </tr> <tr> <td>TTTTF</td> <td>24 31</td> <td>5 6 7b 8a 9a 9b 9d 9e 9g 10 11 17 21 30 36 38 McN</td> </tr> <tr> <td>TTKSK</td> <td>24 36 Tmp</td> <td>5 6 7b 8a 9a 9b 9d 9e 9g 10 11 17 21 30 31 38 McN</td> </tr> <tr> <td>TTKST</td> <td>36 Tmp</td> <td>5 6 7b 8a 9a 9b 9d 9e 9g 10 11 17 21 24 30 31 38 McN</td> </tr> <tr> <td>TTTSK</td> <td>24 Tmp</td> <td>5 6 7b 8a 9a 9b 9d 9e 9g 10 11 17 21 30 31 36 38 McN</td> </tr> <tr> <td>TRTTF</td> <td>8a 24 31</td> <td>5 6 7b 9a 9b 9d 9e 9g 10 11 17 21 30 36 38 McN + 1A.1R</td> </tr> <tr> <td>RRTTF</td> <td>8a 9e 24 31</td> <td>5 6 7b 9a 9b 9d 9g 10 11 17 21 30 36 38 McN</td> </tr> </tbody> </table>										race	Avirulence	Virulence	MCCFC	6 8a 9b 9d 9e 11 24 30 31 36 38	5 7b 9a 9g 10 17 Tmp McN	QCCSM	6 7b 8a 9b 9e 11 30 31 36 38 Tmp	5 9a 9d 9g 10 17 21 24 McN	QFCSC	6 7b 9b 9e 11 24 30 31 36 38 Tmp	5 8a 9a 9d 9g 10 17 21 McN	QTHJC	7b 9a 9e 24 30 31 36 Tmp	5 6 8a 9b 9d 9g 10 11 17 21 38 McN	RCRSC	6 8a 9e 11 24 30 31 Tmp	5 7b 9a 9b 9d 9g 10 17 21 38 McN	RKQQC	9e 10 11 17 24 30 31 38 Tmp	5 6 7b 8a 9a 9b 9d 9g 21 McN	SCCSC	6 7b 8a 9b 11 24 30 31 36 38 Tmp	5 9a 9d 9e 9g 10 17 21 McN	TPMKC	6 9a 9b 24 30 31 38	5 7b 8a 9a 9d 9e 9g 10 11 17 21 36 Tmp McN	TTTTF	24 31	5 6 7b 8a 9a 9b 9d 9e 9g 10 11 17 21 30 36 38 McN	TTKSK	24 36 Tmp	5 6 7b 8a 9a 9b 9d 9e 9g 10 11 17 21 30 31 38 McN	TTKST	36 Tmp	5 6 7b 8a 9a 9b 9d 9e 9g 10 11 17 21 24 30 31 38 McN	TTTSK	24 Tmp	5 6 7b 8a 9a 9b 9d 9e 9g 10 11 17 21 30 31 36 38 McN	TRTTF	8a 24 31	5 6 7b 9a 9b 9d 9e 9g 10 11 17 21 30 36 38 McN + 1A.1R	RRTTF	8a 9e 24 31	5 6 7b 9a 9b 9d 9g 10 11 17 21 30 36 38 McN	<p>Questionable score</p>									
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STRIPE RUST

	Griffin GA Johnson 0-9	Brownstown IL Kolb 0-9	Harrisburg IL Murche 0-9	BattleGround W IN Obert 0-9	Lafayette IN Ohm 0-9
1 Branson	2	3.7	1.0	0.0	2
2 Bess	2	5.7	1.0	3.0	4
3 Shirley	9	2.7	1.3	5.0	5
4 MO080104	1	4.0	1.2	0.0	4
5 IL06-14262	2	6.0	2.7	2.0	5
6 NC08-23090	3	7.0	2.9	7.0	6
7 NC08-23324	1	8.0	3.0	7.0	7
8 GA021087-10LE33	0	2.3	1.0	0.0	2
9 KY03C-1237-32	4	3.0	1.0	0.0	2
10 KY03C-1002-02	8	2.7	1.4	0.0	4
11 P04606RA1-6	0	2.3	1.4	5.0	2
12 P05222A1-7	0	1.0	1.4	0.0	1
13 P05247A1-1	0	2.0	1.1	2.0	2
14 VA08MAS-369	0	1.3	0.9	0.0	2
15 VA09W-73	0	2.0	1.0	1.0	1
16 VA10W-21	9	7.7	2.1	5.5	7
17 MD03W64-10-3	8	5.0	0.9	6.0	6
18 MD03W665-09-1	2	2.7	1.1	0.0	1
19 DAS1001	1	1.3	1.1	0.0	2
20 DAS1002	7	6.7	1.0	0.0	7
21 DAS1003	5	5.7	2.0	0.0	7
22 KWS001	5	2.0	1.8	4.5	6
23 KWS002	6	6.3	0.9	0.0	7
24 KWS003	4	4.0	1.3	1.0	1
25 IL06-13721	1	6.3	1.3	0.0	4
26 IL06-23571	1	2.3	1.1	5.0	6
27 MO081652	1	2.7	1.1	0.0	2
28 OH07-263-3	6	5.7	1.7	1.0	7
29 OH08-180-48	4	1.0	1.0	0.0	1
30 G00120	8	5.3	1.0	0.0	2
31 G09534	2	2.0	0.9	0.0	1
32 G09528	2	4.3	0.9	0.0	1
33 AR02061-1-1	1	3.3	1.0	0.0	1
34 AR01163-3-1	0	1.7	1.7	4.0	3
35 ARS07-0525	0	1.7	0.8	3.0	3
LOCATION MEANS	3.0	3.8	1.3	1.8	3.5
GROWTH STAGE / DATE				May 24	

STRIPE RUST

	Winfield	Richville	Knoxville	Oconto	ENTRY MEANS ALL LOCATIONS	
	KS	MI	TN	WI		
	Perry	Freed	West	Murche		
	0-9	0-9	0-9	0-9		
1	Branson	1	0.3	3.3	1.0	1.6
2	Bess	1	0.0	3.6	1.4	2.4
3	Shirley	8	4.5	4.0	7.6	5.2
4	MO080104	1	0.0	3.0	0.9	1.7
5	IL06-14262	9	3.2	2.3	7.4	4.4
6	NC08-23090	9	3.7	5.0	7.4	5.7
7	NC08-23324	9	1.3	4.0	8.5	5.4
8	GA021087-10LE33	1	0.4	4.3	0.9	1.3
9	KY03C-1237-32	1	2.1	4.6	1.1	2.1
10	KY03C-1002-02	8	0.6	4.6	4.3	3.7
11	P04606RA1-6	1	0.5	2.3	1.3	1.8
12	P05222A1-7	1	0.0	2.6	0.9	0.9
13	P05247A1-1	1	0.4	3.3	1.1	1.4
14	VA08MAS-369	1	0.5	2.0	1.0	1.0
15	VA09W-73	7	0.9	2.3	1.2	1.8
16	VA10W-21	9	8.7	5.0	7.5	6.8
17	MD03W64-10-3	8	2.9	3.3	2.9	4.8
18	MD03W665-09-1	1	0.5	3.6	1.0	1.4
19	DAS1001	8	0.2	2.3	1.1	1.9
20	DAS1002	8	1.8	3.6	6.5	4.6
21	DAS1003	8	1.1	3.6	4.2	4.1
22	KWS001	1	1.9	2.6	4.4	3.2
23	KWS002	7	2.8	4.0	1.9	4.0
24	KWS003	1	0.7	3.0	2.0	2.0
25	IL06-13721	9	0.3	3.0	2.7	3.1
26	IL06-23571	9	1.2	3.6	2.6	3.5
27	MO081652	1	0.9	3.0	1.3	1.4
28	OH07-263-3	8	4.6	3.3	4.6	4.7
29	OH08-180-48	1	1.8	3.0	1.0	1.5
30	G00120	7	1.9	3.3	5.1	3.7
31	G09534	1	1.2	2.6	1.5	1.4
32	G09528	1	0.1	4.0	6.9	2.2
33	AR02061-1-1	1	0.5	3.6	1.1	1.4
34	AR01163-3-1	1	0.2	3.3	1.4	1.8
35	ARS07-0525	1	0.0	3.6	0.8	1.5
LOCATION MEANS	4.3	1.5	3.4	3.0	2.8	
GROWTH STAGE / DATE		10.5.4				

STRIPE RUST

TABLE XMC1215F. STRIPE RUST INFECTION TYPE (IT*) AND SEVERITY (%) ON CULTIVARS AND LINES IN THE WINTER EASTERN WHEAT NURSERY (EXP15) (COORDINATED BY HAROLD BOCKELMAN) (UNIFORM EASTERN SOFT RED WINTER WHEAT NURSERY) AT WHITLOW FARM (LOC 04) NEAR PULLMAN, MT VERNON (LOC 05), WALLA WALLA (LOC 06), AND LIND (LOC 07), WA WHEN RECORDED AT THE INDICATED DATES AND STAGES OF PLANT GROWTH, 2012 UNDER NATURAL INFECTION

