UNIFORM WINTER WHEAT FUSARIUM HEAD BLIGHT SCREENING NURSERY

1999 NURSERY REPORT

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This is a joint progress report of cooperative investigations underway and funded by the State Agricultural Experiment Stations, private companies, and the United States Department of Agriculture, Agricultural Research Service. This report contains preliminary data that 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 a tool for the use of the cooperators and their official staff and those persons having direct interest in the development of agricultural research programs.

This 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.

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HORTICULTURE AND CROP SCIENCE SERIES 690

December 1, 1999

In 1999, 24 breeding lines and 4 checks were evaluated in the Winter Wheat FHB screening nursery. Breeding lines were contributed by seven cooperators. Thirteen entries were repeated from the 1998 nursery. Heading dates among the entries spanned 8-12 days at most locations.

Disease rating categories could be separated into three groups:

1) field symptoms (incidence, severity, and index),
2) kernel symptoms (kernel rating and scabby seed percentage) and
3) DON

Lines that performed well in more than one disease rating category (listed in alphabetical order)

Field, Kernel, and DON:	Ernie, Goldfield, IL95-4162, OH609,
Field and Kernel:	IL94-1909, NY87048W-7387, VA96-54-326
Field and DON:	IL94-24078, P92823A1
Kernel and DON:	M94-1069, M95-3349

Greenhouse ratings of Type 2 resistance and kernel symptoms were similar to field ratings.
In general, entries that were more resistant for a trait also had lower standard deviations for that trait. In contrast to results from 1998, there was even some similarity in rankings for DON across locations.

We included the 1998 trait means for those lines that were repeated in 1999. Ernie, IL94-1909, P88288C1, Goldfield, and NY87048W-7387 exhibited consistently above average resistance in more than one disease category in both years. Other lines also performed well.

Only four of the 28 entries evaluated derive their resistance from Sumai3. Some of the better lines did not have Chinese sources of resistance in their pedigrees. It will be interesting to see the progress we can make when non-Sumai3 sources of resistance are combined with Sumai3-derived sources.

Finally, please continue to rate Heading date and perhaps height of the entries in this nursery. When a larger than usual range in either trait existed at a location significant correlations were detected between that trait and a disease assessment trait.

This report can also be accessed via the web from the FHB initiative web site http://www.scabusa.org/.

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Entry List, 1999 Nursery

No.	Entry	Cooperator	Location Grown	Pedigree
1	Patterson	IN Crop Imrov.		Early Check (S)
2	Freedom	OH Found. Seed		Late Check (R)
3	P2545	Pioneer Hibred		Late Check (S)
4	Ernie	MO Found. Seed		Early Check (R)
5	M94-1069	Beazer	West Lafayette, IN	PFT7882 / Hancock // Sawyer (PFT7882 is Brazilian triticale)
6	M95-3349	Beazer	West Lafayette, IN	S76 / N80738 // Pioneer 2555
7	OH544	Campbell	Wooster, OH	Dynasty / MD55-586-21
8	OH552	Campbell	Wooster, OH	IN71761A4-31-5-33 / MD55-286-21
9	OH609	Campbell	Wooster, OH	IN 71761A4-31-5-48 / Dynasty // AGRA GR 863 /Coker 83-27
10	OH657	Campbell	Wooster, OH	McNair1003 / Adena // Adena
11	Roane	Griffey	Blacksburg, VA	VA71-54-147 / Coker 68-15 // IN65309C1-18-2-3-2
12	VA96-54-326	Griffey	Blacksburg, VA	SC861562 / Coker 9803
13	VA96W-348	Griffey	Blacksburg, VA	IN81401A1-32-2 / FFR555W
14	IL94-1909	Kolb	Urbana, IL	OH416 / IL87-2834-1
15	IL96-24078	Kolb	Urbana, IL	IN8138I1-16-5-50 // Ning 7840 / Sawyer
16	IL95-4162	Kolb	Urbana, IL	PSR W71 / Howell // IL84-4046
17	P86958RC4	Ohm	West Lafayette, IN	IN7942H1-20-2-1*2 /3/ Auburn // Caldwell*2/ ACC 1690 (H13H13)
18	P88288C1	Ohm	West Lafayette, IN	Auburn / Coker84-27 // IN84187H1-11-1
19	Goldfield (P89118RC1-9-3-3)	Ohm	West Lafayette, IN	INW9241 / P79410D1-3 // Clark
20	P92823A1	Ohm	West Lafayette, IN	Ning7840 / Clark*4
21	Geneva	Sorrells	Ithaca, NY	GE / Cl12658 / Burt /3/ HNCll /4/ GE
22	Cayuga	Sorrells	Ithaca, NY	Geneva / Clark'sCream // Geneva
23	NY87048W-7387	Sorrells	Ithaca, NY	Houser / Su Mei // Harus
24	NY87047W-7405	Sorrells	Ithaca, NY	Houser / Su Mei // Houser
25	NY86003-106	Sorrells	Ithaca, NY	bulked F2 of: Geneva / NY65305-2 and Tyler / NY65305-2 (NY65305-2 is Forte/ Ys sibF2 // St
26	NY86003-27	Sorrells	Ithaca, NY	bulked F2 of: Geneva / NY65305-2 and Tyler / NY65305-2 (NY65305-2 is Forte/ Ys sibF2 // St
27	Foster	Van Sanford	Lexington, KY	KY83-60 / TYLER // KY83-75 (previously tested as KY85C-31-6)
28	KY89C-895-14	Van Sanford	Lexington, KY	Pioneer 2548/ CL850655, (CL850655 is a Coker breeding line).

