UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service

State Agricultural Experiment Stations, Cooperating

2003 - 2004

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 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. Confirmed results will be published through established channels. 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.

This report includes data furnished by the State Agricultural Experiment Stations. The report is not intended for publication and should not be referred to in literature citations nor quoted in publicity or advertising. Use of the data may be granted for certain purposes upon written request to the agency or agencies involved.

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

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2003-2004 UNIFORM EASTERN SOFT RED WINTER WHEAT NURSERY
LIST OF ENTRIES AND PEDIGREES

Entry No.	Cultivar/ Designation	Pedigree	Contributor	1st Year in Nursery
1	Caldwell	Benhur sib*2/Siete Cerros	Check	88-89
2	Foster	KY 83-60/Tyler//KY 83-75 (formerly KY 85C-31-6)	Check	96-97
3	Patton	SW85*94/IN82104B1-3-2 (formerly A94-1048)	Check	96-97
4	Roane	VA71-54-147(CI17449)/C68-15//IN65309C1-18-2-3-2 (formerly VA93-54-429)	Check	95-96
5	AR 910-9-1	AR369-4-2/Bayles	Bacon	01-02
6	VA00W-526	FFR555W/VA91-54-343(IN71761A4-31-5-48//71-54-147/MCN1813)// GA8619/D25(MCN1003/CK797/3/Hunter//Veery/Amigo)	Griffey	02-03
7	VA97W-375WS	CK9803/Freedom:White Seed Line	Griffey	02-03
8	VAN98W-170WS	FFR555W/Gore//CK9803/VA87-54-636(Sal/Jugoslavia):White Seed Line	Griffey	02-03
9	T143	P2751/2*T814	Wilson	02-03
10	M99*3098	TX85-264/VA88-52-69	Beazer	02-03
11	OH708	IL85-3132-1/Irena//OH449/VA86-54-290	Sneller	02-03
12	MO981020	MO11769/Madison	McKendry	02-03
13	MO980829	MO11769/Madison	McKendry	02-03
14	B980582	L881060/L880436	Hancock	02-03
15	B980696	L880421/Boranjka	Hancock	02-03
16	IL97-3632	IL90-6364/Y88-3a	Kolb	02-03
17	T141	T441/T13	Wilson	03-04
18	AR 93027-3-2	Pio2571/Coker9024	Bacon	03-04
19	MD 11-52	Coker9803/Freedom	Costa	03-04
20	MV 5-46	71-54-147/CK68-15//IN65309C7-18-2-3-2/FFR555W//MSY*3/Balkan//Sal	Costa	03-04
21	P91202RB1-3-3-4-5	81401A1-32//85437B1-1/Clark	Ohm	03-04
22	P961341A3-1-2	9017C1-1//92823A1-2/9218B4-4/3/P107/4/Patterson	Ohm	03-04
23	P97397E1-11-2-4-1-1	96204A1-12//Goldfield/92823A1-11	Ohm	03-04
24	B980006	L880102/PT88-32	Hancock	03-04
25	KY93C-0378-5-2	VA88-52-69/2510//KY84C-48-1	Van Sanford	03-04
26	KY93C-1238-17-1	VA87-54-558/KY83C-004//2510	Van Sanford	03-04
27	Danny exp.	IN81381I16-5-50/GR962	Lafever	03-04
28	Jolly exp.	Wynn/IN83179A1-6-2-4-1	Lafever	03-04
29	Apple exp.	Glory/Pio2545	Lafever	03-04
30	MSU Line E1007	Pio2555/Pio2737W	Ward	03-04
31	IL99-15867	IL93-2879/P881705A-1-X-60	Kolb	03-04
32	G39186	Madison/Roazon//G3566	Brown	03-04
33	G39050	Excel/VA85-52-24	Brown	03-04
34	G39030	VA91-54-219/ABI89-4584	Brown	03-04
35	OH743	OH529/OH506	Sneller	03-04
36	OH751	10584-0801/Coker9663	Sneller	03-04
37	M00-3701	Pio2737W/891-4584A (Pike/FL302)	Beazer	03-04
38	M99-2408	Pio2510/E86-6646	Beazer	03-04
39	NY89066-7131	88038 (Geneva/Pio2550)/Harus	Sorrells	03-04
40	X00*1118	LX161C//8138L1/PT881	Moreno	03-04
41	X00-1079	P2510/MO11769/XY901B	Moreno	03-04
42	WB-1001	Elkhart/VA94-54-549//P2552	Moreno	03-04
43	GA 931233-E17	Gore*2/GA83267	Johnson	03-04

LOCATION NOTES

Bay, Arkansas

Cooperators:	June Hancock, David Hill, Richard Gray Syngenta Seeds
Planted:	October 23, 2003
Harvested:	June 10, 2004
Comments:	Very mild winter. Rain at flowering. Leaf rust moved in late, but we did get good notes.

Stuttgart, Arkansas

Cooperators:	Robert Bacon, John Kelly, Charlie Parsons University of Arkansas
Planted:	October 17, 2003
Harvested:	June 2, 2004
Fertilizer:	100-0-0

Clay Co., Jackson Co., Fayetteville, Keiser, Kibler, Arkansas

Cooperators:	Gene Milus University of Arkansas
Comments:	Fayetteville: The stripe rust nursery was inoculated with a field collection from Stuttgart, AR in 2000 (virulence on Yr9 and representative of what was present then). Clay County: 0-9 scale, values of 3 or higher were susceptible. Keiser: 0-9 scale, values of 6.5 or higher were susceptible. Jackson County: 0-9 scale, values of 4 or higher were susceptible. Kibler: Rated at soft dough stage on 5/7, diseases in order of prevalence were Septoria leaf blotch, stripe rust, and leaf rust.

Georgetown, Delaware

Cooperators:	Bob Uniatowski University of Delaware
Planted:	October 21, 2003
Harvested:	June 23, 2004
Fertilizer:	60-0-20

Quincy, Florida

Cooperators:	Ronald D. Barnett, Lloyd Schell University of Florida
Planted:	November 17, 2003
Fertilizer:	75-50-75
Comments:	Had a problem with uniformity due to a residual herbicide, thus unable to get usable yield data.

Griffin, Georgia

Cooperators:	Jerry W. Johnson, D. Bland, S. Sutton, J. Youmans University of Georgia
Fertilizer:	90-0-0

Aberdeen, Idaho

Cooperators:	Charles Erickson, Scott McNeil, Harold Bockelman USDA-ARS, National Small Grains Collection
Planted:	September 18, 2003
Harvested:	July 21, 2004
Comments:	Plant heights were not taken due to high variability, also reflected in the CV.

Brownstown, Illinois

Cooperators:	Frederick L. Kolb, Norman Smith University of Illinois
Planted:	October 8, 2003
Harvested:	June 24, 2004
Fertilizer:	40 N preplant, 60 N spring topdress, P and K ok
Comments:	Good to excellent stands, good fall growth, no winter kill. Heading and harvest about one week earlier than normal. Slight to moderate FHB. Unresolved error in yield data for one rep of entry 39.

Urbana, Illinois

Cooperators:	Frederick L. Kolb, Norman Smith University of Illinois
Planted:	November 1, 2003
Harvested:	June 22, 2004
Fertilizer:	40 N preplant, 40 N spring topdress, P and K ok
Comments:	Excellent stands, good fall growth, no winter kill. Heading and harvest about one week earlier than normal. Little disease pressure. BYDV stunting from 2 reps of PAV-IL inoculated hills, Stunting = ((Ht. of control hill - Ht. of inoculated hill)/ Ht of control hill) * 100. FHB data from 3 reps in a inoculated, misted nursery. FHB index = (% Incidence * % Severity)/100; ISK index = .3 * Incidence + .3 Severity + .4 * % FDK. SBMV from 2 reps of rows in SBMV nursery.

Greensburg, Indiana

Cooperators:	Sam Brown Genesis Seed Research
Planted:	October 7, 2003
Harvested:	June 25, 2004

Fertilizer:	28-46-32 fall; 80-0-0 spring
Comments:	Good stand establishment, exposed plots during winter cold, abnormally moist March, warm dry April, moist and normal May temperatures. Harvested a week earlier than usual. Little to no foliar diseases, however Fusarium HB took a toll. FHB index = percent of heads showing symptoms 1 = 0 to 10, 2 = 11 to 20, 3 = 21 to 30, 4 = 31 to 40, 5 = 41 to 50% or more.

Lafayette, Indiana

Cooperators:	Benjamin Moreno, Justin Cooley Westbred LLC
Planted:	October 5, 2003
Harvested:	June 24, 2004
Comments:	One rep test, heavy scab and lodging pressure due to continuos rain at flowering and early dought stage. It dried out by harvest time so yield and TWT were decent.

West Lafayette, Indiana

Cooperators:	Herbert W. Ohm Purdue University
Planted:	September 28, 2003
Harvested:	June 23, 2004
Fertilizer:	35-90-0 fall; 90-0-0 spring
Comments:	Mild winter, early spring growth, cool/wet mid-March through April, so plant stunting in slightly low areas. Harvest was 7-10 days earlier than typical. Severe FHB, other diseases negligible. Point inoculation severity: mean percentage diseased spikelets at 24 d after inoculation of a floret in 3rd spikelet from tips of spikes, bagged for 3 d after inoculation and misted for 3 weeks after inoculation. Natural infection severity: visual estimate of average disease spread in diseased spikes in yield plots on June 10--thus, less disease spread on late-maturing lines.

West Lafayette, Indiana

Cooperators:	Sue Cambron USDA-ARS, Crop Production & Pest Control Research
Comments:	Provided Hessian fly data. Expressed as number of plants R vs number of plants S.

Woodburn, Indiana

Cooperators:	Curtis Beazer, Eugene Glover AgriPro Wheat
Planted:	October 21, 2003
Harvested:	July 1, 2004

Fertilizer: 30 N fall; 70 N in Feb.; 25 N in April
Comments: Nursery was planted late and emerged from winter with thin stands and low tillering. Spring fertilizer was split to promote tillering. Stands were thin the entire season. Armyworms cleaned off the leaves late in the season.

Wichita, Kansas
Cooperators: James A. Wilson
Trio Research
Planted: October 13, 2003
Harvested: July 8, 2004
Fertilizer: 60 N
Comments: Water damage to plots in the fall. Some hail in the spring. Late harvest.

Winfield, Kansas
Cooperators: Sid Perry
Westbred LLC
Comments: Nursery was lost to an early hailstorm.

Logan Co., Kentucky
Cooperators: David Van Sanford
University of Kentucky
Planted: October 16, 2003
Harvested: June 16, 2004
Fertilizer: P,K according to soil test; 60 N at GS3; 50 N at GS5
Comments: High CVs make the yield data of questionable value. A fertilizer overlap contributed to the problem.

Woodford Co., Kentucky
Cooperators: David Van Sanford
University of Kentucky
Planted: October 21, 2003
Harvested: June 30, 2004
Fertilizer: P,K according to soil test; 60 N at GS3; 50 N at GS5
Comments: High CVs make the yield data of questionable value. Heavy lodging. The mildew data was consistent and the %FDK data should be meaningful.

Baton Rouge, Louisiana
Cooperators: Stephen A. Harrison, Kelly Arceneaux, Fred Lareaux
Louisiana State University
Planted: December 1, 2003
Comments: Heading Date: Relative heading date from 6-row headrow plot. 0 = very early; 3 = early for Baton Rouge 9 (low vern, non-phto facultative). 5 = average (Pioneer 26R61,

AGS 2000); 7 = vernalized and might yield OK but late; 8 = marginal, partial vern, too late for south LA; 9 = non vernalized. "e" indicates early heading off types/bolting. Phenotype: overall appearance, leaf health, vigor, tillering, etc. 0 = best, 9 = worst. Leaf and Stripe Rust: 0 = none. No ratings for non-vern lines, which generally had old and yellowed leaves. Moderate leaf rust and light stripe rust pressure.

Clarksville, Maryland

Cooperators:	Jose Costa, Aaron Cooper University of Maryland
Planted:	October 8, 2003
Harvested:	June 21, 2004
Fertilizer:	80 N

Dundee, Michigan

Cooperators:	Benjamin Moreno, Justin Cooley Westbred LLC
Planted:	October 10, 2003
Harvested:	July 8, 2004

Merrill, Michigan

Cooperators:	Rick Ward Michigan State University
Planted:	September 30, 2003
Harvested:	July 19, 2004
Fertilizer:	Preplant 200# of 10-12-13 + 1%Mn + 100# Gyp + 10#Cu; spring 90 N as urea.
Comments:	Light to moderate scab pressure depending on flowering date. Moderate leaf blotch pressure. Yield, test weight, and grain moisture data were acquired electronically on the plot combine at the time of harvest. Grain moisture data is based on actual moisture at harvest. Yield data are standardized to 13% moisture. Data reported as scores are based on a 0-9 scale, where 0 is the best possible score. Plant height is reported as the distance in inches from the ground to the tip of average heads in a plot. The flowering date indicates the average number of days past January 1st that a given entry reached the point where ½ of its heads were flowering. The causal organism(s) of the leaf blotching were not identified, but were likely a combination of Stagonospora tritici, (formerly known as Septoria tritici), and S. nordorum. Sprouting data is based on greenhouse evaluation of 5 heads from two replications.

Heads were collected within 48 hours of harvest and dried for seven days. Scores were taken after the heads were subjected to near-continuous misting for five to seven days, where zero indicates that there was no sprouting present.

St. Paul, Minnesota

Cooperators: Dave Long, James Kolmer
USDA-ARS Cereal Disease Laboratory

Comments: Seedling reaction to leaf rust. No field/adult plant data for leaf rust and stem rust were available due to severe winterkill.

Columbia, Missouri

Cooperators: Anne L. McKendry, David Tague
University of Missouri

Planted: October 17, 2003
Harvested: June 29, 2004
Fertilizer: 40 N fall; 80 N spring

Lincoln, Nebraska

Cooperators: P. Stephen Baenziger
University of Nebraska

Lincoln, Nebraska

Cooperators: Robert A. Graybosch
USDA-ARS Wheat, Sorghum, and Forage Research Unit

Comments: Provided the 1RS data.

Ithaca, New York

Cooperators: Mark E. Sorrells, D. Benscher
Cornell University

Raleigh, North Carolina

Cooperators: David Marshall
USDA-ARS Plant Science Research

Comments: Provided PM seedling data.

Smithville, Ohio

Cooperators: Hal Lafever
Sunbeam Extract Co.

Comments: No data to report due to serious flooding damage.

Wooster, Ohio

Cooperators: Clay Sneller
Ohio State University, OARDC

Wooster, Ohio

Cooperators:	Charles Gaines USDA-ARS Soft Wheat Quality Lab
Comments:	Provided the nursery quality data.

Enid, Oklahoma

Cooperators:	Brett Carver, Ella Vogle Oklahoma State University
Comments:	The standard cultivar used to determine acid-soil tolerance was 2163, with an assigned rating of 2 on a scale of 1 (tolerant) to 5 (highly susceptible). Readings taken at Enid, OK (new location in 2004, pH = 4.6, 70 ppm Al, and Al saturation = 11%) on the date indicated.

Nairn, Ontario

Cooperators:	Mark Etienne Hyland Seeds
Planted:	October 21, 2003
Harvested:	August 9, 2004
Fertilizer:	12 N preplant; 90 N spring
Comments:	Late planted, good to average winter survival. Heading about a week earlier, harvest a week later. Cool, wet spring/summer--June's high was about 4C below the long term average! Mildew arrived later in season as well as other diseases; most lines missed FHB infection, traces of stripe and stem rust--due to data logger malfunction, disease notes lost--back to paper in 2004-05.

Ridgetown, Ontario

Cooperators:	Arend E. Smid Ridgetown College, University of Guelph
Planted:	October 9, 2003
Harvested:	July 19, 2004
Fertilizer:	12-48-48; 55 N topdress
Comments:	Excellent growing conditions. Absence of stormy weather throughout the growing season resulted in little or no lodging. No winterkill. Little or no leaf rust noted.

Knoxville, Tennessee

Cooperators:	Dennis West University of Tennessee
Planted:	October 28, 2003
Harvested:	June 9, 2004
Fertilizer:	30-30-30 fall; 60-0-0 spring

Blacksburg, Virginia

Cooperators: Carl Griffey, T. Pridgen, Joe Paling
Virginia Tech

Planted: October 9, 2003

Harvested: June 27, 2004

Fertilizer: 25-60-100 on 10/7; 60-0-0 on 4/7

Comments: 1 Belgian Lodging = Area x Intensity x 0.2. Area is rated on a scale from 1 (plot unaffected) to 10 (entire plot affected). Intensity is rated on a scale from 1 (plants standing upright) to 5 (plants lying flat on the ground). In three separate greenhouse experiments, wheat lines were inoculated at the two-leaf seedling stage using two races of leaf rust (TNRJ with virulence for resistance genes Lr1, 2a, 2c, 3a, 3ka, 9, 10, 11, 14a, 24, 30 and MCRK with virulence for genes Lr1, 3a, 3ka, 10, 11, 14a, 18, 26, 30) and a field composite of powdery mildew with virulence for resistance genes Pm2,3a, 3c, 3c, 3f, 4a, 4b, 5, 6, 7, 8). Observed reactions of leaf rust differentials with genes Lr18 and 26 to race MCRK were only moderately susceptible. Observed reactions of powdery mildew differentials with genes Pm2, 5, 8 gave intermediate to moderately susceptible reactions. For powdery mildew differentials, two sets of differentials (the standard Chancellor set and an experimental Coker 68-15 set) were used in some cases, but there were discrepancies [Pm7, 17 (Amigo)] between the two sets in a few cases in which Coker 68-15 differentials did not give the expected reaction type. The Coker 68-15 differential set used in these tests is not a final set. Also, in some cases where treated seed was sent, the reaction types may not be reflective of genetic resistance. Infection type for leaf rust was rated on a 0-3 (0-2 = resistant and 3=susceptible) scale and for powdery mildew on a 0-4 (0-2 = resistant, 3 = moderately susceptible, and 4 = susceptible). Where indicated reaction types R=resistant, MR=moderately resistant, I=Intermediate, MS=moderately susceptible, and S=susceptible. Reaction types of heterogeneous lines are noted with the predominant disease score listed preceding the slash. For example a disease score of 12MR/TRS, indicates that most plants were scored as 12MR and a Trace (TR) number of plants were scored as S. Disease score having “C” indicates Chlorosis was observed and “N” indicates Necrosis.

Warsaw, Virginia

Cooperators: Carl Griffey, T. Pridgen, Joe Paling

	Virginia Tech
Planted:	October 19, 2003
Harvested:	June 14, 2004
Fertilizer:	30-60-60-5S on 10/17; 25# of 15-0-0 on 12/21 and 2/17; 60# of 24-0-0-3S on 3/30
Comments:	1 Belgian Lodging = Area x Intensity x 0.2. Area is rated on a scale from 1 (plot unaffected) to 10 (entire plot affected). Intensity is rated on a scale from 1 (plants standing upright) to 5 (plants lying flat on the ground).

Mt. Vernon,
Pullman, Washington

Cooperators:	Xianming Chen USDA-ARS Wheat Genetics, Quality, Physiology & Disease Research
Comments:	Provided adult stripe rust data.

Arlington, Wisconsin

Cooperators:	Roger Borges, Mark Martinka University of Wisconsin
Planted:	September 26, 2003
Harvested:	August 6, 2004
Fertilizer:	90# actual

YIELD (bu/acre)

		Bay AR		Stuttgart AR		Georgetown DE		Griffin GA		Aberdeen ID		Brownstown IL	
		ab	rank	ab	rank	ab	rank		rank		rank	ab	rank
1	Caldwell	49.4	40	77.1	30	63.3	40	76.9	27	93.3	38	59.4	37
2	Foster	56.9	32	79.4	24	69.0	26	79.9	21	101.5	31	63.9	23
3	Patton	67.2	9	80.5	19	69.1	25	78.0	25	105.8	25	62.0	31
4	Roane	72.0	4	78.0	27	76.8	8	89.8	9	91.3	39	55.6	41
5	AR 910-9-1	63.1	21	82.1	16	76.2	11	69.9	38	96.0	35	67.0	11
6	VA00W-526	64.0	18	83.2	12	76.4	10	76.4	29	121.5	7	59.5	36
7	VA97W-375WS	64.6	16	80.0	22	68.2	29	92.1	5	120.4	12	63.9	23
8	VAN98W-170WS	62.2	22	82.2	15	59.1	41	76.2	30	103.0	27	53.6	42
9	T143	64.9	15	96.7	1	68.5	27	76.1	33	103.4	26	59.2	38
10	M99*3098	65.9	12	77.9	28	72.5	21	86.8	11	108.8	20	64.6	20
11	OH708	70.2	5	76.1	32	83.6	1	86.0	12	106.2	24	64.2	22
12	MO981020	66.8	11	78.3	26	73.0	19	80.8	20	109.7	19	66.4	14
13	MO980829	63.5	20	74.0	34	74.5	14	81.9	19	102.9	28	66.8	12
14	B980582	72.9	3	79.8	23	73.4	15	93.5	4	94.0	37	62.4	29
15	B980696	67.1	10	82.9	13	66.5	34	90.9	7	102.1	30	56.7	40
16	IL97-3632	60.5	25	77.7	29	67.8	30	104.1	1	78.2	42	69.5	4
17	T141	52.5	38	70.0	39	67.5	32	62.0	43	78.3	41	61.1	33
18	AR 93027-3-2	59.2	28	92.2	2	70.0	23	76.0	34	101.1	32	70.6	1
19	MD 11-52	60.3	26	80.2	20	75.0	13	66.2	42	106.4	23	64.3	21
20	MV 5-46	78.8	1	74.0	34	73.3	16	83.1	16	126.8	3	65.3	16
21	P91202RB1-3-3-4-5	52.4	39	82.9	13	65.4	38	69.5	40	98.7	34	60.8	34
22	P961341A3-1-2	69.8	7	76.6	31	66.2	37	82.0	18	119.9	13	60.5	35
23	P97397E1-11-2-4-1-1	57.9	29	84.0	11	67.2	33	82.6	17	116.6	16	66.1	15
24	B980006	65.1	13	81.7	17	73.3	16	76.6	28	75.5	43	68.3	7
25	KY93C-0378-5-2	69.5	8	88.0	3	78.7	6	76.2	30	108.3	21	66.8	12
26	KY93C-1238-17-1	65.0	14	84.1	10	78.2	7	76.2	30	114.0	17	69.3	5
27	Danny exp.	38.0	42	69.0	40	63.8	39	69.9	38	79.5	40	65.3	16
28	Jolly exp.	56.0	36	74.0	34	68.3	28	69.0	41	110.1	18	63.8	25
29	Apple exp.	44.1	41	71.2	38	69.3	24	74.5	36	95.8	36	65.3	16
30	MSU Line E1007	60.9	24	78.5	25	78.9	4	96.2	3	119.5	14	67.7	8
31	IL99-15867	70.2	6	84.3	9	78.9	4	85.5	14	107.4	22	68.6	6
32	G39186	57.3	30	81.4	18	76.8	8	72.9	37	120.6	10	69.6	3
33	G39050	56.1	35	73.3	37	67.6	31	79.1	22	102.6	29	62.8	26
34	G39030	60.2	27	75.8	33	66.5	34	98.7	2	100.6	33	62.8	26
35	OH743	54.9	37	67.5	41	70.4	22	92.1	5	119.2	15	62.3	30
36	OH751	56.3	34	67.5	41	73.0	19	77.5	26	134.9	2	62.7	28
37	M00-3701	62.1	23	87.2	5	82.5	2	90.6	8	123.2	6	67.3	9
38	M99-2408	63.8	19	85.9	7	75.3	12	78.2	23	126.0	4	61.8	32
39	NY89066-7131	32.6	43	58.2	43	52.3	43	76.0	34	124.8	5		
40	X00*1118	64.3	17	84.7	8	73.1	18	78.1	24	121.3	8	67.1	10
41	X00-1079	57.0	31	87.7	4	66.4	36	85.9	13	139.6	1	65.2	19
42	WB-1001	73.2	2	86.4	6	81.5	3	88.2	10	120.5	11	70.5	2
43	GA 931233-E17	56.6	33	80.1	21	56.9	42	83.4	15	120.7	9	58.1	39
LOCATION MEANS		61.1		79.4		71.0		81.1		108.1		64.0	
LSD (.05)		8.9		10		9.3				24.85		6	
CV %		9		7.8		8.1				16.74		5.8	
REPS		3		3		3				4		3	
Harvest Plot Size (sq.ft.)		61.06		70		62.5		55		21.77		34	

