

The background of the entire page is a close-up photograph of several golden wheat stalks, showing the individual grains and awns in detail. The stalks are arranged vertically and slightly overlapping, creating a textured, naturalistic backdrop.

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service

State Agricultural Experiment Stations, Cooperating

2015 - 2016

**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
Small Grains and Potato Germplasm Research
1691 S. 2700 W.
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December 2016

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**2015-2016 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	MO080104	L910097/MO 92-599	Check	09-10
3	Hilliard	25R47/Jamestown (formerly VA11W-108)	Check	13-14
4	Pioneer Brand 25R46	W940262W1/25R47//W960095H1	Check	15-16
5	0762A1-2-8	981129A1-45-3/99793RE2-3//INW0301/92145E8-7-7-3-57/3/981477A1/981312A1//INW0316	Mohammadi	13-14
6	IL10-21934	IL97-1828//IL03-18438//IL00-8633	Kolb	14-15
7	TN1603	Z00-3554/(AR584A-3-1/OK91P648-41)-F6/[(B950590//VA96W-270//92145E8-7-7-1-9/Pat)]-F6/Shirley	West	15-16
8	VA11W-279	NC00-15389 (GA85240-6/NC96BGTAS5)/GF951079-2E31 (GA881130/Gore)//USG3555 (VA02W-555)	Griffey	15-16
9	VA11W-313	25R47/GF951079-2E31 (GA881130/Gore)//USG3555 (VA02W-555)	Griffey	15-16
10	VA12W-31	SS MPV57 (VA97W-24)/M99*3098 (TX85-264/VA88-52-69)//VA03W-434 (Roane/CK9835//VA96-54-270)	Griffey	15-16
11	KWS 072	IL00-8530/P99840C4-8-4//B030543/P99840C4-8-4	Murche	15-16
12	KWS 074	USG3555/Shirley	Murche	15-16
13	KWS 078	MO011126*//W06202B7202	Murche	15-16
14	KY06C-1178-16-10-3	KY93C-0004-22-1/NC03-11458//KY97C-0519-04-05	Van Sanford	15-16
15	KY06C-1195-37-2-5	Pembroke08/02JH000014//KY96C-0770-3	Van Sanford	15-16
16	KY06C-2067-16-7-1	KY97C-0519-04-05/Agripro Cooper	Van Sanford	15-16
17	IL11-28222	IL02-18228//IL01-16170//M03-3616	Kolb	15-16
18	IL11-6543	IL97-1828//IL02-18228	Kolb	15-16
19	OK11311F	Sabbe/Ok102//Jagalene	Carver	15-16
20	DH11SRW8-59	Branson/BW4020	Obert	15-16
21	DH11SRW41-26	Patton/M03-3616-C	Obert	15-16
22	AR06017-6-2	AR800-1-3-1/C9663	Mason	15-16
23	AR06050-7-2	C9553/AR98084-4-1	Mason	15-16
24	MD09W272-8-4-13-3-15	VA02W713//SS8641/25R42	Wight	15-16
25	MD09W272-8-4-14-6	VA02W713//SS8641/25R42	Wight	15-16
26	MD09W272-8-4-14-8	VA02W713//SS8641/25R42	Wight	15-16
27	OH10-219-65	P99608C1-1-3/Branson	Sneller	15-16
28	OH09-207-68	M99*3098/OH743	Sneller	15-16
29	04620A1-1-7-4-17	Truman/9017C1//92823A1/9218B4/3/P107/4/PATT/5//INW9811/GLD//96204A1	Mohammadi	15-16
30	06497A1-7-3	INW0412/B990081//0128A1-46	Mohammadi	15-16

LOCATION NOTES

Marianna, Arkansas

Cooperator: Esten Mason
University of Arkansas
Planted: November 1, 2015
Harvested: June 7, 2016
Fertilizer: 150 N + 24 Amm Sulfate
Notes: Low yielding plots impacted by stripe rust which caused severe lodging. Some scab as well, 10-days of rain prior to harvest hurt test weights. Stuttgart location did not get planted. Stripe rust data reported is from **Fayetteville** inoculated plots with susceptible check rated 9.

Griffin, Georgia

Cooperator: Mohamed Mergoum, Jerry Johnson, Steve Sutton, Ben Lopez, John Youmans
University of Georgia
Planted: November 17, 2015
Harvested: June 3, 2016
Fertilizer: 20 N preplant; 80 N topdress

Brownstown, Illinois

Cooperator: Fred Kolb
University of Illinois
Planted: October 3, 2015
Harvested: June 21, 2016
Fertilizer: Amm Sulfate 30 fall; 55 spring
Notes: Severe stripe rust.

Champaign, Illinois

Cooperator: Jana Murche
KWS Cereals USA
Planted: September 30, 2015
Harvested: July 2, 2016
Fertilizer: 70 + 40 N
Notes: Severe stripe rust.

Urbana, Illinois

Cooperator: Fred Kolb
University of Illinois
Planted: September 28, 2015
Harvested: June 28, 2016
Fertilizer: Amm Sulfate 30 fall; 55 spring
Notes: Stripe rust impacted yield, but not as severe as Brownstown. Substantial lodging in the scab nursery likely contributed to high CVs.

Battle Ground, Indiana

Cooperator: Sam Brown
Trinity Wheat Research

Planted: September 24, 2015
Harvested: June 28, 2016
Fertilizer: fall 34-24-24; spring 64-0-0
Notes: Stripe rust and Septoria tritici were absolutely horrific! BYD was not pretty either. Excellent mild fall, exceptional growth. Appeared to be only minimal fall BYD infection. There was winter damage, but less than expected. June 20 saw 50-60 mph gusts with 1.5 in. rain. June 22 saw 80-100 mph gusts with 2 in. rain. A one-two combo punch that resulted in lodging and contributed to high CVs. Value of the yield data is debatable.

New Haven, Indiana

Cooperator: Jana Murche
KWS Cereals USA
Planted: October 10, 2015
Harvested: July 8, 2016
Fertilizer: 100 N
Notes: Little stripe rust.

West Lafayette, Indiana

Cooperator: Mohsen Mohammadi
Purdue University
Planted: October 1, 2015
Harvested: June 21, 2016
Notes: Stripe rust severely infected some plots.

West Lafayette, Indiana

Cooperator: Sue Cambron
USDA-ARS, Crop Production & Pest Control Research
Notes: Hessian fly data with multiple biotypes. No data for biotype D due to loss of over half of the population when a cold storage unit overheated. It can still be determined which lines have the H5 gene, as those will be resistant to B and C but susceptible to O and L.

Windfall, Indiana

Cooperator: Kyle Lively, Greg Marshall
DuPont Pioneer
Planted: September 23, 2015
Notes: Some interaction between virus and winter kill. Both WSSMV and WSBMV present.

Winfield, Kansas

Cooperator: Sid Perry
Monsanto
Planted: October 15, 2015
Harvested: July 1, 2016

Lexington, Kentucky

Cooperator: David Van Sanford
University of Kentucky
Planted: October 23, 2015
Harvested: June 28, 2016
Fertilizer: 105 total N; P,K according to soil tests
Notes: Warm winter led to serious BYD, early heading dates.

Schochoh, Kentucky

Cooperator: David Van Sanford
University of Kentucky
Planted: October 13, 2015
Harvested: June 18, 2016
Fertilizer: 105 total N; P,K according to soil tests
Notes: Inconsistent lodging, perhaps due to N application variability.

Clarksville, Maryland

Cooperator: Jason Wight
University of Maryland
Notes: A tornado wiped out the nursery.

Mason, Michigan

Cooperator: Eric Olson
Michigan State University
Planted: September 23, 2015
Harvested: July 6, 2016
Notes: Limited rainfall after flowering affected yield and FHB ratings. Heavy stripe rust pressure. Uniform SBMV infection, rated 0=R, 1=MR, 2=MS, 3=S.

St. Paul, Minnesota

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

Columbia, Missouri

Cooperator: Anne McKendry, David, Tague, Caitlin Vore
University of Missouri
Planted: October 1, 2015
Harvested: July 9, 2016
Fertilizer: 40 fall, 80 spring
Notes: Nursery was planted into a dry seed bed and irrigated to give good fall stands. Season was very cool and dry early and then very hot. Significant rainfall occurred just prior to harvest and lowered testweights and prevented an otherwise early harvest. Stripe rust was significant and developed beyond the period when lines were rated so these data would and should have been much worse on susceptible lines. The cool season well into grainfill resulted in continued stripe rust development into grainfill and reduced test weights in

susceptible lines. FHB data from an overhead mist, inoculated nursery - however, the season was extremely cool and dry through heading and much of the rating period so visual disease levels were lower than normal. Then, there were 19 straight days of > 90 degrees F and I expect DON levels may be higher than the data would suggest. I expect these data underestimate the amount of disease that we eventually had in susceptible lines.

Lincoln, Nebraska

Cooperator: Stephen Baenziger
University of Nebraska

Notes: Hail damaged the nursery resulting in secondary tillering, late heads and shriveled seed.

Ithaca, New York

Cooperator: Mark Sorrells
Cornell University

Planted: October 5, 2015

Harvested: July 11, 2016

Fertilizer: 200 of 10-20-20; 120 of Amm nitrate topdress

Clayton, North Carolina

Cooperator: Paul Murphy
North Carolina State University

Planted: October 14, 2015

Harvested: May 28, 2016

Fertilizer: 130 N

Notes: Very heavy rains from Nov. through Feb. decimated the fertility regime. However, the generally later Eastern Uniform entries were obviously less damaged by the temperature drop to 28 for 4 hours on April 6.

Laurel Springs & Raleigh, North Carolina

Cooperator: David Marshall, Myron Fountain
USDA-ARS, Plant Science Research

Raleigh, North Carolina

Cooperator: Christina Cowger
USDA-ARS, Plant Science Research

Notes: Eastern Septoria Nursery data. Stagonospora nodorum blotch (SNB) data with separate ratings for leaves and glumes. Randomized, straw-inoculated, irrigated. Data is from Raleigh, no data available from Kinston. Data are excellent for the early lines; heavy leaf rust pressure and high temperatures increased CVs on the late lines.

Custar, Ohio

Cooperator: Clay Sneller
OARDC, Ohio State University

Fertilizer: 100 N

Napoleon, Ohio

Cooperator: Don Obert
Limagrain Cereal Seeds
Planted: September 26, 2015
Harvested: June 29, 2016
Notes: No diseases of any significance.

Wooster, Ohio

Cooperator: Byung-Kee Baik, Anthony Karcher
USDA-ARS, Soft Wheat Quality
Notes: Milling and baking quality data.

Enid, Oklahoma

Cooperator: Brett Carver, Melanie Bayles
Oklahoma State University
Notes: Acid soil tolerance data. Soil pH=4.0 to 4.3. Scale of 0 (most tolerant) to 5 (most susceptible) based on overall vigor, discoloration, and tiller production. Vegetative ratings may not associate with those taken on adult plants; adult-plant ratings not recorded due to difficulty in detecting genetic differences. Inherent differences in tillering capacity and growth habit (prostrate vs. erect) may have biased vegetative ratings.

Nairn, Ontario

Cooperator: Mark Etienne
Dow AgroSciences
Planted: October 14, 2015
Harvested: July 29, 2016
Fertilizer: 225 kg of 6-24-24 on 10/12; 100Kg N, 15Kg S 34,0,0, 0.05S (295kg/Ha) on 4/28
Notes: Good open winter with above normal temperatures. Adequate moisture in early part of season. Higher than normal levels of stripe rust seen across Ontario in 2016. Yield averages above historical norms for region. Stripe rust tolerance played a major role in yield expression this year. Very warm temperatures around flowering and prior to harvest, eliminating presence of natural FHB symptoms. Inoculated/misted nursery results are included for FHB.

Knoxville, Tennessee

Cooperator: Dennis West
University of Tennessee
Planted: October 21, 2015
Harvested: June 15, 2016
Fertilizer: 90-30-30

Milan, Tennessee

Cooperator: Dennis West
University of Tennessee
Planted: November 9, 2015
Harvested: June 13, 2016
Fertilizer: 110-0-0

Blacksburg, Virginia

Cooperator: Carl Griffey
Virginia Tech
Planted: October 15, 2015
Harvested: June 29, 2016
Fertilizer: fall 30-60-80-S/8-B/1.5; spring 30 units UAN at GS25, 50 Units UAN at GS30

Warsaw, Virginia

Cooperator: Carl Griffey
Virginia Tech
Planted: October 22, 2015
Harvested: June 20, 2016
Fertilizer: fall 30-60-60-5; spring 30lbs./A 12001.5

Central Ferry, Pullman, Washington

Cooperator: Kim Campbell
USDA-ARS, Wheat Genetics, Quality, Physiology, & Disease Research
Planted: October 15, 2015 (CF); September 25, 2015 (Pul)
Notes: Stripe rust came in early this year. Central Ferry had fall infection. Only one rating at Pullman because heat matured the crop early.

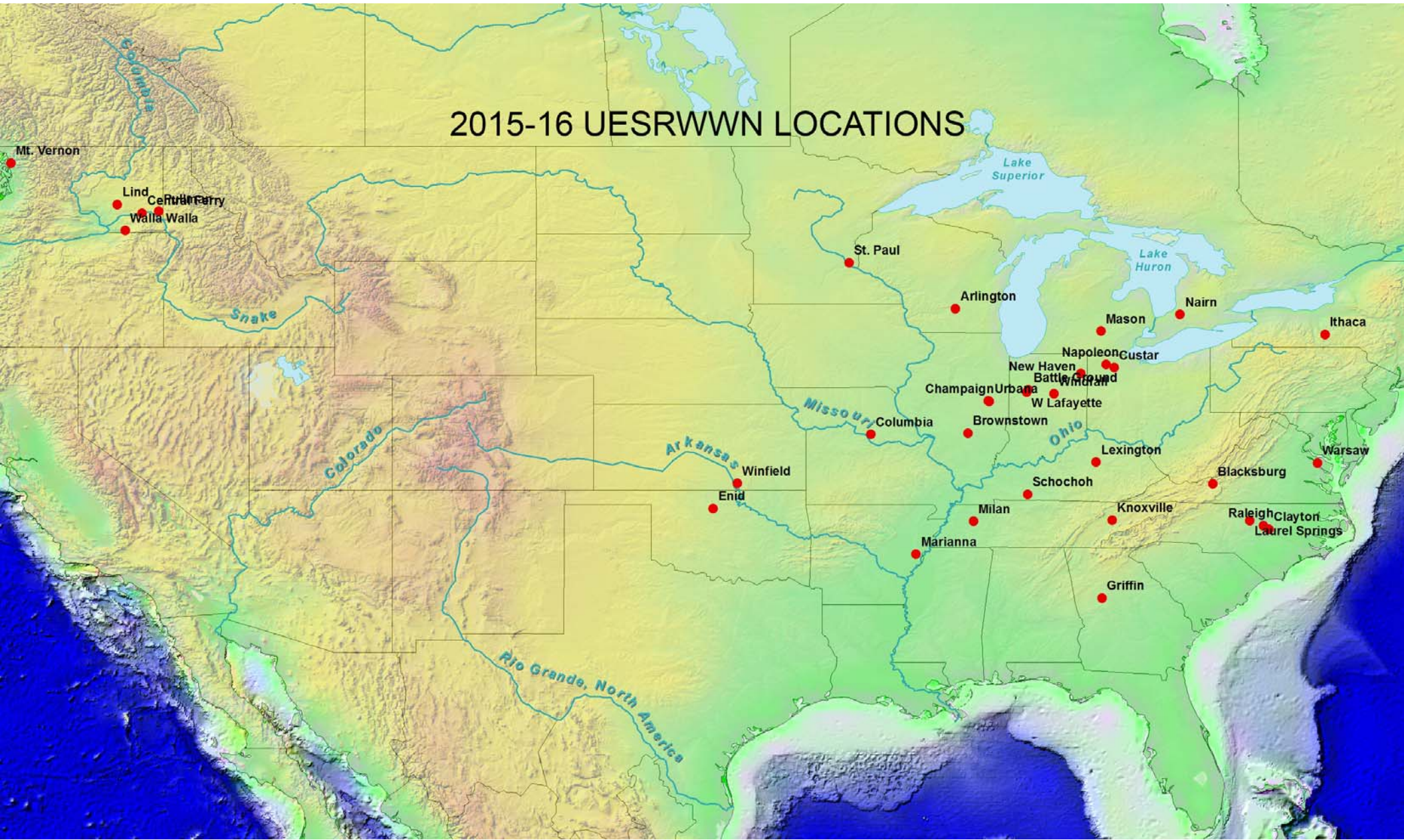
Mt. Vernon, Pullman, Walla Walla, Lind, Washington

Cooperator: Xianming Chen
USDA-ARS, Wheat Genetics, Quality, Physiology, & Disease Research
Notes: Seedling and adult stripe rust data.

Arlington, Wisconsin

Cooperator: Shawn Conley, Adam Roth
University of Wisconsin
Planted: September 23, 2015
Harvested: July 14, 2016
Fertilizer: 55 N at spring green up; previous crop soybeans
Notes: Heavy stripe rust pressure.