Location Notes

Kibler, Arkansas

Cooperators: Gene Milus, Louis K. Prom
University of Arkansas (Fayetteville, AR)
Reps: 4 Plot size: 1 row x 5' Seed date: 10/27/98 Harvest date: 6/2/99
Fertilizer:
Inoculation method: Natural, colonized corn kernels, sprayed with conidial suspension
Precipitation during grain fill: Sprinkler irrigated
Average temp during grain fill:
Date/Feekes Growth Stage when scored:

Griffin, Georgia

Cooperators: Jerry Johnson
University of Georgia
No data to report - unable to plant nursery due to late arrival of seed.

Urbana, Illinois

Cooperators: Fred Kolb, L.K. Boze, N.J. Smith
University of Illinois
Reps: 4 Plot size: 3 ft. row Seed date: 10/2/98 Harvest date: 7/6/99
Fertilizer: 40 lbs N/A preplant, P and K ok, no spring topdress
Inoculation method: Mixture of isolates cultured on wheat, wheat spread on the ground in nursery 2-4 wks before flowering
Precipitation during grain fill: Misted twice per day, approx. 0.25 in/day
Average temp during grain fill: cool
Date/Feekes Growth Stage when scored: Approx. 25-29 days after heading

Lafayette, Indiana

Cooperators: Curtis Beazer
Agripro Seeds Inc.
No data to report - material was being screened in Colorado and problems did not allow them to complete the screen.

Lafayette, Indiana

Cooperators: Koy Miskin
Hybritech Seeds Inc.
No data to report.

Vincennes, Indiana

Cooperators: Greg Shaner, George Buechley
Purdue University (West Lafayette, IN)
Reps: 1 Plot size: Seed date: Harvest date:
Fertilizer:
Inoculation method:
Precipitation during grain fill:
Average temp during grain fill:
Date/Feekes Growth Stage when scored:

West Lafayette, Indiana

Cooperators: Herb Ohm
Purdue University
No data to report - no sprinkling facilities this season - negligible FHB infection.

Windfall, Indiana

Cooperators: Bill Laskar, Greg Marshall
Pioneer Hibred Int'l.
No data to report - poor FHB development due to hot, dry weather at time of inoculation.

Manhattan, Kansas

Cooperators: Bob Bowden, Bill Bockus, Mark Davis, Rollie Sears
Kansas State University
Reps: Plot size: Seed date: 10/15/98 Harvest date:
Fertilizer:
Inoculation method: Corn kernels spread 4/1, 4/13, 4/26 and 5/3; 303g/25 sq ft.
Precipitation during grain fill: Irrigated with fine impact sprinklers starting 5/3 and ending 6/1, from 9:00 pm to 5:00 am at 3 min/hour.
Average temp during grain fill: (Weather dry and windy)
Date/Feekes Growth Stage when scored: 5/31, 6/4, 6/9

Lexington, Kentucky

Cooperators: David Van Sanford, Marla Hall
University of Kentucky
Reps: 4 Plot size: 1 row x 4' Seed date: 10/29/98 Harvest date: 7/1/99
Fertilizer: P & K according to soil tests; N applied as 28% UAN: 65 lb actual N/acre at Feekes 3 plus 25 lb/acre at Feekes 6; Harmony Extra applied at Feekes 5 at 0.5 oz/acre
Inoculation method: Corn kernels innoculated with F. gramanerium were spread on 4/28 and 5/17.
Precipitation during grain fill: Irrigated with fine mist system during hours of 8-9 am and 4-5 pm daily.
Average temp during grain fill: (Extremely dry spring, with little rain during flowering.)
Date/Feekes Growth Stage when scored:

Baton Rouge, Louisiana

Cooperators: Steve Harrison
Louisiana State University
No data to report - nursery did not head out due to inadequate vernalization.

College Park, Maryland

Cooperators: Jose Costa
University of Maryland
No data to report - no FHB due to dry spring.

East Lansing, Michigan

Cooperators: Rick Ward, Janet Lewis
Michigan State University
Reps: 2 Plot size: 11' x 5' Seed date: 10/5/98 Harvest date:
Fertilizer:
Inoculation method: Infected corn spread on soil surface.
Precipitation during grain fill: Irrigated through flowering.
Average temp during grain fill:
Date/Feekes Growth Stage when scored:

Columbia, Missouri

Cooperators: Anne McKendry
University of Missouri
Greenhouse data, notes on page 16.

Lincoln, Nebraska

Cooperators: Steve Baenziger
University of Nebraska
No data to report - no data of significance from 1 rep nursery.

Ithaca, New York

Cooperators: Mark Sorrells, Gary Bergstrom
Cornell University
No data to report - unable to induce FHB infection (probably due to severe drought).

Raleigh, North Carolina

Cooperators: Paul Murphy
North Carolina State University
No data to report - not enough FHB infection going in field to get reliable data.

Wooster, Ohio

Cooperators: Kim Campbell, Pat Lipps
Ohio State University/ OARDC
Reps: 4 Plot size: 1 row x 4' Seed date: 10/2/98 Harvest date: 7/8,9/99
Fertilizer: 300 lb 6-24-24 in fall, 60 ln N as ammonium nitrate in March
Inoculation method: Infected corn kernels spread 2 weeks prior to heading
Precipitation during grain fill: Mist sprinkler irrigated (6-9:30 am and 9-10:30 pm); 37.9 mm rain
Average temp during grain fill: 15.5 C
Date/Feekes Growth Stage when scored: 6/18/99 (GS11.2)

Ridgetown, Ontario - Canada

Cooperators: Llliljana Tamburic-Ilincic, Art Schaafsma, Arend Smid
University of Guelph
Reps: 4 Plot size: 1 row x 4 m Seed date: 10/2/98 Harvest date: 7/23/99
Fertilizer: 80 kg/ha actual N (34-0-0) applied 4/7/99
Inoculation method: Sprayed with conidial suspension, rate of 100 ml/plot at a concentration of 250,000 spores/mL, at flowering.
Precipitation during grain fill: Plots misted daily beginning after first plots inoculated, at rate of about 7.5 mm water/day.
Average temp during grain fill: High temperatures; maximum temperature between 30.25 and 33.44 C.
Date/Feekes Growth Stage when scored: 6/24/99

Brookings, South Dakota

Cooperators: Jackie Rudd, Y. Jin
South Dakota State University
No data to report.