Entry No.	Cultivar/ Designation	Pedigree	Contributor	1st Year in Nursery	2012 PLOT	LOC 04		LOC 05		LOC 06		LOC 07		Summary**	Overall rating***		
						7/2		5/14		6/11		6/13				6/14	
						Flowering IT %	Stem elong. IT %	Milk IT %	Milk-S. dough IT %	Milk IT %	Milk IT %	Milk IT %					
1	Branson	Pio2737W/891-4584A (Pike/FL302)	Check	03-04	1	8/80	2/20	5/20	5/80	5/5	S	9					
2	Bess	MO11769/Madison (formerly MO9810)	Check	02-03	2	8/90	5/50	8/70	5/40	8/5	S	9					
3	Shirley	VA94-52-25 /Coker 9835//VA96-54-25	Check	05-06	3	8/100	8/50	8/100	5/50	8/2	S	9					
4	MO080104	L910097/MO 92-599	Check	09-10	4	8/90	5/25	5/70	5/40	2/5	S	9					
5	IL06-14262	IL00-8530/IL97-1828	Kolb	10-11	5	8/100	8/60	8/100	5/40	8/2	S	9					
6	NC08-23090	NC97-10076/C9704//P26R61	Murphy	11-12	6	8/90	8/50	8/90	5/80	8/10	S	9					
7	NC08-23324	B960164/NC94-7197//McCormick	Murphy	11-12	7	8/100	8/60	8/100	5/80	8/5	S	9					
8	GA021087-10LE33	P26R61/AGS2010	Johnson	11-12	8	5/20	5/20	5/30	5/20	8/2	MR	3					
9	KY03C-1237-32	P25R18/KY92C-0010-17//KY96C-076	Van Sanford	11-12	9	5/30	8/20	5/70	-	2/10	MS	6					
10	KY03C-1002-02	P25W33/P25W60//P25W33/KY90C-0	Van Sanford	11-12	10	8/90	8/60	8/100	8/90	8/15	S	9					
11	P04606RA1-6	Truman/INW0316	Ohm	11-12	11	8/100	8/50	5/70	5/70	8/15	S	9					
12	P05222A1-7	99840/INW0304//INW0304/INW0316	Ohm	11-12	12	5/10	5/25	5/30	3/20	8/5	MR	4					
13	P05247A1-1	99840*2/03726//99794	Ohm	11-12	13	8/50	5/30	5/50	8/40	8/5	MS	7					
14	VA08MAS-369	McCormick/GA881130LE5	Griffey	11-12	14	5/30	5/25	5/35	5/30	8/5	MR	4					
15	VA09W-73	SS520/VA99W-188(VA91-54-343/Ro	Griffey	11-12	15	5/50	5/25	5/40	5/70	3/5	MS	6					
16	VA10W-21	Z00-5018(U90-1A//ZX90-2C1/P2580)	Griffey	11-12	16	8/100	8/60	8/100	8/70	8/15	S	9					
17	MD03W64-10-3	P26R61/Chesapeake	Costa	11-12	17	8/100	8/60	8/100	5/70	3/5	S	9					
18	MD03W665-09-1	USG3209/Tribute//Chesapeake	Costa	11-12	18	3/20	2/15	2/20	5/40	3/5	MR	4					
19	DAS1001	TW006-007/Emmit(TW044-094)	Etienne	11-12	19	8/90	3/30	5/40	5/40	5/5	S	9					
20	DAS1002	Emmit(TW044-094)/TW005-008	Etienne	11-12	20	8/100	8/50	8/100	8/70	8/5	S	9					
	PS 279	(Susceptible check)			21	8/100	8/50	8/90	8/90	8/15	S	9					
21	DAS1003	TW165-065/P25R23	Etienne	11-12	22	8/100	8/60	8/90	8/40	8/5	S	9					
22	KWS001	Totem/M98-2152	Murche	11-12	23	8/90	8/50	8/90	8/50	2/5	S	9					
23	KWS002	TW044-094/Honey	Murche	11-12	24	8/90	8/50	8/100	8/50	8/2	S	9					
24	KWS003	95-3245/Ernie	Murche	11-12	25	8/100	5/65	5/70	8/70	8/2	S	9					
25	IL06-13721	IL00-8530/IL97-3632	Kolb	11-12	26	8/100	8/70	8/100	8/100	8/5	S	9					
26	IL06-23571	IL96-6472/P25W33//IL94-1653	Kolb	11-12	27	5/40	8/70	8/100	8/100	8/10	S	9					
27	MO081652	P2552/MO980829	McKendry	11-12	28	8/100	5/55	5/70	5/20	5/2	S	9					
28	OH07-263-3	OH748/Bravo	Sneller	11-12	29	-	8/70	8/100	8/30	8/2	S	9					
29	OH08-180-48	Douglas/McCormick	Sneller	11-12	30	8/70	5/60	5/70	8/50	8/2	S	8					

STRIPE RUST

TABLE XMC1215F. STRIPE RUST INFECTION TYPE (IT*) AND SEVERITY (%) ON CULTIVARS AND LINES IN THE WINTER EASTERN WHEAT NURSERY (EXP15) (COORDINATED BY HAROLD BOCKELMAN) (UNIFORM EASTERN SOFT RED WINTER WHEAT NURSERY) AT WHITLOW FARM (LOC 04) NEAR PULLMAN, MT VERNON (LOC 05), WALLA WALLA (LOC 06), AND LIND (LOC 07), WA WHEN RECORDED AT THE INDICATED DATES AND STAGES OF PLANT GROWTH, 2012 UNDER NATURAL INFECTION

30	G00120	B980582//T814/L900819	Obert	11-12	31	8 90	8 60	8 100	8 50	8 2	S	9
31	G09534	ABI89-4584/T814//T814/L900819	Obert	11-12	32	5 20	8 50	5 70	8 70	5 5	S	8
32	G09528	T814/Boone	Obert	11-12	33	8 90	5 40	5 40	5 40	8 2	S	9
33	AR02061-1-1	AR910-9-1/Pat	Mason	11-12	34	5 20	2 30	5 35	8 50	8 2	MS	7
34	AR01163-3-1	USG3709/AR800-1-3-1	Mason	11-12	35	8 60	5 40	5 70	5 40	2 5	MS	7
35	ARS07-0525	GA951395-10-7/TX99D4031	Marshall	11-12	36	8 40	3 30	3 20	5 30	8 5	MS	6
	PS 279	(Susceptible check)			37	8 100	8 50	8 90	8 90	8 15	S	9
	PS 279	(Susceptible check)			38	8 100	8 60	8 90	8 90	8 15	S	9
	PS 279	(Susceptible check)			39	8 100	8 60	8 90	8 90	8 15	S	9
	BARLEY FILL	END OF NURSERY			40	- -	- -	- -	- -	- -	-	-

* Infection Type (IT) was recorded based on the 0-9 scale with ITs 8 and 9 combined as 8 (the most susceptible reaction) in field data. Generally IT 0-3 are considered resistant, 4-6 intermediate, and 7-9 susceptible. Heterogenous reactions of an entry were indicated by two or more ITs separated by "," for most plants with the first IT and few plants with the second IT or connected with "-" for entries containing plants with continuous ITs. Entries with a high IT in the first note, but a low IT in the second note at LOC 05 may indicate that they have high-temperature, adult-plant (HTAP) resistance.

** R = resistant, MR = moderately resistant, MS = moderately susceptible, and S = susceptible.

*** 1 = most resistant and 9 most susceptible.

Note: 1) The summary and ratings are based on the highest IT and % severity to discourage use of race-specific resistance.

STRIPE RUST

TABLE XMC1215GH. STRIPE RUST INFECTION TYPE (IT) ON SEEDLINGS AND ADULT-PLANTS OF CULTIVARS AND LINES IN THE WINTER EASTERN WHEAT NURSERY (EXP15) COORDINATED BY HAROLD BOCKLMAN (UNIFORM EASTERN SOFT RED WINTER WHEAT NURSERY) TESTED WITH SELECTED *Puccinia striiformis* f. sp. *tritici* (PST) RACES UNDER CONTROLLED GREENHOUSE CONDITIONS AT LOW TEMPERATURES (DIURNAL TEMPERATURES GRADUALLY CHANGING FROM 4 TO 20°C FOR THE SEEDLING TESTS AND AT HIGH TEMPERATURES (DIURNAL TEMPERATURES GRADUALLY CHANGING FROM 10 TO 30°C) FOR THE ADULT-PLANT TESTS (Seed of all entries were not treated with fungicides)