YIELD (bu/acre)

		Urbana IL		Greensburg IN		Lafayette IN		W. Lafayette IN		Woodburn IN		Wichita KS	
		ab	rank	ab	rank	a	rank	ab	rank	ab	rank		rank
1	Caldwell	72.6	21	79.5	36	80.7	42	78.4	31	58.1	34	38.3	39
2	Foster	72.8	20	94.6	16	93.2	25	83.3	25	62.4	21	45.4	30
3	Patton	69.5	27	91.2	21	101.5	6	94.0	1	65.6	11	44.0	34
4	Roane	78.7	5	98.0	12	97.1	16	89.7	10	67.0	8	53.0	15
5	AR 910-9-1	67.8	30	103.9	5	67.3	43	85.4	21			40.2	38
6	VA00W-526	58.9	42	75.8	40	87.1	37	65.8	42			40.4	37
7	VA97W-375WS	66.3	32	77.9	39	88.7	34	75.2	35	61.4	24	44.9	33
8	VAN98W-170WS	66.4	31	81.5	34	92.0	28	73.5	39	45.7	41	61.9	6
9	T143	73.8	17	91.7	20	90.6	30	74.3	38	53.2	40	63.9	3
10	M99*3098	74.5	14	91.1	22	90.9	29	82.9	27	67.2	7	64.5	2
11	OH708	66.0	33	75.6	41	97.1	17	76.1	33	72.8	1	45.8	29
12	MO981020	72.9	19	107.4	1	101.4	7	89.0	11	64.0	16	56.5	11
13	MO980829	76.0	11	101.3	7	98.9	12	93.5	3	64.9	12	49.0	21
14	B980582	72.0	22	106.0	2	88.8	33	84.7	23	64.2	14	48.8	22
15	B980696	74.3	15	104.2	4	86.9	38	88.2	13	58.0	35	58.9	10
16	IL97-3632	81.0	1	100.0	8	96.1	20	92.7	4	61.3	27	51.5	17
17	T141	59.5	40	82.1	33	89.4	32	77.5	32	61.4	25	36.4	41
18	AR 93027-3-2	79.9	2	93.3	18	97.6	15	84.6	24	57.7	37	60.6	8
19	MD 11-52	64.4	34	74.4	42	85.4	39	71.1	41	57.8	36	49.7	18
20	MV 5-46	61.4	37	83.7	30	93.1	26	74.7	36	61.3	26	47.1	27
21	P91202RB1-3-3-4-5	59.7	39	89.5	23	92.2	27	84.9	22	64.0	15	42.1	35
22	P961341A3-1-2	76.2	10	82.5	32	83.9	40	83.2	26	54.9	38	48.0	25
23	P97397E1-11-2-4-1-1	64.1	35	95.5	13	94.2	22	86.7	17	59.2	33	49.3	19
24	B980006	70.5	25	98.4	11	98.4	14	88.3	12	60.2	31	51.8	16
25	KY93C-0378-5-2	69.1	28	92.3	19	99.1	11	82.8	28	61.8	23	63.6	4
26	KY93C-1238-17-1	78.3	6	87.6	26	99.7	9	87.9	14	68.1	4	64.9	1
27	Danny exp.	61.0	38	86.0	28	83.9	40	76.1	34	60.5	30	48.5	23
28	Jolly exp.	59.5	40	78.3	38	89.9	31	73.3	40	63.2	20	47.0	28
29	Apple exp.	68.0	29	87.4	27	96.7	18	89.9	9	66.2	9	42.1	35
30	MSU Line E1007	74.3	15	88.4	24	96.5	19	85.5	20	59.8	32	55.9	14
31	IL99-15867	79.1	4	98.6	10	93.8	23	91.8	6	64.3	13	59.8	9
32	G39186	73.4	18	95.2	14	101.8	5	86.3	18	67.2	6	61.9	6
33	G39050	71.4	23	79.2	37	93.5	24	81.5	30	60.7	29	56.0	12
34	G39030	75.4	13	99.0	9	98.7	13	90.0	8	60.9	28	56.0	12
35	OH743	70.5	25	82.7	31	95.0	21	87.5	16	67.5	5	31.1	42
36	OH751	70.7	24	94.0	17	100.5	8	81.8	29	68.7	3	45.4	30
37	M00-3701	78.1	7	103.2	6	102.3	4	91.2	7	71.2	2	38.3	39
38	M99-2408	76.0	11	104.8	3	105.0	2	87.7	15	66.1	10	49.1	20
39	NY89066-7131	58.4	43	65.6	43	87.2	36	63.1	43	54.3	39	29.1	43
40	X00*1118	78.1	7	95.0	15	102.8	3	92.5	5	63.6	17	45.4	30
41	X00-1079	79.5	3	85.8	29	99.3	10	93.8	2	63.4	19	47.5	26
42	WB-1001	78.0	9	88.1	25	105.8	1	86.1	19	62.0	22	62.8	5
43	GA 931233-E17	63.8	36	81.5	34	88.3	35	74.3	37	63.5	18	48.1	24
LOCATION MEANS		70.7		90.0		93.8		83.3		62.3		49.9	
LSD (.05)		5.7		7.4				7.2		8.5		14.9	
CV %		5		6				6.1		8.4		14.8	
REPS		3		2		1		4		3		2	
Harvest Plot Size (sq.ft.)		34		32		45				58		36	

YIELD (bu/acre)

		Logan Co. KY		Woodford Co. KY		Clarksville MD		Dundee MI		Merrill MI		Columbia MO	
		a	rank	a	rank	ab	rank	ab	rank	ab	rank	ab	rank
1	Caldwell	51.8	41	49.8	40	60.5	42	64.8	39	74.6	38	46.2	42
2	Foster	80.7	10	59.3	33	63.1	41	76.6	8	77.9	31	59.6	26
3	Patton	51.9	40	67.3	23	69.1	27	90.0	1	83.6	16	68.6	5
4	Roane	65.0	27	61.0	31	73.5	17	79.1	4	82.1	20	53.3	37
5	AR 910-9-1	62.9	30	60.7	32	63.1	40	61.3	42	83.7	15	60.3	25
6	VA00W-526	56.3	38	51.1	38	70.9	23	70.0	27	92.9	1	49.9	39
7	VA97W-375WS	61.8	31	79.4	4	75.1	10	65.9	36	76.9	32	51.7	38
8	VAN98W-170WS	61.3	33	74.3	12	75.8	9	59.7	43	75.8	36	48.1	41
9	T143	89.9	5	73.2	14	66.3	35	62.1	41	69.2	42	59.3	28
10	M99*3098	83.2	7	62.5	29	66.2	36	67.1	33	79.2	27	64.5	16
11	OH708	91.9	4	83.7	1	65.5	38	76.7	7	92.9	1	67.9	7
12	MO981020	67.2	21	67.8	22	78.2	3	75.5	12	84.4	14	67.1	9
13	MO980829	76.6	14	70.6	20	73.8	15	73.9	19	87.7	8	65.1	14
14	B980582	99.2	2	64.4	26	69.1	28	77.9	5	88.3	7	65.3	13
15	B980696	74.6	17	79.3	5	65.9	37	67.8	30	85.1	13	62.9	21
16	IL97-3632	59.4	36	51.6	36	73.3	18	74.7	16	86.1	11	69.8	3
17	T141	57.6	37	64.3	27	66.6	34	74.5	17	80.3	25	59.4	27
18	AR 93027-3-2	54.7	39	62.9	28	65.4	39	65.2	38	70.7	40	61.4	24
19	MD 11-52	66.7	22	77.5	8	75.9	8	69.2	28	79.2	27	54.3	35
20	MV 5-46	66.0	24	71.7	16	77.9	5	72.6	21	67.6	43	54.5	34
21	P91202RB1-3-3-4-5	63.4	29	46.6	42	66.8	32	74.3	18	83.2	17	54.9	32
22	P961341A3-1-2	72.6	18	71.7	16	69.6	25	68.6	29	75.1	37	66.8	11
23	P97397E1-11-2-4-1-1	64.6	28	74.9	11	69.2	26	67.3	32	78.6	30	57.2	30
24	B980006	80.4	11	65.8	25	66.9	31	70.4	26	82.1	20	63.1	19
25	KY93C-0378-5-2	101.9	1	74.1	13	73.9	14	66.7	35	80.3	25	63.1	19
26	KY93C-1238-17-1	66.3	23	71.8	15	82.1	2	75.5	11	86.2	10	66.9	10
27	Danny exp.	44.9	43	51.3	37	70.5	24	64.7	40	82.6	18	65.7	12
28	Jolly exp.	61.3	33	55.7	35	66.7	33	65.5	37	76.6	33	54.8	33
29	Apple exp.	75.4	16	71.3	19	67.7	30	67.3	31	76.6	33	54.3	35
30	MSU Line E1007	81.7	9	77.2	9	75.1	11	75.2	13	85.3	12	57.1	31
31	IL99-15867	49.7	42	58.2	34	72.9	19	70.7	25	78.9	29	69.0	4
32	G39186	76.1	15	78.5	6	75.1	12	75.0	15	82.4	19	64.9	15
33	G39050	59.8	35	81.8	3	72.5	20	73.0	20	81.4	23	63.2	18
34	G39030	86.3	6	50.3	39	73.8	16	72.5	22	81.3	24	61.6	23
35	OH743	79.5	13	66.7	24	76.2	7	76.1	9	87.3	9	61.9	22
36	OH751	68.1	20	75.2	10	71.5	22	84.2	2	90.1	5	58.4	29
37	M00-3701	95.5	3	82.0	2	74.2	13	75.8	10	92.8	3	67.3	8
38	M99-2408	80.4	11	77.9	7	76.5	6	77.5	6	91.0	4	68.4	6
39	NY89066-7131	65.7	26	43.1	43	52.0	43	66.9	34	76.3	35	41.1	43
40	X00*1118	65.9	25	71.6	18	68.3	29	75.2	14	88.5	6	71.3	2
41	X00-1079	82.7	8	62.1	30	72.2	21	82.5	3	74.4	39	72.8	1
42	WB-1001	68.8	19	68.7	21	82.6	1	71.6	23	70.1	41	64.1	17
43	GA 931233-E17	61.5	32	46.9	41	77.9	4	71.1	24	81.9	22	48.7	40
LOCATION MEANS		70.5		66.4		70.9		71.9		81.4		60.6	
LSD (.05)		24		21.9		7.5		5.97		6		5.8	
CV %		20		19.6		6.5		6.3		3.6		5.9	
REPS		2		2		2		2		2		3	
Harvest Plot Size (sq.ft.)		40		40		48		45		60		55	

YIELD (bu/acre)

		Lincoln NE		Ithaca NY		Wooster OH		Nairn ON		Ridgetown ON		Knoxville TN	
			rank	a	rank	ab	rank	ab	rank	ab	rank	a	rank
1	Caldwell	83.6	37	66.1	39	53.3	42	74.3	26	100.2	39	54.8	39
2	Foster	89.7	28	63.9	41	59.5	38	72.4	30	104.7	32	67.7	22
3	Patton	85.8	32	78.3	26	63.3	34	82.3	10	113.7	20	67.5	24
4	Roane	97.4	11	89.6	8	64.4	32	70.3	33	114.6	16	74.1	11
5	AR 910-9-1	96.6	14	87.9	10	71.0	15	80.5	13	118.3	9	58.3	36
6	VA00W-526	98.9	10	82.3	18	74.2	7	81.4	11	120.3	5	74.2	10
7	VA97W-375WS	84.6	34	73.4	35	72.8	11	62.5	43	109.3	27	75.1	8
8	VAN98W-170WS	93.9	20	79.7	23	64.2	33	67.7	38	102.8	37	60.4	29
9	T143	100.1	6	62.0	42	58.3	40	81.2	12	99.8	40	74.8	9
10	M99*3098	97.3	12	72.1	36	72.7	14	72.8	28	116.9	12	73.5	15
11	OH708	110.4	1	91.1	7	73.9	9	80.3	14	119.2	6	85.2	1
12	MO981020	99.7	7	81.4	22	69.5	18	77.1	21	118.7	8	73.9	12
13	MO980829	105.7	3	77.5	30	69.8	17	85.4	5	122.3	3	59.0	34
14	B980582	93.2	21	78.1	27	69.2	20	84.5	8	119.2	6	76.1	7
15	B980696	91.6	26	78.9	25	73.7	10	71.3	32	114.1	17	76.4	6
16	IL97-3632	93.0	22	86.4	12	82.2	3	72.6	29	114.0	19	69.3	19
17	T141	74.9	42	76.2	32	57.9	41	75.4	23	110.2	25	50.1	42
18	AR 93027-3-2	90.3	27	71.1	37	51.8	43	78.3	18	99.5	41	57.8	37
19	MD 11-52	84.4	35	73.7	34	72.8	12	68.3	37	108.8	29	62.2	28
20	MV 5-46	99.7	7	93.1	5	79.1	4	69.1	35	101.6	38	68.1	21
21	P91202RB1-3-3-4-5	94.7	17	86.1	14	84.8	1	76.4	22	114.1	17	51.5	40
22	P961341A3-1-2	94.3	18	77.6	29	68.3	24	69.4	34	103.9	34	76.8	5
23	P97397E1-11-2-4-1-1	82.8	38	65.5	40	72.7	13	64.9	41	103.9	34	60.3	30
24	B980006	95.9	15	78.0	28	66.7	27	73.6	27	110.4	24	73.7	14
25	KY93C-0378-5-2	79.5	41	82.6	16	68.7	22	75.1	24	111.3	23	80.1	3
26	KY93C-1238-17-1	96.7	13	95.0	3	70.0	16	77.9	19	115.8	13	80.5	2
27	Danny exp.	73.5	43	77.4	31	61.9	36	68.6	36	104.2	33	58.4	35
28	Jolly exp.	81.4	39	81.8	20	65.2	29	63.7	42	98.6	42	51.4	41
29	Apple exp.	92.7	23	82.1	19	68.1	25	65.2	40	102.9	36	63.0	26
30	MSU Line E1007	89.3	30	88.7	9	66.7	27	85.3	6	112.0	22	69.9	17
31	IL99-15867	107.7	2	61.9	43	65.1	30	82.7	9	109.0	28	62.9	27
32	G39186	89.6	29	84.4	15	67.4	26	74.9	25	113.7	20	67.7	22
33	G39050	84.1	36	86.3	13	74.0	8	79.3	15	114.8	15	69.2	20
34	G39030	85.4	33	74.0	33	61.8	37	79.0	16	117.2	11	73.9	12
35	OH743	95.4	16	87.5	11	69.1	21	85.1	7	121.2	4	57.6	38
36	OH751	92.5	24	94.6	4	68.6	23	78.5	17	118.0	10	60.1	31
37	M00-3701	92.5	24	100.2	1	84.3	2	95.2	1	125.4	1	64.8	25
38	M99-2408	99.3	9	98.1	2	77.7	5	91.0	2	124.7	2	69.7	18
39	NY89066-7131	80.8	40	81.5	21	63.2	35	65.3	39	97.5	43	30.2	43
40	X00*1118	104.4	5	82.5	17	69.2	19	88.5	3	115.2	14	59.8	33
41	X00-1079	94.1	19	79.0	24	64.5	31	77.5	20	106.4	31	71.3	16
42	WB-1001	104.5	4	67.8	38	76.1	6	86.1	4	110.0	26	79.9	4
43	GA 931233-E17	87.9	31	91.5	6	58.7	39	72.2	31	108.0	30	59.9	32
LOCATION MEANS		92.3		80.6		68.5		76.4		111.3		66.3	
LSD (.05)				14		6.6		4.7		8		17.2	
CV %				10.5		5.9		5.8		5.11		16	
REPS		1						3		4		3	
Harvest Plot Size (sq.ft.)								44.55		48.28		39	

YIELD (bu/acre)

		Blacksburg VA		Warsaw VA		Arlington WI	
		ab	rank	a	rank	a	rank
1	Caldwell	63.5	34	62.6	39	44.9	33
2	Foster	68.8	14	77.1	9	44.6	34
3	Patton	67.2	17	66.3	33	63.6	8
4	Roane	74.3	3	88.2	1	62.0	13
5	AR 910-9-1	61.1	38	71.5	24	53.0	23
6	VA00W-526	61.9	37	69.2	29	38.1	38
7	VA97W-375WS	62.4	36	73.2	21	41.8	35
8	VAN98W-170WS	60.8	39	76.8	10	35.2	40
9	T143	66.5	19	70.1	26	39.9	36
10	M99*3098	63.6	32	69.8	27	62.8	9
11	OH708	65.7	23	69.7	28	56.7	17
12	MO981020	70.3	11	77.2	8	62.8	9
13	MO980829	75.1	2	73.6	20	60.0	14
14	B980582	66.1	20	75.9	13	68.5	2
15	B980696	68.1	15	66.5	32	66.8	5
16	IL97-3632	63.5	33	76.7	11	64.7	6
17	T141	56.3	41	61.4	40	50.3	26
18	AR 93027-3-2	65.5	25	68.2	30	68.2	3
19	MD 11-52	65.7	24	81.1	4	38.4	37
20	MV 5-46	72.4	6	81.4	3	25.1	43
21	P91202RB1-3-3-4-5	54.2	42	63.5	37	48.4	27
22	P961341A3-1-2	64.3	30	85.2	2	51.0	25
23	P97397E1-11-2-4-1-1	60.7	40	63.6	36	56.7	18
24	B980006	65.0	26	76.2	12	63.7	7
25	KY93C-0378-5-2	72.1	7	79.8	5	46.7	29
26	KY93C-1238-17-1	79.6	1	74.4	19	51.7	24
27	Danny exp.	65.9	22	72.4	22	47.8	28
28	Jolly exp.	63.9	31	60.4	41	45.2	32
29	Apple exp.	65.0	26	79.7	6	36.8	39
30	MSU Line E1007	71.9	8	75.4	14	46.6	30
31	IL99-15867	74.1	4	75.2	15	59.7	15
32	G39186	73.3	5	74.7	18	62.1	12
33	G39050	64.4	29	71.7	23	53.9	22
34	G39030	64.7	28	74.8	16	58.6	16
35	OH743	65.9	21	64.0	35	54.4	21
36	OH751	63.0	35	53.7	42	46.2	31
37	M00-3701	70.7	10	78.3	7	62.3	11
38	M99-2408	69.0	13	70.2	25	69.0	1
39	NY89066-7131	46.1	43	52.9	43	29.4	42
40	X00*1118	69.3	12	64.2	34	67.9	4
41	X00-1079	71.9	9	74.8	16	56.3	19
42	WB-1001	67.9	16	67.2	31	55.4	20
43	GA 931233-E17	66.8	18	63.3	38	31.4	41
LOCATION MEANS		66.2		71.4		52.3	
LSD (.05)		5.9				8.9	
CV %		6.5				10.6	
REPS		3		1		3	
Harvest Plot Size (sq.ft.)		42.75		45		50	

YIELD (bu/acre)

		ENTRY MEANS ALL LOCATIONS	rank	ENTRY MEANS IN-REGION [a]	rank	ENTRY MEANS CV <10% [b]	rank
1	Caldwell	65.9	42	64.6	42	67.2	42
2	Foster	72.9	32	71.8	28	72.8	30
3	Patton	75.8	22	75.4	18	77.3	11
4	Roane	77.6	14	76.7	12	76.7	13
5	AR 910-9-1	73.4	28	73.0	25	76.3	16
6	VA00W-526	73.1	30	71.1	32	73.7	25
7	VA97W-375WS	72.9	31	70.8	34	70.9	35
8	VAN98W-170WS	70.1	38	67.8	39	67.4	41
9	T143	73.7	27	71.5	30	71.6	33
10	M99*3098	76.7	18	74.5	21	75.0	24
11	OH708	79.7	4	78.4	5	76.7	14
12	MO981020	79.1	6	77.8	6	78.7	6
13	MO980829	78.6	10	77.6	8	79.2	4
14	B980582	79.1	7	78.5	4	78.4	8
15	B980696	77.0	16	75.5	17	75.4	20
16	IL97-3632	77.0	17	76.1	14	77.9	10
17	T141	67.2	40	67.9	38	69.5	38
18	AR 93027-3-2	73.1	29	71.6	29	72.8	29
19	MD 11-52	71.6	35	70.7	35	71.3	34
20	MV 5-46	74.9	24	72.4	27	73.0	28
21	P91202RB1-3-3-4-5	71.3	36	70.4	36	73.0	27
22	P961341A3-1-2	74.8	25	72.8	26	72.2	31
23	P97397E1-11-2-4-1-1	72.8	33	71.1	31	72.2	32
24	B980006	75.6	23	75.7	16	75.3	22
25	KY93C-0378-5-2	78.2	13	77.6	7	76.3	18
26	KY93C-1238-17-1	80.1	3	78.8	3	79.5	3
27	Danny exp.	67.1	41	67.0	40	69.0	39
28	Jolly exp.	68.3	39	66.8	41	68.2	40
29	Apple exp.	71.8	34	71.0	33	70.5	36
30	MSU Line E1007	78.5	11	76.5	13	76.4	15
31	IL99-15867	77.0	15	74.8	19	78.6	7
32	G39186	78.7	9	77.4	9	77.1	12
33	G39050	74.6	26	73.5	24	73.4	26
34	G39030	76.3	19	74.7	20	75.2	23
35	OH743	75.9	21	74.4	22	75.4	21
36	OH751	76.1	20	74.1	23	75.4	19
37	M00-3701	83.6	1	83.2	1	83.0	1
38	M99-2408	82.2	2	81.2	2	81.1	2
39	NY89066-7131	61.3	43	58.3	43	59.5	43
40	X00*1118	78.8	8	77.3	10	79.0	5
41	X00-1079	78.3	12	75.9	15	76.3	17
42	WB-1001	79.4	5	76.9	11	78.4	9
43	GA 931233-E17	70.5	37	67.9	37	70.0	37
LOCATION MEANS		74.9		73.5		74.3	
LSD (.05)							
CV %							
REPS							
Harvest Plot Size (sq.ft.)							