2015-16 UESRWWN LOCATIONS



YIELD (bu/acre)

		Marianna		Griffin		Brownstown		Champaign		Urbana		Battle Ground	
		AR		GA		IL		IL		IL		IN	
		Mason		Mergoum		Kolb		Murche		Kolb		Brown	
		a	rank		rank	ab	rank	ab	rank	ab	rank	a	rank
1	Branson	67.6	10	64.4	8	93.0	11	136.3	2	124.3	1	79.3	7
2	MO080104	61.8	13	70.8	4	89.1	13	120.0	10	112.4	9	79.8	6
3	Hilliard	84.3	1	74.9	2	99.4	7	131.5	5	116.8	6	108.2	1
4	Pioneer Brand 25R46	17.8	27	58.6	15	45.9	29	60.7	29	103.4	23	27.4	29
5	0762A1-2-8	64.3	12	42.8	28	104.6	2	132.9	3	116.8	6	52.1	20
6	IL10-21934	26.7	23	86.1	1	68.4	26	101.8	18	109.7	13	65.5	15
7	TN1603	18.1	26	59.5	13	75.4	23	74.9	27	91.0	30	55.2	18
8	VA11W-279	71.7	7	70.0	6	94.2	10	115.5	14	104.1	22	73.6	10
9	VA11W-313	66.9	11	45.4	27	96.7	9	118.9	12	109.2	15	93.7	2
10	VA12W-31	34.3	21	65.9	7	80.4	17	86.0	24	110.3	11	48.9	21
11	KWS 072	28.3	22	63.6	9	75.7	22	90.1	21	109.4	14	44.4	24
12	KWS 074	36.5	19	57.2	16	79.5	18	91.7	20	118.4	3	42.9	26
13	KWS 078	80.8	2	53.1	21	103.9	3	116.8	13	111.3	10	79.0	8
14	KY06C-1178-16-10-3	26.7	24	50.2	26	77.1	20	78.3	26	102.6	24	45.6	22
15	KY06C-1195-37-2-5	1.6	30	52.0	25	49.5	28	61.9	28	91.2	29	36.6	28
16	KY06C-2067-16-7-1	22.7	25	74.9	2	71.9	25	85.4	25	112.7	8	44.1	25
17	IL11-28222	6.8	29	61.3	11	61.0	27	86.8	23	109.2	15	53.7	19
18	IL11-6543	38.7	18	61.3	11	77.0	21	103.6	17	105.4	19	66.8	13
19	OK11311F	71.2	8	52.5	24	79.5	18	129.2	6	98.2	27	57.9	17
20	DH11SRW8-59	76.4	3	56.5	18	99.5	6	143.6	1	118.4	3	92.1	3
21	DH11SRW41-26	36.1	20	39.9	30	85.7	14	88.7	22	102.3	25	41.1	27
22	AR06017-6-2	48.0	16	52.8	22	84.0	15	111.7	15	104.5	21	59.4	16
23	AR06050-7-2	73.1	6	63.0	10	82.6	16	119.3	11	104.9	20	73.3	11
24	MD09W272-8-4-13-3-15	68.7	9	58.9	14	100.5	5	121.5	9	107.0	18	71.5	12
25	MD09W272-8-4-14-6	75.6	4	57.2	16	103.2	4	121.7	8	107.6	17	65.6	14
26	MD09W272-8-4-14-8	73.5	5	70.8	4	99.3	8	123.7	7	110.1	12	75.0	9
27	OH10-219-65	12.9	28	53.7	20	44.2	30	56.1	30	101.9	26	26.1	30
28	OH09-207-68	53.7	14	54.6	19	106.0	1	132.5	4	119.2	2	82.6	4
29	04620A1-1-7-4-17	53.1	15	41.4	29	90.8	12	105.0	16	117.8	5	80.3	5
30	06497A1-7-3	46.4	17	52.8	22	72.7	24	93.0	19	97.9	28	45.2	23
LOCATION MEANS		48.1		58.9		83.0		104.6		108.3		62.2	
LSD (.05)		15.2				6.9		9.87		11.4		13.9	
CV %		10.8				4.2		5.4		5.4		18.5	
Reps		2		1		3		3		3		2	
Harvest Plot Area (sq.ft.)		70		50		34		50		34		32	

YIELD (bu/acre)

		New Haven		W Lafayette		Winfield		Lexington		Schochoh		Mason	
		IN		IN		KS		KY		KY		MI	
		Murche		Mohammadi		Perry		Van Sanford		Van Sanford		Olson	
		ab	rank	a	rank	b	rank	ab	rank	a	rank	ab	rank
1	Branson	74.6	10	121.2	2	73.0	21	62.3	16	78.8	8	75.6	2
2	MO080104	74.6	11	108.7	13	76.0	18	62.8	13	99.0	4	66.7	17
3	Hilliard	79.3	3	117.4	5	95.3	1	64.3	11	105.0	2	63.2	24
4	Pioneer Brand 25R46	75.2	9	102.7	19	95.0	2	65.6	10	54.5	22	57.0	30
5	0762A1-2-8	73.8	13	108.9	12	58.9	30	67.7	9	99.3	3	69.2	8
6	IL10-21934	73.1	15	98.2	26	82.0	9	52.2	27	53.5	24	66.7	16
7	TN1603	70.6	18	103.7	18	61.4	29	46.4	29	34.7	29	67.1	13
8	VA11W-279	70.5	20	100.0	23	79.9	14	54.8	24	86.3	7	60.3	27
9	VA11W-313	70.1	21	116.2	6	90.5	3	59.7	18	46.8	26	67.2	12
10	VA12W-31	74.1	12	99.7	25	81.9	10	79.7	2	65.8	18	66.1	19
11	KWS 072	66.4	27	102.4	21	61.5	28	49.0	28	71.8	13	65.4	20
12	KWS 074	81.2	1	104.0	16	89.4	4	74.9	4	76.0	10	75.6	1
13	KWS 078	67.6	26	122.0	1	79.8	15	61.6	17	53.4	25	66.9	15
14	KY06C-1178-16-10-3	76.3	6	115.7	8	80.6	12	72.5	5	89.7	5	72.4	6
15	KY06C-1195-37-2-5	75.5	8	91.0	29	88.2	5	57.4	22	71.3	14	68.4	10
16	KY06C-2067-16-7-1	78.5	5	115.9	7	82.8	8	68.8	8	69.0	16	70.4	7
17	IL11-28222	69.9	22	119.8	3	80.6	12	54.4	25	36.9	28	62.3	26
18	IL11-6543	67.7	25	117.7	4	73.9	20	59.0	21	54.3	23	73.2	5
19	OK11311F	68.9	24	100.6	22	81.7	11	46.3	30	74.4	11	59.6	28
20	DH11SRW8-59	80.1	2	105.9	15	85.6	7	71.7	6	106.1	1	75.2	3
21	DH11SRW41-26	78.7	4	107.3	14	67.5	26	70.8	7	32.8	30	67.1	14
22	AR06017-6-2	69.3	23	95.6	28	67.0	27	53.8	26	65.7	19	66.4	18
23	AR06050-7-2	64.4	29	103.9	17	86.9	6	62.4	15	46.2	27	63.0	25
24	MD09W272-8-4-13-3-15	65.5	28	109.7	11	74.6	19	59.1	20	54.7	21	64.8	22
25	MD09W272-8-4-14-6	70.5	19	111.9	9	71.6	23	56.9	23	87.2	6	68.3	11
26	MD09W272-8-4-14-8	70.8	17	102.4	20	72.7	22	64.0	12	64.1	20	65.1	21
27	OH10-219-65	73.6	14	99.9	24	76.2	17	59.7	19	67.7	17	63.7	23
28	OH09-207-68	75.6	7	97.9	27	69.2	24	76.3	3	72.5	12	73.3	4
29	04620A1-1-7-4-17	71.8	16	110.2	10	77.6	16	79.9	1	69.0	15	69.0	9
30	06497A1-7-3	56.0	30	81.8	30	67.6	25	62.5	14	76.9	9	57.6	29
LOCATION MEANS		72.1		106.4		77.6		62.5		68.8		66.9	
LSD (.05)		6.81		18.2		8.5		14		26.1		10.3	
CV %		5.08		11.6		5.2		9.4		16		7.4	
Reps		3		4		2		2		2		2	
Harvest Plot Area (sq.ft.)		50		40		75		40		40		70	

YIELD (bu/acre)

		Columbia MO		Ithaca NY		Clayton NC		Raleigh NC		Custar OH		Napoleon OH	
		McKendry		Sorrells		Murphy		Marshall		Sneller		Obert	
		ab	rank	ab	rank	ab	rank	a	rank	ab	rank	ab	rank
1	Branson	70.5	10	86.3	6	35.9	13	47.0	18	92.1	9	100.6	17
2	MO080104	75.0	8	84.3	8	39.0	7	55.1	16	95.6	6	99.5	18
3	Hilliard	86.8	1	82.4	10	38.9	8	85.7	1	97.5	4	92.5	27
4	Pioneer Brand 25R46	43.4	27	94.1	1	33.4	18	66.9	9	93.9	8	93.3	25
5	0762A1-2-8	77.9	5	68.5	26	37.8	10	34.9	28	81.9	22	98.2	19
6	IL10-21934	57.2	19	78.9	16	40.5	3	24.9	30	77.6	26	108.2	3
7	TN1603	42.4	28	73.3	24	33.6	17	57.8	13	82.0	21	104.7	8
8	VA11W-279	73.0	9	79.5	15	41.5	2	74.3	3	82.1	20	111.7	2
9	VA11W-313	80.2	4	81.0	14	39.2	6	80.1	2	88.2	14	101.5	16
10	VA12W-31	59.4	18	78.0	17	38.2	9	67.6	8	92.0	10	103.1	12
11	KWS 072	46.9	26	74.8	23	35.2	14	29.7	29	88.1	15	94.0	23
12	KWS 074	60.4	17	87.4	4	36.5	12	56.4	15	94.7	7	90.3	29
13	KWS 078	80.6	3	76.3	21	32.7	19	44.5	19	103.9	1	95.1	22
14	KY06C-1178-16-10-3	47.2	25	87.1	5	23.7	30	51.0	17	85.8	16	102.1	14
15	KY06C-1195-37-2-5	27.9	30	83.3	9	41.6	1	42.9	22	85.5	17	85.9	30
16	KY06C-2067-16-7-1	56.6	21	84.9	7	26.9	28	44.2	20	97.6	3	93.3	24
17	IL11-28222	47.6	24	77.5	18	30.6	22	40.4	23	84.1	19	103.9	9
18	IL11-6543	54.8	22	76.7	19	28.0	26	43.7	21	90.9	11	106.6	7
19	OK11311F	69.7	12	68.2	27	29.9	24	36.5	26	84.3	18	111.8	1
20	DH11SRW8-59	80.9	2	89.8	3	30.4	23	57.6	14	89.9	13	101.7	15
21	DH11SRW41-26	63.7	15	81.3	13	34.2	15	40.0	24	97.1	5	93.0	26
22	AR06017-6-2	67.9	13	67.2	28	33.9	16	58.7	12	75.1	28	90.7	28
23	AR06050-7-2	67.9	13	72.2	25	31.9	21	66.4	10	90.0	12	96.1	21
24	MD09W272-8-4-13-3-15	70.4	11	76.6	20	39.5	5	64.1	11	79.2	24	106.9	6
25	MD09W272-8-4-14-6	75.6	6	75.2	22	40.1	4	68.1	6	58.6	30	103.5	11
26	MD09W272-8-4-14-8	75.6	6	81.4	12	36.6	11	67.7	7	77.7	25	103.1	13
27	OH10-219-65	31.7	29	81.6	11	29.9	25	36.4	27	81.6	23	97.3	20
28	OH09-207-68	61.5	16	92.6	2	27.2	27	70.1	5	97.9	2	107.9	4
29	04620A1-1-7-4-17	56.7	20	65.8	29	32.6	20	70.5	4	77.0	27	103.8	10
30	06497A1-7-3	51.3	23	58.1	30	26.0	29	38.3	25	69.8	29	107.4	5
LOCATION MEANS		62.0		78.8		34.2		54.0		86.4		100.3	
LSD (.05)		7.8		8.9		3.7				14.1		16.4	
CV %		7.5		6.7		4.6				8.3		7.9	
Reps		3		3		2		1		3		2	
Harvest Plot Area (sq.ft.)		55		41		64				50			

YIELD (bu/acre)

		Nairn ON Etienne		Knoxville TN West		Milan TN West		Blacksburg VA Griffey		Warsaw VA Griffey		Arlington WI Roth	
		ab	rank	ab	rank	ab	rank	ab	rank	ab	rank	a	rank
1	Branson	138.1	2	82.0	18	66.9	6	63.6	28	64.9	9	121.6	4
2	MO080104	116.6	9	91.4	11	66.5	7	64.9	24	55.4	26	109.3	15
3	Hilliard	130.9	6	101.2	2	69.1	4	82.9	4	59.9	15	130.8	2
4	Pioneer Brand 25R46	90.4	25	70.4	26	39.1	29	70.4	18	62.7	12	88.3	29
5	0762A1-2-8	107.8	14	93.1	8	58.4	16	73.0	15	67.1	6	117.4	9
6	IL10-21934	91.4	23	93.3	7	46.0	28	63.8	27	70.0	5	106.8	19
7	TN1603	91.3	24	62.9	30	53.7	19	50.5	30	58.9	18	101.1	21
8	VA11W-279	128.7	7	87.9	14	56.9	17	73.2	13	65.5	8	117.8	8
9	VA11W-313	111.1	11	98.4	4	63.6	9	73.7	11	63.6	11	125.5	3
10	VA12W-31	109.8	13	88.8	12	61.4	13	87.3	1	70.9	3	116.0	10
11	KWS 072	83.5	28	78.7	21	55.7	18	68.2	21	59.5	16	97.7	24
12	KWS 074	102.3	17	74.7	23	53.2	21	83.1	3	75.0	1	107.9	17
13	KWS 078	136.0	3	100.7	3	64.6	8	77.6	7	52.9	28	113.8	12
14	KY06C-1178-16-10-3	95.0	21	67.9	29	52.5	25	66.2	22	59.4	17	110.1	14
15	KY06C-1195-37-2-5	73.9	29	69.6	28	47.6	27	64.0	26	55.6	25	98.3	23
16	KY06C-2067-16-7-1	104.4	15	83.0	17	52.6	24	64.4	25	63.7	10	107.6	18
17	IL11-28222	96.9	20	73.7	24	52.8	22	68.3	20	52.8	29	96.7	26
18	IL11-6543	92.0	22	70.1	27	53.5	20	69.7	19	57.3	23	98.6	22
19	OK11311F	86.8	27	71.0	25	52.7	23	61.1	29	46.8	30	109.1	16
20	DH11SRW8-59	103.4	16	88.4	13	63.5	10	85.4	2	72.4	2	132.4	1
21	DH11SRW41-26	101.0	18	80.3	19	73.4	1	73.2	14	58.9	19	93.1	27
22	AR06017-6-2	112.9	10	92.6	10	62.5	11	65.7	23	57.8	21	114.6	11
23	AR06050-7-2	119.4	8	84.5	16	60.3	14	75.7	8	56.1	24	105.5	20
24	MD09W272-8-4-13-3-15	134.7	5	95.1	5	70.9	3	75.0	10	53.4	27	112.6	13
25	MD09W272-8-4-14-6	139.4	1	103.2	1	72.1	2	71.3	17	57.5	22	118.5	7
26	MD09W272-8-4-14-8	135.3	4	93.8	6	69.0	5	77.9	6	60.0	14	118.7	6
27	OH10-219-65	70.4	30	77.8	22	35.7	30	73.3	12	58.2	20	91.9	28
28	OH09-207-68	110.5	12	86.1	15	62.4	12	75.5	9	70.1	4	121.0	5
29	04620A1-1-7-4-17	98.2	19	92.8	9	59.9	15	78.6	5	67.0	7	96.7	25
30	06497A1-7-3	90.1	26	79.6	20	49.5	26	72.0	16	61.1	13	84.0	30
LOCATION MEANS		106.7		84.4		58.2		71.7		61.1		108.8	
LSD (.05)		11.86		8.4		10.9		9.5		6.7		7.8	
CV %		5.8		6.1		9.1		7.8		6.4			
Reps		2		3		2		2		2		3	
Harvest Plot Area (sq.ft.)		28.2		42.5		60		45		45		70	

YIELD (bu/acre)

	ENTRY MEANS ALL LOCATIONS		ENTRY MEANS IN-REGION a		ENTRY MEANS CV <10% b		
		rank		rank		rank	
1	Branson	84.2	3	85.6	3	85.4	4
2	MO080104	82.3	9	83.1	9	82.1	11
3	Hilliard	91.6	1	92.2	1	87.3	1
4	Pioneer Brand 25R46	67.1	26	66.2	27	68.7	27
5	0762A1-2-8	79.5	12	82.1	11	83.1	7
6	IL10-21934	72.6	20	71.6	23	74.9	20
7	TN1603	65.4	28	65.9	28	67.4	28
8	VA11W-279	82.2	10	82.9	10	81.2	12
9	VA11W-313	82.8	6	84.1	6	82.6	9
10	VA12W-31	77.7	15	78.1	15	80.3	13
11	KWS 072	68.3	24	68.9	24	71.3	24
12	KWS 074	77.1	16	77.4	16	79.9	14
13	KWS 078	82.3	8	83.7	8	84.3	5
14	KY06C-1178-16-10-3	72.3	22	73.0	21	72.9	22
15	KY06C-1195-37-2-5	63.4	29	62.7	29	64.9	29
16	KY06C-2067-16-7-1	74.0	18	73.6	18	76.0	19
17	IL11-28222	67.8	25	67.5	25	70.7	25
18	IL11-6543	72.5	21	73.0	20	74.1	21
19	OK11311F	72.8	19	73.3	19	72.7	23
20	DH11SRW8-59	87.8	2	89.3	2	87.2	2
21	DH11SRW41-26	71.1	23	72.7	22	78.1	17
22	AR06017-6-2	74.1	17	75.4	17	76.0	18
23	AR06050-7-2	77.9	13	78.1	14	78.2	16
24	MD09W272-8-4-13-3-15	80.6	11	81.9	12	82.5	10
25	MD09W272-8-4-14-6	82.5	7	84.2	5	82.8	8
26	MD09W272-8-4-14-8	82.8	5	83.9	7	84.0	6
27	OH10-219-65	62.6	30	62.3	30	64.8	30
28	OH09-207-68	83.2	4	85.1	4	85.9	3
29	04620A1-1-7-4-17	77.7	14	79.4	13	79.2	15
30	06497A1-7-3	66.6	27	67.1	26	69.0	26
LOCATION MEANS		76.1		76.8		77.6	
LSD (.05)							
CV %							
Reps							
Harvest Plot Area (sq.ft.)							