Entry No.	Cultivar/ Designation	Pedigree	Contributor	1st Year in Nursery	2012 PLOT	Infection type produced by PST races ^a									Possible HTAP ^c resistance
						Seedling Test ^b (4 - 20°C)					Adult-plant Test ^b (10 - 30°C)				
						PST-37	PST-45	PST-100	PST-114	PST-127	PST-100	PST-114	PST-127		
1	Branson	Pio2737W/891-4584A (Pike/FL302	Check	03-04	1	5	8	8	8	8	2,2,2	2,2,2	2,3,3	High	
2	Bess	MO11769/Madison (formerly MO98	Check	02-03	2	8	8	8	8	8	2,2,2	2,2,2	2,2,2	High	
3	Shirley	VA94-52-25 /Coker 9835//VA96-54	Check	05-06	3	2	2	8	8	8	8,8,8	8,8,8	8,8,8	No	
4	MO080104	L910097/MO 92-599	Check	09-10	4	8	8	8	8	8	2,2,2	3,3,3	3,3,3	Moderate	
5	IL06-14262	IL00-8530/IL97-1828	Kolb	10-11	5	2,8	8	8	8	8	2,2,2	7,7,7	8,8,8	Specific	
6	NC08-23090	NC97-10076/C9704//P26R61	Murphy	11-12	6	8	8	8	8	8	8,8,8	8,8,8	8,8,8	No	
7	NC08-23324	B960164/NC94-7197//McCormick	Murphy	11-12	7	8	8	8	8	8	3,3,3	2,2,2	7,7,7	Specific	
8	GA021087-10LE33	P26R61/AGS2010	Johnson	11-12	8	8	8	8	8	8	2,2,2	2,2,2	2,3,5	High	
9	KY03C-1237-32	P25R18/KY92C-0010-17//KY96C-0	Van Sanford	11-12	9	8	8	8	8	8	2,2,2	3,3,3	3,3,3	Moderate	
10	KY03C-1002-02	P25W33/P25W60//P25W33/KY900	Van Sanford	11-12	10	8	8	8	8	8	5,5,5	5,5,5	5,5,5	Low	
11	P04606RA1-6	Truman/INW0316	Ohm	11-12	11	8	8	8	8	8	2,3,3	3,3,3	3,3,3	Moderate	
12	P05222A1-7	99840/INW0304//INW0304/INW03	Ohm	11-12	12	8	2	8	8	8	2,2,2	2,2,2	3,3,3	Moderate	
13	P05247A1-1	99840*2/03726//99794	Ohm	11-12	13	2	2	8	8	8	2,2,2	8,8,8	8,8,8	Specific	
14	VA08MAS-369	McCormick/GA881130LE5	Griffey	11-12	14	5	8	8	8	8	3,3,3	8,8,8	5,5,5	Specific	
15	VA09W-73	SS520/VA99W-188(VA91-54-343//	Griffey	11-12	15	5	8	8	8	8	8,8,8	2,2,3	8,8,8	Specific	
16	VA10W-21	Z00-5018(U90-1A//ZX90-2C1/P25	Griffey	11-12	16	8	8	8	8	8	8,8,8	8,8,8	8,8,8	No	
17	MD03W64-10-3	P26R61/Chesapeake	Costa	11-12	17	2	2	8	8	8	3,3,3	3,3,3	4,4,4	Moderate	
18	MD03W665-09-1	USG3209/Tribute//Chesapeake	Costa	11-12	18	2	2	8	8	8	3,3,3	2,2,2	2,2,2	High	
19	DAS1001	TW006-007/Emmit(TW044-094)	Etienne	11-12	19	8	8	8	8	8	3,3,3	5,5,5	5,5,5	Low	
20	DAS1002	Emmit(TW044-094)/TW005-008	Etienne	11-12	20	8	8	8	8	8	3,3,3	8,8,8	5,5,5	Specific	
	PS 279	(Susceptible check)			21	8	8	8	8	8	8,8,8	8,8,8	8,8,8	No	
21	DAS1003	TW165-065/P25R23	Etienne	11-12	22	8	2	8	8	8	2,3,3	3,3,3	3,3,3	Moderate	
22	KWS001	Totem/M98-2152	Murche	11-12	23	2	2	8	8	8	3,3,3	2,2,2	8,8,8	Specific	
23	KWS002	TW044-094/Honey	Murche	11-12	24	8	9	8	8	8	5,5,5	8,8,8	5,5,5	Specific	
24	KWS003	95-3245/Ernie	Murche	11-12	25	8	8	8	8	8	8,8,8	8,8,8	8,8,8	No	
25	IL06-13721	IL00-8530/IL97-3632	Kolb	11-12	26	8	8	8	8	8	5,5,5	3,3,3	5,5,5	Low	
26	IL06-23571	IL96-6472/P25W33//IL94-1653	Kolb	11-12	27	5	8	8	8	8	5,5,5	3,3,3	5,5,5	Low	
27	MO081652	P2552/MO980829	McKendry	11-12	28	8	8	8	8	8	3,3,3	2,2,2	2,2,2	High	

STRIPE RUST

TABLE XMC1215GH. STRIPE RUST INFECTION TYPE (IT) ON SEEDLINGS AND ADULT-PLANTS OF CULTIVARS AND LINES IN THE WINTER EASTERN WHEAT NURSERY (EXP15) COORDINATED BY HAROLD BOCKLMAN (UNIFORM EASTERN SOFT RED WINTER WHEAT NURSERY) TESTED WITH SELECTED *Puccinia striiformis* f. sp. *tritici* (PST) RACES UNDER CONTROLLED GREENHOUSE CONDITIONS AT LOW TEMPERATURES (DIURNAL TEMPERATURES GRADUALLY CHANGING FROM 4 TO 20°C FOR THE SEEDLING TESTS AND AT HIGH TEMPERATURES (DIURNAL TEMPERATURES GRADUALLY CHANGING FROM 10 TO 30°C) FOR THE ADULT-PLANT TESTS (Seed of all entries were not treated with fungicides)

28	OH07-263-3	OH748/Bravo	Sneller	11-12	29	2,8	8	8	8	8	8,8,8	8,8,8	8,8,8	No
29	OH08-180-48	Douglas/McCormick	Sneller	11-12	30	8	8	8	8	8	5,5,5	3,3,3	3,3,3	Moderate
30	G00120	B980582//T814/L900819	Obert	11-12	31	8	8	8	8	8	3,3,3	2,2,2	5,5,5	Moderate
31	G09534	ABI89-4584/T814//T814/L900819	Obert	11-12	32	2,5	8	8	8	8	2,2,2	2,2,2	2,2,2	High
32	G09528	T814/Boone	Obert	11-12	33	8	8	8	8	8	2,2,2	2,2,2	2,2,2	High
33	AR02061-1-1	AR910-9-1/Pat	Mason	11-12	34	8	8	8	8	8	2,2,2	7,7,7	2,2,2	Specific
34	AR01163-3-1	USG3709/AR800-1-3-1	Mason	11-12	35	2,8	8	8	8	8	3,3,3	3,3,3	5,5,5	Moderate
35	ARS07-0525	GA951395-10-7/TX99D4031	Marshall	11-12	36	2	2	8	8	8	3,3,3	2,2,2	3,3,3	Moderate
	PS 279	(Susceptible check)			37	8	8	8	8	8	8,8,8	8,8,8	8,8,8	No

^a Infection Type (IT) was recorded based on the 0-9 scale with ITs 8 and 9 combined as 8 (the most susceptible reaction) in field data. Generally IT 0-3 are considered resistant, 4-6 intermediate, and 7-9 susceptible. Heterogenous reactions of an entry were indicated by two or more ITs separated by "," for most plants with the first IT and few plants with the second IT and the number of plants for each IT is indicated in "()". For adult-plant tests, if the flag leaf has a IT different from the leaf below, the ITs are separated by"/" with the flag leaf IT first.

^b The seedling tests were conducted in October to December 2011 for each race without replications. For adult-plant tests, seeds were planted in late November and seedlings of about 3-5 cm were vernalized at 2-4 °C for 6 to 9 weeks and then transplanted into big pots and grown in the greenhouse (10 to 25 °C diurnal temperature cycle, 16h light) from January to March. Plants at boot to flowering stages were inoculated (Jan to March 2012) with a mixture of urediniospores of a particular race with talc powdery at about 1:20 ratio, incubated for 20 to 24 h in a dew chamber (dark, 10 °C) and then grown in a greenhouse growth chamber at the 10-30°C diurnal temperature cycle with 16 h light. IT was recorded for each plant 18 to 20 days after inoculation. The three reps for each race test were done in different time periods.

^c Entries with a high IT in the seedling low-temperature test but with a low IT in the adult-plant tests under high temperatures have possibly high-temperature adult-plant (HTAP) resistance.

SEPTORIA

	Stuttgart	Logan Co.	Richville	Nairn	ENTRY MEANS	
	AR	KY	MI	ON	ALL LOCATIONS	
	Mason	Van Sanford	Freed	Etienne		
	tritici	tritici	tritici	tritici		
	0-9	0-9	0-9	0-9		
1	Branson	4.0	2.3	2.7	3.0	
2	Bess	5.5	3.8	2.0	3.7	
3	Shirley	2.5	1.4	2.7	2.2	
4	MO080104	5.0	3.8	2.7	4.0	
5	IL06-14262	3.0	0.6	3.0	2.0	
6	NC08-23090	5.0	1.3	2.7	3.7	
7	NC08-23324	3.0	5.9	2.7	4.2	
8	GA021087-10LE33	4.5	2.5	2.3	3.7	
9	KY03C-1237-32	5.0	3.7	3.0	4.1	
10	KY03C-1002-02	4.0	4.7	3.0	3.8	
11	P04606RA1-6	4.5	2.4	2.3	2.9	
12	P05222A1-7	2.5	0.0	1.7	1.5	
13	P05247A1-1	3.5	3.6	3.0	3.4	
14	VA08MAS-369	3.0	0.0	2.3	2.2	
15	VA09W-73	3.0	0.9	3.0	2.4	
16	VA10W-21	3.5	0.8	3.3	3.0	
17	MD03W64-10-3	4.5	1.9	1.3	3.0	
18	MD03W665-09-1	4.5	5.9	2.0	4.1	
19	DAS1001	1.5	0.5	3.7	2.1	
20	DAS1002	4.0	5.4	2.7	3.6	
21	DAS1003	2.5	1.7	3.0	2.1	
22	KWS001	4.0	2.5	2.2	2.5	
23	KWS002	4.5	2.1	3.3	2.8	
24	KWS003	3.5	0.8	3.7	2.9	
25	IL06-13721	5.0	5.4	3.7	4.0	
26	IL06-23571	2.0	1.0	3.0	2.6	
27	MO081652	5.5	6.3	3.3	4.9	
28	OH07-263-3	3.5	0.7	2.7	2.6	
29	OH08-180-48	2.5	0.7	3.3	2.4	
30	G00120	3.5	4.7	2.0	3.2	
31	G09534	3.5	0.7	2.7	2.4	
32	G09528	4.5	3.8	3.3	3.6	
33	AR02061-1-1	5.0	2.5	3.3	3.8	
34	AR01163-3-1	5.5	2.5	3.3	3.7	
35	ARS07-0525	4.5	6.2	3.3	4.3	
LOCATION MEANS		3.3	3.9	2.7	2.8	3.1
GROWTH STAGE / DATE		April 2				