TEST WEIGHT (lbs/bu)

		Bay AR	Stuttgart AR	Georgetown DE	Griffin GA	Aberdeen ID
1	Caldwell	54.5	58.1	54.8	58	61.4
2	Foster	56.1	59.7	54.2	58	60.0
3	Patton	57.7	59.4	55.3	59	60.6
4	Roane	59.4	61.5	58.9	61	62.1
5	AR 910-9-1	57.9	58.9	56.3	57	60.5
6	VA00W-526	57.1	60.5	55.9	61	61.9
7	VA97W-375WS	57.8	58.4	55.2	59	60.4
8	VAN98W-170WS	59.2	60.3	55.0	60	62.3
9	T143	55.1	56.2	51.6	58	60.1
10	M99*3098	57.8	59.8	57.8	59	59.5
11	OH708	54.6	56.7	55.6	60	61.4
12	MO981020	57.9	59.7	57.4	57	61.0
13	MO980829	55.0	56.0	54.7	60	61.3
14	B980582	60.4	60.1	57.1	61	60.4
15	B980696	59.5	60.6	56.9	59	63.1
16	IL97-3632	57.2	58.2	58.0	60	59.3
17	T141	54.7	57.9	55.9	56	60.4
18	AR 93027-3-2	56.3	59.7	56.0	59	60.6
19	MD 11-52	59.2	60.1	57.5	59	60.8
20	MV 5-46	58.7	59.2	58.3	60	62.2
21	P91202RB1-3-3-4-5	55.9	57.2	54.5	58	59.6
22	P961341A3-1-2	57.3	58.6	56.1	59	61.4
23	P97397E1-11-2-4-1-1	55.9	57.9	52.8	58	61.4
24	B980006	57.9	58.6	55.7	60	60.9
25	KY93C-0378-5-2	58.2	60.3	58.6	60	61.1
26	KY93C-1238-17-1	57.9	59.5	59.0	61	62.6
27	Danny exp.	55.2	57.2	53.3	57	59.9
28	Jolly exp.	57.1	59.7	54.3	58	61.2
29	Apple exp.	56.0	59.0	55.6	58	60.1
30	MSU Line E1007	56.4	58.4	57.3	60	61.1
31	IL99-15867	58.5	59.3	56.4	59	60.4
32	G39186	58.3	59.5	57.5	60	60.2
33	G39050	58.2	59.0	56.3	60	61.2
34	G39030	56.8	59.6	59.1	60	62.8
35	OH743	56.7	58.5	56.6	60	61.1
36	OH751	57.8	58.5	57.5	59	62.0
37	M00-3701	57.7	59.4	55.8	59	59.5
38	M99-2408	56.9	59.0	57.2	59	61.3
39	NY89066-7131	53.8	52.4	50.5	57	60.6
40	X00*1118	57.4	60.6	57.5	60	61.0
41	X00-1079	54.5	57.5	50.4	58	61.0
42	WB-1001	58.7	59.4	57.4	60	62.4
43	GA 931233-E17	58.6	59.5	54.1	60	61.8
LOCATION MEANS		57.2	58.8	56.0	59.1	61.0

TEST WEIGHT (lbs/bu)

		Brownstown IL	Urbana IL	Greensburg IN	Lafayette IN	W.Lafayette IN
1	Caldwell	57.6	58.9	57.1	59.3	60.3
2	Foster	58.8	59.0	60.2	59.6	60.3
3	Patton	57.8	58.4	56.0	59.8	60.2
4	Roane	59.6	61.5	62.2	62.1	62.5
5	AR 910-9-1	58.6	58.2	59.5	53.7	59.7
6	VA00W-526	58.6	59.4	55.8	54.2	60.2
7	VA97W-375WS	57.8	58.7	54.4	57.8	57.7
8	VAN98W-170WS	58.1	59.7	57.1	58.5	59.6
9	T143	54.6	57.4	54.2	57.2	57.5
10	M99*3098	57.9	59.9	58.2	61.0	59.3
11	OH708	57.8	58.4	55.5	60.2	58.2
12	MO981020	58.9	59.8	59.8	61.1	60.9
13	MO980829	58.3	59.4	58.6	60.7	58.9
14	B980582	59.1	60.7	61.8	61.6	62.0
15	B980696	59.6	61.7	60.0	60.4	63.0
16	IL97-3632	57.8	59.6	59.2	61.1	61.2
17	T141	58.8	58.4	54.2	60.0	60.7
18	AR 93027-3-2	58.3	60.1	56.8	60.0	60.9
19	MD 11-52	58.2	59.2	53.3	59.3	59.8
20	MV 5-46	58.5	60.1	57.3	61.1	60.4
21	P91202RB1-3-3-4-5	55.4	57.0	53.9	56.8	58.4
22	P961341A3-1-2	56.2	57.6	54.4	57.9	57.7
23	P97397E1-11-2-4-1-1	56.9	57.0	57.3	58.6	59.3
24	B980006	58.5	59.5	59.4	60.7	61.2
25	KY93C-0378-5-2	57.8	60.2	58.6	61.0	60.0
26	KY93C-1238-17-1	58.7	60.5	58.7	60.5	61.9
27	Danny exp.	56.4	58.0	52.3	57.7	58.5
28	Jolly exp.	57.2	58.4	52.0	58.7	58.9
29	Apple exp.	58.2	58.2	52.5	59.3	59.3
30	MSU Line E1007	57.6	59.1	52.8	59.9	59.4
31	IL99-15867	58.5	59.2	57.3	59.1	59.9
32	G39186	58.8	58.9	58.2	60.6	60.5
33	G39050	57.8	58.3	51.8	59.0	59.2
34	G39030	59.6	60.3	59.5	61.2	61.3
35	OH743	58.0	59.2	56.8		60.4
36	OH751	57.8	59.2	58.6	60.1	59.5
37	M00-3701	57.4	58.1	57.6	59.4	59.5
38	M99-2408	57.9	58.8	58.2	59.8	60.6
39	NY89066-7131	56.5	56.7	54.1	59.0	56.9
40	X00*1118	58.5	59.7	57.0	60.1	60.0
41	X00-1079	55.7	58.2	55.7	58.9	58.8
42	WB-1001	57.6	59.6	54.2	59.1	59.7
43	GA 931233-E17	58.7	60.4	55.4	60.4	60.0
LOCATION MEANS		57.9	59.1	56.7	59.4	59.9

TEST WEIGHT (lbs/bu)

		Woodburn IN	Logan Co. KY	Woodford Co. KY	Clarksville MD	Dundee MI
1	Caldwell	56.2	48.6	49.9	56.2	55.5
2	Foster	54.6	50.0	50.2	57.1	55.6
3	Patton	56.3	51.8	52.6	55.6	58.5
4	Roane	57.0	50.6	53.5	58.2	58.8
5	AR 910-9-1		49.3	49.9	55.8	46.8
6	VA00W-526		50.8	53.8	56.0	51.1
7	VA97W-375WS	56.0	49.2	54.0	55.7	53.6
8	VAN98W-170WS	52.7	52.8	55.7	57.1	53.6
9	T143	52.6	48.0	49.5	52.7	51.8
10	M99*3098	57.7	51.1	52.3	57.2	57.4
11	OH708	54.2	53.2	54.5	56.3	55.4
12	MO981020	56.7	53.4	54.9	56.7	58.1
13	MO980829	55.6	52.2	53.3	55.6	56.5
14	B980582	58.1	53.3	55.0	58.3	61.4
15	B980696	58.2	55.2	56.1	58.8	57.2
16	IL97-3632	57.7	52.3	55.9	57.4	56.8
17	T141	58.7	50.0	54.8	57.0	58.1
18	AR 93027-3-2	56.7	49.6	51.2	54.9	56.6
19	MD 11-52	57.0	51.9	54.5	56.2	55.7
20	MV 5-46	58.3	52.3	56.4	58.1	58.9
21	P91202RB1-3-3-4-5	56.8	50.5	53.0	54.3	55.6
22	P961341A3-1-2	56.8	51.1	53.0	54.9	58.0
23	P97397E1-11-2-4-1-1	55.8	53.1	54.5	55.2	57.6
24	B980006	56.7	53.8	52.3	57.1	57.7
25	KY93C-0378-5-2	55.5	54.0	53.5	57.6	56.5
26	KY93C-1238-17-1	56.3	52.4	54.8	58.4	57.3
27	Danny exp.	56.5	51.3	50.5	54.7	55.3
28	Jolly exp.	57.3	52.4	53.6	55.5	56.5
29	Apple exp.	55.2	49.4	54.4	56.4	55.1
30	MSU Line E1007	54.9	51.2	51.7	55.9	54.4
31	IL99-15867	56.3	50.4	51.1	55.4	55.6
32	G39186	57.5	51.9	55.3	56.7	57.0
33	G39050	55.8	51.7	56.0	56.5	56.4
34	G39030	57.2	53.6	54.2	58.5	60.7
35	OH743	56.2	51.8	55.9	57.7	56.5
36	OH751	56.2	53.2	54.9	56.7	57.2
37	M00-3701	55.3	49.2	53.7	55.5	55.5
38	M99-2408	57.2	52.0	56.2	56.6	57.2
39	NY89066-7131	53.0	48.8	51.5	55.3	57.4
40	X00*1118	57.0	51.9	56.4	56.9	58.7
41	X00-1079	54.3	49.6	47.9	55.1	55.9
42	WB-1001	55.4	54.2	52.7	57.6	55.0
43	GA 931233-E17	56.7	53.8	53.8	57.0	56.1
LOCATION MEANS		56.2	51.6	53.5	56.4	56.3

TEST WEIGHT (lbs/bu)

		Merrill MI	Columbia MO	Ithaca NY	Wooster OH	Nairn ON
1	Caldwell	56.6	54.8	50.8	48.8	63.4
2	Foster	57.4	56.7	53.5	51.8	64.0
3	Patton	55.5	55.7	53.1	44.6	63.1
4	Roane	59.5	60.7	53.1	54.6	65.5
5	AR 910-9-1	56.3	57.1	54.3	52.6	64.3
6	VA00W-526	59.5	56.2	53.2	53.9	64.6
7	VA97W-375WS	55.8	54.2	16.9	52.4	63.5
8	VAN98W-170WS	55.7	56.8	32.9	52.8	63.5
9	T143	51.8	50.6	47.9	46.6	61.6
10	M99*3098	58.2	57.2	53.8	54.1	64.1
11	OH708	57.9	56.9	53.5	53.5	62.8
12	MO981020	59.8	59.4	54.8	49.6	64.4
13	MO980829	60.0	56.8	54.1	55.0	63.1
14	B980582	60.3	60.1	56.0	56.8	66.0
15	B980696	60.5	59.4	55.4	55.7	66.4
16	IL97-3632	57.5	59.5	53.5	53.5	63.9
17	T141	58.0	56.6	54.0	47.6	64.4
18	AR 93027-3-2	55.6	57.0	54.0	47.5	64.0
19	MD 11-52	56.3	54.8	50.0	50.0	65.0
20	MV 5-46	56.7	57.8	54.4	51.7	63.9
21	P91202RB1-3-3-4-5	55.5	53.1	44.8	51.7	60.3
22	P961341A3-1-2	54.3	54.7	51.3	51.7	63.3
23	P97397E1-11-2-4-1-1	56.1	53.5	51.4	52.2	63.4
24	B980006	57.8	57.0	54.9	52.8	59.7
25	KY93C-0378-5-2	57.4	57.5	50.8	52.6	62.2
26	KY93C-1238-17-1	55.9	57.8	52.4	50.6	64.4
27	Danny exp.	56.0	54.9	52.0	49.4	62.5
28	Jolly exp.	55.5	52.7	53.2	51.0	62.5
29	Apple exp.	54.1	52.9	51.0	51.5	63.4
30	MSU Line E1007	57.0	54.7	52.7	50.0	63.1
31	IL99-15867	56.5	57.3	52.5	51.8	63.9
32	G39186	57.3	56.4	55.2	53.6	64.6
33	G39050	56.5	55.0	54.9	53.0	63.9
34	G39030	57.8	59.9	53.1	53.6	65.7
35	OH743	60.1	54.4	55.7	53.3	64.2
36	OH751	58.6	56.4	53.3	52.5	63.4
37	M00-3701	57.3	56.3	53.3	53.2	63.7
38	M99-2408	58.9	56.2	54.4	52.9	64.6
39	NY89066-7131	58.7	55.7	46.1	46.1	62.6
40	X00*1118	59.3	57.4	54.0	53.6	65.5
41	X00-1079	55.1	56.9	51.1	48.8	62.5
42	WB-1001	53.3	57.2	54.6	48.3	64.6
43	GA 931233-E17	56.7	55.3	53.0	51.8	63.4
LOCATION MEANS		57.1	56.3	51.5	51.6	63.7

TEST WEIGHT (lbs/bu)

		Ridgetown ON	Knoxville TN	Blacksburg VA	Warsaw VA
1	Caldwell	58.8	55.3	55.1	54.3
2	Foster	59.4	56.1	55.1	55.6
3	Patton	59.6	55.8	53.8	53.7
4	Roane	62.4	58.5	57.4	57.5
5	AR 910-9-1	59.3	55.3	54.5	54.5
6	VA00W-526	60.6	56.5	54.1	56.3
7	VA97W-375WS	58.5	56.9	52.6	54.3
8	VAN98W-170WS	59.6	57.6	54.1	54.3
9	T143	54.6	50.9	52.2	55.3
10	M99*3098	59.8	55.7	54.1	57.1
11	OH708	60.5	55.9	55.8	56.3
12	MO981020	60.4	57.8	55.7	56.0
13	MO980829	60.9	56.2	56.1	56.0
14	B980582	62.1	60.0	56.2	57.1
15	B980696	63.1	59.4	55.7	58.1
16	IL97-3632	60.5	55.6	56.5	56.5
17	T141	60.4	54.2	53.7	55.6
18	AR 93027-3-2	59.4	52.8	53.6	55.6
19	MD 11-52	58.9	56.2	54.5	56.3
20	MV 5-46	59.4	58.4	56.5	57.3
21	P91202RB1-3-3-4-5	58.5	55.1	52.1	53.1
22	P961341A3-1-2	58.7	56.5	53.7	56.0
23	P97397E1-11-2-4-1-1	58.0	55.6	53.0	54.5
24	B980006	60.5	56.3	54.9	56.3
25	KY93C-0378-5-2	60.5	57.6	55.5	56.6
26	KY93C-1238-17-1	60.2	59.4	56.5	57.1
27	Danny exp.	57.6	54.1	53.9	54.7
28	Jolly exp.	58.5	55.9	54.5	55.3
29	Apple exp.	59.3	56.0	55.5	57.3
30	MSU Line E1007	59.7	56.2	55.7	55.2
31	IL99-15867	58.7	54.7	55.0	55.9
32	G39186	60.3	54.6	55.5	55.7
33	G39050	60.6	56.1	55.4	55.8
34	G39030	60.7	56.3	57.0	57.4
35	OH743	62.2	55.8	55.2	56.4
36	OH751	60.3	56.7	55.8	57.0
37	M00-3701	59.8	53.3	54.1	54.6
38	M99-2408	60.6	56.7	54.3	56.0
39	NY89066-7131	60.0	53.6	56.0	55.5
40	X00*1118	61.1	54.6	56.3	57.1
41	X00-1079	58.2	52.5	52.9	55.2
42	WB-1001	59.0	53.1	55.2	55.9
43	GA 931233-E17	60.8	52.3	55.7	57.7
LOCATION MEANS		59.8	55.8	54.9	55.9

TEST WEIGHT (lbs/bu)

		Arlington WI	ENTRY MEANS ALL LOCATIONS	rank
1	Caldwell	50.3	55.8	35
2	Foster	48.9	56.5	24
3	Patton	51.0	56.2	29
4	Roane	53.3	58.9	3
5	AR 910-9-1	51.3	55.9	34
6	VA00W-526	47.7	56.6	21
7	VA97W-375WS	45.6	54.3	42
8	VAN98W-170WS	43.5	55.7	36
9	T143	45.3	53.3	43
10	M99*3098	51.9	57.3	14
11	OH708	51.1	56.6	19
12	MO981020	54.1	57.8	5
13	MO980829	52.3	57.1	17
14	B980582	55.8	59.2	1
15	B980696	55.8	59.1	2
16	IL97-3632	53.3	57.7	8
17	T141	49.9	56.4	26
18	AR 93027-3-2	50.8	56.3	28
19	MD 11-52	46.8	56.4	25
20	MV 5-46	43.9	57.6	9
21	P91202RB1-3-3-4-5	45.6	54.7	40
22	P961341A3-1-2	50.3	56.0	31
23	P97397E1-11-2-4-1-1	51.1	56.0	32
24	B980006	53.7	57.4	12
25	KY93C-0378-5-2	48.1	57.3	15
26	KY93C-1238-17-1	49.2	57.7	7
27	Danny exp.	48.3	55.1	38
28	Jolly exp.	48.0	55.9	33
29	Apple exp.	42.8	55.6	37
30	MSU Line E1007	47.5	56.1	30
31	IL99-15867	51.7	56.6	22
32	G39186	52.5	57.5	10
33	G39050	49.4	56.7	18
34	G39030	52.8	58.3	4
35	OH743	49.8	57.2	16
36	OH751	50.3	57.3	13
37	M00-3701	50.7	56.4	27
38	M99-2408	52.9	57.4	11
39	NY89066-7131	46.3	54.6	41
40	X00*1118	53.0	57.8	6
41	X00-1079	51.2	55.0	39
42	WB-1001	48.6	56.5	23
43	GA 931233-E17	42.6	56.6	20
LOCATION MEANS		49.8	56.5	

KERNEL WEIGHT (grams)

		Nairn ON	Ridgetown ON
		1000 kw	1000 kw
1	Caldwell	34.0	30.1
2	Foster	42.5	32.6
3	Patton	42.5	36.6
4	Roane	35.5	31.4
5	AR 910-9-1	45.5	36.3
6	VA00W-526	39.5	32.8
7	VA97W-375WS	38.5	32.3
8	VAN98W-170WS	41.0	35.1
9	T143	41.0	32.3
10	M99*3098	34.0	30.6
11	OH708	42.0	32.7
12	MO981020	38.5	35.3
13	MO980829	36.5	34.5
14	B980582	38.0	35.4
15	B980696	36.5	35.4
16	IL97-3632	36.5	31.1
17	T141	43.0	38.1
18	AR 93027-3-2	35.5	30.7
19	MD 11-52	36.0	31.5
20	MV 5-46	46.0	34.3
21	P91202RB1-3-3-4-5	40.5	38.1
22	P961341A3-1-2	43.0	36.4
23	P97397E1-11-2-4-1-1	38.0	33.1
24	B980006	34.5	33.9
25	KY93C-0378-5-2	47.5	39.8
26	KY93C-1238-17-1	38.5	33.1
27	Danny exp.	44.5	37.1
28	Jolly exp.	37.5	36.6
29	Apple exp.	40.5	34.9
30	MSU Line E1007	44.0	37.4
31	IL99-15867	37.5	31.0
32	G39186	38.5	34.9
33	G39050	45.5	40.1
34	G39030	35.0	30.0
35	OH743	42.5	39.2
36	OH751	40.5	34.6
37	M00-3701	42.5	37.3
38	M99-2408	40.5	33.5
39	NY89066-7131	38.5	36.9
40	X00*1118	41.5	38.8
41	X00-1079	34.5	29.3
42	WB-1001	47.0	39.1
43	GA 931233-E17	38.5	32.4
LOCATION MEANS		39.8	34.6

HEADING DATE (Julian Days)

		Bay AR	Stuttgart AR	Georgetown DE	Quincy FL	Griffin GA
1	Caldwell	113	106	136	105	105
2	Foster	112	106	137	103	105
3	Patton	111	106	136	96	104
4	Roane	113	107	137	100	104
5	AR 910-9-1	110	104	134	81	100
6	VA00W-526	111	106	138	90	101
7	VA97W-375WS	110	107	134	97	103
8	VAN98W-170WS	109	104	134	98	100
9	T143	105	101	133	76	99
10	M99*3098	112	108	134	98	106
11	OH708	113	108	137	100	105
12	MO981020	113	107	137	90	103
13	MO980829	118	113	140	100	102
14	B980582	107	103	135	79	108
15	B980696	114	110	137	103	103
16	IL97-3632	114	112	137	105	103
17	T141	115	112	137	104	106
18	AR 93027-3-2	110	106	133	96	103
19	MD 11-52	109	106	134	97	103
20	MV 5-46	108	104	134	81	103
21	P91202RB1-3-3-4-5	112	110	136	94	104
22	P961341A3-1-2	109	109	135	90	102
23	P97397E1-11-2-4-1-1	110	108	137	94	104
24	B980006	111	108	135	96	103
25	KY93C-0378-5-2	110	110	137	94	103
26	KY93C-1238-17-1	112	111	134	98	104
27	Danny exp.	111	112	133	99	104
28	Jolly exp.	111	106	134	100	103
29	Apple exp.	113	108	135	105	104
30	MSU Line E1007	111	110	136	96	104
31	IL99-15867	112	109	137	92	104
32	G39186	111	109	135	94	103
33	G39050	112	111	134	98	104
34	G39030	112	111	138	97	105
35	OH743	113	112	138	93	105
36	OH751	112	112	137	91	104
37	M00-3701	109	111	133	99	101
38	M99-2408	111	110	134	105	103
39	NY89066-7131	119	113	139	120	108
40	X00*1118	113	112	135	116	105
41	X00-1079	114	113	138	110	106
42	WB-1001	108	107	133	86	102
43	GA 931233-E17	111	108	138	87	102
	LOCATION MEANS	111.5	108.5	135.7	96.6	103.6
	DATE / GROWTH STAGE					

HEADING DATE (Julian Days)

		Aberdeen ID	Urbana IL	Lafayette IN	W.Lafayette IN	Wichita KS
1	Caldwell	142.5	130.8	130	128.5	119
2	Foster	146.5	131.8	130	130.0	119
3	Patton	145.8	131.0	130	129.0	120
4	Roane	144.5	131.4	130	130.0	120
5	AR 910-9-1	145.0	131.7	133	130.0	120
6	VA00W-526	147.0	132.8	137	131.5	120
7	VA97W-375WS	146.3	129.2	129	129.0	119
8	VAN98W-170WS	146.5	129.2	130	129.0	119
9	T143	144.3	129.5	129	127.5	117
10	M99*3098	143.5	129.3	129	129.5	119
11	OH708	148.8	133.3	131	131.0	120
12	MO981020	146.0	131.8	130	130.5	120
13	MO980829	147.0	135.5	130	133.0	122
14	B980582	144.8	129.0	128	127.5	119
15	B980696	147.5	132.8	129	131.0	120
16	IL97-3632	143.3	131.9	130	130.5	120
17	T141	146.3	132.9	131	131.5	123
18	AR 93027-3-2	143.0	128.7	129	128.0	117
19	MD 11-52	146.8	129.4	129	128.5	119
20	MV 5-46	147.3	129.8	129	129.5	117
21	P91202RB1-3-3-4-5	146.5	130.8	130	129.0	120
22	P961341A3-1-2	145.5	129.5	129	128.0	120
23	P97397E1-11-2-4-1-1	146.8	130.8	129	128.0	119
24	B980006	144.3	130.1	129	128.0	118
25	KY93C-0378-5-2	145.8	132.2	130	130.5	120
26	KY93C-1238-17-1	144.5	131.3	130	129.5	119
27	Danny exp.	146.0	130.8	130	129.0	120
28	Jolly exp.	143.8	129.9	129	128.0	118
29	Apple exp.	146.8	132.3	131	131.0	120
30	MSU Line E1007	145.8	132.2	132	132.0	120
31	IL99-15867	145.5	132.2	130	130.0	120
32	G39186	143.5	129.6	130	129.0	119
33	G39050	145.0	131.3	130	130.0	120
34	G39030	145.8	131.7	130	129.5	120
35	OH743	148.3	133.4	132	131.5	121
36	OH751	147.0	132.9	131	131.0	121
37	M00-3701	145.3	130.0	129	127.5	117
38	M99-2408	146.5	130.7	130	129.5	119
39	NY89066-7131	149.5	136.0	134	136.0	125
40	X00*1118	146.3	131.6	131	132.0	121
41	X00-1079	147.3	133.4	132	132.0	120
42	WB-1001	145.8	130.0	130	128.5	118
43	GA 931233-E17	146.5	131.8	129	129.5	121
LOCATION MEANS DATE / GROWTH STAGE		145.8	131.3	130.2	129.9	119.7