TEST WEIGHT (lbs/bu)

		Marianna AR Mason	Griffin GA Mergoum	Brownstown IL Kolb	Champaign IL Murche	Urbana IL Kolb
1	Branson	53.5	59.8	56.3	55.6	55.0
2	MO080104	56.5	60.0	60.0	57.1	57.3
3	Hilliard	55.5	60.1	57.8	55.5	56.4
4	Pioneer Brand 25R46	.	57.3		44.4	53.6
5	0762A1-2-8	52.0	45.4	56.1	54.6	53.3
6	IL10-21934	.	59.0	54.2	49.1	56.7
7	TN1603	.	57.8	53.0	45.8	52.9
8	VA11W-279	55.1	58.8	57.1	54.8	55.6
9	VA11W-313	51.9	47.5	56.0	52.0	53.4
10	VA12W-31	52.4	53.0	57.1	47.4	55.9
11	KWS 072	50.7	63.2	57.1	52.5	55.6
12	KWS 074	53.6	60.2	57.8	50.4	56.4
13	KWS 078	55.2	53.2	58.5	53.7	55.9
14	KY06C-1178-16-10-3	50.5	54.8	54.1	44.7	55.8
15	KY06C-1195-37-2-5	.	52.6		47.3	53.9
16	KY06C-2067-16-7-1	53.6	59.1	54.5	50.7	55.4
17	IL11-28222	.	56.8	55.4	49.2	56.7
18	IL11-6543	58.4	56.3	58.6	54.6	59.2
19	OK11311F	56.3	65.4	58.9	58.2	56.8
20	DH11SRW8-59	54.3	52.6	58.0	56.3	54.9
21	DH11SRW41-26	54.5	44.5	59.9	56.1	55.6
22	AR06017-6-2	51.7	55.1	55.7	52.6	55.0
23	AR06050-7-2	55.8	61.3	60.5	58.6	56.9
24	MD09W272-8-4-13-3-15	55.4	62.5	59.9	54.7	55.8
25	MD09W272-8-4-14-6	54.3	57.7	59.4	54.4	54.6
26	MD09W272-8-4-14-8	54.9	58.1	58.7	53.9	54.7
27	OH10-219-65		56.6		48.5	54.1
28	OH09-207-68	53.9	50.3	60.2	57.6	55.8
29	04620A1-1-7-4-17	55.0	44.3	58.9	52.6	56.0
30	06497A1-7-3	55.6	55.9	57.0	53.0	56.4
LOCATION MEANS		54.2	56.0	57.4	52.5	55.5

TEST WEIGHT (lbs/bu)

		Battle Ground	New Haven	W Lafayette	Winfield	Lexington
		IN	IN	IN	KS	KY
		Brown	Murche	Mohammadi	Perry	Van Sanford
1	Branson	53.8	55.0	63.5	53.4	54.5
2	MO080104	58.5	58.6	67.7	56.2	58.3
3	Hilliard	56.3	58.6	64.9	54.6	54.8
4	Pioneer Brand 25R46	57.7	59.1	61.0	55.3	54.7
5	0762A1-2-8	53.2	56.4	60.8	52.8	53.5
6	IL10-21934	53.4	58.6	65.1	54.0	56.4
7	TN1603	52.5	55.8	63.1	51.7	51.0
8	VA11W-279	56.8	60.5	65.3	54.4	55.8
9	VA11W-313	53.1	58.3	62.7	52.4	52.3
10	VA12W-31	53.7	58.4	64.4	56.0	57.5
11	KWS 072	53.7	57.2	62.5	53.9	54.7
12	KWS 074	51.5	58.8	64.2	55.3	55.2
13	KWS 078	54.9	58.4	63.9	54.9	57.6
14	KY06C-1178-16-10-3	52.0	58.1	63.6	54.1	54.9
15	KY06C-1195-37-2-5	54.5	58.9	62.6	55.5	55.5
16	KY06C-2067-16-7-1	53.5	58.7	63.6	54.6	52.8
17	IL11-28222	53.2	58.4	65.0	56.8	58.0
18	IL11-6543	57.1	60.8	68.0	58.0	60.7
19	OK11311F	57.8	60.2	66.3	55.7	56.6
20	DH11SRW8-59	55.8	58.9	64.6	54.2	55.4
21	DH11SRW41-26	54.0	57.9	64.0	55.2	56.3
22	AR06017-6-2	54.0	57.1	65.0	53.6	54.1
23	AR06050-7-2	56.6	60.0	65.8	55.4	56.6
24	MD09W272-8-4-13-3-15	55.8	59.6	64.3	55.1	55.3
25	MD09W272-8-4-14-6	54.5	58.7	63.7	54.1	51.4
26	MD09W272-8-4-14-8	54.3	58.2	63.7	53.7	52.9
27	OH10-219-65	49.8	56.9	60.7	53.4	53.8
28	OH09-207-68	55.8	58.8	65.0	53.7	56.6
29	04620A1-1-7-4-17	53.4	58.6	64.5	54.6	56.7
30	06497A1-7-3	56.0	57.2	63.9	54.7	57.5
LOCATION MEANS		54.6	58.4	64.1	54.6	55.4

TEST WEIGHT (lbs/bu)

	Schochoh KY Van Sanford	Mason MI Olson	Columbia MO McKendry	Ithaca NY Sorrells	Clayton NC Murphy	
1	Branson	51.7	58.3	51.3	57.9	57.1
2	MO080104	53.5	56.1	55.0	61.3	60.4
3	Hilliard	54.7	55.2	53.5	60.2	60.3
4	Pioneer Brand 25R46	42.1	57.3	48.0	55.5	61.3
5	0762A1-2-8	52.7	54.4	52.2	58.6	55.6
6	IL10-21934	52.2	60.4	51.8	58.1	59.4
7	TN1603	47.0	58.1	48.8	59.0	58.5
8	VA11W-279	52.4	59.9	54.1	57.8	58.1
9	VA11W-313	52.0	63.6	52.2	60.9	60.3
10	VA12W-31	51.9	62.1	50.2	60.5	60.2
11	KWS 072	53.2	63.4	53.2	61.9	58.6
12	KWS 074	52.5	59.1	49.7	61.1	58.0
13	KWS 078	53.8	55.8	53.3	61.0	62.5
14	KY06C-1178-16-10-3	51.1	56.2	47.4	60.2	59.8
15	KY06C-1195-37-2-5	51.2	57.5	47.6	60.4	59.5
16	KY06C-2067-16-7-1	50.5	57.9	50.8	60.2	57.2
17	IL11-28222	52.0	60.7	51.2	63.0	59.7
18	IL11-6543	46.6	60.0	54.5	63.2	60.9
19	OK11311F	56.0	63.2	54.5	59.0	55.9
20	DH11SRW8-59	51.8	60.7	53.0	60.3	59.7
21	DH11SRW41-26	53.5	58.1	53.0	59.0	59.2
22	AR06017-6-2	52.2	58.5	51.4	55.6	59.0
23	AR06050-7-2	55.8	58.0	54.8	58.7	62.1
24	MD09W272-8-4-13-3-15	52.8	63.9	53.8	59.8	59.4
25	MD09W272-8-4-14-6	50.4	56.2	51.8	59.6	59.3
26	MD09W272-8-4-14-8	51.5	62.3	52.2	60.0	58.7
27	OH10-219-65	46.6	59.0	46.6	60.4	57.3
28	OH09-207-68	53.6	57.0	50.8	55.8	57.5
29	04620A1-1-7-4-17	49.8	62.1	51.9	61.1	58.5
30	06497A1-7-3	53.9	57.0	52.5	59.9	58.9
LOCATION MEANS		51.6	59.0	51.7	59.7	59.1

TEST WEIGHT (lbs/bu)

	Raleigh NC Marshall	Custar OH Sneller	Napoleon OH Obert	Nairn ON Etienne	Knoxville TN West	
1	Branson	54.3	60.8	59.4	61.9	56.4
2	MO080104	56.8	62.6	59.2	63.9	59.9
3	Hilliard	54.7	60.9	58.4	62.4	58.5
4	Pioneer Brand 25R46	55.1	61.8	59.5	58.3	55.6
5	0762A1-2-8	53.0	57.8	59.9	58.5	56.2
6	IL10-21934	54.2	62.1	61.3	62.4	57.9
7	TN1603	51.6	59.3	60.7	59.5	55.3
8	VA11W-279	56.4	71.5	60.3	64.2	59.3
9	VA11W-313	52.3	59.4	62.7	60.0	56.8
10	VA12W-31	55.9	61.2	61.6	60.5	57.9
11	KWS 072	55.3	62.1	59.9	62.2	57.6
12	KWS 074	56.0	61.4	61.8	60.8	56.9
13	KWS 078	55.8	61.5	61.2	62.1	58.8
14	KY06C-1178-16-10-3	55.6	60.9	59.6	59.5	56.7
15	KY06C-1195-37-2-5	53.7	60.7	60.3	59.7	58.9
16	KY06C-2067-16-7-1	54.7	59.4	60.1	60.4	58.5
17	IL11-28222	56.8	62.7	61.3	65.0	60.2
18	IL11-6543	57.1	64.0	60.7	64.8	61.2
19	OK11311F	54.6	64.2	60.7	63.5	59.3
20	DH11SRW8-59	55.1	61.5	62.3	60.2	58.2
21	DH11SRW41-26	54.1	60.8	62.4	61.1	58.9
22	AR06017-6-2	52.2	60.3	59.9	62.2	58.5
23	AR06050-7-2	55.0	62.9	61.4	63.3	58.4
24	MD09W272-8-4-13-3-15	54.2	60.0	60.3	62.7	57.8
25	MD09W272-8-4-14-6	54.4	57.3	60.9	61.0	57.7
26	MD09W272-8-4-14-8	53.3	65.1	58.5	61.5	57.8
27	OH10-219-65	55.3	57.2	61.0	59.7	57.6
28	OH09-207-68	55.2	61.7	60.5	62.5	58.1
29	04620A1-1-7-4-17	55.0	59.6	59.8	61.0	57.0
30	06497A1-7-3	55.5	59.6	60.6	62.0	57.1
LOCATION MEANS		54.8	61.3	60.5	61.6	58.0

TEST WEIGHT (lbs/bu)

		Blacksburg VA	Warsaw VA	Arlington WI	ENTRY MEANS ALL LOCATIONS	
		Griffey	Griffey	Roth		rank
1	Branson	53.4	56.6	57.2	56.4	21
2	MO080104	56.4	59.0	58.8	58.8	3
3	Hilliard	54.4	58.0	58.4	57.6	9
4	Pioneer Brand 25R46	52.4	57.5	55.0	55.4	28
5	0762A1-2-8	51.8	56.1	56.3	54.8	30
6	IL10-21934	56.2	58.4	56.7	57.2	13
7	TN1603	50.3	56.5	55.8	54.7	31
8	VA11W-279	55.0	58.5	60.0	58.3	5
9	VA11W-313	53.3	56.0	57.5	55.9	26
10	VA12W-31	54.2	57.7	58.2	56.9	19
11	KWS 072	57.4	58.7	58.7	57.5	10
12	KWS 074	54.2	58.1	56.9	57.0	17
13	KWS 078	56.1	58.3	58.4	57.6	8
14	KY06C-1178-16-10-3	52.8	58.8	58.6	55.6	27
15	KY06C-1195-37-2-5	55.4	59.2	56.3	56.2	24
16	KY06C-2067-16-7-1	53.4	58.2	57.8	56.3	23
17	IL11-28222	58.5	57.6	59.1	58.0	7
18	IL11-6543	58.9	59.6	58.1	59.2	1
19	OK11311F	56.3	57.4	60.8	59.0	2
20	DH11SRW8-59	54.0	57.9	58.4	57.3	11
21	DH11SRW41-26	55.2	56.9	58.5	56.9	18
22	AR06017-6-2	53.1	55.9	57.8	56.1	25
23	AR06050-7-2	56.0	57.2	59.4	58.7	4
24	MD09W272-8-4-13-3-15	55.0	57.7	59.8	58.1	6
25	MD09W272-8-4-14-6	53.2	57.3	59.1	56.6	20
26	MD09W272-8-4-14-8	53.1	57.8	59.0	57.1	14
27	OH10-219-65	53.3	56.0	54.8	55.2	29
28	OH09-207-68	54.2	57.5	58.6	57.0	15
29	04620A1-1-7-4-17	53.7	56.1	58.4	56.5	21
30	06497A1-7-3	55.8	57.2	58.1	57.2	12
LOCATION MEANS		54.5	57.6	58.0	57.0	

HEADING DATE (Julian days)

	Marianna AR Mason	Griffin GA Mergoum	Champaign IL Murche	Urbana IL Kolb	Battle Ground IN Brown	
1	Branson	109	108	128.4	128	128.0
2	MO080104	104	106	130.0	129	128.0
3	Hilliard	107	106	128.9	129	128.0
4	Pioneer Brand 25R46	111	112	132.7	132	130.0
5	0762A1-2-8	107	106	130.9	131	126.5
6	IL10-21934	103	95	125.3	127	126.0
7	TN1603	105	106	128.9	130	129.0
8	VA11W-279	104	103	126.7	128	125.5
9	VA11W-313	103	103	125.3	126	125.0
10	VA12W-31	111	99	129.9	131	128.0
11	KWS 072	99	111	123.7	125	125.0
12	KWS 074	111	112	129.7	129	129.0
13	KWS 078	110	105	130.3	130	129.0
14	KY06C-1178-16-10-3	111	111	130.2	131	130.0
15	KY06C-1195-37-2-5	107	97	129.6	131	130.5
16	KY06C-2067-16-7-1	109	108	129.4	130	128.5
17	IL11-28222	109	112	129.0	130	128.0
18	IL11-6543	114	111	130.0	129	132.0
19	OK11311F	109	107	128.4	129	128.5
20	DH11SRW8-59	111	110	130.4	130	129.0
21	DH11SRW41-26	110	113	131.0	130	129.5
22	AR06017-6-2	106	100	129.9	131	130.5
23	AR06050-7-2	106	106	129.7	130	130.0
24	MD09W272-8-4-13-3-15	104	98	130.0	130	128.5
25	MD09W272-8-4-14-6	104	99	130.4	130	128.5
26	MD09W272-8-4-14-8	104	101	130.1	130	130.5
27	OH10-219-65	111	112	129.0	129	130.0
28	OH09-207-68	107	111	130.8	129	128.5
29	04620A1-1-7-4-17	111	113	130.3	130	131.0
30	06497A1-7-3	114	111	133.0	133	130.5
LOCATION MEANS	107.7	106.4	129.4	129.6	128.7	

HEADING DATE (Julian days)

		New Haven	W Lafayette	Windfall	Lexington	Schochoh
		IN	IN	IN	KY	KY
		Murche	Mohammadi	Lively	Van Sanford	Van Sanford
1	Branson	139.7	131.8	130	120.5	113.6
2	MO080104	141.3	131.8	131	120.4	111.6
3	Hilliard	140.7	133.5	132	119.1	111.2
4	Pioneer Brand 25R46	143.0	133.8	133	120.5	117.8
5	0762A1-2-8	142.0	133.3	131	118.6	112.5
6	IL10-21934	138.7	130.5	129	113.8	107.7
7	TN1603	140.0	131.3	132	116.0	111.3
8	VA11W-279	140.0	132.8	131	116.2	108.9
9	VA11W-313	139.1	132.3	128	114.6	108.7
10	VA12W-31	142.0	132.5	133	120.0	116.7
11	KWS 072	137.0	132.8	128	113.6	107.7
12	KWS 074	141.3	132.8	131	120.5	114.7
13	KWS 078	142.3	133.3	133	119.3	116.8
14	KY06C-1178-16-10-3	142.5	132.8	132	120.3	114.4
15	KY06C-1195-37-2-5	142.0	132.3	133	121.2	109.2
16	KY06C-2067-16-7-1	142.0	132.0	131	120.6	112.4
17	IL11-28222	140.0	132.5	131	119.5	117.8
18	IL11-6543	140.0	134.8	132	122.7	118.7
19	OK11311F	139.7	132.3	133	119.5	112.9
20	DH11SRW8-59	143.0	133.5	132	124.1	117.8
21	DH11SRW41-26	141.7	132.8	132	119.4	117.3
22	AR06017-6-2	143.0	133.3		119.9	109.9
23	AR06050-7-2	141.9	132.0	133	118.0	110.8
24	MD09W272-8-4-13-3-15	141.7	131.8	133	117.2	111.2
25	MD09W272-8-4-14-6	142.0	133.3	133	119.2	112.3
26	MD09W272-8-4-14-8	142.0	133.3	132	119.0	111.9
27	OH10-219-65	140.7	133.0	131	120.9	115.7
28	OH09-207-68	140.7	134.0	128	118.6	111.7
29	04620A1-1-7-4-17	142.3	133.5	132	122.2	116.7
30	06497A1-7-3	143.0	133.3	134	122.7	
LOCATION MEANS		141.2	132.7	131.5	119.3	113.1

HEADING DATE (Julian days)

	Mason MI Olson	Columbia MO McKendry	Ithaca NY Sorrells	Clayton NC Murphy	Raleigh NC Marshall	
1	Branson	143.5	126.3	147	107	104
2	MO080104	145.0	129.0	147	104	103
3	Hilliard	144.0	126.7	147	105	104
4	Pioneer Brand 25R46	146.5	120.3	149	112	110
5	0762A1-2-8	143.5	124.3	148	107	105
6	IL10-21934	142.5	125.3	146	90	91
7	TN1603	144.5	126.0	147	106	103
8	VA11W-279	143.5	125.3	147	99	102
9	VA11W-313	142.0	122.3	145	98	98
10	VA12W-31	146.0	123.7	149	110	107
11	KWS 072	141.0	124.0	144	97	96
12	KWS 074	144.5	126.7	147	112	108
13	KWS 078	145.0	127.7	149	112	107
14	KY06C-1178-16-10-3	146.0	126.0	149	115	108
15	KY06C-1195-37-2-5	145.0	125.7	149	99	97
16	KY06C-2067-16-7-1	144.0	126.3	148	107	105
17	IL11-28222	145.0	126.0	147	112	108
18	IL11-6543	144.5	126.0	147	115	114
19	OK11311F	144.5	120.0	147	112	108
20	DH11SRW8-59	145.5	126.3	149	112	110
21	DH11SRW41-26	145.5	125.3	148	110	107
22	AR06017-6-2	145.0	125.0	149	97	99
23	AR06050-7-2	144.0	129.3	148	103	103
24	MD09W272-8-4-13-3-15	144.0	122.3	147	98	98
25	MD09W272-8-4-14-6	143.0	126.3	147	99	101
26	MD09W272-8-4-14-8	144.5	118.7	147	99	102
27	OH10-219-65	144.0	126.0	147	112	109
28	OH09-207-68	143.5	125.0	147	101	104
29	04620A1-1-7-4-17	144.5	125.0	148	112	107
30	06497A1-7-3	144.5	126.3	149	115	108
LOCATION MEANS		144.3	125.1	147.5	105.9	104.2

HEADING DATE (Julian days)