2011-12 Eastern Septoria Nursery

Early, rated 4/24/12: FL, GA, LA, SC, NC, TN, AR

Late, rated 5/1/12: NY, IL, IN, OH, KY, MO, VA, MD

Entry #	Entry	Early/ Late	Kinston (means of 2 reps)		Lake Wheeler (means of 2 reps)		Mean 2 locations		Notes
			Leaves	Glumes	Leaves	Glumes	Leaves	Glumes	
1	Branson - S check (lvs/gls)	L	6.5	4.0	4.5	3.5	5.5	3.8	
2	Bess	E	4.5	2.0	4.0	2.5	4.3	2.3	
3	Shirley - MR check (lvs)	L	5.0	2.5	4.5	3.5	4.8	3.0	
4	MO080104	L	5.5	4.5	5.0	4.0	5.3	4.3	
5	IL06-14262	L	3.5	0.5	3.0	1.5	3.3	1.0	PM
6	NC08-23090	E	7.0	3.5	6.0	5.0	6.5	4.3	
7	NC08-23324	E	5.0	3.0	4.5	1.0	4.8	2.0	
8	GA021087-10LE33	E	2.5	0.0	4.0	2.0	3.3	1.0	
9	KY03C-1237-32	L	7.5	5.5	6.5	3.5	7.0	4.5	dried up
10	KY03C-1002-02	L	7.0	4.5	6.5	2.5	6.8	3.5	dried up, LR
11	P04606RA1-6	L	6.0	2.5	3.5	1.5	4.8	2.0	
12	P05222A1-7	L	4.0	2.0	3.0	1.0	3.5	1.5	v late
13	P05247A1-1	L	7.0	7.0	6.5	5.5	6.8	6.3	
14	VA08MAS-369	L	7.0	6.0	6.5	4.5	6.8	5.3	
15	VA09W-73	L	5.5	2.0	5.0	2.5	5.3	2.3	
16	VA10W-21	L	3.5	1.5	4.0	2.0	3.8	1.8	
17	MD03W64-10-3	L	4.5	2.0	3.5	2.0	4.0	2.0	
18	MD03W665-09-1	L	6.0	4.0	5.0	4.5	5.5	4.3	
19	DAS1001	L	3.5	0.0	3.0	0.0	3.3	0.0	v late
20	DAS1002	L	3.0	0.5	3.0	0.5	3.0	0.5	LR!
21	DAS1003	L	3.0	0.0	3.5	0.0	3.3	0.0	LR!
22	KWS001	L	4.0	1.0	5.0	3.0	4.5	2.0	
23	KWS002	L	4.0	0.5	3.0	0.5	3.5	0.5	mixed ?
24	KWS003	L	3.0	0.5	4.0	2.5	3.5	1.5	
25	IL06-13721	L	6.0	3.0	5.5	4.0	5.8	3.5	
26	IL06-23571	L	5.0	4.5	5.0	4.0	5.0	4.3	
27	MO081652	L	5.5	5.0	4.0	3.5	4.8	4.3	
28	OH07-263-3	L	4.0	2.5	5.0	2.5	4.5	2.5	
29	OH08-180-48	L	5.0	1.0	4.5	2.5	4.8	1.8	
30	G00120	L	6.5	3.0	4.5	1.5	5.5	2.3	
31	G09534	L	6.0	2.5	6.0	4.0	6.0	3.3	
32	G09528	L	4.5	1.5	5.0	2.5	4.8	2.0	LR
33	AR02061-1-1	E	6.0	1.5	4.0	1.5	5.0	1.5	
34	AR01163-3-1	E	5.5	3.0	6.0	3.5	5.8	3.3	
35	ARS07-0525	L	3.5	1.0	4.5	3.5	4.0	2.3	
	Neuse - MR check (lvs, gls)	E	3.0	1.0	3.0	0.0	3.0	0.5	
	Malabar - MR check (lvs)	L	3.0	0.0	3.0	0.5	3.0	0.3	
	AGS 2060 - MR check (lvs, gls)	E	3.0	1.0	4.0	0.5	3.5	0.8	
	Jensen - MR check (lvs)	L	3.0	0.0	4.0	0.5	3.5	0.3	v late, LR
	Kaskaskia - MR check (gls)	L	5.0	1.0	4.5	1.0	4.8	1.0	
	USG 3209 - S check (gls)	E	6.0	4.5	5.0	4.0	5.5	4.3	
	AGS 2000 - S check (lvs)	E	7.0	2.5	6.0	2.5	6.5	2.5	
	Pembroke - S check (lvs)	L	7.0	6.5	7.0	5.0	7.0	5.8	

FUSARIUM HEAD BLIGHT (SCAB)

		E Lansing MI		
		incidence	Freed severity	index
		%	%	
1	Branson	13.9	35.6	3.6
2	Bess	5.4	69.7	5.0
3	Shirley	16.1	49.5	9.0
4	MO080104	0.0	31.2	0.0
5	IL06-14262	21.8	22.0	10.6
6	NC08-23090	20.0	13.8	7.7
7	NC08-23324	49.9	35.2	20.0
8	GA021087-10LE33	0.0	66.2	0.0
9	KY03C-1237-32	8.0	0.0	3.0
10	KY03C-1002-02	22.9	37.3	7.4
11	P04606RA1-6	0.0	15.0	1.5
12	P05222A1-7	33.7	25.5	17.2
13	P05247A1-1	32.9	28.8	16.2
14	VA08MAS-369	8.0	54.9	6.5
15	VA09W-73	30.7	38.7	12.9
16	VA10W-21	0.0	3.8	0.0
17	MD03W64-10-3	29.0	68.5	17.8
18	MD03W665-09-1	44.3	104.5	28.3
19	DAS1001	25.5	49.1	10.8
20	DAS1002	18.0	68.7	6.0
21	DAS1003	0.4	0.0	0.0
22	KWS001	19.8	50.6	13.0
23	KWS002	8.8	45.6	2.2
24	KWS003	0.0	39.2	1.1
25	IL06-13721	0.0	0.0	0.0
26	IL06-23571	0.0	2.5	0.0
27	MO081652	8.3	16.5	3.3
28	OH07-263-3	9.6	32.7	5.8
29	OH08-180-48	19.5	9.6	3.8
30	G00120	0.0	18.5	0.5
31	G09534	3.5	32.1	1.9
32	G09528	16.1	27.1	4.7
33	AR02061-1-1	9.2	36.0	1.1
34	AR01163-3-1	15.9	69.1	10.1
35	ARS07-0525	16.8	77.5	9.4
LOCATION MEANS		14.5	36.4	6.9

FUSARIUM HEAD BLIGHT (SCAB)

		Columbia MO McKendry			Nairn ON Etienne	Oconto WI Murche	
		spread	incidence %	severity %	FHBI %	inc x sev %	0-9
1	Branson	4.8	85	33.0	28.1	18.8	2.3
2	Bess	2.7	90	16.0	14.4	13.5	3.0
3	Shirley	4.9	100	33.2	33.2	16.3	3.8
4	MO080104	2.1	90	11.4	10.3	12.0	3.4
5	IL06-14262	1.1	60	6.4	3.8	8.5	3.4
6	NC08-23090	4.0	95	26.9	25.6	19.4	2.9
7	NC08-23324	2.7	90	18.1	16.3	13.5	7.2
8	GA021087-10LE33	6.2	100	38.3	38.3	14.9	5.1
9	KY03C-1237-32	1.4	75	9.3	7.0	13.5	2.5
10	KY03C-1002-02	4.5	98	28.8	28.2	15.1	3.4
11	P04606RA1-6	4.1	75	21.2	15.9	7.3	4.5
12	P05222A1-7	2.2	90	11.5	10.4	9.9	5.2
13	P05247A1-1	3.1	95	19.9	18.9	7.8	7.7
14	VA08MAS-369	3.6	95	21.0	20.0	18.0	4.1
15	VA09W-73	3.6	59	20.7	12.2	8.0	4.3
16	VA10W-21	2.8	98	17.0	16.7	7.8	6.6
17	MD03W64-10-3	3.9	95	25.9	24.6	14.0	4.6
18	MD03W665-09-1	3.9	79	23.4	18.5	14.9	5.1
19	DAS1001	4.7	85	24.9	21.2	3.0	3.2
20	DAS1002	3.3	75	21.1	15.8	12.5	1.4
21	DAS1003	2.3	75	12.3	9.2	9.0	1.4
22	KWS001	2.5	90	14.1	12.7	14.3	3.0
23	KWS002	1.6	55	8.7	4.8	24.8	4.0
24	KWS003	2.1	69	11.0	7.6	12.8	1.9
25	IL06-13721	1.3	70	8.3	5.8	14.5	1.8
26	IL06-23571	2.0	75	12.7	9.5	13.9	1.3
27	MO081652	1.4	75	7.4	5.6	10.9	3.3
28	OH07-263-3	2.5	70	14.6	10.2	16.8	5.6
29	OH08-180-48	2.1	95	13.0	12.4	13.5	4.0
30	G00120	2.6	85	16.9	14.4	13.4	3.8
31	G09534	2.0	85	12.7	10.8	10.1	1.7
32	G09528	3.2	95	19.9	18.9	5.5	1.7
33	AR02061-1-1	3.3	95	22.4	21.3	11.9	1.2
34	AR01163-3-1	4.1	85	20.3	17.3	26.0	3.1
35	ARS07-0525	4.0	90	22.4	20.2	24.0	3.1
LOCATION MEANS		3.0	83.9	18.4	16.0	13.4	3.6