HEADING DATE (Julian Days)

		Logan Co. KY	Woodford Co. KY	Baton Rouge LA	Clarksville MD	Merrill MI
1	Caldwell	122	128	8	131	153.0
2	Foster	121	129	8	131	153.0
3	Patton	120	127	7e	131	151.0
4	Roane	122	128	8e	131	151.0
5	AR 910-9-1	119	127	4	131	150.0
6	VA00W-526	121	128	6	131	153.0
7	VA97W-375WS	121	127	8e	129	153.0
8	VAN98W-170WS	119	126	7	130	152.0
9	T143	118	125	3	130	152.0
10	M99*3098	122	128	8e	131	153.0
11	OH708	122	129	8e	132	154.0
12	MO981020	122	127	6	131	152.0
13	MO980829	129	133	7	134	152.0
14	B980582	116	126	4	129	151.0
15	B980696	122	129	7	131	153.0
16	IL97-3632	123	129	7e	131	152.0
17	T141	123	129	6	131	153.0
18	AR 93027-3-2	121	126	7	129	151.0
19	MD 11-52	121	127	7e	129	153.0
20	MV 5-46	119	127	4	130	151.5
21	P91202RB1-3-3-4-5	121	127	8/4	130	151.0
22	P961341A3-1-2	121	127	6	129	151.5
23	P97397E1-11-2-4-1-1	120	126	8e	130	152.0
24	B980006	121	126	7e	129	152.0
25	KY93C-0378-5-2	121	128	8	131	151.5
26	KY93C-1238-17-1	121	128	7	130	152.5
27	Danny exp.	121	127	8	130	152.5
28	Jolly exp.	121	126	8	129	152.0
29	Apple exp.	123	128	9	131	153.0
30	MSU Line E1007	122	128	8	131	153.0
31	IL99-15867	122	128	7	130	151.5
32	G39186	122	128	8e	130	150.5
33	G39050	121	127	8	130	150.5
34	G39030	122	128	7	131	152.0
35	OH743	122	128	6	131	154.0
36	OH751	121	129	5	131	152.5
37	M00-3701	120	126	8	128	151.5
38	M99-2408	120	127	9	130	152.0
39	NY89066-7131	127	135	9	135	153.0
40	X00*1118	123	129	9	131	153.0
41	X00-1079	123	128	8	131	152.0
42	WB-1001	121	127	6	130	153.0
43	GA 931233-E17	121	128	6	130	152.5
LOCATION MEANS		121.4	127.8		130.5	152.2
DATE / GROWTH STAGE				6-Apr		

HEADING DATE (Julian Days)

		Columbia MO	Lincoln NE	Ithaca NY	Wooster OH	Nairn ON
1	Caldwell	130.7	130	146	140	153.3
2	Foster	130.0	134	146	142	155.0
3	Patton	130.3	135	144	138	150.7
4	Roane	130.7	130	146	141	153.0
5	AR 910-9-1	129.3	131	145	140	152.3
6	VA00W-526	131.0	131	146	142	155.7
7	VA97W-375WS	130.0	130	145	139	153.7
8	VAN98W-170WS	130.0	130	144	140	152.3
9	T143	129.7	131	144	139	151.3
10	M99*3098	130.0	131	146	140	152.3
11	OH708	131.7	132	147	142	154.7
12	MO981020	131.0	130	145	140	152.3
13	MO980829	135.3	136	148	144	157.0
14	B980582	130.3	130	144	139	152.3
15	B980696	131.7	131	146	141	153.7
16	IL97-3632	130.7	131	146	140	152.3
17	T141	130.7	133	144	140	152.0
18	AR 93027-3-2	129.0	131	145	139	151.7
19	MD 11-52	130.3	130	146	139	153.3
20	MV 5-46	129.0	131	145	141	154.0
21	P91202RB1-3-3-4-5	130.0	130	144	139	151.7
22	P961341A3-1-2	130.0	131	145	139	152.3
23	P97397E1-11-2-4-1-1	130.0	131	144	139	153.7
24	B980006	129.7	130	144	139	150.7
25	KY93C-0378-5-2	130.3	132	146	141	154.7
26	KY93C-1238-17-1	130.0	130	145	139	152.7
27	Danny exp.	130.0	130	145	138	150.7
28	Jolly exp.	129.7	130	144	138	152.3
29	Apple exp.	130.7	131	146	142	155.3
30	MSU Line E1007	130.3	130	145	141	154.0
31	IL99-15867	130.3	131	145	140	154.3
32	G39186	129.7	130	144	139	152.3
33	G39050	129.3	130	145	139	152.7
34	G39030	130.3	133	146	141	155.0
35	OH743	131.7	135	146	141	155.7
36	OH751	131.3	131	145	140	156.3
37	M00-3701	130.3	130	144	138	151.0
38	M99-2408	130.3	130	144	140	153.0
39	NY89066-7131	134.7	138	148	145	159.0
40	X00*1118	131.3	131	145	141	152.3
41	X00-1079	131.0	130	146	141	153.7
42	WB-1001	131.0	131	144	139	151.0
43	GA 931233-E17	130.7	130	144	141	154.7
LOCATION MEANS		130.6	131.2	145.2	140.1	153.3
DATE / GROWTH STAGE						

HEADING DATE (Julian Days)

		Ridgetown ON	Knoxville TN	Blacksburg VA	Warsaw VA	ENTRY MEANS ALL LOCATIONS EXCEPT BATON ROUGE	
1	Caldwell	147	121	129	121	129.0	26
2	Foster	147	121	130	123	129.7	33
3	Patton	146	118	129	119	128.1	16
4	Roane	148	121	130	123	129.2	28
5	AR 910-9-1	146	120	129	117	127.2	4
6	VA00W-526	148	122	130	119	129.2	29
7	VA97W-375WS	147	118	129	118	127.9	15
8	VAN98W-170WS	147	117	129	117	127.5	8
9	T143	145	117	127	116	125.5	1
10	M99*3098	146	119	128	121	128.5	19
11	OH708	152	124	131	123	130.5	39
12	MO981020	147	121	130	119	128.5	20
13	MO980829	150	128	132	127	132.4	42
14	B980582	146	119	127	116	126.3	2
15	B980696	148	121	130	123	129.9	35
16	IL97-3632	146	124	130	124	129.8	34
17	T141	148	127	130	125	130.6	40
18	AR 93027-3-2	146	119	127	118	127.3	6
19	MD 11-52	147	117	129	118	127.9	12
20	MV 5-46	147	118	128	117	127.0	3
21	P91202RB1-3-3-4-5	146	122	129	119	128.3	18
22	P961341A3-1-2	147	121	128	117	127.6	11
23	P97397E1-11-2-4-1-1	146	119	128	117	127.9	14
24	B980006	146	119	128	118	127.6	10
25	KY93C-0378-5-2	148	121	130	121	129.0	27
26	KY93C-1238-17-1	148	120	129	123	128.7	25
27	Danny exp.	146	118	129	119	128.3	17
28	Jolly exp.	146	118	128	118	127.6	9
29	Apple exp.	148	122	130	123	130.0	36
30	MSU Line E1007	147	122	130	123	129.4	30
31	IL99-15867	148	121	129	119	128.7	24
32	G39186	146	121	128	118	127.9	13
33	G39050	147	121	129	119	128.5	21
34	G39030	148	123	130	119	129.5	31
35	OH743	150	124	131	123	130.4	38
36	OH751	149	121	130	123	129.5	32
37	M00-3701	145	118	128	117	127.3	7
38	M99-2408	147	119	129	118	128.6	22
39	NY89066-7131	154	129	132	131	134.8	43
40	X00*1118	147	122	129	122	130.4	37
41	X00-1079	149	122	131	124	130.7	41
42	WB-1001	146	119	128	118	127.2	5
43	GA 931233-E17	148	121	130	123	128.6	23
LOCATION MEANS		147.3	120.8	129.2	120.4	128.8	
DATE / GROWTH STAGE							

HEIGHT (inches)

		Bay AR	Stuttgart AR	Georgetown DE	Griffin GA	Brownstown IL
1	Caldwell	39	39	34	35	34.3
2	Foster	39	35	34	34	34.6
3	Patton	39	35	33	34	34.2
4	Roane	36	33	30	30	28.9
5	AR 910-9-1	40	36	37	34	35.8
6	VA00W-526	34	32	30	34	29.1
7	VA97W-375WS	36	34	29	27	30.0
8	VAN98W-170WS	39	35	32	31	33.2
9	T143	35	33	31	30	31.0
10	M99*3098	35	37	30	35	29.7
11	OH708	41	38	37	34	37.5
12	MO981020	38	38	33	33	34.6
13	MO980829	42	40	35	32	37.5
14	B980582	40	35	33	35	33.8
15	B980696	38	36	32	36	32.2
16	IL97-3632	39	40	34	37	36.0
17	T141	39	42	36	34	37.4
18	AR 93027-3-2	37	39	30	32	34.3
19	MD 11-52	33	34	30	24	27.6
20	MV 5-46	37	34	32	30	31.2
21	P91202RB1-3-3-4-5	40	37	34	37	34.1
22	P961341A3-1-2	36	35	32	32	31.6
23	P97397E1-11-2-4-1-1	38	37	30	34	31.0
24	B980006	40	39	33	36	34.2
25	KY93C-0378-5-2	39	37	42	30	32.9
26	KY93C-1238-17-1	37	37	31	31	33.0
27	Danny exp.	39	39	35	35	36.3
28	Jolly exp.	41	32	32	34	35.0
29	Apple exp.	40	40	33	35	36.1
30	MSU Line E1007	38	39	34	35	35.3
31	IL99-15867	37	38	34	37	34.4
32	G39186	39	41	37	34	37.0
33	G39050	43	43	37	41	37.5
34	G39030	37	35	32	34	31.1
35	OH743	37	37	35	35	34.8
36	OH751	39	36	35	35	34.0
37	M00-3701	36	35	31	30	32.3
38	M99-2408	36	34	30	28	31.8
39	NY89066-7131	38	40	36	34	37.0
40	X00*1118	38	39	31	35	35.3
41	X00-1079	38	37	32	32	33.4
42	WB-1001	39	36	33	31	33.3
43	GA 931233-E17	41	38	32	36	34.6
LOCATION MEANS		38.2	36.9	33.1	33.3	33.7

HEIGHT (inches)

		Urbana IL	Lafayette IN	W.Lafayette IN	Wichita KS	Logan Co. KY
1	Caldwell	35.3	38	37.5	37	43
2	Foster	33.1	39	36.3	35	41
3	Patton	35.2		37.5	36	38
4	Roane	30.6		32.8	32	37
5	AR 910-9-1	36.5		38.3	32	40
6	VA00W-526	28.5		30.5	30	35
7	VA97W-375WS	29.6	32	31.8	30	36
8	VAN98W-170WS	33.0	37	34.5	35	40
9	T143	31.7	34	34.3	30	36
10	M99*3098	30.9	37	33.0	32	38
11	OH708	35.3	39	39.3	34	46
12	MO981020	33.0	39	35.8	35	43
13	MO980829	35.9	37	41.3	31	40
14	B980582	32.5	37	35.8	32	39
15	B980696	34.1	38	36.3	33	41
16	IL97-3632	35.4	40	38.0	38	38
17	T141	36.3	41	39.8	34	43
18	AR 93027-3-2	33.9	37	36.8	32	40
19	MD 11-52	27.5	32	30.5	31	34
20	MV 5-46	29.4	35	32.8	30	37
21	P91202RB1-3-3-4-5	34.4	40	38.3	36	41
22	P961341A3-1-2	30.6	35	34.8	32	37
23	P97397E1-11-2-4-1-1	31.2		34.0	32	39
24	B980006	34.6		37.0	32	41
25	KY93C-0378-5-2	32.4		35.3	30	42
26	KY93C-1238-17-1	31.7		34.8	36	42
27	Danny exp.	34.3	41	38.8	35	44
28	Jolly exp.	32.0	40	35.0	33	41
29	Apple exp.	34.1	38	37.8	34	44
30	MSU Line E1007	32.9	38	36.8	38	44
31	IL99-15867	35.2	38	38.0	34	42
32	G39186	36.4	40	39.0	37	43
33	G39050	36.9	42	40.0	38	44
34	G39030	31.9	37	35.0	34	39
35	OH743	33.2	39	36.3	37	44
36	OH751	32.7	38	33.8	31	43
37	M00-3701	32.4	36	34.0	34	41
38	M99-2408	31.6	35	32.0	30	39
39	NY89066-7131	36.3	41	40.0	30	42
40	X00*1118	33.5	39	37.5	34	41
41	X00-1079	31.2	37	33.3	36	39
42	WB-1001	34.9	39	36.5	32	40
43	GA 931233-E17	31.5		36.3	36	39
LOCATION MEANS		33.1	37.8	36.0	33.5	40.4

HEIGHT (inches)

		Woodford Co. KY	Clarksville MD	Dundee MI	Merrill MI	Columbia MO
1	Caldwell	42	36.7	40	39.0	38
2	Foster	40	35.0	35	36.5	36
3	Patton	39	36.3	38	39.0	39
4	Roane	36	33.7	34	35.5	35
5	AR 910-9-1	39	37.7	38	39.5	39
6	VA00W-526	33	31.7	38	33.5	37
7	VA97W-375WS	34	31.3	38	32.5	32
8	VAN98W-170WS	39	35.0	38	36.0	35
9	T143	37	32.7	36	33.5	35
10	M99*3098	35	31.7	39	33.5	33
11	OH708	41	38.7	33	40.0	39
12	MO981020	40	35.7	35	38.0	37
13	MO980829	43	37.7	30	39.5	39
14	B980582	39	36.0	29	38.5	36
15	B980696	40	35.0	38	37.0	35
16	IL97-3632	45	36.3	35	37.5	39
17	T141	41	38.7	37	40.5	41
18	AR 93027-3-2	40	34.7	32	35.5	36
19	MD 11-52	33	30.3	36	29.5	34
20	MV 5-46	33	34.7	36	33.5	33
21	P91202RB1-3-3-4-5	41	37.7	32	39.0	40
22	P961341A3-1-2	34	34.7	36	33.0	38
23	P97397E1-11-2-4-1-1	39	35.0	39	35.0	37
24	B980006	40	36.3	35	37.5	37
25	KY93C-0378-5-2	39	33.3	36	35.5	38
26	KY93C-1238-17-1	40	35.0	38	37.5	36
27	Danny exp.	41	39.3	36	39.0	40
28	Jolly exp.	39	37.3	34	37.0	36
29	Apple exp.	38	35.7	37	37.5	37
30	MSU Line E1007	40	35.0	39	38.0	39
31	IL99-15867	37	35.3	35	35.5	37
32	G39186	41	37.0	32	38.0	39
33	G39050	41	39.7	33	42.0	39
34	G39030	37	33.0	32	34.5	37
35	OH743	42	39.3	33	39.5	40
36	OH751	42	37.7	37	39.5	38
37	M00-3701	37	34.0	36	36.0	35
38	M99-2408	37	33.7	38	35.5	37
39	NY89066-7131	42	39.0	34	41.0	38
40	X00*1118	39	36.3	36	38.0	35
41	X00-1079	37	34.3	38	36.0	36
42	WB-1001	41	35.0	32	38.0	37
43	GA 931233-E17	39	36.7	36	38.5	36
LOCATION MEANS		38.9	35.6	35.6	37.0	37.0

HEIGHT (inches)

		Lincoln NE	Ithaca NY	Wooster OH	Nairn ON	Ridgetown ON
1	Caldwell	35	33.5	37	34.8	40
2	Foster	32	35.5	36	33.3	40
3	Patton	36	37.4	36	33.7	38
4	Roane	33	33.5	35	30.7	37
5	AR 910-9-1	38	39.4	37	36.0	41
6	VA00W-526	30	33.5	31	29.7	34
7	VA97W-375WS	29	31.5	32	30.3	34
8	VAN98W-170WS	30	37.4	35	32.5	37
9	T143	32	33.5	31	31.3	34
10	M99*3098	29	33.5	33	30.5	33
11	OH708	39	39.4	39	39.0	42
12	MO981020	35	37.4	36	35.6	39
13	MO980829	38	37.4	40	37.4	42
14	B980582	34	35.5	37	36.4	39
15	B980696	33	39.4	37	33.7	40
16	IL97-3632	34	39.4	39	35.0	38
17	T141	40	39.4	36	36.8	42
18	AR 93027-3-2	34	33.5	35	33.7	36
19	MD 11-52	28	29.6	30	27.8	31
20	MV 5-46	30	35.5	33	30.3	34
21	P91202RB1-3-3-4-5	35	37.4	37	34.1	39
22	P961341A3-1-2	32	31.5	35	32.5	34
23	P97397E1-11-2-4-1-1	34	35.5	34	33.5	36
24	B980006	37	37.4	37	32.5	38
25	KY93C-0378-5-2	34	33.5	36	31.1	36
26	KY93C-1238-17-1	34	35.5	35	33.9	37
27	Danny exp.	33	41.4	38	33.9	38
28	Jolly exp.	32	39.4	37	33.3	37
29	Apple exp.	36	35.5	36	34.4	38
30	MSU Line E1007	36	35.5	36	34.6	39
31	IL99-15867	36	35.5	37	34.3	38
32	G39186	36	39.4	39	35.6	42
33	G39050	37	43.3	39	37.8	42
34	G39030	32	33.5	34	32.9	37
35	OH743	34	41.4	38	37.0	42
36	OH751	34	39.4	40	36.0	41
37	M00-3701	33	35.5	36	33.9	36
38	M99-2408	30	35.5	37	33.9	35
39	NY89066-7131	34	43.3	40	36.4	43
40	X00*1118	33	37.4	37	35.4	39
41	X00-1079	34	33.5	35	33.7	37
42	WB-1001	35	35.5	36	34.3	36
43	GA 931233-E17	35	39.4	37	34.4	40
LOCATION MEANS		33.8	36.5	36.1	33.9	37.9

HEIGHT (inches)

		Blacksburg VA	Warsaw VA	Arlington WI	ENTRY MEANS ALL LOCATIONS	rank
1	Caldwell	30	35	40	37.1	11
2	Foster	30	32	40	35.8	23
3	Patton	30	33	40	36.3	16
4	Roane	27	32	39	33.2	37
5	AR 910-9-1	32	35	42	37.4	8
6	VA00W-526	25	30	34	32.0	41
7	VA97W-375WS	27	28	35	31.8	42
8	VAN98W-170WS	30	32	34	34.8	29
9	T143	27	31	34	32.8	40
10	M99*3098	27	31	34	33.1	38
11	OH708	32	35	44	38.4	3
12	MO981020	31	34	38	36.3	18
13	MO980829	33	35	42	37.7	7
14	B980582	30	33	37	35.4	25
15	B980696	30	32	39	35.9	22
16	IL97-3632	30	36	38	37.3	10
17	T141	33	36	41	38.5	2
18	AR 93027-3-2	29	33	35	34.8	31
19	MD 11-52	25	28	32	30.4	43
20	MV 5-46	27	31	36	32.8	39
21	P91202RB1-3-3-4-5	30	34	42	36.9	12
22	P961341A3-1-2	29	34	37	33.8	35
23	P97397E1-11-2-4-1-1	28	32	38	34.7	32
24	B980006	30	35	38	36.3	17
25	KY93C-0378-5-2	30	35	37	35.2	28
26	KY93C-1238-17-1	30	33	37	35.3	27
27	Danny exp.	32	38	39	37.7	6
28	Jolly exp.	30	35	38	35.7	24
29	Apple exp.	29	36	41	36.7	15
30	MSU Line E1007	31	34	39	36.8	13
31	IL99-15867	31	33	36	36.0	21
32	G39186	32	36	43	38.0	5
33	G39050	34	38	41	39.5	1
34	G39030	27	31	41	34.3	33
35	OH743	32	32	40	37.3	9
36	OH751	29	32	41	36.7	14
37	M00-3701	28	29	37	34.2	34
38	M99-2408	27	30	39	33.7	36
39	NY89066-7131	30	32	46	38.0	4
40	X00*1118	31	33	36	36.1	20
41	X00-1079	28	32	37	34.8	30
42	WB-1001	29	31	38	35.3	26
43	GA 931233-E17	31	32	37	36.2	19
LOCATION MEANS		29.6	33.0	38.4	35.6	

LODGING

		Stuttgart AR	Georgetown DE	Lafayette IN		Wichita KS
		0-9	0-9	0-9	0-9	0-9
1	Caldwell	2	1.7	1	4	3
2	Foster	0	1.0	2	4	2
3	Patton	0	1.0	4	7	3
4	Roane	0	1.0	6	7	4
5	AR 910-9-1	0	1.3	1	1	3
6	VA00W-526	0	1.0	1	1	2
7	VA97W-375WS	0	1.0	1	1	2
8	VAN98W-170WS	3	1.0	1	3	4
9	T143	0	1.0	1	1	2
10	M99*3098	0	1.0	1	4	2
11	OH708	0	1.0	1	5	2
12	MO981020	0	1.0	1	5	3
13	MO980829	0	1.0	2	5	2
14	B980582	0	1.3	2	5	3
15	B980696	0	1.0	2	7	3
16	IL97-3632	0	1.3	1	2	2
17	T141	0	1.3	1	3	2
18	AR 93027-3-2	0	1.0	1	2	2
19	MD 11-52	0	1.0	1	2	2
20	MV 5-46	0	1.0	1	1	2
21	P91202RB1-3-3-4-5	0	1.0	1	1	2
22	P961341A3-1-2	0	1.0	1	1	1
23	P97397E1-11-2-4-1-1	0	1.0	1	1	2
24	B980006	0	1.0	1	4	2
25	KY93C-0378-5-2	0	2.0	1	3	3
26	KY93C-1238-17-1	0	1.0	3	7	4
27	Danny exp.	0	1.3	1	2	2
28	Jolly exp.	0	1.0	1	3	2
29	Apple exp.	0	1.0	1	3	2
30	MSU Line E1007	0	1.0	1	5	2
31	IL99-15867	0	2.0	2	6	2
32	G39186	0	1.0	3	6	4
33	G39050	0	1.0	2	5	3
34	G39030	0	1.3	3	7	3
35	OH743	1	2.7	4	6	3
36	OH751	0	1.7	5	7	3
37	M00-3701	0	1.0	2	4	3
38	M99-2408	0	1.0	4	5	3
39	NY89066-7131	0	1.0	2	5	1
40	X00*1118	0	1.0	1	4	3
41	X00-1079	0	1.0	1	3	2
42	WB-1001	0	1.0	1	2	2
43	GA 931233-E17	1	1.0	3	4	2
LOCATION MEANS		0.2	1.2	1.8	3.8	2.5
GROWTH STAGE / DATE				early	late	