	Napoleon OH Obert	Nairn ON Etienne	Knoxville TN West	Blacksburg VA Griffey	Warsaw VA Griffey	
1	Branson	141.0	149.0	113	123.0	114.5
2	MO080104	143.0	149.0	113	121.5	112.0
3	Hilliard	142.0	149.5	113	123.0	115.0
4	Pioneer Brand 25R46	144.0	149.0	116	125.0	119.0
5	0762A1-2-8	142.0	151.0	114	123.0	114.5
6	IL10-21934	140.0	148.5	104	118.5	101.5
7	TN1603	142.5	149.5	113	121.0	112.5
8	VA11W-279	141.5	150.0	109	119.5	109.0
9	VA11W-313	140.0	148.5	109	118.0	107.5
10	VA12W-31	144.0	150.0	116	125.0	117.5
11	KWS 072	138.5	147.0	107	118.5	106.0
12	KWS 074	142.0	148.5	117	124.0	118.0
13	KWS 078	144.0	151.0	114	124.0	118.0
14	KY06C-1178-16-10-3	143.0	150.5	116	124.5	118.0
15	KY06C-1195-37-2-5	142.5	150.5	112	124.0	114.5
16	KY06C-2067-16-7-1	142.5	150.5	114	124.0	115.0
17	IL11-28222	142.0	149.0	116	122.5	117.5
18	IL11-6543	142.0	148.0	118	124.5	119.0
19	OK11311F	141.5	149.0	117	122.0	116.0
20	DH11SRW8-59	143.5	151.0	118	125.0	118.5
21	DH11SRW41-26	144.5	149.5	116	124.0	116.0
22	AR06017-6-2	144.0	151.5	113	121.0	110.5
23	AR06050-7-2	142.5	150.0	112	120.5	112.0
24	MD09W272-8-4-13-3-15	143.0	149.5	112	121.5	110.0
25	MD09W272-8-4-14-6	145.0	150.5	114	122.0	112.5
26	MD09W272-8-4-14-8	142.5	150.0	112	123.0	111.0
27	OH10-219-65	141.5	149.0	115	124.0	117.0
28	OH09-207-68	141.0	149.0	112	121.0	112.0
29	04620A1-1-7-4-17	145.0	150.0	116	123.5	116.0
30	06497A1-7-3	146.5	149.5	116	124.0	118.5
LOCATION MEANS		142.6	149.6	113.6	122.5	114.0

HEADING DATE (Julian days)

ENTRY MEANS ALL LOCATIONS

			rank
1	Branson	125.3	15
2	MO080104	125.0	12
3	Hilliard	125.2	14
4	Pioneer Brand 25R46	127.8	27
5	0762A1-2-8	125.6	16
6	IL10-21934	120.2	1
7	TN1603	124.7	10
8	VA11W-279	123.1	4
9	VA11W-313	121.7	3
10	VA12W-31	126.6	19
11	KWS 072	121.1	2
12	KWS 074	126.9	22
13	KWS 078	127.0	23
14	KY06C-1178-16-10-3	127.6	26
15	KY06C-1195-37-2-5	124.6	9
16	KY06C-2067-16-7-1	126.0	18
17	IL11-28222	126.7	20
18	IL11-6543	128.1	29
19	OK11311F	125.8	17
20	DH11SRW8-59	128.0	28
21	DH11SRW41-26	127.1	24
22	AR06017-6-2	124.1	6
23	AR06050-7-2	125.1	13
24	MD09W272-8-4-13-3-15	123.5	5
25	MD09W272-8-4-14-6	124.6	8
26	MD09W272-8-4-14-8	124.2	7
27	OH10-219-65	126.8	21
28	OH09-207-68	124.7	11
29	04620A1-1-7-4-17	127.5	25
30	06497A1-7-3	129.0	30
LOCATION MEANS		125.4	

HEIGHT (inches)

	Marianna AR Mason	Griffin GA Mergoum	Brownstown IL Kolb	Champaign IL Murche	Urbana IL Kolb	
1	Branson	32.5	33	40	45.3	42
2	MO080104	38.0	35	43	48.5	47
3	Hilliard	36.5	34	41	45.6	44
4	Pioneer Brand 25R46	32.5	32	36	44.1	44
5	0762A1-2-8	33.0	29	37	42.4	40
6	IL10-21934	33.5	36	40	45.4	44
7	TN1603	33.5	35	41	42.0	42
8	VA11W-279	30.0	31	36	38.5	38
9	VA11W-313	30.0	30	35	39.5	39
10	VA12W-31	32.5	30	38	42.0	41
11	KWS 072	33.0	30	37	41.0	40
12	KWS 074	32.0	33	40	43.5	43
13	KWS 078	38.5	38	41	46.0	46
14	KY06C-1178-16-10-3	35.0	37	43	45.8	46
15	KY06C-1195-37-2-5	35.0	33	39	44.0	43
16	KY06C-2067-16-7-1	32.5	31	39	43.7	42
17	IL11-28222	34.0	32	40	44.7	44
18	IL11-6543	36.5	33	41	45.9	45
19	OK11311F	34.5	35	41	45.3	43
20	DH11SRW8-59	33.5	32	35	42.3	41
21	DH11SRW41-26	35.5	31	43	45.7	46
22	AR06017-6-2	32.0	29	39	44.2	42
23	AR06050-7-2	37.5	38	42	47.7	47
24	MD09W272-8-4-13-3-15	33.5	30	38	41.3	39
25	MD09W272-8-4-14-6	30.5	29	38	42.1	39
26	MD09W272-8-4-14-8	34.0	31	38	41.4	39
27	OH10-219-65	31.0	32	40	45.7	43
28	OH09-207-68	41.5	34	44	47.4	46
29	04620A1-1-7-4-17	33.0	29	37	38.7	39
30	06497A1-7-3	37.5	34	42	46.7	44
LOCATION MEANS	34.1	32.5	39.5	43.9	42.6	

HEIGHT (inches)

	Battle Ground	New Haven	W Lafayette	Lexington	Schochoh	
	IN	IN	IN	KY	KY	
	Brown	Murche	Mohammadi	Van Sanford	Van Sanford	
1	Branson	39	36.9	38.1	34.2	38.9
2	MO080104	45	41.3	42.0	33.9	46.8
3	Hilliard	43	39.4	39.0	32.4	42.1
4	Pioneer Brand 25R46	40	37.7	38.8	34.3	40.9
5	0762A1-2-8	38	35.0	35.8	28.8	38.8
6	IL10-21934	40	40.3	40.5	34.5	41.7
7	TN1603	37	38.5	38.1	29.0	39.8
8	VA11W-279	36	35.0	35.0	28.5	39.4
9	VA11W-313	36	34.1	35.0	27.4	37.0
10	VA12W-31	38	36.2	37.0	34.1	40.2
11	KWS 072	38	34.0	37.0	28.0	41.0
12	KWS 074	40	37.4	39.5	34.7	42.1
13	KWS 078	44	40.9	42.0	34.5	43.0
14	KY06C-1178-16-10-3	42	40.2	41.1	33.6	44.8
15	KY06C-1195-37-2-5	38	39.8	39.3	32.1	43.4
16	KY06C-2067-16-7-1	37	36.1	40.2	30.9	42.2
17	IL11-28222	43	39.0	40.2	33.9	41.6
18	IL11-6543	43	38.0	41.4	36.9	42.7
19	OK11311F	40	38.1	38.7	31.7	40.3
20	DH11SRW8-59	39	36.2	36.5	32.5	38.7
21	DH11SRW41-26	38	41.5	42.2	36.0	48.6
22	AR06017-6-2	37	37.8	36.4	30.5	38.6
23	AR06050-7-2	43	39.7	40.4	36.4	45.2
24	MD09W272-8-4-13-3-15	37	35.3	35.7	26.9	38.3
25	MD09W272-8-4-14-6	37	35.6	36.4	29.0	38.6
26	MD09W272-8-4-14-8	38	35.3	35.6	29.0	37.2
27	OH10-219-65	42	39.2	40.9	34.5	44.9
28	OH09-207-68	43	39.3	43.3	35.9	45.2
29	04620A1-1-7-4-17	37	34.8	36.1	33.0	38.1
30	06497A1-7-3	40	37.8	38.9	38.8	47.3
LOCATION MEANS	39.6	37.7	38.7	32.5	41.6	

HEIGHT (inches)

	Columbia MO McKendry	Ithaca NY Sorrells	Raleigh NC Marshall	Napoleon OH Obert	Nairn ON Etienne	
1	Branson	40	34	30	37.5	36.6
2	MO080104	36	38	36	45.0	41.5
3	Hilliard	41	34	36	37.0	38.6
4	Pioneer Brand 25R46	33	32	32	37.5	36.0
5	0762A1-2-8	36	30	32	37.0	33.5
6	IL10-21934	36	36	35	39.5	38.2
7	TN1603	36	33	34	39.5	36.6
8	VA11W-279	42	30	33	34.5	34.3
9	VA11W-313	34	31	31	33.5	31.1
10	VA12W-31	38	31	31	36.0	34.1
11	KWS 072	35	32	34	36.5	32.3
12	KWS 074	40	34	33	40.0	37.2
13	KWS 078	39	37	34	41.0	38.8
14	KY06C-1178-16-10-3	42	36	34	41.5	38.6
15	KY06C-1195-37-2-5	44	36	33	40.0	34.3
16	KY06C-2067-16-7-1	42	32	32	39.5	38.4
17	IL11-28222	39	37	34	40.5	33.9
18	IL11-6543	39	36	36	40.0	35.2
19	OK11311F	42	32	32	38.0	34.3
20	DH11SRW8-59	35	30	31	35.5	33.7
21	DH11SRW41-26	38	39	35	45.5	39.8
22	AR06017-6-2	39	34	32	36.0	35.2
23	AR06050-7-2	39	36	36	39.5	35.4
24	MD09W272-8-4-13-3-15	40	31	31	35.5	34.6
25	MD09W272-8-4-14-6	41	30	31	34.5	34.4
26	MD09W272-8-4-14-8	37	31	31	35.0	35.6
27	OH10-219-65	38	36	33	44.0	35.2
28	OH09-207-68	40	37	35	44.0	37.8
29	04620A1-1-7-4-17	38	30	33	35.5	31.7
30	06497A1-7-3	39	34	35	40.5	36.6
LOCATION MEANS	38.6	33.6	33.2	38.7	35.8	

HEIGHT (inches)

		Knoxville	Blacksburg	Warsaw	Arlington	ENTRY MEANS	
		TN	VA	VA	WI	ALL LOCATIONS	rank
		West	Griffey	Griffey	Roth		
1	Branson	32	31.0	31.0	38.0	36.3	17
2	MO080104	35	34.0	32.0	45.0	40.2	1
3	Hilliard	34	30.5	30.5	40.3	37.8	10
4	Pioneer Brand 25R46	36	30.5	31.5	37.3	36.1	20
5	0762A1-2-8	36	29.5	29.0	37.0	34.6	25
6	IL10-21934	30	31.5	32.0	41.3	37.7	11
7	TN1603	35	29.0	30.0	40.0	36.3	19
8	VA11W-279	34	27.5	29.0	36.7	34.1	30
9	VA11W-313	34	27.0	27.0	36.0	33.0	31
10	VA12W-31	35	30.5	29.5	37.0	35.3	21
11	KWS 072	30	31.0	30.0	39.3	34.7	24
12	KWS 074	34	30.5	31.5	39.0	37.1	14
13	KWS 078	29	31.5	34.0	42.0	39.0	5
14	KY06C-1178-16-10-3	35	30.0	31.5	40.7	38.8	6
15	KY06C-1195-37-2-5	33	28.5	31.5	39.0	37.2	13
16	KY06C-2067-16-7-1	34	31.0	30.5	38.7	36.5	17
17	IL11-28222	35	32.5	30.5	39.3	37.6	12
18	IL11-6543	38	32.5	33.0	38.7	38.5	8
19	OK11311F	37	29.0	30.0	39.3	36.9	15
20	DH11SRW8-59	32	28.0	30.0	35.7	34.6	26
21	DH11SRW41-26	39	37.0	33.0	43.3	39.8	3
22	AR06017-6-2	31	28.5	27.5	37.7	35.1	22
23	AR06050-7-2	34	34.0	33.5	43.7	39.4	4
24	MD09W272-8-4-13-3-15	36	28.5	28.0	36.0	34.5	27
25	MD09W272-8-4-14-6	37	31.0	27.5	38.0	34.7	23
26	MD09W272-8-4-14-8	31	25.5	28.0	37.0	34.2	28
27	OH10-219-65	33	34.0	33.0	43.0	38.0	9
28	OH09-207-68	35	33.5	34.0	42.3	39.9	2
29	04620A1-1-7-4-17	35	27.5	28.5	34.3	34.2	29
30	06497A1-7-3	33	34.0	35.0	40.0	38.6	7
LOCATION MEANS		34.1	30.6	30.7	39.2	36.7	

LODGING

	Marianna	Champaign	Urbana	Battle Ground	Schochoh
	AR	IL	IL	IN	KY
	Mason	Murche	Kolb	Brown	Van Sanford
	0-9	0-9	0-9	0-9	0-9
1 Branson	1.0	2.0	1.0	2.3	0.0
2 MO080104	1.5	1.0	1.0	3.0	0.0
3 Hilliard	0.0	1.3	1.0	1.5	0.0
4 Pioneer Brand 25R46	3.0	1.0	1.0	7.5	0.0
5 0762A1-2-8	3.5	1.0	1.0	9.0	0.0
6 IL10-21934	9.0	2.3	1.7	8.3	2.0
7 TN1603	5.0	3.3	1.0	8.5	9.0
8 VA11W-279	0.0	1.3	1.0	5.0	0.0
9 VA11W-313	4.5	2.3	1.0	3.5	0.0
10 VA12W-31	0.0	1.0	1.7	8.8	0.0
11 KWS 072	7.0	1.0	1.0	9.0	0.0
12 KWS 074	0.0	1.0	1.0	8.5	0.0
13 KWS 078	2.5	4.3	1.0	5.5	4.5
14 KY06C-1178-16-10-3	3.0	1.0	1.0	8.8	0.0
15 KY06C-1195-37-2-5	4.5	1.3	1.0	8.0	5.8
16 KY06C-2067-16-7-1	3.0	1.0	1.0	8.5	7.0
17 IL11-28222	9.0	1.3	1.0	4.0	9.0
18 IL11-6543	0.0	1.3	1.0	2.8	0.0
19 OK11311F	0.5	1.0	1.0	3.5	2.0
20 DH11SRW8-59	0.0	1.3	1.0	1.0	0.0
21 DH11SRW41-26	2.5	1.0	1.0	4.0	5.0
22 AR06017-6-2	3.0	1.7	1.0	2.5	0.0
23 AR06050-7-2	1.5	1.3	1.0	2.3	6.5
24 MD09W272-8-4-13-3-15	0.0	1.0	1.0	3.3	2.5
25 MD09W272-8-4-14-6	2.5	1.0	1.0	4.8	0.0
26 MD09W272-8-4-14-8	0.0	1.0	1.0	5.5	0.0
27 OH10-219-65	5.0	1.0	1.0	8.8	0.0
28 OH09-207-68	0.0	1.0	1.0	1.8	5.0
29 04620A1-1-7-4-17	1.5	1.0	1.0	3.0	0.0
30 06497A1-7-3	0.5	1.0	1.0	4.5	0.0
LOCATION MEANS	2.5	1.4	1.0	5.2	1.9
GROWTH STAGE / DATE				June 27	

LODGING

		Columbia MO McKendry 0-9	Raleigh NC Marshall	Nairn ON Etienne 0-9	Blacksburg VA Griffey 0-9	Warsaw VA Griffey 0-9
1	Branson	3.0	1	2.0	0.5	0.5
2	MO080104	2.3	0	2.0	1.5	0.0
3	Hilliard	1.7	1	0.0	0.5	0.0
4	Pioneer Brand 25R46	0.7	0	0.0	0.0	0.0
5	0762A1-2-8	0.7	0	0.0	0.5	0.0
6	IL10-21934	3.3	0	1.5	2.0	0.0
7	TN1603	4.0	2	0.0	3.5	0.0
8	VA11W-279	2.3	1	1.5	5.0	0.0
9	VA11W-313	3.3	0	1.5	2.5	0.0
10	VA12W-31	1.3	0	0.0	4.5	0.0
11	KWS 072	2.7	0	1.0	0.5	0.0
12	KWS 074	1.0	0	0.0	0.5	0.0
13	KWS 078	2.3	0	1.5	3.0	1.0
14	KY06C-1178-16-10-3	1.7	0	0.0	1.5	0.5
15	KY06C-1195-37-2-5	1.0	1	0.0	2.5	0.0
16	KY06C-2067-16-7-1	1.0	0	0.0	0.0	0.0
17	IL11-28222	3.0	1	1.5	1.0	0.5
18	IL11-6543	3.0	1	1.5	1.0	0.5
19	OK11311F	0.3	0	0.0	0.5	0.0
20	DH11SRW8-59	1.7	0	0.0	0.5	0.0
21	DH11SRW41-26	2.0	1	1.5	1.0	0.0
22	AR06017-6-2	2.7	3	0.0	1.0	0.0
23	AR06050-7-2	3.0	1	0.0	1.0	0.0
24	MD09W272-8-4-13-3-15	1.0	1	0.0	1.0	0.0
25	MD09W272-8-4-14-6	1.7	1	0.0	1.5	0.5
26	MD09W272-8-4-14-8	1.3	1	0.0	2.0	0.0
27	OH10-219-65	3.7	0	0.0	0.5	0.0
28	OH09-207-68	1.0	1	0.0	0.5	0.0
29	04620A1-1-7-4-17	2.0	0	0.0	0.0	0.0
30	06497A1-7-3	1.3	0	0.5	0.5	0.5
LOCATION MEANS		2.0	0.6	0.5	1.4	0.1
GROWTH STAGE / DATE						