POWDERY MILDEW

	Richville MI Freed 0-9	Raleigh NC Murphy 0-9	Blacksburg VA Griffey 0-9	Warsaw VA Griffey 0-9	ENTRY MEANS ALL LOCATIONS	
1	Branson	0.0	4.0	0.0	0.0	1.0
2	Bess	1.9	5.0	2.5	0.0	2.4
3	Shirley	0.0	0.0	0.0	0.0	0.0
4	MO080104	0.1	3.0	0.5	0.0	0.9
5	IL06-14262	0.0	4.0	4.0	5.0	3.3
6	NC08-23090	0.0	6.0	1.5	0.0	1.9
7	NC08-23324	0.0	5.0	2.0	2.5	2.4
8	GA021087-10LE33	0.1	3.0	0.0	2.0	1.3
9	KY03C-1237-32	0.0	1.0	1.0	0.5	0.6
10	KY03C-1002-02	0.2	5.0	2.0	0.0	1.8
11	P04606RA1-6	0.4	2.0	2.5	3.0	2.0
12	P05222A1-7	0.1	4.0	0.5	0.0	1.2
13	P05247A1-1	0.0	6.0	3.5	8.5	4.5
14	VA08MAS-369	0.1	3.0	1.0	0.0	1.0
15	VA09W-73	0.0	3.0	0.0	1.0	1.0
16	VA10W-21	0.0	6.0	0.5	2.0	2.1
17	MD03W64-10-3	0.0	2.0	0.5	1.0	0.9
18	MD03W665-09-1	0.2	1.0	0.0	0.0	0.3
19	DAS1001	0.1	6.0	2.5	0.5	2.3
20	DAS1002	0.1	4.0	0.0	0.0	1.0
21	DAS1003	0.0	1.0	2.0	0.0	0.8
22	KWS001	0.0	2.0	1.0	8.0	2.8
23	KWS002	0.1	3.0	2.0	0.0	1.3
24	KWS003	0.0	3.0	0.0	0.0	0.8
25	IL06-13721	0.0	5.0	2.5	0.0	1.9
26	IL06-23571	7.0	4.0	4.5	8.0	5.9
27	MO081652	0.0	4.0	1.5	0.0	1.4
28	OH07-263-3	0.0	5.0	2.5	0.0	1.9
29	OH08-180-48	0.0	5.0	3.5	5.0	3.4
30	G00120	0.1	4.0	1.5	0.0	1.4
31	G09534	0.0	2.0	0.0	0.0	0.5
32	G09528	0.2	1.0	0.0	0.0	0.3
33	AR02061-1-1	0.0	5.0	1.5	3.0	2.4
34	AR01163-3-1	0.0	5.0	0.5	0.0	1.4
35	ARS07-0525	0.0	7.0	1.0	0.0	2.0
LOCATION MEANS		0.3	3.7	1.4	1.4	1.7
GROWTH STAGE / DATE		10.5.4				

PM3 MARKERS

Raleigh

NC

Cowger

Pm3 allele-specific markers

		3a	3b	3c	3d	3e	3f	3g
1	Branson	-	-	-	-	-	-	-
2	Bess	-	-	-	-	-	-	-
3	Shirley							
4	MO080104	-	-	-	-	-	-	-
5	IL06-14262	-	-	-	-	-	-	-
6	NC08-23090	-	-	-	-	-	-	-
7	NC08-23324	-	-	-	-	-	-	-
8	GA021087-10LE33	+	-	-	-	-	-	-
9	KY03C-1237-32	-	+	-	-	-	-	-
10	KY03C-1002-02	-	-	-	-	-	-	-
11	P04606RA1-6	+	-	-	-	-	-	-
12	P05222A1-7	-	-	-	-	-	-	-
13	P05247A1-1	-	-	-	-	-	-	-
14	VA08MAS-369	-	-	-	-	-	-	-
15	VA09W-73	+	-	-	-	-	-	-
16	VA10W-21	+	-	-	-	-	-	-
17	MD03W64-10-3	+	-	-	-	-	-	-
18	MD03W665-09-1	+	-	-	-	-	-	-
19	DAS1001	-	-	-	-	+	-	-
20	DAS1002	-	-	-	-	+	-	-
21	DAS1003	-	-	-	-	+	-	-
22	KWS001	+	-	-	-	-	-	-
23	KWS002	-	-	-	-	-	-	-
24	KWS003	-	-	-	-	-	-	-
25	IL06-13721	-	-	-	-	-	-	-
26	IL06-23571	-	-	-	-	+	-	-
27	MO081652	-	-	-	-	-	-	-
28	OH07-263-3	+	-	-	-	-	-	-
29	OH08-180-48	+	-	-	-	-	-	-
30	G00120	-	-	-	-	-	-	-
31	G09534	-	-	-	-	-	-	-
32	G09528	-	-	-	-	-	-	-
33	AR02061-1-1	-	-	-	-	-	+	-
34	AR01163-3-1	+	-	-	-	-	-	-
35	ARS07-0525	-	-	-	-	-	-	-

VIRUSES

		Urbana		Urbana	Harrisburg	BattleGround
		IL		IL	IL	IN
		Kolb		Kolb	Murche	Obert
		BYDV		SBMV	BYDV	BYDV
		0-9	stunting %	0-9	0-9	0-9
1	Branson	3.5	0		1.6	3.0
2	Bess	4.0	0		3.4	2.3
3	Shirley	5.5	6		3.3	0.3
4	MO080104	4.0	4		2.1	2.7
5	IL06-14262	5.0	4		1.0	0.3
6	NC08-23090	5.0	7		5.2	1.3
7	NC08-23324	4.0	4		2.5	2.0
8	GA021087-10LE33	5.5	4	6.5	4.7	3.7
9	KY03C-1237-32	5.0	6		1.8	2.7
10	KY03C-1002-02	4.5	8		3.6	2.3
11	P04606RA1-6	4.5	10		1.0	0.7
12	P05222A1-7	4.5	7	8.0	1.7	0.7
13	P05247A1-1	6.0	22		2.0	0.0
14	VA08MAS-369	3.0	3		2.9	3.0
15	VA09W-73	3.0	0	8.0	1.7	1.3
16	VA10W-21	5.0	7		2.0	0.7
17	MD03W64-10-3	5.0	7		5.2	3.7
18	MD03W665-09-1	3.5	3		5.0	3.7
19	DAS1001	2.0	13		1.4	0.3
20	DAS1002	4.5	7		2.1	2.0
21	DAS1003	5.0	3	8.0	1.2	2.7
22	KWS001	4.5	6	8.0	1.6	3.7
23	KWS002	5.0	0		3.0	3.3
24	KWS003	3.5	2	7.0	2.9	2.0
25	IL06-13721	6.0	5		3.5	0.7
26	IL06-23571	5.0	3		1.7	1.0
27	MO081652	3.5	0		2.4	1.0
28	OH07-263-3	3.5	0		1.5	2.0
29	OH08-180-48	4.5	5		5.6	2.3
30	G00120	4.0	0	6.0	2.6	1.3
31	G09534	3.5	4		2.5	3.3
32	G09528	5.0	4		2.8	3.7
33	AR02061-1-1	3.5	4		2.2	2.3
34	AR01163-3-1	4.0	7		3.5	2.7
35	ARS07-0525	4.5	2		2.6	1.7
LOCATION MEANS		4.3	4.7		2.7	2.0
GROWTH STAGE / DATE						April 30