Dallas, Texas

Cooperators: David Marshall
Texas A&M University
No data to report - lack of FHB infection.

Blacksburg, Virginia

Cooperators: Carl Griffey, Jianli Chen, Jane Shaw
Virginia Polytechnic Institute and State University
Reps: 4 Plot size: 1 row x 4' Seed date: 10/13/98 Harvest date: 7/5/99
Fertilizer: 10/6/98: 25-100-100/A dry, 3/31/98: 60-0-0/A
Inoculation method: Sprayed with conidial suspension, rate of 1L/100ft sq. at a concentration of 50,000 spores/mL, at heading and flowering.
Precipitation during grain fill: Mist sprinkler irrigated 1 1/2 hours morning and evenings.
Average temp during grain fill:
Date/Feekes Growth Stage when scored: 6/14/99
Additional notes: 10/5/98: 3000 lbs/A lime added to acreage for pH adjustment; 2/11/99: .5 oz/A Harmony for broadleaf control; 3/31/99: .5 oz/A Harmony; 5/10/99: 4 oz/A Bayleton 50 WP applied.

Heading Date (Julian Days*)

		Kibler		Urbana		Vincennes	Manhattan		Lexington		E. Lansing		Wooster		Blacksburg		Entry Mean All Locations except IN	
		AR		IL		IN	KS		KY		MI		OH		VA			
			rank		rank			rank		rank		rank		rank		rank		rank
1	Patterson	102	8	134	5	Mod	126	10	126	4	147	2	138	3	129	7	128.6	4
2	Freedom	104	13	137	20	Mod	134	25	129	17	151	26	144	22	132	19	132.9	20
3	P2545	114	19	137	21	Late	130	17	132	23	150	20	144	23	133	20	134.2	21
4	Ernie	95	2	132	1	Early	130	17	125	1	147	4	139	12	126	2	127.7	2
5	M94-1069	104	13	133	3	Mod	128	12	128	12	148	6	139	8	139	28	131.1	14
6	M95-3349	105	15	135	14	Mod	125	6	128	12	149	13	139	12	130	12	130.1	9
7	OH544	116	21	139	25	Late	128	12	134	27	151	26	145	25	136	25	135.6	24
8	OH552	103	10	135	12	Mod	126	10	127	8	149	13	139	8	129	10	129.5	8
9	OH609	95	2	135	16	Mod	132	22	127	8	149	17	140	15	129	7	129.5	7
10	OH657	118	24	139	23	Late	129	13	132	23	151	24	144	22	135	23	135.2	23
11	Roane	97	3	135	14	Mod	130	17	126	4	149	13	141	16	129	10	129.4	6
12	VA96-54-326	101	6	134	7	Early	125	6	126	4	148	6	140	15	127	3	128.5	3
13	VA96W-348	102	8	134	10	Mod	125	6	127	8	149	13	138	5	137	26	130.3	11
14	IL94-1909	104	13	136	17	Late	125	6	129	17	149	13	139	8	131	16	130.3	10
15	IL96-24078	101	6	132	2	Early	124	2	126	4	146	1	137	1	126	2	127.5	1
16	IL95-4162	102	8	134	7	Mod	125	6	127	8	148	8	139	12	129	10	129.1	5
17	P86958RC4	117	23	134	9	Mod	131	20	129	17	148	8	138	5	132	17	132.7	19
18	P88288C1	113	18	134	5	Mod	124	2	129	17	149	13	138	5	129	7	130.7	12
19	Goldfield	117	23	134	9	Mod	125	6	129	17	147	4	138	3	129	7	131.2	16
20	P92823A1	108	16	135	12	Mod	130	17	128	12	148	8	139	12	130	14	131.1	15
21	Geneva	115	20	138	22	Mod	132	22	131	21	150	22	142	18	132	19	134.2	22
22	Cayuga	121	28	142	28	Late	135	27	135	28	150	22	146	27	138	27	138.1	28
23	NY87048W-7387	120	27	139	25	Late	135	27	134	27	152	28	147	28	136	25	137.6	27
24	NY87047W-7405	109	17	136	19	Mod	130	17	129	17	149	17	143	20	130	14	132.3	18
25	NY86003-106	119	26	140	26	Late	134	25	133	25	150	22	144	24	134	21	136.3	26
26	NY86003-27	119	26	140	27	Late	130	17	132	23	151	26	145	26	134	22	135.9	25
27	Foster	104	13	136	19	Mod	133	23	128	12	150	20	141	17	130	14	131.6	17
28	KY89C-895-14	99	4	135	14	Early	135	27	129	17	149	17	142	19	128	4	131.0	13
	Location Mean	108		136			129		128		149		141		131		131.9	
	LSD			0.8					1.4				2.1		1.5		3.3	
	CV			0.4					0.9				1.1		2.6		2.3	

* Days after December 31, 1998

FHB Incidence (0-100)