LODGING

		Logan Co. KY	Woodford Co. KY	Clarksville MD	Columbia MO	Ridgetown ON
		0-9	0-9	0-9	0-9	0-9
1	Caldwell	4	9	1.0	1.4	0.0
2	Foster	4	6	0.0	1.7	0.0
3	Patton	6	9	0.0	2.0	1.8
4	Roane	6	9	0.3	2.0	2.0
5	AR 910-9-1	7	9	3.7	1.3	1.2
6	VA00W-526	4	8	0.3	0.0	2.0
7	VA97W-375WS	5	9	0.3	0.4	1.8
8	VAN98W-170WS	5	8	2.7	2.0	0.0
9	T143	0	5	0.0	1.0	0.0
10	M99*3098	0	8	0.0	0.4	0.0
11	OH708	2	9	2.3	1.0	1.2
12	MO981020	3	8	1.0	2.3	1.2
13	MO980829	2	7	2.3	2.0	1.2
14	B980582	0	8	0.7	2.0	1.5
15	B980696	6	8	0.0	1.7	0.0
16	IL97-3632	4	7	2.7	1.4	1.5
17	T141	5	7	0.3	1.3	1.5
18	AR 93027-3-2	1	4	0.0	0.7	0.0
19	MD 11-52	2	9	0.7	0.0	1.5
20	MV 5-46	5	7	0.3	2.0	0.0
21	P91202RB1-3-3-4-5	4	9	1.3	0.0	0.0
22	P961341A3-1-2	1	7	0.0	0.1	0.0
23	P97397E1-11-2-4-1-1	0	5	0.0	0.1	0.0
24	B980006	1	1	0.3	2.0	0.0
25	KY93C-0378-5-2	3	0	0.0	0.7	0.0
26	KY93C-1238-17-1	4	9	1.0	1.0	0.0
27	Danny exp.	7	9	1.0	2.0	0.0
28	Jolly exp.	3	8	0.7	0.1	0.0
29	Apple exp.	0	6	0.3	1.3	0.0
30	MSU Line E1007	2	2	0.3	0.4	0.0
31	IL99-15867	4	8	1.0	1.7	1.2
32	G39186	5	0	0.7	2.7	1.8
33	G39050	5	8	0.3	1.0	0.0
34	G39030	1	6	0.0	1.7	2.2
35	OH743	0	6	4.7	2.7	1.8
36	OH751	2	6	0.7	1.0	1.2
37	M00-3701	0	0	0.7	2.3	0.0
38	M99-2408	0	8	1.3	2.3	1.5
39	NY89066-7131	3	4	1.0	0.0	1.2
40	X00*1118	5	7	1.3	0.4	1.5
41	X00-1079	3	9	0.0	0.0	2.0
42	WB-1001	2	9	0.7	1.0	0.0
43	GA 931233-E17	4	6	2.7	0.1	1.2
LOCATION MEANS		3.0	6.7	0.9	1.2	0.8
GROWTH STAGE / DATE						

LODGING

		Warsaw VA	Arlington WI	
		0.2-10	0-9	OVERALL RANK
1	Caldwell	0.2	4.1	36
2	Foster	0.2	2.3	19
3	Patton	0.2	3.8	42
4	Roane	0.2	2.9	43
5	AR 910-9-1	0.2	2.0	33
6	VA00W-526	0.2	0.2	15
7	VA97W-375WS	0.2	0.2	18
8	VAN98W-170WS	0.2	0.2	32
9	T143	0.2	0.2	1
10	M99*3098	0.2	0.2	10
11	OH708	0.2	1.7	25
12	MO981020	0.2	3.3	30
13	MO980829	0.2	5.3	31
14	B980582	0.2	3.1	26
15	B980696	0.2	2.5	37
16	IL97-3632	0.2	2.5	23
17	T141	0.2	2.2	21
18	AR 93027-3-2	0.2	1.5	4
19	MD 11-52	0.2	0.2	14
20	MV 5-46	0.2	0.2	15
21	P91202RB1-3-3-4-5	0.2	0.7	17
22	P961341A3-1-2	0.2	0.2	3
23	P97397E1-11-2-4-1-1	0.2	2.1	2
24	B980006	0.2	2.7	7
25	KY93C-0378-5-2	0.2	1.1	5
26	KY93C-1238-17-1	0.2	1.3	38
27	Danny exp.	0.2	3.3	29
28	Jolly exp.	0.2	0.2	12
29	Apple exp.	0.2	0.2	6
30	MSU Line E1007	0.2	2.7	9
31	IL99-15867	0.2	2.9	34
32	G39186	0.2	2.7	27
33	G39050	0.2	0.2	24
34	G39030	0.2	6.4	40
35	OH743	0.2	4.8	41
36	OH751	0.2	3.3	35
37	M00-3701	0.2	2.1	8
38	M99-2408	0.2	5.3	39
39	NY89066-7131	0.2	0.2	11
40	X00*1118	0.2	2.9	28
41	X00-1079	0.2	2.0	20
42	WB-1001	0.2	0.4	13
43	GA 931233-E17	0.2	0.2	22
LOCATION MEANS		0.2	2.0	
GROWTH STAGE / DATE				

WINTER SURVIVAL

		Bay AR Freeze Damage 1-9	Greensburg IN Winter Kill 1-9	Woodburn IN Winter Kill 0-9	Logan Co. KY Winter Kill 0-9	Woodford Co. KY Winter Kill 0-9
1	Caldwell	3.0	1.0	1.3	0	0
2	Foster	3.0	1.0	2.7	0	0
3	Patton	2.7	1.0	2.3	0	0
4	Roane	2.7	1.0	2.0	0	0
5	AR 910-9-1	2.3	3.0		0	0
6	VA00W-526	3.3	4.0		0	0
7	VA97W-375WS	2.7	1.0	3.7	0	0
8	VAN98W-170WS	3.0	2.0	7.7	0	0
9	T143	2.0	2.0	4.3	0	0
10	M99*3098	3.0	1.0	2.3	0	0
11	OH708	4.0	1.0	3.3	0	0
12	MO981020	3.0	1.0	3.0	0	0
13	MO980829	3.0	1.0	4.3	0	0
14	B980582	2.0	1.5	3.0	0	0
15	B980696	3.0	1.0	3.0	0	0
16	IL97-3632	3.3	1.0	3.3	0	0
17	T141	2.7	1.0	3.3	0	0
18	AR 93027-3-2	3.3	1.0	2.7	0	0
19	MD 11-52	3.3	3.0	2.0	0	0
20	MV 5-46	3.0	5.0	2.3	0	0
21	P91202RB1-3-3-4-5	3.0	1.0	2.3	0	0
22	P961341A3-1-2	2.7	1.0	3.3	0	0
23	P97397E1-11-2-4-1-1	2.7	1.0	3.0	0	0
24	B980006	2.3	1.0	2.7	0	0
25	KY93C-0378-5-2	3.3	1.0	3.3	0	0
26	KY93C-1238-17-1	2.7	1.0	2.7	0	0
27	Danny exp.	2.7	1.0	2.7	0	0
28	Jolly exp.	3.3	1.0	1.0	0	0
29	Apple exp.	2.7	1.0	2.3	0	0
30	MSU Line E1007	3.3	1.0	2.7	0	0
31	IL99-15867	3.7	1.0	2.0	0	0
32	G39186	2.7	1.0	2.3	0	0
33	G39050	3.3	1.0	4.0	0	0
34	G39030	3.0	1.5	2.7	0	0
35	OH743	2.7	1.0	2.0	0	0
36	OH751	3.0	1.0	1.0	0	0
37	M00-3701	2.7	1.0	3.0	0	0
38	M99-2408	2.3	1.0	2.3	0	0
39	NY89066-7131	3.3	1.0	1.7	0	0
40	X00*1118	2.0	1.0	2.7	0	0
41	X00-1079	3.0	1.0	3.0	0	0
42	WB-1001	2.7	1.0	4.3	0	0
43	GA 931233-E17	4.0	2.0	4.3	0	0
	LOCATION MEANS	2.9	1.3	2.9	0.0	0.0
	GROWTH STAGE / DATE		3			

WINTER SURVIVAL

		Columbia MO Winter Survival %	Ithaca NY Winter Survival %	Nairn ON Winter Survival %	Arlington WI Winter Survival 0-9
1	Caldwell	58	83	94	9.0
2	Foster	56	98	96	9.0
3	Patton	77	100	97	9.0
4	Roane	55	97	96	9.0
5	AR 910-9-1	57	97	97	9.0
6	VA00W-526	52	97	95	7.0
7	VA97W-375WS	56	97	92	8.3
8	VAN98W-170WS	42	100	88	8.8
9	T143	56	85	95	9.0
10	M99*3098	54	93	94	9.0
11	OH708	66	98	95	9.0
12	MO981020	66	99	96	9.0
13	MO980829	60	89	97	8.8
14	B980582	68	90	97	9.0
15	B980696	63	83	94	9.0
16	IL97-3632	64	97	92	7.7
17	T141	59	100	93	9.0
18	AR 93027-3-2	60	100	92	9.0
19	MD 11-52	48	98	93	9.0
20	MV 5-46	40	100	86	4.8
21	P91202RB1-3-3-4-5	59	99	91	9.0
22	P961341A3-1-2	64	99	95	9.0
23	P97397E1-11-2-4-1-1	50	99	92	9.0
24	B980006	69	99	95	9.0
25	KY93C-0378-5-2	59	92	94	8.7
26	KY93C-1238-17-1	77	96	92	9.0
27	Danny exp.	76	98	92	8.8
28	Jolly exp.	71	100	88	9.0
29	Apple exp.	60	95	85	9.0
30	MSU Line E1007	74	100	98	9.0
31	IL99-15867	64	95	96	9.0
32	G39186	70	100	92	9.0
33	G39050	67	100	95	9.0
34	G39030	61	100	93	9.0
35	OH743	63	100	90	8.7
36	OH751	69	98	88	9.0
37	M00-3701	60	100	97	9.0
38	M99-2408	69	100	96	9.0
39	NY89066-7131	56	95	90	9.0
40	X00*1118	68	99	97	9.0
41	X00-1079	81	98	97	9.0
42	WB-1001	75	100	94	9.0
43	GA 931233-E17	40	100	90	7.0
	LOCATION MEANS	61.8	96.8	93.4	8.7
	GROWTH STAGE / DATE				

LEAF RUST

		Bay AR	Quincy FL	Woodford Co. KY	Baton Rouge LA	Blacksburg VA
		1-9	0-9	% flag	0-9	0-9
1	Caldwell	4.7	1.0	1		2.0
2	Foster	5.7	4.0	5		6.7
3	Patton	3.3	5.0	1		3.3
4	Roane	2.7	3.5	1		2.3
5	AR 910-9-1	3.0	3.5	1	2	1.0
6	VA00W-526	3.7	4.5	5	0	1.0
7	VA97W-375WS	1.3	0.5	2	7	1.3
8	VAN98W-170WS	2.7	3.5	2	0	1.0
9	T143	5.7	2.7	1	5	2.7
10	M99*3098	5.0	6.0	1	1	2.3
11	OH708	2.0	0.0	1	0	0.7
12	MO981020	6.0	7.0	5	1	3.0
13	MO980829	6.0	6.0	10	1	1.3
14	B980582	2.3	0.0	1	0	0.7
15	B980696	2.7	1.0	1	1	1.3
16	IL97-3632	5.3	2.5	1	1	2.7
17	T141	4.3	3.0	5	1	2.0
18	AR 93027-3-2	3.3	0.0	2	0	1.0
19	MD 11-52	3.3	2.0	1	0	1.0
20	MV 5-46	3.7	4.5	1	2	3.0
21	P91202RB1-3-3-4-5	5.0	4.0	2	2	2.3
22	P961341A3-1-2	1.7	0.0	1	0	0.3
23	P97397E1-11-2-4-1-1	2.7	2.5	5	0	1.0
24	B980006	4.3	2.0	5	0	1.0
25	KY93C-0378-5-2	6.3	7.5	20	1	5.3
26	KY93C-1238-17-1	3.7	5.0	1	0	1.7
27	Danny exp.	8.0	8.5	10	3	9.0
28	Jolly exp.	6.3	7.0	20	4	6.3
29	Apple exp.	8.0	7.0	20	3	7.3
30	MSU Line E1007	6.0	7.0	15	0	6.0
31	IL99-15867	1.3	0.0	2	0	1.0
32	G39186	4.3	5.5	2	4	3.7
33	G39050	5.7	7.0	2	0	2.3
34	G39030	5.0	5.0	2	7	2.0
35	OH743	5.0	2.5	2	3	0.3
36	OH751	6.7	4.5	2	0	1.0
37	M00-3701	5.0	0.5	2	1	1.3
38	M99-2408	6.0	1.5	10		3.7
39	NY89066-7131	7.3	6.5	15		7.0
40	X00*1118	5.0	4.5	2		3.7
41	X00-1079	5.7	4.5	2	3	1.7
42	WB-1001	5.3	3.0	2	1	4.7
43	GA 931233-E17	3.3	6.0	5	1	1.0
	LOCATION MEANS	4.5	3.8	4.6	1.5	2.7
	GROWTH STAGE / DATE		27-Apr			

LEAF RUST

Blacksburg VA

		LR 04 TNRJ	LR 04 MCRK			LR 04 TNRJ	LR 04 MCRK
1	Caldwell	3S	3S	Ir differential	Tc Lr1	3S	3S
2	Foster	;1=R	2;	Ir differential	Tc Lr2a	3S	0;R
3	Patton	0;R	;12	Ir differential	Tc Lr2c	3S	;1-CR
4	Roane	3S	23	Ir differential	Tc Lr3a	3S	3S
5	AR 910-9-1	3S	23	Ir differential	Tc Lr9	3S	0;R
6	VA00W-526	3S	3S	Ir differential	Tc Lr16	12=MR	;12-CNR
7	VA97W-375WS	0;R	2;	Ir differential	Tc Lr24	3S	0;R
8	VAN98W-170WS	3S	3S	Ir differential	Tc Lr26	;1-R	23-MS
9	T143	3S	;12	Ir differential	Tc Lr3ka	3S	3S
10	M99*3098	3S	3S	Ir differential	Tc Lr11	3S	3S
11	OH708	23MS	12;	Ir differential	Tc Lr17	;12MR	;12-CR
12	MO981020	3S	3S	Ir differential	Tc Lr30	3S	3S
13	MO980829	3S	3S	Ir differential	Tc Lr18	;1-R	3C
14	B980582	3S	0;1	Ir differential	Tc Lr14a	3S	3S
15	B980696	23;MS	;12	Ir differential	Tc Lr10	3S	3S
16	IL97-3632	3S	3S	Ir differential	Tc LrB	;12-MR	;12CR
17	T141	3;S	3S				
18	AR 93027-3-2	3S	0;			12/4/2003	12/19/2003
19	MD 11-52	0;R	;12				
20	MV 5-46	;12-MR	2;				
21	P91202RB1-3-3-4-5	3S	23				
22	P961341A3-1-2	3S	3S				
23	P97397E1-11-2-4-1-1	;1-R	;1				
24	B980006	3S	3S				
25	KY93C-0378-5-2	3S	23				
26	KY93C-1238-17-1	S/0;R	;23				
27	Danny exp.	3S	23				
28	Jolly exp.	3S	23				
29	Apple exp.	3S	23				
30	MSU Line E1007	3S	3S				
31	IL99-15867	;1R	0;				
32	G39186	0;R	;2	treated seed			
33	G39050	0;R	;1	treated seed			
34	G39030	0;R	;12	treated seed			
35	OH743	3S	0;				
36	OH751	3S	0;1				
37	M00-3701	3S	;12				
38	M99-2408	S/;12MR	3S				
39	NY89066-7131	3S	23				
40	X00*1118	3S	3S				
41	X00-1079	3S	0;				
42	WB-1001	3S	3S				
43	GA 931233-E17	;12=MR	23				
GROWTH STAGE / DATE		12/4/2003	12/19/2003				

LEAF RUST

St. Paul MN

Reactions produced by NA race*

		CBMT	**MCDS**	**MCRK**	KBBG	TCTD	**TNRJ**	TLGK	TFBJ	**THBJ**	Postulated Genes***
1	Caldwell	3	3	3	;	3	3	3	3	3	+
2	Foster	;	3;	3	;1c	3	;2c	;	;1c3	;23	11,26
3	Patton	;	3-;	;-3	;1c	;	;	;	3-;	;-3	+
4	Roane	;	;	3	;	;1c	3	3,1;	;	;	10,11
5	AR 910-9-1	;	3	2c,	3	3	-	;-3	;1c	;2c	+
6	VA00W-526	;	3	3	3	;	3	3	3	3	0
7	VA97W-375WS	;2	;	;	;	;	;	;	;	;	+
8	VAN98W-170WS	;2	;	;2	;	;	;1c	;2c	;1c	;	+
9	T143	;2c	;	;	3	3	3	3	3	3	2a,+
10	M99*3098	;	;1c	3	;1c1	3	3	3	;	;	1,11
11	OH708	3	3	;1c	;1c1	3;	3;	3;	;1c	;	+
12	MO981020	3	3	3	3	3	3	3;	3;	3	0
13	MO980829	3	3	3	3-;	3	3	3	3-;	3	0
14	B980582	;	;	;	;	;	3	3	;	;	9,11
15	B980696	2c-3	3	;1c	;	;	3	;1c2	;2c	;1c	+
16	IL97-3632	;	3-;	3	3	;1c1	3	;1c2	23;	23;	+
17	T141	;2c-3	3	2c-;	3-;	;-3	;-3	;	;	;	+
18	AR 93027-3-2	;	;	;	3	;	3	3;	;3	;3	2a,10,+
19	MD 11-52	;1c	;	;1	;	;	;	;	;	;	+
20	MV-5-46	;	-	-	;1	;	3	-	;	;1	9,24,+
21	P91202RB1-3-3-4-5	;	;	23;	;	-	-	;3	;1	;3	+
22	P961341A3-1-2	;	3-;	3-;	3-;	3	;-3	;2	;2	;2	+
23	P97397E1-11-2-4-1-1	;1c	;1c	;	;	3	;	;	;2	;2	2a,11,26
24	B980006	3	3	3	3-;	3-;	3	3	3	3	0
25	KY93C-0378-5-2	;	;1c	3	-	3	;	-	;	;	11,26
26	KY93C-1238-17-1	;	;1c	3;	;	3	;-3	-	;	;	+
27	Danny exp.	3	3	3	-	3	3	3	3	3	0
28	Jolly exp.	;1c	;	3;	;	;	;-3	;-3	;	;	+
29	Apple exp.	3	-	3	3	3	-	3	-	-	0
30	MSU Line E1007	;	;	3;	;	;	3	3	;1c	;1c	+
31	IL99-15867	;	3	-	;	3-;	;	;	;	;1c	17,26
32	G39186	;	;	;	;	;	;	;	;	;1c	+
33	G39050	;	;	;	;	;	;	;	;	;	+
34	G39030	;	;	;	;	;	;	;	;	;	+
35	OH743	;	;	;	;	;	3	3	;	;	9,+
36	OH751	;	;	;	;	;	3-;	3	;	;	9,+
37	M00-3701	;1c	;	;	3	;	3	3	3	3	2a,10
38	M99-2408	3	;1c	3	2c1	;	3	3	;	3;	+
39	NY89066-7131	23-3	23	23-3	;	;1	3	;2	23-;	23;	;1c
40	X00*1118	3	3	3	3	;	2c;	;2	;	23;	+
41	X00-1079	;	;	;	;	3	3	3	;1c	;	2a,11+
42	WB-1001	;	;1c	;1c	;	;	;-2	3-;	;2	;2	+
43	GA 931233-E17	3	;1c	3	;	;	;	3	;2	;	18,+

*Single genes tested: = 1,2a,2c,3,3Ka,9,10,11,14a,16,17,18,24,26,30,B

**Virulence formula:

CBMT=3,3ka,10,14a,18,30,B
MCDS=1.3.3ka,10.14a.17.26,B
MCRK=1,3,3ka,10,11,14a,18,26,30
KBBG=2a,2c,3,10
TCTD=1,2a,2c,3,3ka,11,14a,17,26.30
TNRJ=1,2a,2c,3,3ka,9,10,11,14a,24,30
TLGK=1,2a,2c,3,9,10,11,14a,18
TFBJ=1,2a,2c,3,10,14a,24,26
THBJ=1,2a,2c,3,10,14a,16,26

***+=Lr gene(s) present but unable to identify with these Lr virulence combinations

Note: MCDS, MCRK, TNRJ and THBJ were the most commonly found races in the U.S. in 2003.