LODGING

	Arlington WI Roth 0-9
1 Branson	0
2 MO080104	4
3 Hilliard	0
4 Pioneer Brand 25R46	0
5 0762A1-2-8	0
6 IL10-21934	3
7 TN1603	0
8 VA11W-279	0
9 VA11W-313	0
10 VA12W-31	0
11 KWS 072	0
12 KWS 074	0
13 KWS 078	0
14 KY06C-1178-16-10-3	0
15 KY06C-1195-37-2-5	0
16 KY06C-2067-16-7-1	0
17 IL11-28222	0
18 IL11-6543	0
19 OK11311F	0
20 DH11SRW8-59	0
21 DH11SRW41-26	3
22 AR06017-6-2	0
23 AR06050-7-2	3
24 MD09W272-8-4-13-3-15	0
25 MD09W272-8-4-14-6	0
26 MD09W272-8-4-14-8	3
27 OH10-219-65	0
28 OH09-207-68	3
29 04620A1-1-7-4-17	0
30 06497A1-7-3	0
LOCATION MEANS	0.6
GROWTH STAGE / DATE	

WINTER DAMAGE

	Champaign IL Murche 0-9	Battle Ground IN Brown 0-9	Windfall IN Lively 0-9	Ithaca NY Sorrrells 0-9	Nairn ON Etienne 0-9
1	Branson	0.8	1.3	2	0.7
2	MO080104	1.8	2.3	3	0.2
3	Hilliard	2.3	1.8	4	0.2
4	Pioneer Brand 25R46	0.9	1.0	1	0.7
5	0762A1-2-8	0.8	2.0	3	0.7
6	IL10-21934	2.8	4.0	5	0.7
7	TN1603	3.0	3.3	7	0.7
8	VA11W-279	3.7	3.8	6	0.7
9	VA11W-313	2.8	3.3	4	0.5
10	VA12W-31	2.2	3.0	4	0.9
11	KWS 072	1.1	2.8	4	1.1
12	KWS 074	1.1	1.5	1	0.9
13	KWS 078	1.0	1.5	2	0.9
14	KY06C-1178-16-10-3	1.1	1.8	3	0.7
15	KY06C-1195-37-2-5	3.7	3.8	6	1.1
16	KY06C-2067-16-7-1	1.0	2.0	3	0.7
17	IL11-28222	1.0	2.3	3	0.5
18	IL11-6543	0.8	1.5	2	0.7
19	OK11311F	2.4	2.5	3	1.1
20	DH11SRW8-59	1.1	1.0	2	0.7
21	DH11SRW41-26	0.9	1.8	2	0.5
22	AR06017-6-2	1.2	2.8	5	1.6
23	AR06050-7-2	0.8	2.5	4	0.2
24	MD09W272-8-4-13-3-15	3.8	3.3	7	0.7
25	MD09W272-8-4-14-6	2.9	3.5	6	0.5
26	MD09W272-8-4-14-8	3.0	2.8	6	0.5
27	OH10-219-65	1.2	1.8	3	1.4
28	OH09-207-68	1.1	1.0	1	2.0
29	04620A1-1-7-4-17	1.0	1.0	1	1.1
30	06497A1-7-3	1.2	4.0	3	2.3
LOCATION MEANS	1.8	2.3	3.5	0.2	0.8
GROWTH STAGE / DATE		March 9	March 8		

LEAF RUST

	Champaign IL Murche 0-9	Windfall IN Lively 0-9	Schochoh KY Van Sanford 0-9	Blacksburg VA Griffey 0-9	Warsaw VA Griffey 0-9
1 Branson	3.7	5	1.0	2.0	4.5
2 MO080104	4.0	6	2.0	6.0	5.0
3 Hilliard	2.0	0	0.0	1.0	3.0
4 Pioneer Brand 25R46		5		7.0	4.5
5 0762A1-2-8	4.0	5	1.0	5.5	3.0
6 IL10-21934	2.0	4		5.0	5.5
7 TN1603	3.0	8	6.5	9.0	5.0
8 VA11W-279	1.0	0	0.0	0.0	0.5
9 VA11W-313	1.7	0		1.5	2.0
10 VA12W-31	2.0	1	1.0	2.0	1.5
11 KWS 072	2.3	2		2.5	2.5
12 KWS 074	2.3	3	1.0	3.5	3.5
13 KWS 078	2.0	0		0.5	3.0
14 KY06C-1178-16-10-3	2.5	6		7.5	5.0
15 KY06C-1195-37-2-5		1		1.0	1.5
16 KY06C-2067-16-7-1	2.0	2		7.0	5.5
17 IL11-28222	1.0	0	2.0	3.0	1.5
18 IL11-6543	1.7	3	2.0	5.5	3.5
19 OK11311F	2.3	0		2.0	0.5
20 DH11SRW8-59	3.7	6	7.0	7.5	4.5
21 DH11SRW41-26	3.3	7		7.0	3.0
22 AR06017-6-2	3.0	1	1.0	0.5	0.5
23 AR06050-7-2	2.0	1	0.0	5.0	3.5
24 MD09W272-8-4-13-3-15	1.0	0	0.0	0.5	0.5
25 MD09W272-8-4-14-6	1.0	0	1.0	0.0	0.0
26 MD09W272-8-4-14-8	1.0	0	0.0	0.5	0.0
27 OH10-219-65		3		3.0	4.0
28 OH09-207-68	4.7	7	8.0	6.0	4.0
29 04620A1-1-7-4-17	6.7	8	4.0	7.0	4.5
30 06497A1-7-3	2.3	5		5.5	5.0
LOCATION MEANS	2.5	3.0	2.1	3.8	3.0
GROWTH STAGE / DATE		June 8			

LEAF RUST (SEEDLING)

St. Paul
MN
Kolmer

	Lr gene marker*	Lr gene postulation	TNBGJ	TNRJJ	TBBGS	
1	Branson	Lr2a	3+	3+	3+	
2	MO080104	Lr14a	;23	3+	;	
3	Hilliard	Lr18	;	;23	;	
4	Pioneer Brand 25R46	Lr26	Lr17, Lr26	;	;	
5	0762A1-2-8	Lr37	Lr24,+	-	2+3	
6	IL10-21934	---	3+	3+	3+	
7	TN1603	---	Lr1	3+	3+	32+;
8	VA11W-279	Lr37	Lr11,Lr17, Lr26	;	;	;
9	VA11W-313	---	Lr18	;	;	;
10	VA12W-31	---	+	;	;	;
11	KWS 072	---	Lr11, Lr26	;12	3+;	;
12	KWS 074	---	---	-	3+	3+
13	KWS 078	Lr9	Lr9	3	3+	;
14	KY06C-1178-16-10-3	---	---	32+	3+	;2-
15	KY06C-1195-37-2-5	Lr9	Lr9, Lr11	;2-	3+	;
16	KY06C-2067-16-7-1	Lr26	Lr11	;	3+	;
17	IL11-28222	---	Lr11,+	;3	3+	;
18	IL11-6543	---	---	3+	3+	3
19	OK11311F	Lr37,Lr24	Lr1, Lr10, Lr14a	3+	3+	32+;
20	DH11SRW8-59	---	Lr11	;	2+3	;
21	DH11SRW41-26	Lr9?, Lr26	Lr26	;2	;	;
22	AR06017-6-2	---	Lr9, Lr24	;	32+	;
23	AR06050-7-2	---	Lr18	;	;1-	;
24	MD09W272-8-4-13-3-15	Lr37, Lr26	+	;	;	;
25	MD09W272-8-4-14-6	Lr37, Lr26	+	;	;	;
26	MD09W272-8-4-14-8	Lr37, Lr26	Lr18	;	;	;
27	OH10-219-65	---	Lr10	3+	3+	32+;
28	OH09-207-68	---	Lr10	3+	3+	32+;
29	04620A1-1-7-4-17	---	---	;23	3+	32+;
30	06497A1-7-3	---	Lr26, +	-	;	;

* marker data from Gina Brown-Guedira

+ = additional resistance, unable to postulate

--- = no resistance

LEAF RUST (SEEDLING)

St. Paul
MN
Kolmer

		TCRKG	KFBJG	MBDSD	MCTNB	MFJSB	MJBGJ	PBLRG
1	Branson	3+	3+	0;	0;	0;	0;	;
2	MO080104	3+	32+;	;22+	3+	3+	3+	;2+
3	Hilliard	3+	;2	;1-	;12-	;12-	;	;2
4	Pioneer Brand 25R46	;2	0;	;	3+	3+	;	;2-
5	0762A1-2-8	;1-	23	;1-	1+	3+	;12-	;2-
6	IL10-21934	3+	3+	3+	3+	3+	3+	3+
7	TN1603	3+	;	3+	3+	3+	3+	3+
8	VA11W-279	;2-	;	;	33+	;	;	;
9	VA11W-313	3+	;1-	;12-	;1-	;	;	;2
10	VA12W-31	;1	;1-	0;	0;	0;	0;	;
11	KWS 072	3+	0;	;2	3+	2+3;	;	2;
12	KWS 074	3+	3+/3+;	3+;/1-	3+	3+	;	3+
13	KWS 078	0;	0;	;	;	;	;	0;
14	KY06C-1178-16-10-3	3+	32+	32+	3+	3+	32+	3+
15	KY06C-1195-37-2-5	0;	0;	;	;	;	0;	0;
16	KY06C-2067-16-7-1	22+;/3+	32+;	;	3+	3+	;	;
17	IL11-28222	3+	0;	0;	0	0;	0;	0;
18	IL11-6543	3+	3+	3+	3+	3+	3+	3+
19	OK11311F	3+;	0	;3+	;	3+	3+	;
20	DH11SRW8-59	32+;	0;	;	3+	3+	-	;2
21	DH11SRW41-26	3+2+;	0;	2+3	3+	3+	;	;2
22	AR06017-6-2	0;	0;	0;	0;	;	;	0;
23	AR06050-7-2	3+	;1-	;	;	;	;	;
24	MD09W272-8-4-13-3-15	;1-	;1-	;	;1-	;	;	;
25	MD09W272-8-4-14-6	;12-	0;	;	;1-	;	;	;
26	MD09W272-8-4-14-8	3+	0;	;	;1-	;	;	;
27	OH10-219-65	3+	3+	3+	;	3+	3+	3+
28	OH09-207-68	3+	3+	3+	3+	3+	3+	3+
29	04620A1-1-7-4-17	3+;	3+	3+	3+	22+;	3+	3+;
30	06497A1-7-3	23;	3+	;	3+	1+	-	;1-

LEAF RUST (SEEDLING)

Blacksburg
VA
Griffey

	16VT-LR Seedling TNRJ (0-3)	16VT-LR Seedling TCRK + MFQS (0-3)
1 Branson	3	23;
2 MO080104	3	3
3 Hilliard	23;	3;
4 Pioneer Brand 25R46	0;	3
5 0762A1-2-8	3/Tr;1-	3/12;
6 IL10-21934	3	3
7 TN1603	3	3
8 VA11W-279	;1=	;1=Tr3
9 VA11W-313	23;	3
10 VA12W-31	1-;	;1-
11 KWS 072	3;/1=	3
12 KWS 074	3	3
13 KWS 078	3	23;
14 KY06C-1178-16-10-3	3-	32
15 KY06C-1195-37-2-5	3	;23
16 KY06C-2067-16-7-1	;1=	23
17 IL11-28222	3-;	;23
18 IL11-6543	3	3
19 OK11311F	23;	3
20 DH11SRW8-59	3	3
21 DH11SRW41-26	1;=	3
22 AR06017-6-2	3	;23
23 AR06050-7-2	23;	3;
24 MD09W272-8-4-13-3-15	0;	3
25 MD09W272-8-4-14-6	0;	3
26 MD09W272-8-4-14-8	0;	3
27 OH10-219-65	3	3
28 OH09-207-68	3	3
29 04620A1-1-7-4-17	3	3
30 06497A1-7-3	;1=	3

LEAF RUST (SEEDLING)

Blacksburg
VA
Griffey

GENE	16 TNRJ (0-3)	15 TNRJ (0-3)	16 TCRK + MFQS (0-3)	15 TCRK + MFQS (0-3)
Lr1	3	3	3	3
Lr2a	3	3	2;	3;
Lr2c	3	3	;2	;3
Lr3	3	3	3-	N/A
Lr9	3	3	;3	0;/3
Lr16	21;N	1-CN	;1-	12-N
Lr24	3	3	32	3
Lr26	1-;C	;1-	3	3
Lr3ka	3	3	;2	12
Lr11	3	3	3	3+
Lr17	21;	12CN	;1=	12-;
Lr30	3	3	23-	2;
LrB	12-	21CN	12N	12/23
Lr10	3	3	3	3
Lr14a	3	3	3	3
Lr18	23	23C	23	23
Lr21	12-;N	1N	21;	;1N
Lr28	23	23	3	3
Lr41				
Lr42				
Lr3bg	21;	1CN	;23	12
Lr14b	3	3	3	3
Lr20	3	3	3	3
Lr23	23-	23-CN	12;	1;/23;

STEM RUST

St. Paul, MN - Jin		QFCSC	QTHJC	MCCFC	RCRSCR	KQQC	TPMKC	TTTTF	QCCSM	TKTTF	TKTTF	TRTTF	TKKTF	TTKSK	TTKSK	TTKST	TTTSK	TTKTT	St. Paul field stem rust	St. Paul field stem rust	Field notes	Gene postulation						
CDL 15/16#	Nursery	Line	06ND76C	75ND717C	59KS19	77ND82A	99KS76A-1	74MN1409	1MN84A-1	75WA165-2	13ETH18-1	13GER17-2	06YEM34-1	13GER16-1	04KEN156-0	04KEN156-0	06KEN19V-2	07KEN24-4	14KEN58-1	Field: M-9G, hill plot	Field: X-13, 1m row		Please refer to footnote F for comments					
77	Local ck 1	McNair 701	4	4	4	4	4	4	4	3+	3+	3	3+	4	3+	3	3+	3+	80S	70S								
78	Local ck 2	Red Chief	2+3	2+3	4	2+3	2+3	4	3	2+3	3+	2+3	4	3+	2+3	2+	2+	2+3	3	60S	60S							
79	Local ck 3	Prairie Red	2	2	2	2	2-	2	2	2	22+	2	3-	3+	2;	2	2-	2	2	40MR	30MRMS		1A.1R					
80	UESR 1	Branson	2	3	2	4	4	2	4	2-	2+3	2+	3+	3+	3	3+	2+3/3+	3	33+	60S	50SMS							
81	UESR 2	MO080104	4	4	4	4	4	4	4	4	3+	3+	4	4	3+	3+	3+	3+	3+	70S	60S							
82	UESR 3	Hilliard	3+	3	3	4	4	4	4	4	3	3	4	3+	3	3+	3+	3+	3+	60S	50MSS							
83	UESR 4	Pioneer Brand 25R46	2	2-	2-	2-	2-	2-	2-	2-	2-	2-	2-	2-	3/2	3+	3+	3	3+	30MR	30MR/40SMS		Sr31					
84	UESR 5	0762A1-2-8	0;	;	;	13	0	0;	;	13	31;	1;	;	1	0/2	3+	4	3+	3	3+	20SMS	15S		Sr2?				
85	UESR 6	IL10-21934	2	4	2	4	4	2	4	2	2+		4	3	3+					60S	40MS-S							
86	UESR 7	TN1603	4	4	-	4	3+	3	4	4	3+		4	3+	3+					60S	50MS							
87	UESR 8	VA11W-279	;	1	0;	;	13-	;	4	31;/3/;	31;/;	4/2-	;	2+3	2+3	2-/3+	;	11+	;	1+	0	0	3	0/3	TR	TMS	BIN	Sr2+36
88	UESR 9	VA11W-313	3/0;	3+/31;	0	3	13;/4	31;/4	4	0;/31;/4	3+	3+	3+	;	1/3	0;	;	3+	0	3+	0;	20MS/40S	40SMS/SMSS		Sr36			
89	UESR 10	VA12W-31	3C	3C	4	3C	4	4	4	4	3+		3+	3+	3					70S	50SMS							
90	UESR 11	KWS 072	4/2	4/2	2-/4	4/2-	2-/4	4/2-	2/4	4/2	0/2-/3+	3	2-/3+	3+	3	3+	3/0	0/3+	3+	60S	40MS							
91	UESR 12	KWS 074	4	4	4	4	3-3	4	4	4	3+		3+	3+	3					50SMS	50SMS							
92	UESR 13	KWS 078	4/2	4	2	4	4	4/2	4	2/4	3+		3	3+	3+					60S	60S							
93	UESR 14	KY06C-1178-16-10-3	4	4	3	4	4	4	4	4	3+		3+	3+	3+					70S	60S							
94	UESR 15	KY06C-1195-37-2-5	4	4	4	4	4/2-	4	4	4	3+		3+	3+	3+					70S	60S							
95	UESR 16	KY06C-2067-16-7-1	2	2/4	2-	2-	2-	2	2-	2	0/2-	2-	2-/3+	2-	3	3+/0	3	0	3+	25MR	40MR		Sr31					
96	UESR 17	IL11-28222	4	4	3	3	4	4/2-	4	4	3/0		3+	3+	3+					50MS	60SMS							
97	UESR 18	IL11-6543	2-	3	-	4	4	2	3	2-	3		4	2+3	3					40SMS	40MS							
98	UESR 19	OK11311F	;	1-/4	;	1	;	1-/31;	2/31;	31;/2-	31;/2-	3	;	3+/2-	2-	4	2+3	;	1/3	3+/2-	2+	2-	3	TR	TSMS,TR		1A.1R?	
99	UESR 20	DH11SRW8-59	4	4	4	4	3 (1pl)	4	4	4	3+		4	3+/2	3+					50MSS	60MSS							
100	UESR 21	DH11SRW41-26	;	2	0;	0;	2-	-	;	2-	;	0;	0	2-/4	2-	3+	3+	2-/3+	3+LIF	3+	TMR	10RMR		Sr31				
101	UESR 22	AR06017-6-2	0	0	0	2-	0;	0;	;	2-	0	0/3+	0	2-	0;	0;	0	0/2-	0	0	TR			Sr36+31				
102	UESR 23	AR06050-7-2	4	4	3	3	3-3	4	3	3	3		4	3	3-					60S	50MSS							
103	UESR 24	MD09W272-8-4-13-3-15	;	0;	0;	;	1-	-	;	;	;	2-	2-	2	2-	3	3+	3+	3+LIF	3+	0	TR		Sr31				
104	UESR 25	MD09W272-8-4-14-6	;	0	0	;	;	;	;	1-/2-	;	2-	2-	2-	2-	3	3+	3+	3	3+	TR	SR		Sr31				
105	UESR 26	MD09W272-8-4-14-8	;	0;	0;	;	;	;	;	0;	;	3-	2-	2-	2-	3	3+	3+LIF	0	3+	TR	SR		Sr31				
106	UESR 27	OH10-219-65	2	4	2	4	3	2	4	2-	3		4	2+3	3+					60S	40MS							
107	UESR 28	OH09-207-68	0;	0;	0	4	31;	31;	4	0	3+	3+	3	;	1	0;	0;	0	3+	0;	25MSS	30MS		Sr36				
108	UESR 29	04620A1-1-7-4-17	3	4	3	3	-	3	3	4	3+		3	3-	3+					60S	50SMS							
109	UESR 30	06497A1-7-3	2-/2+3	2-	-	;	2-	2-	2	;	1-/3	-	2-	2-	2-	2-	3+	3	3LIF	3LIF	2+3	5RMR	10MRR/40SMS		Sr31			