		Kibler		Urbana		Lexington		E. Lansing		Wooster		Ridgetown		Blacksburg		Entry Mean	
		AR		IL		KY		MI		OH		ON		VA		All Locations	
			rank		rank		rank		rank		rank		rank		rank		rank
1	Patterson	78.8	26	67.5	27	5.9	20	59.0	15	42.5	13	62.5	14	30.7	2	49.5	19
2	Freedom	68.8	24	15.0	4	4.1	14	50.0	9	51.3	17	67.5	19	54.7	24	44.5	18
3	P2545	51.3	16	46.3	21	9.0	24	86.0	27	70.0	28	92.5	28	72.0	27	61.0	27
4	Ernie	47.5	10	21.3	7	1.3	4	85.0	26	27.5	6	47.5	5	22.7	1	36.1	6
5	M94-1069	55.0	17	30.0	15	5.6	19	35.0	3	43.8	15	65.0	17	35.3	6	38.5	11
6	M95-3349	48.8	12	37.5	19	3.2	10	90.0	28	30.0	9	62.5	14	32.7	4	43.5	15
7	OH544	22.5	1	13.8	3	1.1	3	25.0	1	7.5	2	22.5	1	46.0	16	19.8	1
8	OH552	66.3	21	46.3	21	9.9	25	67.0	20	66.3	23	82.5	27	39.3	12	53.9	24
9	OH609	51.3	16	30.0	15	5.0	16	49.0	7	11.3	3	65.0	17	36.0	7	35.4	5
10	OH657	42.5	5	11.3	2	3.6	11	65.0	19	43.8	15	42.5	3	54.7	24	37.6	9
11	Roane	62.5	19	57.5	25	18.4	28	75.0	21	63.8	21	62.5	14	62.7	26	57.5	25
12	VA96-54-326	50.0	14	28.8	13	8.6	23	46.0	5	37.5	12	52.5	8	36.7	9	37.2	8
13	VA96W-348	76.3	25	65.0	26	15.3	27	85.0	26	66.3	23	72.5	22	49.3	19	61.4	28
14	IL94-1909	46.3	8	20.5	5	0.7	2	59.0	15	5.0	1	25.0	2	41.3	13	28.3	2
15	IL96-24078	45.0	7	21.3	7	1.7	5	42.0	4	31.3	11	47.5	5	35.3	6	32.0	3
16	IL95-4162	30.0	3	26.3	10	2.7	9	60.0	16	26.3	5	52.5	8	44.0	14	34.5	4
17	P86958RC4	43.8	6	68.8	28	3.9	12	61.0	17	66.3	23	67.5	19	51.3	20	51.8	22
18	P88288C1	48.8	12	37.5	19	7.6	21	83.0	24	21.3	4	50.0	6	46.7	17	42.1	13
19	Goldfield	30.0	3	47.5	23	2.4	8	49.0	7	43.8	15	57.5	10	36.7	9	38.1	10
20	P92823A1	47.5	10	28.8	13	5.4	18	55.0	12	28.8	7	62.5	14	31.3	3	37.0	7
21	Geneva	67.5	23	30.0	15	5.0	17	55.0	12	67.5	26	77.5	25	56.7	25	51.3	20
22	Cayuga	67.5	23	27.5	11	4.0	13	51.0	10	30.0	9	77.5	25	37.3	11	42.1	14
23	NY87048W-7387	48.8	12	11.3	2	0.7	1	35.0	3	67.5	26	70.0	21	46.0	16	39.9	12
24	NY87047W-7405	87.5	28	52.5	24	8.2	22	81.0	23	61.3	19	70.0	21	52.0	21	58.9	26
25	NY86003-106	38.8	4	23.8	8	1.8	6	50.0	9	56.3	18	60.0	11	78.0	28	44.1	16
26	NY86003-27	85.0	27	26.3	10	4.5	15	55.0	12	62.5	20	75.0	23	52.7	22	51.6	21
27	Foster	58.8	18	33.8	17	2.2	7	65.0	19	31.3	11	82.5	27	36.7	9	44.3	17
28	KY89C-895-14	66.3	21	47.5	23	11.5	26	77.0	22	67.5	26	52.5	8	49.3	19	53.1	23
	Location Mean	54.7		34.8		6.2		60.5		43.8		61.0		45.3		43.7	
	LSD	17.0		14.0		4.2				34.6		27.7		15.9		13.3	
	CV	22.0		28.6		66.0				56.1		32.0		25.7		28.8	

FHB Severity (1-100)