VIRUSES

	Winfield	Lexington	Logan Co.	Columbia	Nairn	
	KS	KY	KY	MO	ON	
	Perry	Van Sanford	Van Sanford	McKendry	Etienne	
	SBMV	BYDV	BYDV	SBMV	BYDV	
	0-9	0-9	0-9	0-9	0-9	
1	Branson	1.0	1.5	1.0	0.3	0.2
2	Bess	3.0	3.0	4.5	1.0	0.5
3	Shirley	2.0	0.5	1.5	0.3	0.2
4	MO080104	2.0	2.0	1.5	0.3	0.2
5	IL06-14262	3.5	1.0	1.5	0.7	0.0
6	NC08-23090	1.0	3.0	1.5	0.0	0.5
7	NC08-23324	1.0	2.5	2.0	0.0	0.0
8	GA021087-10LE33	3.0	3.5	1.0	1.7	0.7
9	KY03C-1237-32	2.0	4.0	1.0	0.0	0.5
10	KY03C-1002-02	1.0	4.0	1.5	0.0	0.5
11	P04606RA1-6	1.0	0.5	1.0	0.0	0.2
12	P05222A1-7	6.0	0.5	1.0	0.0	0.3
13	P05247A1-1	2.0	0.5	1.0	0.0	0.0
14	VA08MAS-369	1.0	2.0	2.5	0.0	0.5
15	VA09W-73	7.0	1.0	1.5	0.3	0.2
16	VA10W-21	2.0	2.5	2.0	0.0	0.7
17	MD03W64-10-3	2.0	1.0	2.0	0.0	0.7
18	MD03W665-09-1	3.0	2.5	1.5	1.3	0.5
19	DAS1001	2.0	2.0	4.5	1.0	0.5
20	DAS1002	2.0	4.5	1.0	0.0	0.0
21	DAS1003	1.5	4.0	1.5	0.0	0.0
22	KWS001	2.0	4.5	2.5	0.0	0.2
23	KWS002	1.0	3.5	3.0	0.7	0.5
24	KWS003	1.5	2.0	2.5	0.7	0.3
25	IL06-13721	1.5	0.0	1.0	0.0	0.0
26	IL06-23571	1.5	2.0	0.5	0.0	0.3
27	MO081652	1.0	2.5	2.0	0.3	0.2
28	OH07-263-3	1.0	1.5	1.5	0.0	0.5
29	OH08-180-48	1.0	1.0	1.0	0.7	0.3
30	G00120	6.5	1.0	1.5	1.0	0.8
31	G09534	2.0	2.0	3.5	0.7	0.3
32	G09528	2.5	1.5	1.0	0.3	0.2
33	AR02061-1-1	1.0	1.0	0.5	0.0	0.0
34	AR01163-3-1	7.0	2.5	2.5	0.7	0.0
35	ARS07-0525	1.0	2.0	2.5	0.0	0.0
LOCATION MEANS	2.3	2.1	1.8	0.3	0.3	
GROWTH STAGE / DATE						

VIRUSES

		Knoxville	Blacksburg
		TN	VA
		West	Griffey
		BYDV	BYDV
		0-9	0-9
1	Branson	2.0	4.5
2	Bess	3.0	5.5
3	Shirley	2.0	3.0
4	MO080104	4.0	6.5
5	IL06-14262	2.0	1.5
6	NC08-23090	4.0	2.5
7	NC08-23324	4.3	8.0
8	GA021087-10LE33	3.0	7.0
9	KY03C-1237-32	3.3	5.0
10	KY03C-1002-02	3.6	5.5
11	P04606RA1-6	2.0	2.5
12	P05222A1-7	2.0	3.0
13	P05247A1-1	2.0	1.0
14	VA08MAS-369	3.0	5.5
15	VA09W-73	2.0	4.5
16	VA10W-21	3.3	4.0
17	MD03W64-10-3	3.6	7.0
18	MD03W665-09-1	3.6	7.5
19	DAS1001	4.0	6.5
20	DAS1002	4.3	6.5
21	DAS1003	3.0	5.0
22	KWS001	3.3	4.5
23	KWS002	4.0	7.5
24	KWS003	3.0	4.0
25	IL06-13721	2.0	4.0
26	IL06-23571	4.3	6.5
27	MO081652	3.0	6.0
28	OH07-263-3	2.0	3.0
29	OH08-180-48	3.6	6.0
30	G00120	3.0	5.0
31	G09534	3.0	6.0
32	G09528	4.0	6.0
33	AR02061-1-1	2.6	4.5
34	AR01163-3-1	4.0	6.0
35	ARS07-0525	3.0	5.0
LOCATION MEANS		3.1	5.0
GROWTH STAGE / DATE			

HESSIAN FLY

W Lafayette IN

Cambron

	BIO B	BIO C	BIO D	BIO O	BIO L	
	R-S	R-S	R-S	R-S	R-S	
1	Branson	15-2	0-16	0-18	11-3	0-18
2	Bess	0-17	0-17	0-17	0-18	0-19
3	Shirley	0-13	0-15	0-17	0-18	0-18
4	MO080104	6-9	0-16	0-18	0-12	0-18
5	IL06-14262	9-7	7-12	0-17	0-17	0-18
6	NC08-23090	0-21	0-18	0-19	0-17	0-19
7	NC08-23324	0-22	0-15	0-16	0-16	0-15
8	GA021087-10LE33	0-18	0-17	0-19	0-13	0-19
9	KY03C-1237-32	0-22	0-18	0-19	0-16	0-18
10	KY03C-1002-02	0-18	0-16	0-15	0-17	0-17
11	P04606RA1-6	13-6	14-0	17-0	0-13	0-17
12	P05222A1-7	0-16	all S	0-15	0-10	0-12
13	P05247A1-1	0-18	all S	0-15	0-14	0-14
14	VA08MAS-369	0-21	all S	0-20	0-15	0-18
15	VA09W-73	0-18	all S	0-15	0-18	0-19
16	VA10W-21	0-20	all S	0-19	0-19	0-19
17	MD03W64-10-3	0-18	all S	0-15	5-9	0-14
18	MD03W665-09-1	0-16	all S	0-19	0-13	0-12
19	DAS1001	0-16	all S	0-16	0-17	0-19
20	DAS1002	0-19	all S	0-17	0-18	0-17
21	DAS1003	0-18	all S	0-16	11-6	0-20
22	KWS001	0-21	all S	0-17	0-18	0-18
23	KWS002	0-17	all S	0-12	0-11	0-12
24	KWS003	0-15	all S	0-16	0-15	0-20
25	IL06-13721	16-0	all S	0-17	0-12	0-14
26	IL06-23571	16-2	19-0	0-14	0-20	0-20
27	MO081652	12-6	8-6	0-20	0-20	0-17
28	OH07-263-3	0-17	all S	0-18	0-15	0-17
29	OH08-180-48	12-6	all S	0-21	10-8	0-18
30	G00120	0-21	all S	0-18	0-19	0-18
31	G09534	0-19	all S	0-20	0-17	0-19
32	G09528	0-22	all S	0-16	0-5	0-13
33	AR02061-1-1	0-16	all S	0-18	0-16	0-19
34	AR01163-3-1	0-21	all S	0-15	0-16	0-11
35	ARS07-0525	17-0	19-0	16-0	16-0	12-2

CEREAL LEAF BEETLE

	Nairn
	ON
	Etienne
	0-9
1	Branson 2.0
2	Bess 2.7
3	Shirley 2.0
4	MO080104 2.3
5	IL06-14262 2.7
6	NC08-23090 3.0
7	NC08-23324 3.0
8	GA021087-10LE33 2.0
9	KY03C-1237-32 2.0
10	KY03C-1002-02 2.3
11	P04606RA1-6 3.0
12	P05222A1-7 2.3
13	P05247A1-1 2.3
14	VA08MAS-369 2.7
15	VA09W-73 2.3
16	VA10W-21 2.3
17	MD03W64-10-3 2.0
18	MD03W665-09-1 3.0
19	DAS1001 3.3
20	DAS1002 2.0
21	DAS1003 3.0
22	KWS001 2.7
23	KWS002 2.7
24	KWS003 2.3
25	IL06-13721 2.3
26	IL06-23571 2.3
27	MO081652 2.0
28	OH07-263-3 2.3
29	OH08-180-48 2.0
30	G00120 1.7
31	G09534 3.0
32	G09528 2.3
33	AR02061-1-1 2.0
34	AR01163-3-1 3.7
35	ARS07-0525 2.0

FREEZE TEST

Raleigh
NC

Livingston

		% Survival			Avg. Survival Ratings		
		Rep 1	Rep 2	Avg.	Rep 1	Rep 2	Avg.
1	Branson	80	95	88	3.0	2.8	2.9
2	Bess	90	90	90	3.3	3.5	3.4
3	Shirley	40	50	45	1.0	1.0	1.0
4	MO080104	75	80	78	2.0	1.8	1.9
5	IL06-14262	80	80	80	2.0	2.2	2.1
6	NC08-23090	50	60	55	1.4	1.2	1.3
7	NC08-23324	75	70	73	1.7	1.5	1.6
8	GA021087-10LE33	55	50	53	1.3	1.4	1.4
9	KY03C-1237-32	40	45	43	0.8	0.9	0.9
10	KY03C-1002-02	30	40	35	0.5	0.8	0.7
11	P04606RA1-6	65	70	68	1.2	1.2	1.2
12	P05222A1-7	70	70	70	1.4	1.4	1.4
13	P05247A1-1	45	50	48	1.2	1.0	1.1
14	VA08MAS-369	80	75	78	2.1	2.0	2.1
15	VA09W-73	70	70	70	2.0	2.2	2.1
16	VA10W-21	90	85	88	3.0	2.6	2.8
17	MD03W64-10-3	85	80	83	3.0	2.8	2.9
18	MD03W665-09-1	90	85	88	3.2	3.2	3.2
19	DAS1001	70	75	73	1.6	1.8	1.7
20	DAS1002	70	70	70	2.0	1.8	1.9
21	DAS1003	45	40	43	0.8	1.0	0.9
22	KWS001	80	85	83	2.4	2.6	2.5
23	KWS002	90	85	88	3.0	3.2	3.1
24	KWS003	80	75	78	2.4	2.6	2.5
25	IL06-13721	80	80	80	2.8	2.8	2.8
26	IL06-23571	75	80	78	2.4	2.0	2.2
27	MO081652	70	65	68	1.8	2.0	1.9
28	OH07-263-3	40	45	43	0.8	1.0	0.9
29	OH08-180-48	80	80	80	2.0	1.5	1.8
30	G00120	50	65	58	1.0	0.8	0.9
31	G09534	70	70	70	1.6	1.9	1.8
32	G09528	50	55	53	1.3	1.3	1.3
33	AR02061-1-1	60	60	60	1.7	1.4	1.6
34	AR01163-3-1	50	55	53	1.5	1.2	1.4
35	ARS07-0525	70	75	73	2.0	1.8	1.9

**2012 Crop
Advanced Milling and Baking Evaluation
Set 2012 A19**

2012 UESRWWN

Entries #: 1250941 - 1250969

A total of 35 samples were grown in a composite of nursery locations and submitted to the laboratory for milling and baking quality evaluations. The standard quality data were compared to the average for the cultivar checks given for this nursery and quality scores for all entries are adjusted to the check average. A table of observed and historical quality scores is given below.