STEM RUST

Notes and explanations for stem rust evaluation of breeding germplasm									
A. Races used in seedling evaluations:									
Race	Origin	Virulence on differential genes			B. Seedling rating scale:				
MCCFC	USA	5 7b 9g 10 17 Tmp McN			0 to 4 infection type scale of Stakmen et al., 3 or 4 are considered susceptible				
QCCSM	USA	5 9a 9d 9g 10 17 21 24 McN			"/" denotes heterogeneous, the predominant type given first.				
QFCSC	USA	5 8a 9a 9d 9g 10 17 21 McN			"LIF" denotes low infection frequency, or fewer number of pustules.				
QTHJC	USA	5 6 8a 9b 9d 9g 10 11 17 21 McN			"C" stands for excessive chlorosis				
RCRSC	USA	5 7b 9a 9b 9d 9g 10 17 21 36 McN			"N" stands for excessive necrosis				
RKQQC	USA	5 6 7b 8a 9a 9b 9d 9g 21 36 McN			"Sr2M" referred to seedling chlorosis, similar to Sr2 expression in seedling under certain environment				
TPMKC	USA	5 7b 8a 9d 9e 9g 10 11 17 21 36 Tmp McN							
TTTTF	USA	5 6 7b 8a 9a 9b 9d 9e 9g 10 11 17 21 30 36 38 Tmp McN							
TTKSK	Kenya	5 6 7b 8a 9a 9b 9d 9e 9g 10 11 17 21 30 31 38 McN							
TTKST	Kenya	5 6 7b 8a 9a 9b 9d 9e 9g 10 11 17 21 24 30 31 38 McN							
TTKTT	Kenya	5 6 7b 8a 9a 9b 9d 9e 9g 10 11 17 21 24 30 31 38 Tmp McN							
TRTTF	Yemen	5 6 7b 9a 9b 9d 9e 9g 10 11 17 21 30 36 38 Tmp McN							
TKTTF	Ethiopia	5 6 7b 8a 9a 9b 9d 9e 9g 10 17 21 30 36 38 Tmp McN (*avirulent on Sr7a)							
TKTTF	Germany	5 6 7b 8a 9a 9b 9d 9e 9g 10 17 21 30 36 38 Tmp McN (and Sr7a)							
TKKTP	Germany	5 6 7b 8a 9a 9b 9d 9e 9g 10 17 21 24 30 38 Tmp McN (and 1A.1R)							
* Red font represents unique and/or significant virulence or combination of virulences									
References for description of significant races used in the screening:									
TTKST: Jin et al. (2008) <i>Plant Dis</i> 92:923-926.									
TTTTF: Jin et al. (2009) <i>Plant Dis</i> 93:367-370.									
TTKTT: Newcomb et al. (2016) <i>Phytopathology</i> 106:729-736.									
TRTTF: Olivera et al. (2012) <i>Plant Dis</i> 96:623-628.									
TKTTF: Olivera et al. (2015) <i>Phytopathology</i> 105:917-928..									
C. Entries repeated with additional races:									
Entries had low infection types to TTKSK, missing data or mixed plants to this race, was repeated.									
Additional variants of Ug99 and foreign races were used in the repeat tests to help identify genes effective against TTKSK									
D. Field stem rust nursery evaluations:									
Entries were planted in 1-m row plots perpendicular to spreader rows of mixed susceptible wheat lines in X-13 field, and hill-plots in M-9G field									
Nurseries were inoculated by needle injection of spreader rows, and by spray inoculations									
A composite of the following stem rust races was used as inoculum: QFCSC, QTHJC, RCRSC, RKQQC, and TPMKC									
E. Field ratings:									
Stem rust infection responses (R, MR, MS, S or combination thereof) and disease severity (in percentage) were rated when entries were at the soft dough stage									
BIN-Black internode, a likely indication of the presence of Sr2. This trait is considered to be more consistent than pseudo black chaff (PBC) in the St. Paul nursery.									
F. Gene postulations:									
Gene postulations are tentative and for references only. Users are strongly advised to confirm with available markers or other means.									
Postulations were done mainly for Ug99 effective genes. Reasons for postulating other genes are given below:									
Sr7a: one of the few genes effective against US race TTTTTF and the Ethiopian TKTTF that caused epidemics on Digu in 2013-14.									
Sr11: effective against TKTTF from Ethiopia and Germany.									
Sr31: highly effective against all races except Ug99 race group, providing high level of resistance in the field nursery.									
Sr38: highly effective in the field nursery, difficult to postulate due to mesothetic reactions to several races.									
Sr2: reduced disease severity in the field. Sr2 positive was based on a combination of BIN, low disease severity, and seedling infection types.									
Sr2?: postulation with reduced confidence due to a lack of BIN, incorrect seedling IT, or high field disease severity.									
Marker data for postulated genes may be available through USDA-ARS Genotyping Labs. References for markers of Sr7a and Sr11 can be found:									
Turner et al. (2016) <i>Crop Sci</i> 56:1-7									
Jayaveeramut et al. (2016) <i>Phytopathology</i> (in press, available as First Look)									

STRIPE RUST

		Fayetteville	Brownstown	Champaign	Urbana
		AR	IL	IL	IL
		Mason	Kolb	Murche	Kolb
		0-9	0-9	0-9	0-9
1	Branson	0.0	0.0	2.0	1.7
2	MO080104	1.5	1.5	4.0	2.3
3	Hilliard	0.0	0.0	1.3	1.0
4	Pioneer Brand 25R46	7.0	8.5	9.0	7.7
5	0762A1-2-8	0.0	0.0	1.0	1.3
6	IL10-21934	5.0	9.3	8.3	3.3
7	TN1603	3.0	9.3	8.7	5.0
8	VA11W-279	0.2	1.5	1.3	1.7
9	VA11W-313	0.2	0.7	2.0	4.0
10	VA12W-31	3.0	9.3	3.7	2.0
11	KWS 072	3.0	9.3	8.7	5.7
12	KWS 074	3.0	8.5	5.3	3.3
13	KWS 078	1.5	1.5	3.7	2.0
14	KY06C-1178-16-10-3	3.0	9.3	6.7	2.7
15	KY06C-1195-37-2-5	5.0	9.3	8.7	5.0
16	KY06C-2067-16-7-1	5.0	9.3	7.7	3.3
17	IL11-28222	5.0	9.3	8.3	4.7
18	IL11-6543	1.5	9.3	7.0	2.0
19	OK11311F	0.2	0.2	2.3	1.3
20	DH11SRW8-59	0.0	0.0	1.0	1.0
21	DH11SRW41-26	0.7	7.0	6.3	3.3
22	AR06017-6-2	0.7	5.0	3.3	2.0
23	AR06050-7-2	0.2	0.2	3.0	2.7
24	MD09W272-8-4-13-3-15	0.0	0.0	1.7	1.3
25	MD09W272-8-4-14-6	0.0	0.0	1.3	1.3
26	MD09W272-8-4-14-8	0.2	0.2	1.0	2.0
27	OH10-219-65	8.5	9.0	9.0	8.0
28	OH09-207-68	0.2	0.0	1.3	1.7
29	04620A1-1-7-4-17	0.7	7.0	4.0	1.3
30	06497A1-7-3	3.0	8.5	5.0	5.0
LOCATION MEANS		2.0	4.8	4.6	3.0
GROWTH STAGE / DATE		April 14	April 25		

STRIPE RUST

	Battle Ground IN Brown	New Haven IN Murche	W Lafayette IN Mohammadi	Schochoh KY Van Sanford
	0-9	0-9	0-9	0-9
1 Branson	0.0	1.0	0.3	1.0
2 MO080104	4.5	2.0	1.0	2.5
3 Hilliard	0.0	1.0	0.0	1.0
4 Pioneer Brand 25R46	9.0	4.6	7.5	7.0
5 0762A1-2-8	0.5	1.0	0.3	
6 IL10-21934	6.0	2.7	2.8	1.0
7 TN1603	8.0	3.7	4.3	6.0
8 VA11W-279	0.5	1.6	0.5	1.0
9 VA11W-313	3.5	1.4	0.3	
10 VA12W-31	6.0	2.7	1.5	1.0
11 KWS 072	9.0	3.7	4.3	2.5
12 KWS 074	7.5	3.3	3.8	2.0
13 KWS 078	6.0	1.6	1.3	3.0
14 KY06C-1178-16-10-3	8.0	2.0	2.3	
15 KY06C-1195-37-2-5	9.0	4.3	5.3	3.5
16 KY06C-2067-16-7-1	9.0	2.4	1.8	5.0
17 IL11-28222	6.0	2.7	2.3	2.0
18 IL11-6543	6.0	3.0	0.5	
19 OK11311F	1.0	1.0	0.3	
20 DH11SRW8-59	2.0	1.0	0.5	
21 DH11SRW41-26	6.5	2.6	2.3	
22 AR06017-6-2	1.5	1.4	0.5	2.0
23 AR06050-7-2	0.5	1.6	0.5	3.0
24 MD09W272-8-4-13-3-15	1.0	1.0	0.3	1.0
25 MD09W272-8-4-14-6	1.5	1.0	0.0	2.0
26 MD09W272-8-4-14-8	1.0	0.9	0.0	2.0
27 OH10-219-65	9.0	4.0	8.0	6.5
28 OH09-207-68	2.0	1.3	0.8	
29 04620A1-1-7-4-17	4.0	2.9	0.8	3.0
30 06497A1-7-3	9.0	3.7	5.7	
LOCATION MEANS	4.6	2.2	2.0	2.8
GROWTH STAGE / DATE	May 12			

STRIPE RUST

		Mason MI Olson		Columbia MO McKendry	Laurel Springs NC Marshall	Nairn ON Etienne
	IT		severity	0-9		0-9
1	Branson	4.0	25	0.0	0	0.5
2	MO080104	5.5	35	0.0	4	3.0
3	Hilliard	3.5	20	0.0	0	0.0
4	Pioneer Brand 25R46	9.0	95	0.0	7	6.0
5	0762A1-2-8	3.5	10	0.0	0	1.0
6	IL10-21934	7.0	75	0.0	7	5.5
7	TN1603	6.0	70	0.0	6	4.0
8	VA11W-279	5.0	25	0.2	0	0.0
9	VA11W-313	4.0	30	0.0	0	0.0
10	VA12W-31	5.0	45	0.0	6	1.5
11	KWS 072	5.5	60	0.0	7	4.5
12	KWS 074	6.5	65	0.0	5	3.0
13	KWS 078	2.0	20	0.1	0	2.5
14	KY06C-1178-16-10-3	8.0	85	0.0	5	5.5
15	KY06C-1195-37-2-5	8.0	90	1.8	6	5.5
16	KY06C-2067-16-7-1	7.5	75	0.0	4	4.5
17	IL11-28222	6.5	60	0.5	5	2.0
18	IL11-6543	3.5	15	0.7	4	2.5
19	OK11311F	2.0	20	1.4	0	3.0
20	DH11SRW8-59	3.5	20	0.6	0	0.0
21	DH11SRW41-26	6.5	55	1.6	7	5.0
22	AR06017-6-2	1.5	15	0.5	0	0.5
23	AR06050-7-2	1.5	20	1.5	0	1.0
24	MD09W272-8-4-13-3-15	6.0	40	4.3	4	0.5
25	MD09W272-8-4-14-6	2.0	25	0.8	3	0.0
26	MD09W272-8-4-14-8	2.5	15	5.0	4	0.0
27	OH10-219-65	8.0	95	5.5	7	5.5
28	OH09-207-68	2.0	10	4.0	0	0.5
29	04620A1-1-7-4-17	3.0	15	7.3	5	1.5
30	06497A1-7-3	7.5	85	5.3	4	4.5
LOCATION MEANS		4.9	43.8	1.4	3.3	2.5
GROWTH STAGE / DATE						

STRIPE RUST

		Milan	Central Ferry		Central Ferry	
		TN	WA	WA	WA	WA
		West	Campbell	Campbell	Campbell	Campbell
			IT	severity	IT	severity
		0-9	0-9	0-100	0-9	0-100
1	Branson	1.0	8.0	8	5.0	40
2	MO080104	1.5	2.5	5	5.0	50
3	Hilliard	1.0	6.5	8	5.0	35
4	Pioneer Brand 25R46	6.0	8.0	10	8.0	30
5	0762A1-2-8	1.0	6.5	10	5.0	8
6	IL10-21934	5.5	8.0	10	6.5	40
7	TN1603	5.0	6.5	10	6.5	30
8	VA11W-279	1.0	6.5	10	5.0	45
9	VA11W-313	1.5	4.0	3	6.5	40
10	VA12W-31	2.0	6.5	8	5.0	45
11	KWS 072	6.0	6.5	10	5.0	40
12	KWS 074	4.0	4.0	10	6.5	30
13	KWS 078	1.0	4.0	5	5.0	23
14	KY06C-1178-16-10-3	4.5	8.0	10	6.5	50
15	KY06C-1195-37-2-5	5.0	8.0	10	6.5	45
16	KY06C-2067-16-7-1	5.0	4.0	10	5.0	45
17	IL11-28222	4.0	4.0	8	5.0	25
18	IL11-6543	1.5	6.5	13	6.5	20
19	OK11311F	1.5	5.0	10	5.0	5
20	DH11SRW8-59	1.0	5.0	8	6.5	25
21	DH11SRW41-26	3.5	8.0	13	6.5	60
22	AR06017-6-2	1.5	6.5	15	5.0	23
23	AR06050-7-2	2.5	5.0	10	6.5	20
24	MD09W272-8-4-13-3-15	1.0	2.5	3	8.0	40
25	MD09W272-8-4-14-6	1.0	2.5	3	5.0	10
26	MD09W272-8-4-14-8	1.0	5.0	10	5.0	15
27	OH10-219-65	6.0	6.5	8	5.0	55
28	OH09-207-68	1.0	8.0	13	5.0	15
29	04620A1-1-7-4-17	2.0	8.0	13	5.0	30
30	06497A1-7-3	3.0	6.5	10	5.0	20
LOCATION MEANS		2.7	5.9	8.9	5.7	31.9
GROWTH STAGE / DATE			April 15		May 10	

STRIPE RUST

Pullman
WA
Campbell

	IT	severity
	0-9	0-100
1 Branson	6.5	70
2 MO080104	8.0	65
3 Hilliard	6.5	45
4 Pioneer Brand 25R46	8.0	90
5 0762A1-2-8	8.0	40
6 IL10-21934	8.0	80
7 TN1603	8.0	90
8 VA11W-279	8.0	35
9 VA11W-313	8.0	40
10 VA12W-31	8.0	90
11 KWS 072	8.0	90
12 KWS 074	8.0	85
13 KWS 078	8.0	80
14 KY06C-1178-16-10-3	8.0	90
15 KY06C-1195-37-2-5	8.0	85
16 KY06C-2067-16-7-1	8.0	80
17 IL11-28222	8.0	90
18 IL11-6543	8.0	90
19 OK11311F	8.0	40
20 DH11SRW8-59	8.0	55
21 DH11SRW41-26	8.0	85
22 AR06017-6-2	8.0	50
23 AR06050-7-2	8.0	50
24 MD09W272-8-4-13-3-15	6.5	25
25 MD09W272-8-4-14-6	8.0	45
26 MD09W272-8-4-14-8	8.0	35
27 OH10-219-65	8.0	90
28 OH09-207-68	8.0	50
29 04620A1-1-7-4-17	8.0	85
30 06497A1-7-3	8.0	90
LOCATION MEANS	7.9	67.8
GROWTH STAGE / DATE	June 2	

STRIPE RUST

TABLE XMC1615F. STRIPE RUST INFECTION TYPE (IT^a) AND SEVERITY (%) ON CULTIVARS AND LINES IN THE WINTER EASTERN WHEAT NURSERY (EXP15) COORDINATED BY HAROLD BOCKELMAN AT LOCATIONS IN PCFS FARM PULLMAN (LOC 04), MT. VERNON (LOC 05), WALLA WALLA (LOC 06), AND LIND (LOC 07), WA WHEN RECORDED AT THE INDICATED DATES AND STAGES OF PLANT GROWTH IN 2016 UNDER NATURAL INFECTION^b

Entry No.	Cultivar/ Designation	2016 PLOT	LOC 04		LOC 05 ^c				LOC 06				LOC 07		Field summary ^d	Overall rating ^e	Possible HTAP resistance ^f
			6/13		4/18		5/18		4/7		5/4		5/25				
			S. dough IT %	S. elong. IT %	S. elong. IT %	H.-flower. IT %	S. elong. IT %	Heading IT %	L. flower. IT %								
1	Branson	1	5	30	2,8	15,80	5	70	8	10	5	20	5	20	MS	6	Moderate
2	MO080104	2	8	80	3	30	5	40	8	10	5	30	5	5	S	8	Moderate
3	Hilliard	3	5	20	3	30	7	80	8	5	3	25	3	10	S	8	Moderate
4	Pioneer Brand 25R46	4	8	100	8	80	7	80	8	20	8	95	8	60	S	9	No
5	0762A1-2-8	5	5	10	5	30	5	50	8	20	3	10	8	1	MR-MS	5	Moderate
6	IL10-21934	6	8	100	8	80	8	90	8	5	8	95	8	50	S	9	No
7	TN1603	7	8	100	8	80	8	90	8	10	8	95	8	60	S	9	No
8	VA11W-279	8	3	5	2	10	3	30	8	5	2	2	2	2	MR	3	Low
9	VA11W-313	9	5	10	2	10	3	40	2	2	3	15	5	10	MR	3	Low
10	VA12W-31	10	8	100	8	60	8	100	8	5	8	95	8	60	S	9	No
11	KWS 072	11	8	100	8	60	8	100	8	10	8	90	8	20	S	9	No
12	KWS 074	12	8	100	8	60	8	90	8	15	8	95	8	50	S	9	No
13	KWS 078	13	8	100	8	60	7	90	8	20	7	85	8	40	S	9	No
14	KY06C-1178-16-10-3	14	8	100	8	80	8	100	8	10	8	95	8	60	S	9	No
15	KY06C-1195-37-2-5	15	8	100	8	80	8	100	8	10	8	90	8	70	S	9	No
16	KY06C-2067-16-7-1	16	8	100	8	80	8	100	8	15	8	90	8	40	S	9	No
17	IL11-28222	17	8	100	8	80	8	100	8	5	8	95	5	20	S	9	No
18	IL11-6543	18	8	100	8	80	8	90	8	10	8	95	3	20	S	9	No
19	OK11311F	19	5	10	2	15	4	50	8	10	3	15	5	10	MR-MS	5	Low
20	DH11SRW8-59	20	5	30	5	30	6	70	5	5	3	20	3	10	MS	6	Low
PS279	SUSCEPTIBLE CHECK+B68	21	8	100	8	80	8	50	8	20	8	95	8	80	S	9	No
21	DH11SRW41-26	22	8	100	8	60	8	90	8	20	8	60	8	10	S	9	No
22	AR06017-6-2	23	8	10	5	30	6	70	8	20	5	25	2	5	MS	6	Low
23	AR06050-7-2	24	2	10	2	20	4	30	5	5	3	20	5	5	MR	4	Moderate
24	MD09W272-8-4-13-3-15	25	3	10	2	10	4	50	0	0	2	10	2	2	MR-MS	5	No
25	MD09W272-8-4-14-6	26	5	15	2	10	3	20	8	10	3	15	8	5	MR	4	No
26	MD09W272-8-4-14-8	27	5	10	2	10	4	30	8	10	2	5	2	5	MR	4	No
27	OH10-219-65	28	8	100	8	80	8	100	8	15	8	95	8	60	S	9	No
28	OH09-207-68	29	5,8	10	2,8	15,80	4	40	3	5	2	15	3	5	MR	4	Moderate
29	04620A1-1-7-4-17	30	8	100	8	60	8	80	8	10	7	60	5	10	S	9	No
30	06497A1-7-3	31	8	100	8	60	7	80	8	20	8	90	8	70	S	9	Low
PS279	SUSCEPTIBLE CHECK	32	8	100	8	80	8	90	8	20	8	95	8	80	S	9	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 or connected with "-" for entries containing plants with continuous ITs.