		Kibler		Urbana		Vincennes		Lexington		E. Lansing		Wooster		Ridgetown		Blacksburg		Entry Mean	
		AR		IL		IN		KY		MI		OH		ON		VA		All Locations	
			rank		rank		rank		rank		rank		rank		rank		rank		rank
1	Patterson	33.5	28	43.9	28	3.0	13	33.3	21	33.3	26	19.1	24	10.8	17	19.7	18	24.6	27
2	Freedom	21.0	20	13.2	5	7.0	24	16.0	7	19.4	9	11.5	13	11.5	20	24.7	26	15.5	11
3	P2545	16.5	12	19.2	21	2.0	9	23.0	12	25.0	19	21.2	25	25.6	27	26.7	28	19.9	23
4	Ernie	12.1	4	10.9	1	1.0	4	3.5	2	13.9	2	7.4	5	5.0	4	15.3	9	8.6	1
5	M94-1069	19.3	17	23.0	26	1.0	4	11.1	6	19.4	9	15.0	17	7.5	8	23.3	24	15.0	9
6	M95-3349	19.6	18	17.6	13	5.0	19	43.1	24	27.8	23	15.8	20	11.1	19	18.7	17	19.8	22
7	OH544	14.3	8	17.3	11	1.0	4	6.4	4	33.3	26	15.6	19	5.0	4	15.3	9	13.5	5
8	OH552	11.0	2	12.1	3	2.0	9	17.2	9	16.7	5	10.8	10	9.4	14	15.7	11	11.8	4
9	OH609	23.0	22	21.2	24	5.0	19	30.4	19	16.7	5	5.9	4	9.8	15	15.7	11	15.9	13
10	OH657	13.5	7	17.0	10	1.0	4	23.4	13	25.0	19	10.2	8	4.9	2	16.0	12	13.9	6
11	Roane	24.2	24	18.9	19	7.0	24	53.5	28	22.2	14	24.3	28	11.1	18	26.7	28	23.5	26
12	VA96-54-326	23.6	23	18.2	17	5.0	19	29.5	17	16.7	5	14.3	15	9.1	12	20.0	19	17.0	16
13	VA96W-348	20.4	19	22.2	25	10.0	27	38.7	23	22.2	14	24.2	27	13.2	21	14.3	6	20.7	25
14	IL94-1909	17.4	14	13.3	6	2.0	9	4.4	3	16.7	5	3.2	1	3.0	1	13.0	4	9.1	3
15	IL96-24078	13.3	6	20.3	22	5.0	19	27.1	15	19.4	9	9.7	7	9.2	13	18.3	15	15.3	10
16	IL95-4162	19.3	17	15.6	8	3.0	13	47.5	25	22.2	14	4.1	2	7.2	7	22.0	22	17.6	18
17	P86958RC4	21.8	21	25.5	27	3.0	13	47.5	26	22.2	14	16.4	21	9.0	11	16.7	14	20.3	24
18	P88288C1	12.1	3	17.6	13	1.0	4	34.5	22	27.8	23	5.1	3	8.4	9	18.7	17	15.6	12
19	Goldfield	14.4	9	14.4	7	3.0	13	30.2	18	19.4	9	11.2	12	7.1	6	13.0	4	14.1	7
20	P92823A1	27.1	26	18.6	18	7.0	24	27.5	16	19.4	9	15.0	18	13.6	22	16.7	14	18.1	19
21	Geneva	15.8	11	12.2	4	5.0	19	17.1	8	27.8	23	14.0	14	26.2	28	22.7	23	17.6	17
22	Cayuga	12.9	5	19.2	21	5.0	19	31.5	20	36.1	28	8.5	6	23.5	26	12.3	2	18.6	21
23	NY87048W-7387	9.8	1	11.2	2	0.0	1	1.8	1	8.3	1	16.6	22	10.6	16	13.0	4	8.9	2
24	NY87047W-7405	27.1	25	17.9	15	3.0	13	27.1	15	25.0	19	11.1	11	8.6	10	11.3	1	16.4	14
25	NY86003-106	15.8	10	17.8	14	2.0	9	8.5	5	22.2	14	14.4	16	15.9	23	20.7	21	14.7	8
26	NY86003-27	16.7	13	16.0	9	5.0	19	18.8	10	27.8	23	18.5	23	23.1	25	20.7	21	18.3	20
27	Foster	18.5	15	18.0	16	10.0	27	19.3	11	25.0	19	10.7	9	17.3	24	14.7	7	16.7	15
28	KY89C-895-14	32.9	27	21.1	23	10.0	27	51.2	27	36.1	28	23.5	26	6.8	5	23.7	25	25.7	28
	Location Mean	18.8		18.3		4.1		24.0		23.1		13.5		11.0		18.2		16.7	
	LSD	9.9		7.6				21.9				ns		12.2		7.3		6.4	
	CV	37.5		29.4				71.9				72.4		74.7		29.4		38.8	

FHB Index (0-100)