Lab Number	Entry Number	ENTRY	From Advanced Milling Database Scoring						Predicted from Measured Data					
			Milling Quality Score		Baking Quality Score		Softness Equivalent Score		Milling Quality Score		Baking Quality Score		Softness Equivalent Score	
1251501	1	Branson	68.26	C	72.03	B	81.31	A	65.67	C	39.48	F	62.71	C
1251502	2	Bess	58.72	D	62.71	C	66.72	C	54.41	D	24.05	F	41.41	E
1251503	3	Shirley	67.58	C	67.51	C	66.95	C	65.37	C	44.49	E	47.25	E
1251504	4	MO 080104	57.55	D	42.58	E	66.95	C	50.63	D	19.23	F	52.81	D
		Average	63.03		61.21		70.48		59.02		31.81		51.05	
		Adjustment Bias for Trial	4.00		29.39		19.44							
		Diagnostics - Correlations	1.0		0.8		0.9							

The adjusted average values of the provided checks are predicted to have decreased milling, baking, and softness equivalent scores when compared to the historical average. The observed scores for the checks correlated to the historical scores for milling, baking, and softness equivalence at a level of $r=1.0$, $r>0.8$, and $r>0.9$, respectively. The relative rankings and correlations indicate that the results of the quality scores are likely predictive of future results.

Changes in 2012 Evaluations

After many years of use and buildup, our bake sheets have been replaced with newer ones. These new sheets produce a cookie with an average difference of 0.6 cm when compared to the old bake sheets. The cookie diameter was 96.8% (3.2% smaller) of the size of a cookie baked on the old sheets. This value was based on cookies made with 22 flour samples at the beginning of the evaluation process and resulted in a standard deviation of 1.36 and standard error of 0.29. We will be reporting the diameters using the new sheets for this year's samples, so you may need to adjustment the baking quality score if comparing with test lines from previous years.

Additional Information on Analysis

This nursery contained seed that displayed very little Fusarium Head Blight, weathering, and black point. However, sprouting was observed in KY03C-1237-32. A probability of high alpha-amylase activity as well as increased starch damage may be present within this sample. The quality trait averages of the tested samples indicate that milling yield and flour protein were within the expected target range for soft wheat characteristics. The SRC's of lactic acid and sucrose demonstrated higher than normal results for these soft wheat traits, while softness equivalence had a reduced nursery average value.

Of the characteristics of quality we measure at the Soft Wheat Quality Laboratory, milling yield is the most reproducible and perhaps most important because it is genetically and environmentally associated with good soft wheat flour quality. Usually, the goal for the samples is to produce 70% or greater milling yield when ran through the Quadrumat Junior Flour Mill. This nursery produced an average of 68.9%. Sample KWS003 had the highest yield at 72.1%. Right behind KWS003 was KWS002 and IL06-14262, both at 71.1% yield.

After milling yield, the second trait that we recommend for use in selection is softness equivalent. It tends to have high heritability and is an important predictor of break flour yield. Larger values are preferred for most soft wheat manufactured goods, particularly cakes and other high sugar baked products. An average softness equivalence of 52% was acquired for this nursery, with the sample IL06-23571 exhibiting the most softness equivalence at 57.9%. Respectable softness equivalence can also be found in DAS1002 and OH08-180-48. The check, Bess, had softness equivalence similar to hard wheat. It is normally above 50%, but maybe harder due to environmental conditions. A total of 7 breeding lines had softness equivalence less than Bess (49.6%) and have poor softness equivalent quality. These lines should be considered for discarding unless they have some redeeming factor in field performance.

Sucrose SRC is probably the best predictor of cookie quality and is a measure of arabinoxylan content, which can strongly affect water absorption in baked products. Sucrose SRC typically increases in wheat samples with lower flour yield and lower softness equivalent. The cross hydration of gliadins by sucrose also causes sucrose SRC values to be correlated to flour protein and lactic acid SRC. Soft wheat flours for cookies typically also have a target of 95% or less. This trial displayed an average of 98.9% as IL06-14262 had the lowest sucrose absorption rate. This sample also had the largest baking quality score (94.6) amongst the test lines.

Lactic acid SRC is a good measure of gluten strength. It also correlates to flour protein concentration but the effect is dependent on genotypes and growing conditions. The average for this trial was 106.4% with an array of test lines that were considered both “strong” in gluten strength (above 105%) and “weak” in gluten strength (below 85%), suggesting that the trial has both genetic and internal environmental variances for gluten strength. There were 19 test lines that ranged from 107% to 128.6% that exhibit “strong” characteristics of gluten strength and may be of value for the manufacturing of crackers or other products requiring gluten strength. Contrary, 5 lines demonstrated “weak” gluten strength as the values ranged from 84% to 68%. Within these lines, KWS001 and DAS1001 generated gluten strength less than 70% lactic acid SRC and are very weak. Unless these lines have other redeeming soft wheat features, they may cause problems for many manufacturers.

To select the best lines for milling and baking quality, we sequentially sorted for flour yield and selected all lines with greater flour yield than the nursery average. We then repeated the operation for softness equivalent and the solvent retention capacities of sucrose and lactic acid, selecting the lines that were better than average in each case. Based on culling, the most prominent entries that were better or similar to that of the check Branson consist of G09528, OH08-180-48, IL06-14262, and DAS1002.

Please contact me if you have questions concerning this trial.