^b Entries with a high IT in the first note, but a low IT in the second note at Mt. Vernon (LOC 05) may indicate that they have high-temperature, adult-plant (HTAP) resistance.

^c R = resistant, MR = moderately resistant, MS = moderately susceptible, and S = susceptible.

^d 1 = most resistant and 9 most susceptible.

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

^e The high-temperature adult-plant (HTAP) resistance data were based on greenhouse tests (see data in the "Greenhouse Tests" worksheet).

Unknown = Whether the entry has HTAP resistance or not couldn't be determined as it was resistant to all tested races in the seedling stage.

TBT = to be tested. Entries with the combination of Yr5 and/or Yr15 may not have HTAP resistance but their resistance should be highly effective as no races virulent to either of the genes are found in the US.

^f The high-temperature adult-plant (HTAP) resistance data were based on greenhouse tests. Unknown = Whether the entry has HTAP resistance or not couldn't be determined as it was resistant to all tested races in the seedling stage.

STRIPE RUST

TABLE XMC1615GH. STRIPE RUST INFECTION TYPE (IT) ON SEEDLINGS AND ADULT-PLANTS OF CULTIVARS AND LINES IN THE EASTERN WHEAT NURSERY (EXP15) COORDINATED BY HAROLD BOCKELMAN 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 (ALL SEEDS WERE NOT TREATED)

Entry No.	Cultivar/ Designation	2016 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)				
			PSTv-4	PSTv-14	PSTv-37	PSTv-40	PSTv-51	PSTv-14	PSTv-37	PSTv-40		
1	Branson	1	8	8	8	8	8	8	2,2,2	3,3,3	3,3,3	Moderate
2	MO080104	2	8	8	8	8	8	8	3,3,3	3,3,3	2,2,3	Moderate
3	Hilliard	3	8	8	8	8	8	8	3,3,3	3,3,5	2,2,2	Moderate
4	Pioneer Brand 25R46	4	8	8	8	8	8	8	8,8,8	8,8,8	8,8,8	No
5	0762A1-2-8	5	8	8	8	8	8	8	2,2,2	3,3,3	3,3,3	Moderate
6	IL10-21934	6	8	8	8	8	8	8	8,8,8	8,8,8	2,2,2	No
7	TN1603	7	8	8	8	8	8	8	8,8,8	8,8,8	8,8,8	No
8	VA11W-279	8	8	8	8	8	8	8	3,3,3	5,5,6	3,3,3	Low
9	VA11W-313	9	8	8	8	8	8	8	3,3,5	5,5,5	2,5,5	Low
10	VA12W-31	10	8	8	8	8	8	8	8,8,8	8,8,8	6,6,6	No
11	KWS 072	11	8	8	8	8	8	8	8,8,8	8,8,8	8,8,8	No
12	KWS 074	12	8	8	8	8	8	8	8,8,8	8,8,5	8,8,8	No
13	KWS 078	13	8	8	8	8	8	8	8,8,8	5,5,8	5,8,8	No
14	KY06C-1178-16-10-3	14	8	8	8	8	8	8	8,8,8	8,8,8	8,8,8	No
15	KY06C-1195-37-2-5	15	8	8	8	8	8	8	8,8,8	8,8,8	8,8,8	No
16	KY06C-2067-16-7-1	16	8	8	8	8	8	8	8,8,8	8,8,8	5,5,5	No
17	IL11-28222	17	8	8	8	8	8	8	8,8,8	8,8,8	8,8,8	No
18	IL11-6543	18	8	8	8	8	8	8	3,3,3	8,8,8	8,8,8	No
19	OK11311F	19	8	7	8	8	8	8	2,2,2	5,5,5	5,5,5	Low
20	DH11SRW8-59	20	8	8	8	8	8	8	3,3,3	5,5,5	3,3,3	Low
PS279	SUSCEPTIBLE CHECK	21	8	8	8	8	8	8	8,8,8	8,8,8	8,8,8	No
21	DH11SRW41-26	22	8	8	8	8	8	8	8,8,8	8,8,8	8,8,8	No
22	AR06017-6-2	23	8	8	8	8	8	8	3,3,3	5,5,5	6,6,6	Low
23	AR06050-7-2	24	8	5	8	8	8	8	3,3,3	3,3,3	2,2,2	Moderate
24	MD09W272-8-4-13-3-15	25	8	8	8	8	8	8	2,2,3	8,8,8	2,2,2	No
25	MD09W272-8-4-14-6	26	8	8	8	8	8	8	2,2,2	8,8,8	2,2,2	No
26	MD09W272-8-4-14-8	27	8	8	8	8	8	8	2,2,2	8,8,8	2,2,2	No
27	OH10-219-65	28	8	8	8	8	8	8	8,8,8	8,8,8	8,8,8	No
28	OH09-207-68	29	8	8	8	8	8	8	3,3,3	3,3,3	2,2,2	Moderate
29	04620A1-1-7-4-17	30	8	8	8	8	8	8	8,8,8	8,8,8	8,8,8	No
30	06497A1-7-3	31	8	8	8	8	8	8	3,8,8	5,5,5	3,3,3	Low
PS279	SUSCEPTIBLE CHECK	32	8	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.

Virulence/avirulence formulae (Yr genes) of the tested races:

PSTv-4: **1,6,9,17,27,SP,Tye**5,7,8,10,15,24,32,43,44,Tr1,Exp2
PSTv-14: **1,6,7,8,9,17,27,43,44,Tr1,Exp2,Tye**5,10,15,24,32,SP
PSTv-37: **6,7,8,9,17,27,43,44,Tr1,Exp2**/1,5,10,15,24,32,SP,Tye
PSTv-40: **6,7,8,9,10,24,27,32,43,44,Tr1,Exp2**/1,5,15,17,SP,Tye
PSTv-51: **1,6,7,8,9,10,17,24,27,32,43,44,SP,Tr1,Exp2,Tye**5,15

^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 to all tested three races in the adult-plant tests under high temperatures have possibly high-temperature adult-plant (HTAP) resistance.

SEPTORIA

	Battle Ground	Schochoh
	IN	KY
	Brown	Van Sanford
	tritici	tritici
	0-9	0-9
1	Branson	3.0
2	MO080104	2.5
3	Hilliard	2.5
4	Pioneer Brand 25R46	
5	0762A1-2-8	1.5
6	IL10-21934	4.0
7	TN1603	5.0
8	VA11W-279	1.5
9	VA11W-313	4.0
10	VA12W-31	1.0
11	KWS 072	4.0
12	KWS 074	3.5
13	KWS 078	2.0
14	KY06C-1178-16-10-3	3.5
15	KY06C-1195-37-2-5	3.0
16	KY06C-2067-16-7-1	6.0
17	IL11-28222	3.5
18	IL11-6543	1.5
19	OK11311F	2.5
20	DH11SRW8-59	1.5
21	DH11SRW41-26	4.5
22	AR06017-6-2	2.5
23	AR06050-7-2	3.0
24	MD09W272-8-4-13-3-15	1.5
25	MD09W272-8-4-14-6	3.0
26	MD09W272-8-4-14-8	2.5
27	OH10-219-65	
28	OH09-207-68	3.5
29	04620A1-1-7-4-17	5.0
30	06497A1-7-3	4.5
	LOCATION MEANS	6.5
	GROWTH STAGE / DATE	May 12
		3.1

SEPTORIA

2015-16 Eastern Septoria Nursery

Early: FL, GA, LA, SC, NC, TN, AR, OK, TX

Late: NY, IL, IN, OH, KY, MO, KS, VA, MD

Entry nbr	Other test	UE Entry #	Designation	Mkt Class	Maturity (E/L)	Leaves	Glumes
1	Sept check		AGS 2000	SRW	E	8.0	3.0
2	Sept check		AGS 2060	SRW	E	4.5	3.0
3	Sept check		Neuse	SRW	E	3.5	2.0
4	Sept check		USG 3209	SRW	E	7.5	6.0
5	Sept check		Branson	SRW	L	3.5	3.0
6	Sept check		Shirley	SRW	L	4.5	3.5
7	Sept check		Jensen	SRW	L	5.5	6.5
8	Sept check		Kaskaskia	SRW	L	4.0	4.5
9	Sept check		Malabar	SRW	L	4.5	6.0
80	UE	2	MO080104	SRW	L	6.5	6.0
81	UE	4	Pioneer Brand 25R46	SRW	L	5.5	1.5
82	UE	5	0762A1-2-8	SRW	L	3.5	6.0
83	UE	6	IL10-21934	SRW	L	5.5	3.0
84	UE	7	TN1603	SRW	E	7.5	4.5
85	UE	8	VA11W-279	SRW	L	3.5	5.0
86	UE	9	VA11W-313	SRW	L	4.5	2.5
87	UE	10	VA12W-31	SRW	L	5.0	2.5
88	UE	11	KWS 072	SRW	L	7.0	6.0
89	UE	12	KWS 074	SRW	L	3.0	3.0
90	UE	13	KWS 078	SRW	L	3.5	1.5
91	UE	14	KY06C-1178-16-10-3	SRW	L	4.0	1.5
92	UE	15	KY06C-1195-37-2-5	SRW	L	4.5	4.5
93	UE	16	KY06C-2067-16-7-1	SRW	L	5.0	4.5
94	UE	17	IL11-28222	SRW	L	5.5	6.5
95	UE	18	IL11-6543	SRW	L	2.5	5.5
96	UE	19	OK11311F	SRW	E	3.5	3.5
97	UE	20	DH11SRW8-59	SRW	L	4.5	2.5
98	UE	21	DH11SRW41-26	SRW	L	5.0	6.0
99	UE	22	AR06017-6-2	SRW	E	4.5	4.0
100	UE	23	AR06050-7-2	SRW	E	5.5	3.5
101	UE	27	OH10-219-65	SRW	L	4.0	3.0
102	UE	28	OH09-207-68	SRW	L	5.0	5.0
103	UE	29	04620A1-1-7-4-17	SRW	L	4.5	4.5
104	UE	30	06497A1-7-3	SRW	L	4.5	6.0

FUSARIUM HEAD BLIGHT (SCAB)

		Urbana IL Kolb						
		INCIDENCE	SEVERITY	FDK	Fhbndx	ISKndx	ISKndx	DON
		(%)	(%)	(%)	(0-100)	(0-100)	Rank	(ppm)
1	Branson	53	70	50	37	57	28	1.6
2	MO080104	10	21	22	2	18	4	0.4
3	Hilliard	47	59	43	28	49	24	1.9
4	Pioneer Brand 25R46	15	21	30	3	23	6	0.6
5	0762A1-2-8	18	20	8	5	15	2	0.6
6	IL10-21934	33	37	8	13	24	8	0.9
7	TN1603	90	94	37	85	70	30	5.0
8	VA11W-279	50	22	68	14	39	15	3.8
9	VA11W-313	67	34	23	24	40	16	4.0
10	VA12W-31	63	48	40	31	49	26	2.2
11	KWS 072	67	37	23	25	41	17	1.7
12	KWS 074	27	39	22	10	29	11	0.8
13	KWS 078	13	25	10	4	16	3	0.6
14	KY06C-1178-16-10-3	47	26	13	12	27	9	1.1
15	KY06C-1195-37-2-5	30	36	42	10	36	14	2.7
16	KY06C-2067-16-7-1	47	55	53	27	52	27	2.5
17	IL11-28222	33	40	13	15	27	10	0.4
18	IL11-6543	10	16	17	2	15	1	0.4
19	OK11311F	53	66	60	35	60	29	4.0
20	DH11SRW8-59	57	59	37	34	49	25	3.3
21	DH11SRW41-26	27	63	43	17	44	21	1.9
22	AR06017-6-2	60	45	33	27	45	22	2.2
23	AR06050-7-2	50	71	27	36	47	23	1.7
24	MD09W272-8-4-13-3-15	30	20	70	6	43	19	1.4
25	MD09W272-8-4-14-6	37	21	67	7	44	20	1.6
26	MD09W272-8-4-14-8	33	16	67	4	42	18	1.8
27	OH10-219-65	37	43	18	15	31	13	1.0
28	OH09-207-68	15	46	28	7	30	12	0.8
29	04620A1-1-7-4-17	17	42	8	7	21	5	1.5
30	06497A1-7-3	25	36	13	9	24	7	0.6
LOCATION MEANS		38.7	41.0	33.1	18.3	36.8	15.5	1.8
GROWTH STAGE / DATE		June 8 - 14						

FUSARIUM HEAD BLIGHT (SCAB)

		Champaign IL	Mason MI		
		Murche	Olson	INCIDENCE	INDEX
		0-9	SEVERITY	%	
			%		
1	Branson	3.3	76	80	61
2	MO080104	2.3	85	30	26
3	Hilliard	3.3	60	65	40
4	Pioneer Brand 25R46	2.0	60	85	51
5	0762A1-2-8	1.7	61	60	52
6	IL10-21934	2.3	31	40	18
7	TN1603	6.0	76	100	76
8	VA11W-279	3.3	67	55	48
9	VA11W-313	5.0	58	80	49
10	VA12W-31	5.0	50	75	38
11	KWS 072	4.3	69	90	60
12	KWS 074	3.3	79	75	59
13	KWS 078	2.7	38	30	13
14	KY06C-1178-16-10-3	3.7	31	40	11
15	KY06C-1195-37-2-5	4.3	53	50	28
16	KY06C-2067-16-7-1	3.0	53	75	40
17	IL11-28222	3.3	48	45	25
18	IL11-6543	2.7	58	60	46
19	OK11311F	3.7	60	80	48
20	DH11SRW8-59	3.0	71	70	50
21	DH11SRW41-26	2.0	64	75	49
22	AR06017-6-2	2.7	56	65	36
23	AR06050-7-2	2.7	22	20	9
24	MD09W272-8-4-13-3-15	1.3	44	60	28
25	MD09W272-8-4-14-6	1.3	75	85	64
26	MD09W272-8-4-14-8	1.7	71	70	50
27	OH10-219-65	5.0	44	35	19
28	OH09-207-68	2.3	63	50	30
29	04620A1-1-7-4-17	2.0	78	95	74
30	06497A1-7-3	2.7	44	50	28
LOCATION MEANS		3.1	58.1	63.0	40.8
GROWTH STAGE / DATE					

FUSARIUM HEAD BLIGHT (SCAB)

Columbia
MO
McKendry

	SCAB INC*SEV/100%	INC %	SEV %	FDK %	ISK (0.3*INC)+(0.3*SEV)+(0.4*FDK)	DON ppm	Greenhouse Spread/# spiklets	
1	Branson	12	70	17	50	40	0.6	40
2	MO080104	5	55	10	20	27	0.3	8
3	Hilliard	10	40	24	30	31	0.8	17
4	Pioneer Brand 25R46	13	85	14	40	46	0.3	13
5	0762A1-2-8	7	35	18	23	25	0.3	8
6	IL10-21934	6	55	11	15	26	0.1	9
7	TN1603	17	85	21	75	62	1.8	21
8	VA11W-279	9	65	14	30	36	0.4	9
9	VA11W-313	22	80	28	33	45	0.7	26
10	VA12W-31	17	95	18	48	53	1.6	12
11	KWS 072	13	90	14	58	54	0.5	18
12	KWS 074	12	95	13	38	47	0.4	31
13	KWS 078	11	60	18	25	33	0.4	16
14	KY06C-1178-16-10-3	25	90	28	65	61	1.1	41
15	KY06C-1195-37-2-5	9	50	17	43	37	2.5	19
16	KY06C-2067-16-7-1	14	95	15	43	50	0.3	21
17	IL11-28222	16	75	21	35	43	0.4	18
18	IL11-6543	22	65	33	58	53	0.3	40
19	OK11311F	12	60	21	35	38	1.4	24
20	DH11SRW8-59	12	50	23	30	34	1.3	18
21	DH11SRW41-26	5	35	13	23	23	1.4	7
22	AR06017-6-2	7	45	16	30	30	1.2	10
23	AR06050-7-2	27	90	30	40	52	1.0	78
24	MD09W272-8-4-13-3-15	14	50	26	30	35	0.1	25
25	MD09W272-8-4-14-6	16	65	25	50	47	0.4	23
26	MD09W272-8-4-14-8	6	45	13	30	29	0.4	12
27	OH10-219-65	18	90	20	43	50	0.9	23
28	OH09-207-68	19	75	25	35	44	0.3	24
29	04620A1-1-7-4-17	6	40	15	20	25	0.4	12
30	06497A1-7-3	4	35	11	20	22	0.3	8
LOCATION MEANS	12.8	65.5	19.1	37.0	40.0	0.7	21.0	
GROWTH STAGE / DATE								