		Kibler		Urbana		Manhattan		Lexington		E. Lansing		Wooster		Ridgetown		Blacksburg		Entry Mean	
		AR		IL		KS		KY		MI		OH		ON		VA		All Locations	
			rank		rank		rank		rank		rank		rank		rank		rank		rank
1	Patterson	27.8	28	30.0	28	19.5	26	2.2	20	19.7	23	7.7	18	6.8	14	6.4	12	15.0	28
2	Freedom	14.4	23	2.0	2	5.5	9	0.7	7	9.7	8	6.2	14	8.3	18	13.3	25	7.5	14
3	P2545	8.5	13	9.0	22	10.3	20	2.0	19	21.5	25	14.4	25	23.5	27	19.7	28	13.6	25
4	Ernie	5.9	6	2.2	3	5.3	7	0.1	2	11.8	13	3.0	7	2.6	4	3.5	1	4.3	3
5	M94-1069	10.4	16	7.2	21	8.5	17	0.9	9	6.8	2	5.8	13	4.9	9	8.8	19	6.7	12
6	M95-3349	9.6	15	6.9	19	21.3	28	1.1	13	25.0	27	6.5	15	7.1	16	6.1	11	10.4	20
7	OH544	4.0	1	2.4	5	5.3	7	0.1	3	8.3	6	1.5	5	1.1	2	7.7	16	3.8	1
8	OH552	7.5	10	5.5	16	4.0	2	1.9	18	11.2	12	8.3	19	8.1	17	5.9	8	6.5	11
9	OH609	11.3	19	6.9	19	6.0	11	1.6	15	8.2	5	1.5	4	7.1	16	5.6	7	6.0	8
10	OH657	5.5	4	2.3	4	7.8	15	1.0	12	16.3	19	5.0	11	2.2	3	9.1	20	6.1	9
11	Roane	15.3	24	10.9	25	20.0	27	10.1	28	16.7	20	15.0	26	8.5	19	16.9	27	14.2	26
12	VA96-54-326	11.9	20	5.4	14	8.0	16	2.7	24	7.7	3	3.7	9	4.7	7	7.2	15	6.4	10
13	VA96W-348	15.5	25	14.7	26	11.5	21	5.8	26	18.9	22	16.5	27	10.5	22	6.9	14	12.5	24
14	IL94-1909	8.2	12	2.8	6	4.3	3	0.1	1	9.8	9	0.3	1	0.9	1	5.2	5	3.9	2
15	IL96-24078	6.1	9	4.6	11	8.7	18	0.5	6	8.2	5	3.2	8	5.1	11	6.5	13	5.4	5
16	IL95-4162	6.0	8	4.2	9	5.3	7	1.3	14	13.3	14	1.2	2	4.8	8	9.7	21	5.7	6
17	P86958RC4	8.1	11	18.1	27	6.0	11	2.4	22	13.6	15	9.9	21	6.5	13	8.8	17	9.2	19
18	P88288C1	6.0	7	6.6	17	6.8	14	2.9	25	23.1	26	1.3	3	4.4	6	8.8	19	7.5	13
19	Goldfield	4.1	2	7.1	20	12.0	22	0.9	8	9.5	7	4.3	10	5.1	11	4.7	3	6.0	7
20	P92823A1	12.6	21	5.4	14	6.0	11	2.6	23	10.7	10	12.9	23	8.8	21	5.1	4	8.0	16
21	Geneva	10.6	17	3.6	7	9.5	19	1.7	16	15.3	17	8.9	20	24.9	28	12.6	24	10.9	21
22	Cayuga	8.7	14	5.3	12	4.8	5	1.7	17	18.4	21	2.7	6	20.6	26	4.6	2	8.4	17
23	NY87048W-7387	4.8	3	1.3	1	3.5	1	0.5	5	2.9	1	14.2	24	8.6	20	6.0	10	5.2	4
24	NY87047W-7405	24.3	27	9.7	23	13.0	23	1.0	11	20.3	24	7.3	17	6.0	12	5.9	9	10.9	22
25	NY86003-106	5.9	5	4.1	8	4.8	5	0.2	4	11.1	11	6.6	16	12.6	23	16.3	26	7.7	15
26	NY86003-27	13.9	22	4.3	10	13.8	24	2.2	21	15.3	17	10.7	22	20.5	25	11.5	22	11.5	23
27	Foster	10.7	18	5.4	14	6.8	14	0.9	10	16.3	19	5.6	12	15.8	24	5.5	6	8.4	18
28	KY89C-895-14	21.8	26	10.2	24	19.0	25	5.8	27	27.8	28	17.9	28	4.3	5	11.7	23	14.8	27
	Location Mean	10.7		7.1		9.2		2.0		14.2		7.2		8.4		8.6		8.4	
	LSD	6.5		5.3		5.9		2.1				ns		12.7		5.2		4.3	
	CV	43.4		53.5				89.8				111.2		98.3		44.7		52.0	

FHB Index - Kansas
Area Under the Disease Progression Curve (AUDPC)
Measurements taken on Julian days 151, 155 and 160

			Day 151	Day 155	Day 160	AUDPC	
			Index	Index	Index		rank
1		Patterson	3.0	19.5	25.0	17.4	24
2		Freedom	1.3	5.5	20.8	8.8	12
3		P2545	1.5	10.3	30.0	13.8	20
4		Ernie	1.3	5.3	14.7	7.0	4
5		M94-1069	1.4	8.5	26.3	11.8	16
6		M95-3349	4.8	21.3	47.5	24.9	26
7		OH544	1.0	5.3	25.8	10.0	15
8		OH552	0.8	4.0	10.0	4.9	1
9		OH609	3.4	6.0	15.3	8.0	7
10		OH657	1.1	7.8	20.5	9.8	14
11		Roane	5.0	20.0	46.0	23.9	25
12		VA96-54-326	3.5	8.0	32.5	13.8	21
13		VA96W-348	1.8	11.5	26.0	13.4	19
14		IL94-1909	0.9	4.3	19.8	7.8	5
15		IL96-24078	2.0	8.7	28.3	12.7	18
16		IL95-4162	1.1	5.3	12.8	6.4	3
17		P86958RC4	1.0	6.0	18.3	8.3	8
18		P88288C1	2.5	6.8	16.0	8.4	9
19		Goldfield	4.3	12.0	25.0	13.9	22
20		P92823A1	2.0	6.0	18.3	8.5	11
21		Geneva	3.1	9.5	23.8	12.0	17
22		Cayuga	1.3	4.8	19.0	7.9	6
23		NY87048W-7387	0.6	3.5	11.3	5.0	2
24		NY87047W-7405	2.8	13.0	33.0	16.3	23
25		NY86003-106	0.9	4.8	22.5	8.8	13
26		NY86003-27	2.0	13.8	75.0	28.2	28
27		Foster	1.4	6.8	17.3	8.5	10
28		KY89-895-14	3.5	19.0	56.8	26.0	27
		Mean	2.1	9.2	26.3	12.4	
		LSD	1.9	5.9	11.3		