Best regards,
Tony Karcher

ADVANCED NURSERY EVALUATION
FOR SOFT WHEAT MILLING AND BAKING QUALITY
2012 CROP

UESRWVN

Lab Number	Entry Number	ENTRY	Modified Milling Quality Score	Modified Baking Quality Score	Modified Softness Equivalent Score	Test Weight (LB/BU)	Whole Grain Protein (at 12%)	Whole Grain Hardness (0-100)	Flour Yield (%)	Softness Equivalent (%)	Flour Protein (at 14%)	As Is Lactic Acid SRC (%)	Sucrose SRC (%)	Cookie Diameter (cm)	Top Grade (0-9)									
1251501	1	Branson	69.68	C	68.87	C	82.15	A	62.36		10.61	27.20	69.96	+	57.08	+	8.31	117.62	s	98.30	+	17.97		4
1251502	2	Bess	58.42	D	53.44	D	60.85	C	62.80		10.36	27.32	67.69		49.55	q	8.53	97.82	w	103.49		17.85		3
1251503	3	Shirley	69.37	C	73.89	B	66.69	C	62.04		11.06	28.78	69.89	+	51.61		8.59	96.28	w	96.44	+	18.52	+	3
1251504	4	MO080104	54.64	D	48.62	E	72.25	B	63.73		10.41	32.99	66.93	q	53.58		8.30	121.51	s	107.62	q	17.60	q	4
1251505	5	IL06-14262	75.19	B	94.62	A	79.28	B	63.23		9.46	25.76	71.07	+	56.07	+	7.64	104.13	w	86.28	+	18.69	+	7
1251506	6	NC08-23090	57.44	D	55.01	D	71.28	B	61.84		10.48	31.93	67.49	q	53.24		8.42	109.26		98.79		17.29	q	2
1251507	7	NC08-23324	58.52	D	51.34	D	57.99	D	63.68		10.48	35.95	67.71		48.54	q	8.63	113.25	s	103.62		17.78		1
1251508	8	GA021087-10LE33	67.78	C	59.50	D	56.97	D	63.79		11.08	25.50	69.57		48.18	q	8.92	128.57	s	100.31		18.11		1
1251509	9	KY03C-1237-32	53.42	D	50.41	D	65.56	C	63.02		11.16	30.98	66.69	q	51.22		8.86	123.71	s	105.75	q	17.77		1
1251510	10	KY03C-1002-02	71.64	B	45.99	E	54.83	D	62.91		8.47	39.77	70.35	+	47.42	q	8.90	112.39	s	105.34	q	17.67		6
1251511	11	P04606RA1-6	53.93	D	50.36	D	65.72	C	63.24		11.40	32.25	66.79	q	51.27		9.02	83.98	w	106.64	q	17.86		2
1251512	12	P05222A1-7	62.40	C	56.81	D	70.49	B	63.31		11.03	31.40	68.49		52.96		8.51	91.25	w	97.73	+	17.35	q	1
1251513	13	P05247A1-1	56.54	D	63.64	C	56.78	D	60.68		11.36	28.42	67.31	q	48.11	q	8.97	80.46	w	93.71	+	17.82		6
1251514	14	VA08MAS-369	67.19	C	61.97	C	61.52	C	64.53		10.66	34.46	69.46		49.79	q	8.71	127.92	s	97.85	+	17.94		5
1251515	15	VA09W-73	60.62	C	73.98	B	70.82	B	63.93		10.64	37.35	68.13		53.07		8.27	108.36		93.76	+	18.17		4
1251516	16	VA10W-21	68.03	C	10.36	F	40.00	E	63.55		9.35	35.10	69.63	+	42.17	q	7.66	117.54	s	110.09	q	15.79	q	0
1251517	17	MD03W64-10-3	42.92	E	51.31	D	60.68	C	63.34		12.19	45.16	64.57	q	49.49	q	9.78	111.04	s	100.96		17.61	q	3
1251518	18	MD03W665-09-1	54.83	D	52.00	D	73.95	B	63.81		11.44	43.04	66.97	q	54.18		8.99	108.44		102.96		17.46	q	1
1251519	19	DAS1001	60.53	C	78.96	B	74.94	B	59.70		9.52	30.07	68.12		54.53		7.65	68.08	w	92.05	+	18.21		6
1251520	20	DAS1002	73.16	B	81.76	A	82.00	A	61.63		10.11	29.57	70.66	+	57.03	+	7.89	99.72	w	93.06	+	18.36	+	7
1251521	21	DAS1003	66.59	C	83.93	A	77.06	B	62.59		9.59	27.84	69.34		55.28	+	7.24	81.45	w	91.72	+	18.44	+	5
1251522	22	KWS001	60.76	C	77.01	B	75.34	B	63.30		11.01	31.05	68.16		54.67		8.40	68.13	w	92.87	+	18.21		3
1251523	23	KWS002	75.33	B	84.12	A	76.41	B	61.78		9.63	28.99	71.09	+	55.05	+	7.72	86.38	w	91.71	+	18.51	+	6
1251524	24	KWS003	80.40	A	69.56	C	65.70	C	62.59		10.78	27.11	72.11	+	51.27		8.60	118.37	s	92.89	+	17.93		6
1251525	25	IL06-13721	72.74	B	66.40	C	67.24	C	64.04		10.64	28.21	70.57	+	51.81		8.49	107.01		97.89	+	18.11		6
1251526	26	IL06-23571	72.62	B	90.55	A	84.33	A	64.22		11.24	29.75	70.55	+	57.85	+	8.85	98.47	w	91.74	+	18.91	+	4
1251527	27	MO081652	54.30	D	49.59	E	68.21	C	64.24		11.07	34.10	66.86	q	52.15		8.59	125.42	s	106.67	q	17.70		3
1251528	28	OH07-263-3	71.96	B	73.98	B	72.13	B	63.66		10.05	29.21	70.42	+	53.54		8.25	94.72	w	98.12	+	18.53	+	7
1251529	29	OH08-180-48	71.43	B	79.32	B	81.86	A	63.34		9.81	32.58	70.31	+	56.98	+	7.74	118.55	s	96.47	+	18.48	+	4
1251530	30	G00120	60.07	C	47.60	E	55.35	D	63.74		11.70	34.84	68.02		47.60	q	9.43	126.87	s	102.83		17.59	q	4
1251531	31	G09534	60.29	C	54.28	D	63.35	C	62.98		10.72	25.52	68.07		50.43	q	8.33	125.25	s	105.25	q	17.99		3
1251532	32	G09528	67.25	C	76.08	B	70.00	B	62.67		10.53	32.14	69.47		52.79		8.09	124.18	s	96.59	+	18.57	+	3
1251533	33	AR02061-1-1	61.98	C	56.89	D	64.98	C	63.12		11.42	34.22	68.41		51.01		8.65	110.05		101.66		17.84		5
1251534	34	AR01163-3-1	66.98	C	66.38	C	61.33	C	63.27		9.83	32.16	69.41		49.72	q	8.26	125.44	s	96.46	+	18.09		2
1251535	35	ARS07-0525	70.23	B	54.69	D	64.49	C	62.47		11.40	31.69	70.07	+	50.84	q	8.86	93.14	w	104.12		17.94		6
		Average	64.26		63.24		67.79		63.00		10.59	31.78	68.87		52.00		8.46	106.42		98.91		17.96		3.83

Footnotes:

- 'q' - questionable or undesirable quality. Marked on lines greater than a standard deviation from the mean of the checks in a unpreferred level.
- '+' - Above average quality marked on lines with greater than a standard deviation away from mean of the checks in a preferred level
- 's' - strong gluten. Greater than one standard deviation more than the mean of checks.
- 'w' - weak gluten. Greater than one standard deviation less than the mean of the check.

	= More preferred than average		= Stronger gluten than average
	= Less preferred than average		= Weaker gluten than average

ADVANCED NURSERY EVALUATION
FOR SOFT WHEAT MILLING AND BAKING QUALITY
2012 CROP

Lab Number	Entry Number	ENTRY	From Advanced Milling Database Scoring						Predicted from Measured Data						Data Transferred from Scores Sheet									
			Milling Quality Score	Baking Quality Score	Softness Equivalent Score	Milling Quality Score	Baking Quality Score	Softness Equivalent Score	Test Weight (LB/BU)	Whole Wheat Grain (at 12%)	Hardness (0-100)	Flour Yield (%)	Softness Equivalent (%)	Flour Protein (at 14%)	As Is Lactic Acid SRC (%)	Sucrose SRC (%)	Cookie Diameter (cm)	Top Grade (0-9)						
1251501	1	Branson	68.26	C	72.03	B	81.31	A	65.67	C	39.48	F	62.71	C	62.36	10.61	27.20	69.96	57.08	8.31	117.62	98.30	17.97	4
1251502	2	Bess	58.72	D	62.71	C	66.72	C	54.41	D	24.05	F	41.41	E	62.80	10.36	27.32	67.69	49.55	8.53	97.82	103.49	17.85	3
1251503	3	Shirley	67.58	C	67.51	C	66.95	C	65.37	C	44.49	E	47.25	E	62.04	11.06	28.78	69.89	51.61	8.59	96.28	96.44	18.52	3
1251504	4	MO 080104	57.55	D	42.58	E	66.95	C	50.63	D	19.23	F	52.81	D	63.73	10.41	32.99	66.93	53.58	8.30	121.51	107.62	17.60	4
		Average	63.03		61.21		70.48		59.02		31.81		51.05		62.73		29.07	68.62	52.96	8.43	108.31	101.46	17.99	3.50
		Adjustment Bias for Trial	4.00		29.39		19.44																	
		Diagnostics - Correlations	1.0		0.8		0.9																	
		Standard Errors Used for Grading*																0.964	2.088	0.477	2.420	2.790	0.363	

Prediction Models

SE Score= $-98.66 + 2.827*SE$

BQ Score= $-129.74 + 14.267*Dia - 1.279*Suc - 1.488*Fprotein \text{ as is moist} + 0.891*SE$

MY Score= $-282.08 + 4.971*FYLD$

ADVANCED EVALUATION
FOR SOFT WHEAT MILLING AND BAKING QUALITY
2012 CROP

GRAIN CONDITION SCALE

0 None
1 up to 10%
2 10% to 40%
3 above 40%

UESRWVN

Lab Number	Entry Number	ENTRY	FHB (0-3)	Weathering (0-3)	Sprouting (0-3)	Black Point (0-3)	Shriveling After Cleaning (0-3)	Comments
1251501	1	Branson	0	0	0	0	1	CHECK
1251502	2	Bess	1	0	0	0	1	CHECK
1251503	3	Shirley	1	1	0	1	1	CHECK
1251504	4	MO080104	1	0	0	1	1	CHECK
1251505	5	IL06-14262	0	0	0	0	1	
1251506	6	NC08-23090	1	1	0	1	1	
1251507	7	NC08-23324	1	1	0	1	1	
1251508	8	GA021087-10LE33	0	0	0	0	1	
1251509	9	KY03C-1237-32	1	2	1	1	1	
1251510	10	KY03C-1002-02	1	1	0	0	1	
1251511	11	P04606RA1-6	0	0	0	0	1	
1251512	12	P05222A1-7	0	0	0	0	1	
1251513	13	P05247A1-1	0	1	0	0	1	
1251514	14	VA08MAS-369	0	0	0	1	1	
1251515	15	VA09W-73	1	1	0	1	1	
1251516	16	VA10W-21	0	1	0	1	0	
1251517	17	MD03W64-10-3	1	1	0	1	1	
1251518	18	MD03W665-09-1	1	1	0	1	2	
1251519	19	DAS1001	1	1	0	1	1	
1251520	20	DAS1002	0	0	0	0	1	
1251521	21	DAS1003	1	0	0	1	1	
1251522	22	KWS001	1	0	0	0	0	
1251523	23	KWS002	0	0	0	1	1	
1251524	24	KWS003	0	0	0	0	0	
1251525	25	IL06-13721	1	0	0	0	0	
1251526	26	IL06-23571	1	0	0	0	0	
1251527	27	MO081652	1	1	0	1	1	
1251528	28	OH07-263-3	0	1	0	1	1	
1251529	29	OH08-180-48	1	1	0	0	1	
1251530	30	G00120	0	0	0	0	1	
1251531	31	G09534	0	0	0	0	1	
1251532	32	G09528	0	0	0	1	1	
1251533	33	AR02061-1-1	1	0	0	1	1	
1251534	34	AR01163-3-1	1	1	0	0	1	
1251535	35	ARS07-0525	0	1	0	1	1	