FUSARIUM HEAD BLIGHT (SCAB)

		Nairn ON Etienne		
		INCIDENCE	SEVERITY	INDEX
		0-9	0-9	0-9
1	Branson	5.4	3.4	2.1
2	MO080104	1.6	2.0	0.3
3	Hilliard	3.8	3.2	1.3
4	Pioneer Brand 25R46	3.6	2.7	1.4
5	0762A1-2-8	2.9	1.6	0.5
6	IL10-21934	2.9	1.8	0.6
7	TN1603	5.0	4.1	2.2
8	VA11W-279	4.7	4.3	2.4
9	VA11W-313	6.1	4.3	2.9
10	VA12W-31	4.5	3.2	1.6
11	KWS 072	5.6	5.4	3.4
12	KWS 074	3.2	3.8	1.3
13	KWS 078	5.2	3.2	1.8
14	KY06C-1178-16-10-3	4.7	3.2	1.9
15	KY06C-1195-37-2-5	4.3	4.1	2.0
16	KY06C-2067-16-7-1	3.6	3.2	1.3
17	IL11-28222	2.6	2.7	0.8
18	IL11-6543	4.5	2.3	1.4
19	OK11311F	7.0	4.1	3.1
20	DH11SRW8-59	6.8	4.5	3.4
21	DH11SRW41-26	4.1	4.7	2.2
22	AR06017-6-2	5.9	5.0	3.2
23	AR06050-7-2	3.2	3.6	1.5
24	MD09W272-8-4-13-3-15	3.6	2.5	1.0
25	MD09W272-8-4-14-6	3.4	1.8	0.8
26	MD09W272-8-4-14-8	3.8	3.6	1.6
27	OH10-219-65	3.4	4.5	1.7
28	OH09-207-68	4.1	2.3	1.1
29	04620A1-1-7-4-17	2.0	2.5	0.6
30	06497A1-7-3	3.4	3.4	1.2
LOCATION MEANS		4.2	3.3	1.7
GROWTH STAGE / DATE				

POWDERY MILDEW

	Battle Ground IN	Ithaca NY	Raleigh NC	Nairn ON	Warsaw VA	
	Brown 0-9	Sorrells 0-9	Marshall	Etienne 0-9	Griffey 0-9	
1	Branson	2.5	0.0	4	2.0	2.5
2	MO080104	3.0	0.0	0	2.0	6.5
3	Hilliard	0.0	0.0	0	0.5	2.0
4	Pioneer Brand 25R46	8.0	0.0	6	4.0	4.5
5	0762A1-2-8	0.0	0.0	5	2.5	4.0
6	IL10-21934	3.0	0.0	6	5.0	5.0
7	TN1603	1.0	0.0	5	2.5	3.0
8	VA11W-279	0.0	0.0	0	1.5	2.0
9	VA11W-313	2.0	0.0	5	2.5	3.0
10	VA12W-31	1.0	0.0	0	1.0	2.0
11	KWS 072	3.0	0.0	6	3.0	4.0
12	KWS 074	4.0	0.0	0	1.0	2.5
13	KWS 078	6.0	1.7	6	2.0	6.5
14	KY06C-1178-16-10-3	0.0	0.0	5	2.5	5.5
15	KY06C-1195-37-2-5	7.0	2.0	7	4.5	6.5
16	KY06C-2067-16-7-1	4.5	0.0	5	3.5	4.5
17	IL11-28222	6.5	2.0	5	5.0	6.0
18	IL11-6543	3.0	0.0	2	3.5	2.5
19	OK11311F	9.0	4.0	5	3.5	7.0
20	DH11SRW8-59	0.0	0.0	2	0.0	1.5
21	DH11SRW41-26	0.0	0.0	5	4.0	4.0
22	AR06017-6-2	3.5	1.0	6	2.0	4.5
23	AR06050-7-2	1.0	0.0	1	2.0	2.5
24	MD09W272-8-4-13-3-15	0.0	0.0	5	0.0	4.5
25	MD09W272-8-4-14-6	0.0	0.0	5	0.5	3.0
26	MD09W272-8-4-14-8	0.0	0.0	5	1.0	3.5
27	OH10-219-65	4.0	1.0	6	3.0	6.0
28	OH09-207-68	0.0	0.0	3	0.0	3.5
29	04620A1-1-7-4-17	0.0	0.0	4	1.5	1.5
30	06497A1-7-3	0.0	0.0	5	3.5	3.0
LOCATION MEANS		2.4	0.4	4.0	2.3	3.9
GROWTH STAGE / DATE		May 5				

VIRUSES

	Battle Ground	Windfall	Lexington	Mason	Knoxville	
	IN	IN	KY	MI	TN	
	Brown	Lively	Van Sanford	Olson	West	
	BYDV	WSSMV/WSBMV	BYDV	SBMV	BYDV	
	0-9	0-9	0-9	0-3	0-9	
1	Branson	2.0	2	2.5	1.5	2.7
2	MO080104	4.0	3	5.0	2.0	3.3
3	Hilliard	2.0	2	5.0	2.0	2.7
4	Pioneer Brand 25R46	5.0	1	3.0	0.0	2.0
5	0762A1-2-8	2.0	5	2.0	0.0	2.7
6	IL10-21934	0.0	3	5.0	2.0	3.7
7	TN1603	0.0	6	6.0	1.5	4.3
8	VA11W-279	1.0	6	6.0	2.0	2.0
9	VA11W-313	1.0	1	4.0	0.0	2.0
10	VA12W-31	2.0	4	1.5	2.0	2.7
11	KWS 072	3.0	2	5.5	0.0	3.0
12	KWS 074	2.0	1	3.0	0.0	2.7
13	KWS 078	3.0	3	4.5	1.5	2.0
14	KY06C-1178-16-10-3	0.0	1	4.0	0.5	3.3
15	KY06C-1195-37-2-5	2.0	3	5.0	1.0	3.7
16	KY06C-2067-16-7-1	2.0	1	4.0	1.0	4.0
17	IL11-28222	1.0	2	2.5	1.0	3.0
18	IL11-6543	0.0	1	3.0	0.0	1.7
19	OK11311F	3.5	4	6.0	2.5	3.0
20	DH11SRW8-59	1.5	3	3.0	2.0	1.3
21	DH11SRW41-26	0.0	4	2.5	0.0	3.3
22	AR06017-6-2	4.0	7	6.0	0.0	3.3
23	AR06050-7-2	1.0	5	6.0	3.0	3.0
24	MD09W272-8-4-13-3-15	1.0	2	4.0	0.5	4.0
25	MD09W272-8-4-14-6	3.0	3	4.5	1.0	3.0
26	MD09W272-8-4-14-8	1.5	2	3.0	0.0	2.3
27	OH10-219-65	4.0	2	3.5	1.0	3.7
28	OH09-207-68	3.5	4	3.0	0.0	3.7
29	04620A1-1-7-4-17	3.0	1	3.5	0.5	1.0
30	06497A1-7-3	3.0	3	2.5	1.0	2.3
LOCATION MEANS		2.0	2.9	4.0	1.0	2.8
GROWTH STAGE / DATE		May 12	March 23		11	

VIRUSES

		Blacksburg VA Griffey BYDV 0-9
1	Branson	1.0
2	MO080104	0.5
3	Hilliard	0.5
4	Pioneer Brand 25R46	1.0
5	0762A1-2-8	1.0
6	IL10-21934	1.0
7	TN1603	2.0
8	VA11W-279	1.5
9	VA11W-313	1.0
10	VA12W-31	0.5
11	KWS 072	1.0
12	KWS 074	1.0
13	KWS 078	0.5
14	KY06C-1178-16-10-3	1.0
15	KY06C-1195-37-2-5	1.0
16	KY06C-2067-16-7-1	1.0
17	IL11-28222	0.5
18	IL11-6543	0.5
19	OK11311F	1.0
20	DH11SRW8-59	0.5
21	DH11SRW41-26	1.5
22	AR06017-6-2	1.5
23	AR06050-7-2	1.0
24	MD09W272-8-4-13-3-15	1.5
25	MD09W272-8-4-14-6	1.0
26	MD09W272-8-4-14-8	0.5
27	OH10-219-65	1.0
28	OH09-207-68	1.0
29	04620A1-1-7-4-17	0.0
30	06497A1-7-3	0.5
LOCATION MEANS		0.9
GROWTH STAGE / DATE		

PRE-HARVEST SPROUTING

	Ithaca NY Sorrells 0-9
1 Branson	1.4
2 MO080104	0.6
3 Hilliard	2.4
4 Pioneer Brand 25R46	1.2
5 0762A1-2-8	2.0
6 IL10-21934	0.1
7 TN1603	2.1
8 VA11W-279	0.8
9 VA11W-313	2.1
10 VA12W-31	1.4
11 KWS 072	1.6
12 KWS 074	1.3
13 KWS 078	0.9
14 KY06C-1178-16-10-3	1.0
15 KY06C-1195-37-2-5	0.6
16 KY06C-2067-16-7-1	0.1
17 IL11-28222	0.4
18 IL11-6543	1.6
19 OK11311F	0.4
20 DH11SRW8-59	1.1
21 DH11SRW41-26	1.2
22 AR06017-6-2	3.6
23 AR06050-7-2	1.0
24 MD09W272-8-4-13-3-15	4.1
25 MD09W272-8-4-14-6	4.5
26 MD09W272-8-4-14-8	2.9
27 OH10-219-65	0.5
28 OH09-207-68	0.6
29 04620A1-1-7-4-17	1.5
30 06497A1-7-3	0.1
LOCATION MEANS	1.4

KERNEL WEIGHT

		W Lafayette	Nairn
		IN	ON
		Mohammadi	Etienne
		tkw	tkw
1	Branson	36.2	36.0
2	MO080104	34.2	33.8
3	Hilliard	35.3	35.1
4	Pioneer Brand 25R46	31.7	28.7
5	0762A1-2-8	36.6	32.9
6	IL10-21934	34.6	29.8
7	TN1603	34.7	31.4
8	VA11W-279	35.7	36.6
9	VA11W-313	39.0	37.0
10	VA12W-31	30.6	27.1
11	KWS 072	36.1	33.9
12	KWS 074	30.8	30.5
13	KWS 078	38.8	37.0
14	KY06C-1178-16-10-3	37.3	32.4
15	KY06C-1195-37-2-5	32.7	29.5
16	KY06C-2067-16-7-1	35.8	29.6
17	IL11-28222	27.9	25.4
18	IL11-6543	36.3	31.8
19	OK11311F	39.2	39.2
20	DH11SRW8-59	41.3	33.5
21	DH11SRW41-26	40.0	31.9
22	AR06017-6-2	32.4	33.6
23	AR06050-7-2	36.6	38.5
24	MD09W272-8-4-13-3-15	34.8	36.7
25	MD09W272-8-4-14-6	33.1	33.2
26	MD09W272-8-4-14-8	33.4	34.4
27	OH10-219-65	31.3	27.0
28	OH09-207-68	36.3	37.8
29	04620A1-1-7-4-17	36.9	32.3
30	06497A1-7-3	35.1	34.5
LOCATION MEANS		35.1	33.0

HESSIAN FLY

W Lafayette
IN
Cambron

	Bio B	Bio C	Bio O	Bio L
	R-S	R-S	R-S	R-S
1 Branson	13-5	0-21	0-16	0-20
2 MO080104	16-0	12-14	0-17	0-24
3 Hilliard	17-0	17-0	0-15	0-19
4 Pioneer Brand 25R46	0-18	0-20	0-17	0-20
5 0762A1-2-8	0-21	0-14	0-15	0-19
6 IL10-21934	19-0	0-18	0-14	0-15
7 TN1603	0-23	0-16	0-20	0-19
8 VA11W-279	20-0	22-0	14-1	18-0
9 VA11W-313	10-13	12-9	12-6	18-1
10 VA12W-31	0-23	0-24	0-18	0-20
11 KWS 072	0-15	0-19	0-20	0-19
12 KWS 074	0-18	0-18	0-17	0-17
13 KWS 078	0-18	0-17	0-13	0-20
14 KY06C-1178-16-10-3	14-0	0-14	0-13	0-15
15 KY06C-1195-37-2-5	0-14	7-9	0-15	0-16
16 KY06C-2067-16-7-1	0-16	0-16	0-12	0-15
17 IL11-28222	20-0	0-18	0-18	0-19
18 IL11-6543	17-0	0-20	0-17	0-22
19 OK11311F	0-21	9-11	0-14	0-19
20 DH11SRW8-59	0-17	0-17	0-18	0-17
21 DH11SRW41-26	16-2	15-0	0-13	0-20
22 AR06017-6-2	0-19	0-21	0-16	0-18
23 AR06050-7-2	0-20	0-20	0-18	0-23
24 MD09W272-8-4-13-3-15	22-0	19-0	0-17	0-24
25 MD09W272-8-4-14-6	20-0	17-0	0-22	0-20
26 MD09W272-8-4-14-8	1-19	16-1	0-18	0-22
27 OH10-219-65	22-0	0-21	0-23	0-21
28 OH09-207-68	22-0	19-0	0-18	0-20
29 04620A1-1-7-4-17	0-11	11-3	0-12	0-15
30 06497A1-7-3	0-15	7-2	0-9	0-6

ACID SOIL TOLERANCE

Enid
OK
Carver

		0-5	0-5	0-5
1	Branson	4	3	3
2	MO080104	3	3	4
3	Hilliard	2	1	2
4	Pioneer Brand 25R46	3	2	3
5	0762A1-2-8	2	1	2
6	IL10-21934	2	3	3
7	TN1603	2	2	3
8	VA11W-279	3	3	3
9	VA11W-313	2	3	3
10	VA12W-31	3	3	2
11	KWS 072	2	2	3
12	KWS 074	3	2	3
13	KWS 078	1	1	1
14	KY06C-1178-16-10-3	2	3	3
15	KY06C-1195-37-2-5	0	1	2
16	KY06C-2067-16-7-1	1	1	3
17	IL11-28222	1	1	2
18	IL11-6543	3	2	3
19	OK11311F	1	3	1
20	DH11SRW8-59	1	1	2
21	DH11SRW41-26	1	2	3
22	AR06017-6-2	2	1	1
23	AR06050-7-2	1	1	1
24	MD09W272-8-4-13-3-15	3	2	3
25	MD09W272-8-4-14-6	3	1	1
26	MD09W272-8-4-14-8	1	1	1
27	OH10-219-65	4	3	3
28	OH09-207-68	3	3	3
29	04620A1-1-7-4-17	4	2	3
30	06497A1-7-3	3	1	2
LOCATION MEANS		2.2	1.9	2.4
GROWTH STAGE / DATE		Nov. 20	April 15	May 18

ADVANCED NURSERY EVALUATION
FOR SOFT WHEAT MILLING AND BAKING QUALITY
2016 CROP

Rankings/Grade Summary

Lab Number	Entry Number	Entry	Adjusted Flour Yield %	Adjusted Flour Yield % Rank	Adjusted Flour Yield % Grade	Cookie Diameter cm	Cookie Diameter cm Rank	Cookie Diameter cm Grade
1651611	1	Branson						
1651612	2	MO080104						
1651613	3	Hilliard						
1651614	4	Pioneer Brand 25R46						
1651615	5	0762A1-2-8	66.0	20	F	18.5	13	C
1651616	6	IL10-21934	67.8	10	D	18.3	20	D
1651617	7	TN1603	70.7	1	B	18.7	6	C
1651618	8	VA11W-279	67.1	15	D	18.4	17	C
1651619	9	VA11W-313	67.4	13	D	18.7	10	C
1651620	10	VA12W-31	66.4	19	F	18.7	7	C
1651621	11	KWS 072	67.3	14	D	18.6	11	C
1651622	12	KWS 074	67.5	12	D	19.1	1	B
1651623	13	KWS 078	70.0	3	B	18.7	8	C
1651624	14	KY06C-1178-16-10-3	69.3	5	C	18.3	19	D
1651625	15	KY06C-1195-37-2-5	67.8	9	D	18.6	12	C
1651626	16	KY06C-2067-16-7-1	68.6	6	C	18.4	18	C
1651627	17	IL11-28222	66.6	17	F	18.9	3	B
1651628	18	IL11-6543	66.5	18	F	18.2	22	D
1651629	19	OK11311F	67.0	16	D	18.1	23	D
1651630	20	DH11SRW8-59	68.2	8	C	18.8	5	B
1651631	21	DH11SRW41-26	68.6	7	C	19.0	2	B
1651632	22	AR06017-6-2	69.7	4	C	18.9	4	B
1651633	23	AR06050-7-2	64.1	25	F	18.5	14	C
1651634	24	MD09W272-8-4-13-3-15	63.9	26	F	17.7	25	F
1651635	25	MD09W272-8-4-14-6	65.3	23	F	18.4	16	C
1651636	26	MD09W272-8-4-14-8	65.4	22	F	18.0	24	D
1651637	27	OH10-219-65	67.7	11	D	18.5	15	C
1651638	28	OH09-207-68	70.1	2	B	18.7	9	C
1651639	29	04620A1-1-7-4-17	64.5	24	F	17.6	26	F
1651640	30	06497A1-7-3	65.5	21	F	18.2	21	D

**Adjusted Flour Yield Grade
(Based on Samples Between 2009 and 2015)**

Grade	Range	Percent
A	>70.85	15
B	9.71 to 70.8	20
C	8.23 to 69.7	30
D	6.86 to 68.2	20
F	<66.86	15

**Cookie Diameter
(Based on Samples Between 2009 and 2015)**

Grade	Range	Percent
A	>19.25	15
B	8.83 to 19.2	20
C	8.35 to 18.8	30
D	7.94 to 18.3	20
F	<17.94	15