FHB Kernel Rating*

			Urbana		Wooster		Entry Mean	
			IL		OH		Both Locations	
				rank		rank		rank
1		Patterson	48.0	16	0.0	5	24.0	15
2		Freedom	60.0	23	1.8	26	30.9	23
3		P2545	68.0	26	1.5	25	34.8	26
4		Ernie	30.0	5	0.0	5	15.0	5
5		M94-1069	28.0	3	1.0	23	14.5	4
6		M95-3349	28.0	3	0.0	5	14.0	3
7		OH544	70.0	27	1.0	23	35.5	27
8		OH552	58.0	21	0.3	13	29.1	21
9		OH609	58.0	21	0.5	17	29.3	22
10		OH657	38.0	11	0.0	5	19.0	11
11		Roane	53.0	19	1.0	23	27.0	19
12		VA96-54-326	63.0	24	0.0	5	31.5	24
13		VA96W-348	80.0	28	0.3	13	40.1	28
14		IL94-1909	18.0	1	0.0	5	9.0	1
15		IL96-24078	43.0	13	0.8	19	21.9	13
16		IL95-4162	35.0	9	0.0	5	17.5	8
17		P86958RC4	35.0	9	0.3	13	17.6	10
18		P88288C1	48.0	16	0.3	13	24.1	16
19		Goldfield	33.0	7	0.3	13	16.6	7
20		P92823A1	65.0	25	0.8	19	32.9	25
21		Geneva	43.0	13	2.0	28	22.5	14
22		Cayuga	50.0	18	1.0	23	25.5	17
23		NY87048W-7387	28.0	3	0.0	5	14.0	3
24		NY87047W-7405	58.0	21	0.3	13	29.1	21
25		NY86003-106	35.0	9	0.3	13	17.6	10
26		NY86003-27	33.0	7	0.0	5	16.5	6
27		Foster	43.0	13	0.8	19	21.9	13
28		KY89C-895-14	50.0	18	2.0	28	26.0	18
		Location Mean	46.0		0.6		23.5	
		LSD	12.0		1.2		ns	
		CV	18.3		149.8		45.7	

* IL measured kernel quality on a 0-9 scale, which was converted to 0-90. OH measured visual kernel rating as a percent.

Scabby Seed (%)

		Wooster		Blacksburg		Entry Mean	
		OH		VA		Both Locations	
			rank		rank		rank
1	Patterson	8.0	7	4.5	3	6.3	3
2	Freedom	16.7	28	13.3	26	15.0	27
3	P2545	15.5	27	15.0	28	15.2	28
4	Ernie	9.8	11	9.7	22	9.8	17
5	M94-1069	8.2	8	5.5	6	6.8	5
6	M95-3349	6.2	2	7.0	13	6.6	4
7	OH544	12.2	20	6.7	10	9.4	14
8	OH552	10.9	15	7.8	16	9.4	13
9	OH609	9.3	10	4.5	3	6.9	7
10	OH657	7.6	6	15.0	28	11.3	24
11	Roane	12.2	19	9.3	21	10.7	22
12	VA96-54-326	8.7	9	5.8	8	7.3	8
13	VA96W-348	12.7	24	6.7	10	9.7	16
14	IL94-1909	5.9	1	7.8	16	6.8	6
15	IL96-24078	11.1	16	8.0	18	9.5	15
16	IL95-4162	6.5	5	4.5	3	5.5	1
17	P86958RC4	10.5	13	10.0	23	10.3	20
18	P88288C1	9.8	12	7.8	16	8.8	12
19	Goldfield	6.2	3	5.8	8	6.0	2
20	P92823A1	6.3	4	9.3	21	7.8	9
21	Geneva	12.7	23	10.7	24	11.7	25
22	Cayuga	12.4	21	7.2	14	9.8	18
23	NY87048W-7387	12.7	22	3.3	1	8.0	10
24	NY87047W-7405	14.9	26	6.7	10	10.8	23
25	NY86003-106	11.4	17	8.8	19	10.1	19
26	NY86003-27	11.7	18	13.0	25	12.4	26
27	Foster	10.6	14	5.5	6	8.1	11
28	KY89C-895-14	14.0	25	7.0	13	10.5	21
	Location Mean	10.5		8.1		9.3	
	LSD	4.8		4.1		5.1	
	CV	32.3				26.8	

Vomitoxin (DON)*
(ppm)

			Kibler		Wooster		Blacksburg		Entry Mean	
			AR		OH		VA		All Locations	
				rank		rank		rank		rank
1		Patterson	9.5	12			1.9	7	5.7	15
2		Freedom	11.7	18			5.2	22	8.4	24
3		P2545	12.0	24			8.8	27	10.4	28
4		Ernie	6.0	3			1.6	3	3.8	4
5		M94-1069	7.1	7	3.1	12	2.5	12	4.2	7
6		M95-3349	9.8	14	2.6	9	2.6	13	5.0	12
7		OH544	12.0	24	3.3	13	3.3	16	6.2	17
8		OH552	9.6	13	2.3	6	2.2	8	4.7	10
9		OH609	3.7	1	2.4	7	1.8	4	2.7	1
10		OH657	12.0	24	5.3	19	5.4	23	7.6	22
11		Roane	6.9	5	3.6	14	4.9	21	5.1	13
12		VA96-54-326	8.6	10	2.8	11	2.2	9	4.5	9
13		VA96W-348	6.1	4	2.7	10	3.0	14	3.9	5
14		IL94-1909	12.0	24	1.1	1	3.7	18	5.6	14
15		IL96-24078	4.6	2	1.8	4	1.8	5	2.8	2
16		IL95-4162	7.0	6	1.3	3	1.4	1	3.2	3
17		P86958RC4	12.0	24	4.2	17	3.9	19	6.7	19
18		P88288C1	11.8	19	2.2	5	3.3	17	5.7	16
19		Goldfield	9.3	11	1.2	2	1.4	2	3.9	6
20		P92823A1	8.3	8	2.6	8	2.4	10	4.4	8
21		Geneva	12.0	24	7.9	23	8.1	26	9.3	27
22		Cayuga	12.0	24	5.8	20	3.2	15	7.0	20
23		NY87048W-7387	12.0	24	4.1	16	2.4	11	6.2	18
24		NY87047W-7405	10.8	16	6.4	21	6.0	24	7.7	23
25		NY86003-106	12.0	24	4.6	18	8.9	28	8.5	25
26		NY86003-27	11.1	17	9.0	24	8.0	25	9.3	27
27		Foster	8.5	9	3.9	15	1.9	6	4.8	11
28		KY89C-895-14	10.7	15	7.9	22	4.1	20	7.6	21
		Location Mean	9.6		3.9		3.8		5.8	
		LSD	2.2		3.1				2.6	
		CV	16.1		37.4				26.1	

* DON analysis conducted by Pat Hart's laboratory at Michigan State University. Maximum DON value = 12.