STRIPE RUST

		Fayetteville AR	Baton Rouge LA	Pullman WA	
		% leaf area	0-9	% severity	IT 0-2-5-8
1	Caldwell	55.0		100	8
2	Foster	82.7		100	8
3	Patton	85.0		100	8
4	Roane	22.3		90	8
5	AR 910-9-1	3.0	0	40	8
6	VA00W-526	2.3	0	10	8
7	VA97W-375WS	70.0	0	100	8
8	VAN98W-170WS	56.7	0	100	8
9	T143	36.7		90	5
10	M99*3098	20.0	0	40	8
11	OH708	56.7	1	100	8
12	MO981020	17.3	0	90	5,8
13	MO980829	5.3	0	90	5
14	B980582	31.7	1	80	8
15	B980696	0.7	0	5	0,8
16	IL97-3632	17.3	0	90	8
17	T141	3.0	0	80	5
18	AR 93027-3-2	38.3	1	100	8
19	MD 11-52	75.0	1	100	8
20	MV 5-46	79.3	2	100	8
21	P91202RB1-3-3-4-5	56.7	1	90	8
22	P961341A3-1-2	25.0	0	80	8
23	P97397E1-11-2-4-1-1	63.3	3	100	8
24	B980006	1.3	0	40	5
25	KY93C-0378-5-2	20.7	1	50	8
26	KY93C-1238-17-1	93.7	4	100	8
27	Danny exp.	9.7	0	60	8
28	Jolly exp.	4.7	0	70	8
29	Apple exp.	63.3		100	8
30	MSU Line E1007	61.7	2	100	8
31	IL99-15867	61.7	1	100	8
32	G39186	3.0	1	70	5
33	G39050	2.3	0	5	8
34	G39030	4.7	0	90	8
35	OH743	0.0	0	40	8
36	OH751	71.0	5	100	8
37	M00-3701	0.7	0	15	8
38	M99-2408	76.0		100	8
39	NY89066-7131	38.3		100	8
40	X00*1118	66.7		100	8
41	X00-1079	50.0	2	90	8
42	WB-1001	2.3	0	80	8
43	GA 931233-E17	0.7	0	20	8
LOCATION MEANS		35.7		76.9	
GROWTH STAGE / DATE				30-Jun	30-Jun

STRIPE RUST

		Mt. Vernon WA			
		% severity	IT 0-2-5-8	% severity	IT 0-2-5-8
1	Caldwell	20	5	100	8
2	Foster	40	8	100	8
3	Patton	60	8	100	8
4	Roane	20	5	80	5
5	AR 910-9-1	5	2	90	8
6	VA00W-526	5	2	10	8
7	VA97W-375WS	5	2	100	8
8	VAN98W-170WS	10	3	100	8
9	T143	60	8	100	8
10	M99*3098	5	2	10	2
11	OH708	60	8	100	8
12	MO981020	20	5	100	8
13	MO980829	5	2	30	2
14	B980582	80	8	100	8
15	B980696	0	0	5	2
16	IL97-3632	5	2	80	8
17	T141	5	2	40	5
18	AR 93027-3-2	40	8	100	8
19	MD 11-52	5	2	100	8
20	MV 5-46	90	8	100	8
21	P91202RB1-3-3-4-5	20	8	60	8
22	P961341A3-1-2	40	8	100	8
23	P97397E1-11-2-4-1-1	40	5	100	8
24	B980006	10	3	20	2
25	KY93C-0378-5-2	10	2,8	5	2
26	KY93C-1238-17-1	60	8	100	8
27	Danny exp.	40	5	100	8
28	Jolly exp.	15	3	50	8
29	Apple exp.	80	8	5	8
30	MSU Line E1007	60	8	100	8
31	IL99-15867	40	5	100	8
32	G39186	40	5	100	8
33	G39050	5	2	100	8
34	G39030	5	2	30	2
35	OH743	5	2	5	2
36	OH751	90	8	100	8
37	M00-3701	2	2	5	2
38	M99-2408	80	8	100	8
39	NY89066-7131	60	8	100	8
40	X00*1118	60	8	100	8
41	X00-1079	20	5	100	8
42	WB-1001	5	2	10	2
43	GA 931233-E17	5	2	20	2
LOCATION MEANS		31.0		71.0	6.5
GROWTH STAGE / DATE		24-Apr	24-Apr	4-Jun	4-Jun

SEPTORIA

		Lafayette IN tritici	Dundee MI tritici	Merrill MI tritici 0-9	Columbia MO tritici	Nairn ON tritici 0-9
1	Caldwell	4	3	4.0	60	5.7
2	Foster	3	2	3.5	24	5.0
3	Patton	3	5	4.5	42	6.0
4	Roane	2	2	3.0	52	5.0
5	AR 910-9-1	4	3	3.0	25	5.7
6	VA00W-526	2	6	3.0	8	4.3
7	VA97W-375WS	2	2	3.5	28	5.7
8	VAN98W-170WS	2	4	2.5	22	4.3
9	T143	4	5	5.0	48	6.7
10	M99*3098	3	5	3.0	22	5.3
11	OH708	2	2	2.5	23	5.7
12	MO981020	4	4	3.5	27	5.3
13	MO980829	4	3	2.5	24	5.0
14	B980582	5	5	1.0	23	5.0
15	B980696	4	4	3.5	37	6.0
16	IL97-3632	4	6	3.5	24	6.3
17	T141	4	4	4.0	23	5.7
18	AR 93027-3-2	3	5	3.0	17	4.3
19	MD 11-52	3	6	4.0	63	6.3
20	MV 5-46	2	3	5.0	55	7.7
21	P91202RB1-3-3-4-5	2	6	3.0	55	5.7
22	P961341A3-1-2	2	5	3.0	12	4.0
23	P97397E1-11-2-4-1-1	2	5	4.0	82	6.3
24	B980006	3	4	3.0	38	6.3
25	KY93C-0378-5-2	3	3	3.5	39	5.0
26	KY93C-1238-17-1	2	3	3.0	20	5.3
27	Danny exp.	4	5	4.5	34	6.7
28	Jolly exp.	4	4	3.5	38	7.0
29	Apple exp.	4	5	3.5	36	6.0
30	MSU Line E1007	5	4	2.5	78	7.0
31	IL99-15867	6	4	4.0	29	4.7
32	G39186	6	5	4.0	36	6.3
33	G39050	2	3	3.0	26	5.0
34	G39030	4	3	3.5	33	5.0
35	OH743	3	7	3.5	29	4.3
36	OH751	3	2	2.0	78	4.7
37	M00-3701	3	5	2.0	32	5.3
38	M99-2408	4	3	2.0	30	5.7
39	NY89066-7131	4	3	2.5	21	8.0
40	X00*1118	4	5	3.0	27	6.3
41	X00-1079	3	3	4.0	21	5.7
42	WB-1001	4	4	3.5	49	6.3
43	GA 931233-E17	3	6	3.0	40	5.7
	LOCATION MEANS	3.3	4.1	3.3	35.6	5.7
	GROWTH STAGE / DATE			10.5		

FUSARIUM HEAD BLIGHT (SCAB)

		Urbana IL				
		FHB Incidence %	FHB Severity %	FHB Index 0-100	Kernel Rating % FDK	ISK Index 0-100
1	Caldwell	40.0	38.9	15.3	40.0	39.7
2	Foster	14.0	46.0	7.1	30.0	30.0
3	Patton	11.7	32.2	3.9	46.7	31.8
4	Roane	27.7	15.5	5.2	33.3	26.3
5	AR 910-9-1	36.7	48.1	17.6	46.7	44.1
6	VA00W-526	45.0	17.6	7.8	53.3	40.1
7	VA97W-375WS	78.3	44.7	34.9	43.3	54.2
8	VAN98W-170WS	60.0	57.7	33.0	36.7	50.0
9	T143	63.3	56.7	35.6	50.0	56.0
10	M99*3098	13.3	26.6	2.7	46.7	30.6
11	OH708	15.7	49.6	7.7	46.7	38.2
12	MO981020	2.3	18.9	0.4	20.0	14.4
13	MO980829	4.3	12.8	0.6	20.0	13.2
14	B980582	1.0	30.3	0.3	20.0	17.4
15	B980696	16.3	31.7	6.5	36.7	29.1
16	IL97-3632	13.0	34.7	4.6	30.0	26.3
17	T141	20.0	59.0	11.5	53.3	45.0
18	AR 93027-3-2	26.7	45.0	12.0	36.7	36.2
19	MD 11-52	78.3	39.4	30.9	56.7	58.0
20	MV 5-46	36.7	35.4	11.6	40.0	37.6
21	P91202RB1-3-3-4-5	53.3	61.6	32.9	40.0	50.5
22	P961341A3-1-2	51.7	41.0	20.3	26.7	38.5
23	P97397E1-11-2-4-1-1	6.3	17.0	1.1	33.3	20.3
24	B980006	12.3	37.2	4.7	43.3	32.2
25	KY93C-0378-5-2	46.7	25.2	12.0	36.7	36.2
26	KY93C-1238-17-1	26.7	47.9	12.7	46.7	41.0
27	Danny exp.	60.0	25.5	16.4	40.0	41.7
28	Jolly exp.	63.3	39.8	26.8	46.7	49.6
29	Apple exp.	50.0	54.4	26.8	53.3	52.6
30	MSU Line E1007	51.7	28.2	14.6	40.0	40.0
31	IL99-15867	4.3	27.6	1.3	40.0	25.6
32	G39186	17.7	53.0	9.4	46.7	39.9
33	G39050	46.7	69.0	32.6	46.7	53.4
34	G39030	20.0	19.4	3.9	33.3	25.2
35	OH743	43.3	23.8	8.8	40.0	36.1
36	OH751	21.7	21.8	4.7	23.3	22.4
37	M00-3701	38.3	35.5	14.1	43.3	39.5
38	M99-2408	21.7	29.5	5.8	60.0	39.3
39	NY89066-7131	60.0	40.2	24.0	50.0	50.1
40	X00*1118	36.7	48.9	18.4	40.0	41.7
41	X00-1079	40.0	38.7	14.9	46.7	42.3
42	WB-1001	60.0	57.0	34.8	43.3	52.4
43	GA 931233-E17	50.0	66.3	35.4	30.0	46.9
LOCATION MEANS		34.6	38.4	14.5	40.4	38.0
GROWTH STAGE / DATE						

FUSARIUM HEAD BLIGHT (SCAB)

W.Lafayette
IN

		Point Inoculation % Severity	Natural Infection % Incidence	Natural Infection % Severity	Natural Infection Index
1	Caldwell	46.7	20.0	65.0	13.0
2	Foster	50.2	15.0	70.0	10.5
3	Patton	55.6	10.0	50.0	5.0
4	Roane	18.9	7.0	45.0	3.2
5	AR 910-9-1	40.7	20.0	60.0	12.0
6	VA00W-526	16.3	15.0	40.0	6.0
7	VA97W-375WS	38.1	65.0	77.5	50.3
8	VAN98W-170WS	90.9	27.5	80.0	21.9
9	T143	33.7	47.5	85.0	40.3
10	M99*3098	20.6	12.5	47.5	5.4
11	OH708	41.9	22.5	80.0	18.0
12	MO981020	13.0	5.5	40.0	2.1
13	MO980829	5.9	3.5	27.5	1.0
14	B980582	10.1	6.0	30.0	1.8
15	B980696	20.9	10.0	50.0	5.5
16	IL97-3632	16.6	10.0	60.0	6.0
17	T141	75.7	20.0	75.0	15.0
18	AR 93027-3-2	56.8	15.0	75.0	11.3
19	MD 11-52	35.6	65.0	75.0	49.0
20	MV 5-46	47.3	45.0	75.0	33.5
21	P91202RB1-3-3-4-5	47.1	35.0	82.5	28.9
22	P961341A3-1-2	33.2	55.0	65.0	35.0
23	P97397E1-11-2-4-1-1	8.9	4.0	27.5	1.1
24	B980006	49.0	10.5	65.0	6.6
25	KY93C-0378-5-2	41.5	20.0	72.5	14.6
26	KY93C-1238-17-1	17.7	17.5	72.5	12.8
27	Danny exp.	23.1	25.0	35.0	8.8
28	Jolly exp.	66.5	30.0	55.0	16.8
29	Apple exp.	63.7	12.5	77.5	9.8
30	MSU Line E1007	36.3	30.0	65.0	19.5
31	IL99-15867	13.7	13.5	55.0	7.8
32	G39186	47.8	12.5	70.0	8.8
33	G39050	57.3	27.5	75.0	20.8
34	G39030	15.2	11.0	65.0	7.0
35	OH743	32.5	17.5	65.0	11.3
36	OH751	21.6	12.5	45.0	5.8
37	M00-3701	21.6	17.5	70.0	12.3
38	M99-2408	23.2	7.0	55.0	3.9
39	NY89066-7131	26.2	12.5	50.0	6.3
40	X00*1118	54.1	12.5	55.0	7.5
41	X00-1079	16.3	12.5	65.0	8.3
42	WB-1001	74.3	50.0	85.0	43.0
43	GA 931233-E17	90.5	25.0	70.0	17.5
LOCATION MEANS		37.6	21.2	61.6	14.5
GROWTH STAGE / DATE					

FUSARIUM HEAD BLIGHT (SCAB)

		Bay AR	Greensburg IN	Lafayette IN		Woodford Co. KY
			1-5			% FDK
1	Caldwell	2.7	2.5	3	6	11.5
2	Foster	3.3	2.5	3	4	31.8
3	Patton	3.0	3.0	3	4	7.0
4	Roane	2.3	3.0	3	3	5.4
5	AR 910-9-1	4.7	2.0	5	7	7.9
6	VA00W-526	2.7	2.5	3	5	10.7
7	VA97W-375WS	6.7	4.5	6	7	6.2
8	VAN98W-170WS	4.3	3.5	6	6	1.1
9	T143	3.3	3.0	6	7	10.3
10	M99*3098	2.3	3.0	4	6	16.1
11	OH708	2.3	4.0	4	4	3.9
12	MO981020	2.0	2.0	2	2	5.4
13	MO980829	1.0	1.0	3	5	16.4
14	B980582	2.3	1.5	2	3	3.0
15	B980696	2.0	2.5	6	6	2.3
16	IL97-3632	1.3	2.0	2	3	1.8
17	T141	1.7	2.0	5	5	2.3
18	AR 93027-3-2	3.7	3.0	4	5	10.3
19	MD 11-52	7.0	5.0	7	8	8.3
20	MV 5-46	5.7	2.5	4	6	5.4
21	P91202RB1-3-3-4-5	4.0	4.0	5	6	1.7
22	P961341A3-1-2	3.0	3.0	5	7	3.2
23	P97397E1-11-2-4-1-1	2.7	3.0	2	2	6.3
24	B980006	3.3	2.5	4	5	21.8
25	KY93C-0378-5-2	4.0	3.0	6	6	5.9
26	KY93C-1238-17-1	4.0	3.5	6	8	12.6
27	Danny exp.	2.3	3.0	5	6	1.3
28	Jolly exp.	5.0	5.0	7	7	8.4
29	Apple exp.	2.7	4.0	5	6	40.8
30	MSU Line E1007	3.7	3.0	5	5	14.5
31	IL99-15867	2.7	2.5	4	6	14.6
32	G39186	3.0	2.0	4	4	4.5
33	G39050	4.0	4.0	6	6	5.7
34	G39030	2.3	2.0	3	5	15.4
35	OH743	2.7	2.0	4	4	2.6
36	OH751	3.0	2.5	4	5	1.9
37	M00-3701	3.3	2.0	5	5	3.7
38	M99-2408	2.3	2.0	4	5	1.9
39	NY89066-7131	1.0	2.0	4	6	10.8
40	X00*1118	2.0	3.0	4	6	5.1
41	X00-1079	3.0	3.0	5	6	9.6
42	WB-1001	7.0	3.0	8	8	14.6
43	GA 931233-E17	3.7	2.5	5	6	13.2
	LOCATION MEANS	3.2	2.8	4.4	5.4	9.0
	GROWTH STAGE / DATE			early	late	

FUSARIUM HEAD BLIGHT (SCAB)

		Dundee MI	Columbia MO	Arlington WI
			Index %	%
1	Caldwell	4	9	30
2	Foster	6	8	37
3	Patton	4	9	18
4	Roane	2	3	17
5	AR 910-9-1	7	8	22
6	VA00W-526	3	9	25
7	VA97W-375WS	4	24	47
8	VAN98W-170WS	3	13	53
9	T143	3	13	35
10	M99*3098	3	4	22
11	OH708	7	11	17
12	MO981020	2	2	5
13	MO980829	7	0	3
14	B980582	4	1	5
15	B980696	3	6	6
16	IL97-3632	3	5	7
17	T141	4	9	37
18	AR 93027-3-2	3	3	7
19	MD 11-52	4	24	55
20	MV 5-46	4	12	53
21	P91202RB1-3-3-4-5	3	16	37
22	P961341A3-1-2	4	12	43
23	P97397E1-11-2-4-1-1	3	1	22
24	B980006	4	5	27
25	KY93C-0378-5-2	4	11	30
26	KY93C-1238-17-1	3	9	42
27	Danny exp.	4	7	38
28	Jolly exp.	4	15	50
29	Apple exp.	2	20	43
30	MSU Line E1007	3	16	28
31	IL99-15867	4	6	12
32	G39186	4	8	32
33	G39050	5	7	37
34	G39030	4	5	17
35	OH743	6	12	17
36	OH751	3	5	23
37	M00-3701	4	9	47
38	M99-2408	2	5	28
39	NY89066-7131	3	8	35
40	X00*1118	2	11	10
41	X00-1079	2	8	9
42	WB-1001	2	14	52
43	GA 931233-E17	2	35	33
LOCATION MEANS		3.7	9.7	28.1
GROWTH STAGE / DATE				

POWDERY MILDEW

		Lafayette IN	Woodford Co. KY	Merrill MI	Wooster OH	Ridgetown ON	
			0-9	0-9	0-9	0-9	OVERALL RANK
1	Caldwell	7	6	1.5	2.3	4.5	43
2	Foster	6	6	1.0	4.0	3.0	40
3	Patton	5	5	1.5	3.0	3.5	36
4	Roane	1	7	1.0	1.0	0.5	18
5	AR 910-9-1	3	4	2.0	1.0	0.5	18
6	VA00W-526	1	3	1.0	0.0	0.0	3
7	VA97W-375WS	1	2	1.5	0.0	0.0	2
8	VAN98W-170WS	4	2	0.5	0.3	0.0	8
9	T143	3	4	3.0	0.3	1.5	24
10	M99*3098	5	4	0.5	0.3	1.5	23
11	OH708	1	4	1.0	1.7	1.0	14
12	MO981020	4	4	1.0	2.7	2.0	29
13	MO980829	5	4	1.0	2.3	2.5	32
14	B980582	2	6	1.0	2.0	2.5	28
15	B980696	4	4	0.5	1.3	3.0	26
16	IL97-3632	2	4	2.0	1.0	1.5	18
17	T141	1	3	1.5	0.3	0.0	5
18	AR 93027-3-2	3	5	2.0	2.3	4.0	34
19	MD 11-52	1	2	1.0	0.0	0.0	1
20	MV 5-46	2	2	1.0	0.0	0.0	3
21	P91202RB1-3-3-4-5	1	4	1.5	0.7	0.0	10
22	P961341A3-1-2	2	5	1.5	3.7	2.0	30
23	P97397E1-11-2-4-1-1	2	3	2.0	0.7	1.0	14
24	B980006	3	4	1.5	4.3	3.5	34
25	KY93C-0378-5-2	3	4	1.0	2.7	0.0	21
26	KY93C-1238-17-1	1	4	1.0	0.0	0.0	7
27	Danny exp.	2	4	1.5	3.7	1.0	25
28	Jolly exp.	2	6	3.5	1.7	1.0	30
29	Apple exp.	2	4	1.0	0.3	1.0	13
30	MSU Line E1007	1	3	0.5	2.0	1.5	11
31	IL99-15867	4	5	4.5	3.7	3.5	41
32	G39186	4	5	2.0	4.3	3.5	37
33	G39050	2	5	1.0	1.3	1.5	22
34	G39030	4	7	1.5	4.0	2.5	38
35	OH743	2	4	2.5	2.3	2.0	26
36	OH751	3	4	0.5	1.0	0.5	16
37	M00-3701	1	4	0.5	0.3	0.0	5
38	M99-2408	1	3	0.5	2.3	0.0	8
39	NY89066-7131	2	4	1.0	1.3	1.5	17
40	X00*1118	4	5	1.5	4.3	5.0	39
41	X00-1079	5	5	2.5	5.0	3.5	42
42	WB-1001	3	4	3.0	3.3	1.5	32
43	GA 931233-E17	2	5	1.0	0.0	0.0	11
LOCATION MEANS		2.7	4.2	1.5	1.8	1.6	
GROWTH STAGE / DATE				10.5		26-May	

POWDERY MILDEW

Blacksburg VA

		PM 04 COMP				PM 04 COMP
1	Caldwell	3MS	pm differential	Chancellor	-	4S
2	Foster	0R	pm differential	Axminster	Pm 1	0R
3	Patton	01R	pm differential	C68-15*7/CI 13836	Pm 1	0R
4	Roane	4S	pm differential	Ulka	Pm 2	23INS
5	AR 910-9-1	3MS	pm differential	Asosan	Pm 3a	4S
6	VA00W-526	0R	pm differential	Chul	Pm 3b	2I
7	VA97W-375WS	0R	pm differential	Sonora*	Pm 3c	34MS
8	VAN98W-170WS	4S	pm differential	C68-15*6/Sonora	Pm 3c	34MS/0R
9	T143	34MS	pm differential	C68-15*6/Trit	Pm 3c	4S/0R
10	M99*3098	34S	pm differential	Michigan Amber	Pm 3f	4S
11	OH708	23I	pm differential	Yuma	Pm 4a	4S
12	MO981020	4S	pm differential	C68-15*5/Yuma	Pm 4a	4S/1R
13	MO980829	4S	pm differential	C68-15*5/Kapli	Pm 4a	34MS
14	B980582	34S	pm differential	Ronos	Pm 4b	4S
15	B980696	4S	pm differential	Hope	Pm 5	2I?
16	IL97-3632	34S	pm differential	C747*	Pm 6	4S
17	T141	0R	pm differential	Transec*	Pm 7	4S
18	AR 93027-3-2	4S	pm differential	C68-15*7/Transec	Pm 7	0R
19	MD 11-52	0R	pm differential	Federation/Kavkaz	Pm 8	2I?
20	MV 5-46	12MR/TRS	pm differential	Amigo	Pm 17	0R/2plts S
21	P91202RB1-3-3-4-5	34MS	pm differential	C68-15*5//747/Amigo	Pm 17	4S
22	P961341A3-1-2	4S				
23	P97397E1-11-2-4-1-1	34S				12/18/2003
24	B980006	4S				
25	KY93C-0378-5-2	2MRI				
26	KY93C-1238-17-1	01R				
27	Danny exp.	4S				
28	Jolly exp.	4S				
29	Apple exp.	4S				
30	MSU Line E1007	4S				
31	IL99-15867	4S				
32	G39186	3MS	treated seed			
33	G39050	34MS	treated seed			
34	G39030	34MS	treated seed			
35	OH743	4S				
36	OH751	34MS				
37	M00-3701	23MSI				
38	M99-2408	23MSI				
39	NY89066-7131	34MS				
40	X00*1118	4S				
41	X00-1079	4S				
42	WB-1001	2MRI				
43	GA 931233-E17	23I				

GROWTH STAGE / DATE 12/18/2003

POWDERY MILDEW

Raleigh NC

Isolate

		1	2	3	4	5	6	7	8	9	10	11	12	13	Probable *Pm* gene(s)
1	Caldwell	S	S	S	S	S	S	S	S	S	S	S	S	S	no avirulent cultures
2	Foster	R	R	R	S	R	R	R	R	R	S	S	I	R	3c, 3e, 3f, 5a, 6, 7, 9, 17
3	Patton	R	R	R	R	R	R	R	R	R	S	S	S	S	7, 8
4	Roane	R	I	R	R	R	R	R	R	R	S	S	S	R	3f, 5a, 7, 8, 9
5	AR 910-9-1	S	S	S	S	S	R	S	R	S	I	S	S	R	3f, 5a, 7
6	VA00W-526	R	R	R	R	I	R	R	R	I	S	S	I	S	3c, 7, 8, 17
7	VA97W-375WS	R	S	S	S	S	R	R	R	R	S	S	S	I	3f, 5a, 7
8	VAN98W-170WS	S	S	S	S	S	S	S	R	S	S	S	S	S	7
9	T143	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt
10	M99*3098	S	S	S	S	S	S	S	R	S	S	S	R	R	3e, 3f, 5a, 6, 7
11	OH708	S	S	S	S	S	S	S	I	S	S	S	S	S	no avirulent cultures
12	MO981020	S	S	S	S	S	S	S	S	S	S	S	S	S	no avirulent cultures
13	MO980829	S	S	S	S	S	S	S	S	S	S	S	S	S	no avirulent cultures
14	B980582	S	S	S	S	S	S	S	R	S	S	S	I	R	3e, 3f, 5a, 6, 7
15	B980696	S	S	S	S	S	S	S	R	S	S	S	S	S	7
16	IL97-3632	S	S	S	S	S	S	S	S	S	S	S	S	S	no avirulent cultures
17	T141	R	S	R	R	S	R	R	R	R	S	S	R	S	3c, 7, 8
18	AR 93027-3-2	S	S	S	S	S	S	S	R	S	S	R	R	R	3e, 3f, 5a, 6, 7
19	MD 11-52	S	S	R	S	S	I	S	R	R	R	R	S	R	3f, 5a, 7
20	MV 5-46	R	R	R	R	R	S	R	R	R	R	R	R	R	3a, 3b, 3c, 3e, 3f, 5a, 6, 8, 9
21	P91202RB1-3-3-4-5	R	R	R	R	R	R	R	R	R	S	S	R	R	3c, 3e, 3f, 4b, 5a, 6, 7, 8, 9, 17
22	P961341A3-1-2	S	S	S	S	S	S	S	R	S	S	S	S	S	7
23	P97397E1-11-2-4-1-1	S	S	S	S	S	S	S	R	I	S	R	R	R	3e, 3f, 5a, 6, 7
24	B980006	S	S	S	S	S	S	S	R	S	S	S	S	S	7
25	KY93C-0378-5-2	R	R	R	S	S	S	R	R	R	R	R	R	R	3a, 3b, 3c, 3e, 3f, 5a, 6, 7
26	KY93C-1238-17-1	R	R	R	R	S	I	R	R	R	R	R	R	R	3a, 3b, 3c, 3e, 3f, 5a, 6, 7, 8
27	Danny exp.	R	R	R	R	R	R	R	R	R	S	S	R	R	3c, 3e, 3f, 4b, 5a, 6, 7, 8, 9, 17
28	Jolly exp.	R	R	S	S	R	S	S	R	R	S	S	R	R	3e, 3f, 5a, 6, 7, 9
29	Apple exp.	S	S	S	S	S	S	S	R	S	R	R	R	R	3a, 3e, 3f, 5a, 6, 7
30	MSU Line E1007	S	S	S	S	S	S	S	R	S	S	S	S	S	7
31	IL99-15867	S	S	S	S	S	S	S	S	S	S	S	S	S	no avirulent cultures
32	G39186	R	R	R	R	R	R	R	R	R	R	R	R	R	no virulent cultures
33	G39050	R	S	R	R	S	R	R	R	R	S	S	I	R	3c, 3e, 3f, 5a, 6, 7, 8
34	G39030	R	I	R	S	R	R	R	R	R	S	S	R	R	3c, 3e, 3f, 5a, 6, 7, 9, 17
35	OH743	S	S	S	S	S	S	S	R	S	S	S	S	I	3f, 5a, 7
36	OH751	S	S	S	S	S	S	S	R	S	R	R	R	R	3a, 3e, 3f, 5a, 6, 7
37	M00-3701	S	S	S	S	S	S	S	R	R	S	S	I	I	3e, 3f, 5a, 6, 7
38	M99-2408	S	I	S	S	S	S	S	R	R	R	S	S	R	3f, 5a, 7
39	NY89066-7131	S	S	S	S	S	S	S	S	S	S	S	S	S	no avirulent cultures
40	X00*1118	S	S	S	S	S	S	S	R	S	S	S	S	S	7
41	X00-1079	S	S	S	S	S	S	S	S	S	S	S	S	S	no avirulent cultures
42	WB-1001	R	R	R	S	S	S	R	R	R	R	S	R	R	3b, 3c, 3e, 3f, 5a, 6, 7
43	GA 931233-E17	R	S	S	I	S	S	S	I	R	R	I	R	I	3a, 3e, 3f, 5a, 6, 7, 8

See next page for avirulence/virulence combinations of each isolate. "No virulent isolates" indicates the cultivar or line was resistant (or intermediate) to the isolates tested and therefore has a *Pm* gene or allele (or combination) not represented in the differential set. "No avirulent isolates" indicates the cultivar or line was susceptible to all the isolates tested, and therefore does not contain any of the *Pm* genes or alleles tested. Only one isolate (#8) was avirulent on entry #8 (VAN98W-170WS), entry #15 (B980696), entry #22 (P961341A3-1-2), entry #24 (B980006), entry #30 (MSU line E1007), and entry #40 (X00*1118), so the probable presence of any *Pm* gene or allele in these entries is tentative. An "nt" indicates the line was not tested.

POWDERY MILDEW

Raleigh NC

Isolate #	*Pm* Avirulence	*Pm* Virulence
1	1a, 2a, 3b, 3c, 4b, 8, 9, 16, 17, 25	3a, 3e, 3f, 5a, 6, 7
2	1a, 2a, 4b, 9, 16, 17, 25	3a, 3b, 3c, 3e, 3f, 5a, 6, 7, 8
3	1a, 3b, 4b, 17, 25	2a, 3a, 3c, 3e, 3f, 5a, 6, 7, 8, 9, 16
4	1a, 4b, 8, 16, 25	2a, 3a, 3b, 3c, 3e, 3f, 5a, 6, 7, 8, 17
5	1a, 2a, 4b, 9, 16, 17, 25	3a, 3b, 3c, 3e, 3f, 5a, 6, 7, 8
6	1a, 2a, 4b, 16, 17, 25	3a, 3b, 3c, 3e, 3f, 5a, 6, 7, 8, 9
7	1a, 2a, 3c, 4b, 16, 17, 25	3a, 3b, 3e, 3f, 5a, 6, 7, 8, 9
8	3a, 3b, 4b, 6, 7, 16, 17, 25	1a, 2a, 3c, 3e, 3f, 5a, 8, 9
9	1a, 3b, 3c, 4b, 9, 16, 17, 25	2a, 3a, 3e, 3f, 5a, 6, 7, 8
10	1a, 2a, 3a, 3b, 16, 25	3c, 3e, 3f, 4b, 5a, 6, 7, 8, 9, 17
11	1a, 2a, 3a, 16	3b, 3c, 3e, 3f, 4b, 5a, 6, 7, 8, 9, 17, 25
12	1a, 3a, 3b, 3c, 3e, 4b, 6, 16, 17, 25	2a, 3f, 5a, 7, 8, 9
13	3a, 3b, 3e, 3f, 4b, 5, 6, 9, 16, 25	1a, 2a, 3c, 7, 8, 17

A total of 16 Pm genes or alleles were evaluated: Pm1a, Pm2a, Pm3a, Pm3b, Pm3c, Pm3e, Pm3f, Pm4b, Pm5a, Pm6, Pm7, Pm8, Pm9, Pm16, Pm17, and Pm25.

DISEASE COMPLEXES

		Keiser AR Soil borne & Spindle Streak 0-9	Jackson Co. AR Soil borne & Spindle Streak 0-9	Kibler AR Foliar Diseases % leaf area
1	Caldwell	3.7	1.3	50.0
2	Foster	0.7	0.3	85.0
3	Patton	0.0	0.7	80.0
4	Roane	0.0	0.7	43.3
5	AR 910-9-1	0.0	0.0	25.0
6	VA00W-526	0.3	2.3	30.0
7	VA97W-375WS	0.0	0.7	68.3
8	VAN98W-170WS	0.0	0.3	61.7
9	T143	0.3	0.7	68.3
10	M99*3098	0.0	0.0	36.7
11	OH708	0.0	0.3	55.0
12	MO981020	0.7	0.0	43.3
13	MO980829	0.7	0.3	25.0
14	B980582	0.0	0.3	36.7
15	B980696	1.0	2.3	31.7
16	IL97-3632	0.0	0.0	25.0
17	T141	0.3	0.3	22.3
18	AR 93027-3-2	0.0	0.7	31.7
19	MD 11-52	0.0	0.0	75.0
20	MV 5-46	0.3	2.3	85.3
21	P91202RB1-3-3-4-5	0.0	0.3	68.3
22	P961341A3-1-2	0.3	0.0	20.0
23	P97397E1-11-2-4-1-1	0.0	0.3	64.3
24	B980006	0.0	0.3	30.0
25	KY93C-0378-5-2	0.0	0.0	25.0
26	KY93C-1238-17-1	0.0	0.3	92.0
27	Danny exp.	1.3	0.7	73.3
28	Jolly exp.	0.3	0.0	30.0
29	Apple exp.	1.0	0.7	75.0
30	MSU Line E1007	0.0	0.0	61.7
31	IL99-15867	0.3	0.7	68.3
32	G39186	2.3	0.7	50.0
33	G39050	0.3	0.0	30.0
34	G39030	0.0	0.0	30.0
35	OH743	2.7	1.0	43.3
36	OH751	0.0	0.0	85.0
37	M00-3701	0.3	0.0	38.3
38	M99-2408	0.3	0.3	84.3
39	NY89066-7131	0.0	0.0	78.7
40	X00*1118	2.0	0.0	90.3
41	X00-1079	0.0	0.3	63.3
42	WB-1001	0.0	0.0	61.7
43	GA 931233-E17	2.0	1.3	36.7
LOCATION MEANS		0.5	0.5	53.0
GROWTH STAGE / DATE		23-Mar	23-Mar	7-May

BYDV

		Griffin GA	Urbana IL	Blacksburg VA	Warsaw VA
			stunting %	0-9	0-9
1	Caldwell	5	14.3	3.0	6
2	Foster	7	33.6	3.0	3
3	Patton	7	8.9	3.3	5
4	Roane	6	18.8	1.7	1
5	AR 910-9-1	6	10.0	3.3	3
6	VA00W-526	7	2.4	1.7	2
7	VA97W-375WS	3	12.9	3.0	3
8	VAN98W-170WS	5	10.0	2.7	1
9	T143	7	10.2	4.3	2
10	M99*3098	5	11.9	2.3	3
11	OH708	3	5.8	3.3	2
12	MO981020	4	13.2	2.7	2
13	MO980829	2	11.7	3.0	2
14	B980582	0	13.5	2.0	1
15	B980696	3	23.2	3.0	3
16	IL97-3632	2	18.0	2.3	3
17	T141	6	1.4	4.0	6
18	AR 93027-3-2	2	0.5	2.7	3
19	MD 11-52	7	15.9	2.7	2
20	MV 5-46	7	25.1	2.7	2
21	P91202RB1-3-3-4-5	6	21.1	3.7	7
22	P961341A3-1-2	1	16.7	1.0	0
23	P97397E1-11-2-4-1-1	4	11.8	2.3	2
24	B980006	3	10.2	3.0	1
25	KY93C-0378-5-2	2	17.2	2.0	2
26	KY93C-1238-17-1	2	11.9	2.7	3
27	Danny exp.	4	16.3	4.0	5
28	Jolly exp.	6	24.7	4.7	5
29	Apple exp.	6	22.2	3.0	4
30	MSU Line E1007	1	14.3	2.3	2
31	IL99-15867	3	10.4	2.3	2
32	G39186	5	18.3	3.3	4
33	G39050	5	11.9	3.3	2
34	G39030	2	22.0	2.3	2
35	OH743	3	14.8	3.3	3
36	OH751	5	18.3	3.7	5
37	M00-3701	5	7.7	3.0	1
38	M99-2408	4	17.7	3.0	5
39	NY89066-7131	2	13.8	4.7	5
40	X00*1118	1	3.8	3.3	3
41	X00-1079	2	13.0	2.0	3
42	WB-1001	5	23.0	2.0	1
43	GA 931233-E17	7	4.2	3.3	1
LOCATION MEANS		4.1	14.1	2.9	2.9

WSSV

		Clay Co. AR	Warsaw VA
		0-9	0-9
1	Caldwell	3.0	3.6
2	Foster	1.7	0.0
3	Patton	0.3	3.6
4	Roane	1.3	0.0
5	AR 910-9-1	3.7	0.0
6	VA00W-526	4.3	0.0
7	VA97W-375WS	0.0	0.0
8	VAN98W-170WS	2.3	0.0
9	T143	3.7	1.8
10	M99*3098	2.0	0.0
11	OH708	1.3	0.0
12	MO981020	3.3	0.0
13	MO980829	2.7	0.0
14	B980582	0.7	0.0
15	B980696	0.7	0.0
16	IL97-3632	1.0	0.0
17	T141	0.0	1.8
18	AR 93027-3-2	3.3	0.0
19	MD 11-52	1.7	0.0
20	MV 5-46	3.3	0.0
21	P91202RB1-3-3-4-5	0.0	0.0
22	P961341A3-1-2	0.7	0.0
23	P97397E1-11-2-4-1-1	0.0	0.0
24	B980006	0.7	0.0
25	KY93C-0378-5-2	0.0	0.0
26	KY93C-1238-17-1	0.0	0.0
27	Danny exp.	0.3	0.0
28	Jolly exp.	0.3	0.0
29	Apple exp.	4.3	0.0
30	MSU Line E1007	0.0	0.0
31	IL99-15867	1.3	0.0
32	G39186	4.0	0.0
33	G39050	1.0	0.0
34	G39030	0.3	0.0
35	OH743	0.7	0.0
36	OH751	0.3	0.0
37	M00-3701	4.0	0.0
38	M99-2408	2.3	0.0
39	NY89066-7131	0.0	0.0
40	X00*1118	1.0	0.0
41	X00-1079	0.3	0.0
42	WB-1001	0.7	0.0
43	GA 931233-E17	3.3	0.0
LOCATION MEANS		1.5	0.3
GROWTH STAGE / DATE		22-Mar	

SBMV

		Urbana IL	W.Lafayette IN
		0-9	0-9
1	Caldwell	6.5	3.5
2	Foster	3.5	3.5
3	Patton	2.5	2.0
4	Roane	7.0	4.0
5	AR 910-9-1	7.5	2.5
6	VA00W-526	9.0	4.0
7	VA97W-375WS	8.5	5.0
8	VAN98W-170WS	8.0	5.0
9	T143	9.0	5.0
10	M99*3098	7.0	4.0
11	OH708	2.0	0.5
12	MO981020	6.0	5.0
13	MO980829	7.5	5.0
14	B980582	6.0	5.0
15	B980696	7.5	7.0
16	IL97-3632	2.5	0.8
17	T141	2.0	2.0
18	AR 93027-3-2	7.5	5.0
19	MD 11-52	7.0	5.0
20	MV 5-46	9.0	5.0
21	P91202RB1-3-3-4-5	2.5	1.0
22	P961341A3-1-2	3.0	0.3
23	P97397E1-11-2-4-1-1	4.0	0.3
24	B980006	2.0	0.3
25	KY93C-0378-5-2	7.0	4.0
26	KY93C-1238-17-1	4.5	1.0
27	Danny exp.	6.0	4.0
28	Jolly exp.	4.5	3.0
29	Apple exp.	6.5	4.0
30	MSU Line E1007	3.5	2.0
31	IL99-15867	6.0	4.0
32	G39186	5.0	4.0
33	G39050	3.0	2.0
34	G39030	7.0	4.0
35	OH743	8.0	4.5
36	OH751	3.5	2.0
37	M00-3701	5.0	3.5
38	M99-2408	6.0	4.0
39	NY89066-7131	4.0	2.0
40	X00*1118	4.5	1.0
41	X00-1079	4.0	2.0
42	WB-1001	6.5	2.0
43	GA 931233-E17	9.0	4.0
LOCATION MEANS		5.6	3.2

HESSIAN FLY

		Biotype B	Biotype C	Biotype D	Biotype E	Biotype L
1	Caldwell	12 - 2	0 - 14	0 - 13	13 - 1	0 - 15
2	Foster	0 - 14	0 - 14	0 - 13	0 - 16	0 - 14
3	Patton	0 - 16	12 - 0	0 - 10	14 - 0	0 - 12
4	Roane	14 - 1	8 - 7	0 - 19	13 - 0	0 - 12
5	AR 910-9-1	0 - 19	0 - 15	0 - 17	13 - 0	0 - 14
6	VA00W-526	0 - 18	0 - 12	0 - 16	0 - 16	0 - 10
7	VA97W-375WS	0 - 17	0 - 14	0 - 12	0 - 11	0 - 16
8	VAN98W-170WS	0 - 11	0 - 13	0 - 12	11 - 0	0 - 8
9	T143	8 - 10	0 - 15	0 - 18	15 - 0	0 - 14
10	M99*3098	9 - 8	0 - 14	0 - 16	15 - 1	0 - 18
11	OH708	11 - 2	0 - 15	0 - 15	14 - 1	0 - 12
12	MO981020	0 - 19	0 - 15	0 - 18	16 - 0	0 - 17
13	MO980829	0 - 14	0 - 15	0 - 16	13 - 0	0 - 17
14	B980582	0 - 19	1 - 13	0 - 17	14 - 0	0 - 15
15	B980696	0 - 14	8 - 5	0 - 13	17 - 0	0 - 16
16	IL97-3632	14 - 1	0 - 15	0 - 15	14 - 0	0 - 14
17	T141	0 - 13	0 - 13	0 - 15	14 - 0	0 - 11
18	AR 93027-3-2	11 - 2	0 - 14	0 - 19	17 - 0	0 - 18
19	MD 11-52	0 - 19	0 - 15	0 - 15	0 - 16	0 - 13
20	MV 5-46	0 - 14	0 - 15	0 - 17	0 - 16	0 - 19
21	P91202RB1-3-3-4-5	11 - 3	5 - 9	0 - 16	10 - 0	0 - 13
22	P961341A3-1-2	10 - 2	14 - 0	10 - 0	10 - 0	0 - 7
23	P97397E1-11-2-4-1-1	3 - 13	14 - 0	13 - 0	15 - 0	0 - 14
24	B980006	0 - 20	10 - 0	0 - 20	0 - 16	0 - 16
25	KY93C-0378-5-2	0 - 14	1 - 13	0 - 14	0 - 15	0 - 15
26	KY93C-1238-17-1	0 - 11	8 - 6	0 - 18	0 - 15	0 - 16
27	Danny exp.	0 - 19	0 - 15	0 - 18	0 - 13	0 - 18
28	Jolly exp.	0 - 14	0 - 14	0 - 18	0 - 12	0 - 17
29	Apple exp.	0 - 14	0 - 12	0 - 13	0 - 10	0 - 12
30	MSU Line E1007	0 - 19	13 - 1	0 - 17	15 - 1	0 - 16
31	IL99-15867	0 - 16	0 - 15	0 - 12	13 - 0	0 - 15
32	G39186	3 - 12	0 - 14	0 - 15	13 - 2	0 - 14
33	G39050	0 - 15	15 - 0	0 - 16	0 - 17	0 - 17
34	G39030	1 - 12	9 - 6	0 - 15	0 - 16	0 - 15
35	OH743	17 - 0	11 - 0	16 - 0	16 - 0	0 - 14
36	OH751	0 - 18	0 - 13	0 - 14	0 - 12	0 - 15
37	M00-3701	15 - 0	0 - 14	0 - 16	13 - 0	0 - 14
38	M99-2408	0 - 14	0 - 15	0 - 15	0 - 16	0 - 16
39	NY89066-7131	0 - 14	11 - 1	0 - 15	0 - 14	0 - 16
40	X00*1118	0 - 17	0 - 13	0 - 18	0 - 16	0 - 16
41	X00-1079	0 - 15	0 - 15	0 - 16	0 - 16	0 - 16
42	WB-1001	0 - 15	0 - 13	0 - 16	0 - 11	0 - 15
43	GA 931233-E17	0 - 19	0 - 9	0 - 17	0 - 14	0 - 18

ACID SOIL TOLERANCE

		Enid OK
		1-5
1	Caldwell	1
2	Foster	1
3	Patton	2
4	Roane	3
5	AR 910-9-1	1
6	VA00W-526	5
7	VA97W-375WS	4
8	VAN98W-170WS	4
9	T143	2
10	M99*3098	3
11	OH708	1
12	MO981020	2
13	MO980829	2
14	B980582	1
15	B980696	3
16	IL97-3632	1
17	T141	2
18	AR 93027-3-2	1
19	MD 11-52	4
20	MV 5-46	2
21	P91202RB1-3-3-4-5	2
22	P961341A3-1-2	3
23	P97397E1-11-2-4-1-1	4
24	B980006	3
25	KY93C-0378-5-2	3
26	KY93C-1238-17-1	3
27	Danny exp.	4
28	Jolly exp.	5
29	Apple exp.	1
30	MSU Line E1007	2
31	IL99-15867	2
32	G39186	3
33	G39050	4
34	G39030	2
35	OH743	2
36	OH751	4
37	M00-3701	3
38	M99-2408	4
39	NY89066-7131	4
40	X00*1118	3
41	X00-1079	3
42	WB-1001	4
43	GA 931233-E17	3
LOCATION MEANS		2.7
GROWTH STAGE / DATE		28-May

1RS STATUS

		Lincoln NE
1	Caldwell	Non.1RS
2	Foster	1BL.1RS
3	Patton	1BL.1RS
4	Roane	Non.1RS
5	AR 910-9-1	Non.1RS
6	VA00W-526	1AL.1RS
7	VA97W-375WS	1BL.1RS
8	VAN98W-170WS	Non.1RS
9	T143	Non.1RS
10	M99*3098	Non.1RS
11	OH708	Non.1RS
12	MO981020	Non.1RS
13	MO980829	Non.1RS
14	B980582	Non.1RS
15	B980696	Non.1RS
16	IL97-3632	Non.1RS
17	T141	1AL.1RS
18	AR 93027-3-2	Non.1RS
19	MD 11-52	1BL.1RS
20	MV 5-46	1BL.1RS
21	P91202RB1-3-3-4-5	Non.1RS
22	P961341A3-1-2	Non.1RS
23	P97397E1-11-2-4-1-1	1BL.1RS
24	B980006	Non.1RS
25	KY93C-0378-5-2	Non.1RS
26	KY93C-1238-17-1	1BL.1RS
27	Danny exp.	Non.1RS
28	Jolly exp.	Non.1RS
29	Apple exp.	Non.1RS
30	MSU Line E1007	Non.1RS
31	IL99-15867	Non.1RS
32	G39186	Non.1RS
33	G39050	Non.1RS
34	G39030	Non.1RS
35	OH743	Non.1RS
36	OH751	Non.1RS
37	M00-3701	Non.1RS
38	M99-2408	Non.1RS
39	NY89066-7131	Non.1RS
40	X00*1118	Non.1RS
41	X00-1079	Non.1RS
42	WB-1001	Non.1RS
43	GA 931233-E17	Non.1RS

SPROUTING

		East Lansing MI Pre-harvest Sprout Score 0-9
1	Caldwell	8.5
2	Foster	5.9
3	Patton	5.2
4	Roane	4.4
5	AR 910-9-1	9.0
6	VA00W-526	6.9
7	VA97W-375WS	8.7
8	VAN98W-170WS	8.9
9	T143	6.4
10	M99*3098	5.0
11	OH708	5.7
12	MO981020	5.0
13	MO980829	1.9
14	B980582	6.0
15	B980696	8.2
16	IL97-3632	4.5
17	T141	5.9
18	AR 93027-3-2	2.8
19	MD 11-52	4.8
20	MV 5-46	8.0
21	P91202RB1-3-3-4-5	8.9
22	P961341A3-1-2	9.3
23	P97397E1-11-2-4-1-1	1.8
24	B980006	3.5
25	KY93C-0378-5-2	2.0
26	KY93C-1238-17-1	3.9
27	Danny exp.	3.6
28	Jolly exp.	3.1
29	Apple exp.	7.5
30	MSU Line E1007	5.4
31	IL99-15867	6.6
32	G39186	7.6
33	G39050	2.0
34	G39030	8.9
35	OH743	2.2
36	OH751	2.9
37	M00-3701	2.9
38	M99-2408	4.0
39	NY89066-7131	8.7
40	X00*1118	6.5
41	X00-1079	6.4
42	WB-1001	7.3
43	GA 931233-E17	2.3
LOCATION MEANS		5.6
GROWTH STAGE / DATE		11.4

MATURITY

		Ridgetown ON Mature Date Julian
1	Caldwell	193
2	Foster	192
3	Patton	192
4	Roane	193
5	AR 910-9-1	192
6	VA00W-526	193
7	VA97W-375WS	193
8	VAN98W-170WS	194
9	T143	191
10	M99*3098	193
11	OH708	195
12	MO981020	191
13	MO980829	194
14	B980582	191
15	B980696	192
16	IL97-3632	192
17	T141	193
18	AR 93027-3-2	193
19	MD 11-52	192
20	MV 5-46	190
21	P91202RB1-3-3-4-5	193
22	P961341A3-1-2	194
23	P97397E1-11-2-4-1-1	190
24	B980006	192
25	KY93C-0378-5-2	194
26	KY93C-1238-17-1	193
27	Danny exp.	190
28	Jolly exp.	191
29	Apple exp.	194
30	MSU Line E1007	194
31	IL99-15867	192
32	G39186	192
33	G39050	192
34	G39030	192
35	OH743	194
36	OH751	194
37	M00-3701	192
38	M99-2408	192
39	NY89066-7131	196
40	X00*1118	192
41	X00-1079	194
42	WB-1001	193
43	GA 931233-E17	194
LOCATION MEANS		192.6

ADVANCED NURSERY EVALUATION FOR SOFT WHEAT MILLING AND BAKING QUALITY

LAB NO.		Samples composited from Urbana, IL; W.Lafayette, IN; Stuttgart, AR	MILLING QUALITY SCORE		BAKING QUALITY SCORE		TEST WT. SCORE		SOFT. EQUIV. SCORE		MICRO T.W. LB/BU	
		STANDARD (#2626, Caldwell)	71.0	B	65.7	C	56.20	D	75.60	B	61.1	
2626	1	Caldwell	71.0	B	65.7	C	56.20	D	75.60	B	61.1	
2627	2	Foster	79.3	B	66.4	C	58.93	D	67.46	C	61.4	
2628	3	Patton	63.6	C	41.9	E	55.33	D	66.08	C	61.0	
2629	4	Roane	55.1	D	35.2	F	82.35	A	69.14	C	64.2	
2630	5	AR 910-9-1	65.3	C	36.9	F	52.11	D	55.88	D	60.6	
2631	6	VA00W-526	63.6	C	35.2	F	64.44	C	41.22	E	62.1	
2632	7	VA97W-375WS	59.3	D	49.7	E	59.79	D	57.52	D	61.5	
2633	8	VAN98W-170WS	74.7	B	57.2	D	65.87	C	59.31	D	62.2	
2634	9	T143	56.5	D	44.4	E	47.53	E	78.20	B	60.0	
2635	10	M99*3098	63.0	C	47.2	E	72.25	B	59.38	D	63.0	
2636	11	OH708	71.3	B	68.2	C	56.26	D	67.87	C	61.1	
2637	12	MO981020	58.1	D	52.7	D	66.80	C	61.36	C	62.4	
2638	13	MO980829	63.6	C	67.7	C	52.48	D	69.70	C	60.6	
2639	14	B980582	59.2	D	51.0	D	73.55	B	64.75	C	63.2	
2640	15	B980696	68.8	C	35.2	F	80.92	A	49.28	E	64.1	
2641	16	IL97-3632	69.3	C	65.7	C	61.28	C	67.89	C	61.7	
2642	17	T141	62.3	C	4.4	F	61.71	C	31.74	F	61.7	
2643	18	AR 93027-3-2	64.1	C	57.2	D	62.95	C	72.43	B	61.9	
2644	19	MD 11-52	54.9	D	61.4	C	67.42	C	56.94	D	62.4	
2645	20	MV 5-46	56.0	D	49.2	E	68.84	C	62.61	C	62.6	
2646	21	P91202RB1-3-3-4-5	62.4	C	57.2	D	49.01	E	59.62	D	60.2	
2647	22	P961341A3-1-2	67.9	C	68.0	C	53.47	D	71.15	B	60.8	
2648	23	P97397E1-11-2-4-1-1	59.3	D	40.7	E	46.22	E	63.99	C	59.9	*
2649	24	B980006	70.2	B	25.4	F	67.04	C	48.31	E	62.4	
2650	25	KY93C-0378-5-2	71.9	B	58.2	D	75.84	B	67.60	C	63.4	
2651	26	KY93C-1238-17-1	72.2	B	67.2	C	74.29	B	75.31	B	63.3	
2652	27	Danny exp.	63.6	C	60.9	C	49.88	E	72.20	B	60.3	
2653	28	Jolly exp.	57.8	D	21.7	F	57.56	D	34.53	F	61.2	
2654	29	Apple exp.	52.4	D	42.7	E	60.91	C	65.61	C	61.6	
2655	30	MSU Line E1007	65.2	C	65.7	C	63.33	C	73.44	B	61.9	
2656	31	IL99-15867	62.6	C	53.4	D	61.16	C	73.09	B	61.7	
2657	32	G39186	68.7	C	58.2	D	65.56	C	72.24	B	62.2	
2658	33	G39050	64.3	C	60.2	C	62.15	C	73.01	B	61.8	
2659	34	G39030	58.9	D	61.7	C	69.34	C	69.19	C	62.7	
2660	35	OH743	61.9	C	49.7	E	67.97	C	64.08	C	62.5	
2661	36	OH751	66.0	C	56.7	D	60.79	C	65.88	C	61.6	
2662	37	M00-3701	63.8	C	64.7	C	54.28	D	77.67	B	60.9	
2663	38	M99-2408	65.0	C	56.4	D	66.73	C	59.18	D	62.3	
2664	39	NY89066-7131	61.7	C	63.9	C	51.43	D	68.36	C	60.5	
2665	40	X00*1118	63.6	C	59.2	D	64.32	C	55.72	D	62.1	
2666	41	X00-1079	66.1	C	68.9	C	53.97	D	65.23	C	60.8	
2667	42	WB-1001	74.9	B	67.7	C	66.49	C	70.41	B	62.3	
2668	43	GA 931233-E17	62.3	C	43.4	E	76.46	B	62.88	C	63.5	

ADVANCED NURSERY EVALUATION FOR SOFT WHEAT MILLING AND BAKING QUALITY

	Samples composited from Urbana, IL; W.Lafayette, IN; Stuttgart, AR	SOFT. EQUIV. %		FLOUR YIELD %		FLOUR PROT. %		LACTIC ACID RET'N	COOKIE DIAM. CM.		TOP GR.
	STANDARD (#2626, Caldwell)	60.3		72.6		8.68		113.6	18.1		5
1	Caldwell	60.3		72.6	Q	8.68		113.6	18.1		5
2	Foster	56.7	*	74.2		9.34		105.0	18.13		5
3	Patton	56.0	*	71.1	*	9.65	*	98.3	17.15	Q	3
4	Roane	57.4		69.4	Q	9.69	*	123.8	16.88	Q	2
5	AR 910-9-1	51.5	Q	71.5	*	9.02		117.9	16.95	Q	2
6	VA00W-526	45.0	Q	71.1	*	9.81	*	111.7	16.88	Q	4
7	VA97W-375WS	52.2	Q	70.3	Q	9.94	*	97.8	17.46	Q	4
8	VAN98W-170WS	53.0	Q	73.3		9.77	*	106.5	17.76	*	6
9	T143	61.4		69.7	Q	8.67		137.0	17.25	Q	3
10	M99*3098	53.1	Q	71.0	Q	9.57	*	107.6	17.36	Q	4
11	OH708	56.8	*	72.7		8.63		109.6	18.2		7
12	MO981020	53.9	*	70.0	Q	9.05		104.8	17.58	Q	4
13	MO980829	57.7		71.1	*	9.04		102.0	18.18		6
14	B980582	55.5	*	70.3	Q	9.77	*	119.1	17.51	Q	3
15	B980696	48.5	Q	72.2		9.31		131.3	16.88	Q	3
16	IL97-3632	56.9	*	72.3		8.51		102.9	18.1		7
17	T141	40.7	Q	70.9	Q	9.64	*	117.2	15.65	Q	1
18	AR 93027-3-2	58.9		71.2	*	8.66		116.5	17.76	*	6
19	MD 11-52	52.0	Q	69.4	Q	9.26		99.7	17.93		5
20	MV 5-46	54.5	*	69.6	Q	9.58	*	96.0	17.44	Q	4
21	P91202RB1-3-3-4-5	53.2	Q	70.9	Q	9.21		106.5	17.76	*	6
22	P961341A3-1-2	58.3		72.0		8.70		99.7	18.19		5
23	P97397E1-11-2-4-1-1	55.1	*	70.3	Q	9.54	*	101.9	17.1	Q	3
24	B980006	48.1	Q	72.4		8.92		120.8	16.49	Q	3
25	KY93C-0378-5-2	56.7	*	72.8		9.15		120.4	17.8	*	5
26	KY93C-1238-17-1	60.2		72.8		8.34		86.5	18.16		6
27	Danny exp.	58.8		71.1	*	9.62	*	118.5	17.91		5
28	Jolly exp.	42.0	Q	70.0	Q	10.31	Q	116.3	16.34	Q	3
29	Apple exp.	55.8	*	68.9	Q	8.99		117.2	17.18	Q	3
30	MSU Line E1007	59.3		71.5	*	9.16		108.9	18.1		5
31	IL99-15867	59.2		70.9	Q	9.19		121.3	17.61	Q	4
32	G39186	58.8		72.1		9.21		111.3	17.8	*	4
33	G39050	59.1		71.3	*	9.49	*	108.1	17.88		3
34	G39030	57.4		70.2	Q	8.49		113.0	17.94		5
35	OH743	55.1	*	70.8	Q	8.68		111.6	17.46	Q	3
36	OH751	56.0	*	71.6	*	9.28		103.9	17.74	*	4
37	M00-3701	61.2		71.2	*	8.79		119.3	18.06		5
38	M99-2408	53.0	Q	71.4	*	8.96		117.7	17.73	*	5
39	NY89066-7131	57.1		70.7	Q	9.64	*	94.6	18.03		4
40	X00*1118	51.4	Q	71.1	*	9.04		125.5	17.84	*	4
41	X00-1079	55.7	*	71.6	*	8.68		107.6	18.23		5
42	WB-1001	58.0		73.4		9.01		115.8	18.18		5
43	GA 931233-E17	54.6	*	70.9	Q	9.42	*	115.1	17.21	Q	3

2004 Crop
Advanced Nursery Evaluation

Entries #2626 - #2668
MBQ - UERN Composites

The 43 entries in this nursery were samples that were composited from three locations: Urbana, Illinois; West Lafayette, Indiana; and Fayetteville, Arkansas.

There have been substantial changes to the Advanced Nursery Evaluation program, and those changes are described in a separate document. The standard data is compared to the "Historical Average" for the cultivar, and quality scores for all entries are adjusted to this average.

The samples in this nursery were compared to entry #2626, CALDWELL. Of the 700 cultivars in the SWQL data-base of Allis-milled cultivars, CALDWELL ranked 196th for Milling Score, based on data from 109 Allis millings.

The standard was similar to the "Historical" Quad data, but slightly higher for test weight and flour yield, and slightly lower for Softness Equivalent (S.E.).

	Allis Data-base	Standard	Quad Data-base
Test Weight	60.9	61.1	59.26
Flour Yield	77.6	72.6	71.55
Break Flour	36.1		
E.S.I.	9.7		
Softness Equivalent	61.1	60.3	62.98
Friability	29.0		
Protein		8.68	8.42
Ash	0.37		
Cookie Diameter	18.1	18.1	18.13
A.W.R.C.	52.8		56.58
Lactic Acid Retention	97	113.6	114.65
Mill Score	71.0 B	71.0 B	
Bake Score	65.7 C	65.7 C	
Test Wt. Score	56.2 D	56.2 D	
S.E. Score	75.6 B	75.6 B	

In the SWQL data-base of 345 Quad-Jr. millings, CALDWELL ranked 119th for flour yield, based on data from 92 Quad millings.

The following table shows how much the quality scores are adjusted to be similar to the adjustment of the standard, after comparison to the "historical data":

Milling Quality Score Factor	-0.4
Baking Quality Score Factor	-1.8
Softness Equivalent Factor	+1.8
Test Weight Score Factor	-1.2

No entries scored "A" for Milling or Baking Quality Score. 32 entries (74%) scored either "B" or "C" for Milling Quality Score, and the rest scored "D".

Only 15 entries had Baking Quality Scores above "D", and they all had scores of "C". The T.W. and S.E. Scores were distributed with more than half the entries scoring "B' or "C".

Notes on the 2003 revision of the Advanced Nursery Evaluation Program

There have been substantial changes made to the Advanced Nursery Evaluation, with the 2003 revision. Both the Milling and Baking Quality Scores are calculated in a different manner. Combined Quality Scores are no longer calculated, and there is no ranking by Combined Quality Score.

The Alkaline Water Retention Capacity (A.W.R.C.) test is no longer being run for Advanced Nursery samples. The A.W.R.C. test used to be 25% of the Baking Quality Scores, along with Softness Equivalent (25%) and Cookie Diameter (50%). With this version, the Baking Quality Score is calculated from the cookie diameter, and compared to the historical cookie diameter for the standard cultivar, from the SWQL Allis-Chalmers data-base.

The Milling Quality Score is calculated in the same manner as in previous versions, however, instead of weighing a test line against a standard with a Milling Score of 100, now the test line is compared to a standard with the same Milling Score as it has in the SWQL data-base of Allis-Chalmers millings.

In previous versions, the standard always had Milling and Baking Quality scores of 100, and the test lines were measured against this score. In the current version, the historical values, from the SWQL data-base of Allis Chalmers millings for the standard cultivar are used.

In the past, if a lenient standard cultivar was used, the test lines could receive high scores although they might have had poor quality attributes. For example, a cultivar might receive a high score when compared to a weak standard, and a low score if compared to a more stringent standard. With this revision, a test line should receive more consistent Milling and Baking Quality Scores, regardless of the standard used.

The assignment of Letter Scores is different, too:

"Old Scores"	**"New Scores"**
100.0 and above = "A"	80.0 and above = "A"
95.9 – 99.9 = "B"	70.0 – 79.9 = "B"
90.0 – 94.9 = "C"	60.0 – 69.9 = "C"
85.0 – 89.9 = "D"	50.0 – 59.9 = "D"
80.0 – 84.9 = "E"	40.0 - 49.9 = "E"
Below 80.0 = "F'	Below 40.0 = "F"

The new Quality Scores are intended to represent the normal distribution of Mill Score and Cookie Diameter from the SWQL data-base of Allis-Chalmers millings.

Grain quality scores are now reported for Test Weight and Softness Equivalent (S.E.). These scores are calculated by normalizing the quality data to fit a scale of 100, and adjusting it according to the response of the standard. (The standard is compared to the historical data for that cultivar, and all entries are adjusted accordingly).

The letter scores associated with the grain quality scores are assigned in the same manner as they are for the Milling and Baking Quality Scores.

The Evaluation of Advanced Nursery Cultivars and Breeding Lines for Milling and Baking Quality (Revised August, 2003)

USDA/ARS
Soft Wheat Quality Lab
Wooster, Ohio 44691

Introduction

This cooperative program for the Eastern soft wheat breeding lines of the Advanced Nursery, provides for the evaluation of milling and baking quality potential. The evaluation consists of three parts: milling quality, baking quality, and grain quality scores.

Appraisals of the quality of test lines are made on a relative basis, comparing test line data with those of the control or standard cultivar. For that purpose, the reference cultivar entry should be harvested from plots in the same nursery and of the same size as those of the test lines in order that environmental effects may be minimized. When several standard cultivars are present in a nursery, we generally select as the reference one whose data indicates the highest quality score. By doing that, we hope to exert maximum quality pressure on the breeding lines.

The scores calculated for the standard are adjusted to approximate the historical values from the SWQL data-base of Allis-Chalmers millings. This correction is then used for the rest of the entries in the nursery, so that variations due to environment are minimalized.

Sample Testinq Procedure

Evaluation requires at least 300-g samples with 500-g being desirable to allow cleaning to remove damaged or shriveled kernels. Because tests performed on abnormal kernels do not provide a valid measurement of quality potential, samples should be clean and essentially free of badly shriveled kernels, or of kernels damaged by insects or disease. Shriveled kernels are removed by aspiration.

A 200-g sample is then tempered for 48 hours to 15 ~ moisture and milled on a modified Quadrumat Jr. mill that has roll corrugations of 31, 36, 39, and 40 corrugations per inch and roll spacings of .040, .008, and .0035 inch. The ground wheat is collected and transferred to a Great Western sifter assembly containing a 40-mesh and a 94-mesh screen and sieved for 90 seconds. The overs of both sieves are weighed and used to calculate the flour yield and Softness Equivalent (SE).

The weight of the overs of the 40-mesh sieve is used to calculate the flour yield by using the following equation:

$$\text{YIELD} = [\ 1 - (\text{OVER 40} / \text{WHEAT WT.})\ ] \times 100$$

In the same manner the weight of the overs of the 94-mesh sieve is used to calculate the softness equivalent (SE) by using the equation:

$$\text{SOFTNESS EQUIVALENT} = [\ 1-(\text{OVER 94} / (\text{WHEAT WT.} - \text{OVER 40}))\ ] \times 100$$

It has been found that with the simple milling procedure used, The flour yields can be affected by the inherent granulation of the wheat cultivar. Therefore, for every one percent change in S.E. there is a .17 % change in flour yield. The flour yields are adjusted to a 52 % S.E. (the mean of all cultivars) by the following equation:

ADJ. FLOUR YIELD = { AS-IS FLOUR YIELD - [.17 X (52.0 - S.E.)] }

Then the overs of the 94-mesh sieve are passed through a second Quadrumat mill and sieved for 90 seconds over a 94-mesh sieve. The overs of the second milling are discarded and the thrus of the 94-mesh sieve from both millings are combined.

The recovered flour is then blended and used to determine moisture, protein, A.W.R.C., and baked into cookies. Moisture and protein are determined by NIR analysis, and a 1-g subsample is used to determine A.W.R.C. The Wooster Sugar-Snap Cookie Method requires an additional 40 g. of flour.

The additional milling step was added to produce a flour that would bake cookies similar in size and appearance to Allis-Chalmers milled flours.

Reference Values

The reference values are simply typical values for the respective tests that one would expect from a good quality soft wheat.

Least Siqnificant Differences

The LSD values determine the size of score penalties for quality shortcomings. In making appraisals of breeding lines for milling and baking quality, we rely on least significant difference (LSD_{05}) values obtained in independent trials in determining whether a breeding line sample differs significantly from the standard cultivar in a given test.

These LSD values are valid only when the standard is equal to the reference value, however, and must be adjusted to compensate for deviation of the actual value from the reference value.

For example, the LSD_{05} for adjusted yield is 0.79% at the reference value (73.59%). The adjusted LSD for a group of samples whose standard has an adjusted yield of 75% is calculated as follows:

(3)

$$LSD_{adj;} = LSD_{.05} \left(\frac{\text{ADJ. YIELD}_s}{\text{ADJ. YIELD}_R}\right) \text{ or}$$

$LSD_{adj} = (0.79\%)\frac{75.0}{73.6} = .805\%$ (at 75%)

where:

ADJ. YIELD_s = adj. yield of standard cultivar

ADJ. YIELD_p = reference value for add. yield

In the presentation of test data, the LSD values are used as a basis for identifying entries with specific quality deficiencies. Values that deviate (in the wrong direction) from the standard by one LSD are designated with an asterisk (*). Values that deviate by more than two LSD's are designated by a "Q".

The LSD_{05} for the tests are shown in the following table:

Test	Reference Value	$LSD_{.05}$ at Reference Value
Yield	73.6%	0.79%
Softness Equiv.	53.0	2.85
Test Weight	77.0 kg/hl	1.16 kg/hl
A.W.R.C.	52.0%	1.43%
Cookie Diam.	18.0 cm.	.24 cm.

Scoring levels

The number of points given per LSD variation from the standard is called the scoring level. The scoring levels were assigned by taking into consideration the range in variation for each test and the size of the LSD associated with the test.

Milling Ouality Score

Milling Quality is based on flour yield from a 200-gram milling. High flour yield is associated with high straight-grade flour yield and with low endosperm separation index (ESI) in Allis-Chalmers milling, both indices of economic advantage in milling. The adjusted yield obtained from the Quadrumat Jr. milling correlates highly with Allis-Chalmers ESI and extraction. Therefore entries with high flour yield receive high Milling Quality Scores.

Milling quality score is based on the comparison of flour yield of an entry to the yield of the standard cultivar. i.e.

$$\text{Milling Quality Score} = (\text{MS Std}) - X \frac{(Y_s - Y_t)}{\text{LSD}}$$

Where MS Std is the Mill Score of the Standard Cultivar, from the SWQL data-base of Allis-Chalmers millings, Y_s and Y_t are flour yields of standard and test line, respectively. LSD is $LSD_{.05}$, for the test, and X is a coefficient calculated to change the score by 2.6 points for each L.S.D. variation. (A test line with adjusted yield one L.S.D. value lower than the standard yield thus will be penalized 2.6 points.)

Scoring for Baking Quality

A large cookie diameter leads to a high baking quality score. The cookie diameter becomes the Baking Quality Score when it is normalized to a scale of 0 – 100 by:

Bake Score = (25 x Predicted Cookie) – 385

Finally, the Bake Score is adjusted to the standard by adding the difference between the Baking Score of the standard, and the Historical Baking Score of the standard, from the SWQL data-base.

Scoring for Grain Quality

A good soft wheat cultivar should have a high Softness Equivalent (S.E.) and a high Test Weight. High SE indicates friable endosperm, and it correlates highly with Allis-Chalmers break flour yield. High break flour yield is necessary for a finely granulated flour, which is in turn associated with large cake volume. The softness equivalent (SE) is also known to relate to kernel softness.

The Test Weight and S.E. scores are calculated by normalizing the quality data to fit a scale of 100. The scores are then adjusted to the standard by comparison to the historical data.

For example, the test weight adjustment factor is calculated by:

$$(\text{Test Weight}_{\text{Historical}}) - (\text{Test Weight}_{\text{Standard}})$$

Letter Scores:

For convenience of grouping entries, we assign letters to numerical scores as follows:

Score Range	Letter Rating
Over 79.9	A
70.0 – 79.9	B
60.0 - 69.9	C
50.0 - 59.9	D
40.0 - 49.9	E
Under 40.0	F

An Appeal for Prudence

We wish to call attention to the fact that this evaluation is on the basis of a single sample with single determinations, with no assurance that either the standard or the entry under test is truly representative of the genotype. Data and evaluation under this program should not be used as the sole basis for quality claims or for decisions on release.

An entry considered promising should be retested again, as further submissions under this program, or after multiplication as Regional Drill Plot and/or Uniform Nursery entry for more rigorous testing and evaluation.