Yield (bu/acre)

Height (in)

		Lexington KY	rank		Lexington KY	rank	Blacksburg VA	rank	Entry Mean Both Locations	rank
1	Patterson	82.4	11		38.0	22	40.7	15	39.3	20
2	Freedom	77.9	17		35.0	11	41.3	17	38.2	14
3	P2545	58.0	26		35.0	11	40.7	15	37.8	13
4	Ernie	57.8	27		32.0	2	36.0	1	34.0	1
5	M94-1069	75.5	18		35.0	11	36.7	4	35.8	8
6	M95-3349	109.1	1		37.0	19	40.0	12	38.5	16
7	OH544	93.7	6		41.0	26	46.3	28	43.7	28
8	OH552	93.5	7		35.0	11	41.7	20	38.3	15
9	OH609	97.1	5		36.0	16	41.3	17	38.7	18
10	OH657	80.6	14		41.0	26	42.7	23	41.8	25
11	Roane	81.8	12		33.0	4	37.7	7	35.3	4
12	VA96-54-326	102.6	3		33.0	4	37.7	7	35.3	4
13	VA96W-348	71.7	21		32.0	2	36.3	2	34.2	2
14	IL94-1909	89.1	9		41.0	26	41.7	20	41.3	23
15	IL96-24078	63.5	24		34.0	7	41.7	20	37.8	13
16	IL95-4162	101.1	4		37.0	19	40.3	13	38.7	18
17	P86958RC4	81.3	13		36.0	16	39.0	9	37.5	10
18	P88288C1	72.2	19		34.0	7	37.7	7	35.8	8
19	Goldfield	107.8	2		38.0	22	42.3	22	40.2	22
20	P92823A1	91.3	8		35.0	11	39.3	11	37.2	9
21	Geneva	56.6	28		36.0	16	43.3	25	39.7	21
22	Cayuga	78.8	15		42.0	28	45.3	27	43.7	28
23	NY87048W-7387	61.3	25		40.0	23	43.0	24	41.5	24
24	NY87047W-7405	66.2	23		34.0	7	36.7	4	35.3	4
25	NY86003-106	71.9	20		37.0	19	41.7	20	39.3	20
26	NY86003-27	68.3	22		41.0	26	43.7	26	42.3	26
27	Foster	77.9	17		36.0	16	39.3	11	37.7	11
28	KY89C-895-14	88.9	10		34.0	7	37.3	5	35.7	6
	Location Mean	82.3			36.0		40.4		38.4	
	LSD	23.6			2.0		1.8		2.5	
	CV	24.9			4.7				3.1	

Other Diseases

		Leaf Rust		Sept. Leaf Blotch		Glume Blotch		Barley Yellow Dwarf Virus		Stagonospora	
		(%)		(0-9)		(%)		(0-9)		(0-9)	
		Vincennes		Vincennes		Vincennes		Blacksburg		Blacksburg	
		IN		IN		IN		VA		VA	
			rank		rank		rank		rank		rank
1	Patterson	1.0	4	8.0	23	20.0	21	4.0	19	6.7	28
2	Freedom	1.0	4	7.0	6	15.0	18	4.0	19	1.3	7
3	P2545	3.0	8	7.0	6	5.0	8	4.0	19	0.7	3
4	Ernie	7.0	17	7.2	14	1.0	1	4.3	23	2.7	19
5	M94-1069	3.0	8	7.2	14	3.0	3	2.7	6	1.0	4
6	M95-3349	5.0	13	7.0	6	5.0	8	3.7	15	0.0	2
7	OH544	15.0	26	7.0	6	5.0	8	1.0	2	3.7	23
8	OH552	10.0	21	8.0	23	10.0	15	4.3	23	3.0	20
9	OH609	0.0	2	7.5	19	15.0	18	5.3	28	2.3	15
10	OH657	5.0	13	7.0	6	5.0	8	3.3	12	2.0	11
11	Roane	10.0	21	7.0	6	5.0	8	3.3	12	3.3	22
12	VA96-54-326	10.0	21	7.2	14	3.0	3	2.0	3	1.3	7
13	VA96W-348	10.0	21	8.5	26	5.0	8	4.0	19	2.0	11
14	IL94-1909	7.0	17	7.0	6	5.0	8	3.0	9	5.0	26
15	IL96-24078	5.0	13	8.0	23	5.0	8	5.3	28	1.3	7
16	IL95-4162	3.0	8	7.3	17	7.0	13	5.0	26	3.3	22
17	P86958RC4	5.0	13	7.0	6	15.0	18	3.0	9	2.3	15
18	P88288C1	0.0	2	7.2	14	15.0	18	1.0	2	2.3	15
19	Goldfield	3.0	8	7.5	19	35.0	27	2.3	4	1.3	7
20	P92823A1	3.0	8	8.0	23	35.0	27	4.7	25	6.0	27
21	Geneva	10.0	21	7.5	19	25.0	23	3.0	9	2.3	15
22	Cayuga	10.0	21	7.0	6	25.0	23	4.0	19	4.0	25
23	NY87048W-7387	5.0	13	7.2	14	30.0	25	3.7	15	4.0	25
24	NY87047W-7405	40.0	28	9.0	28	50.0	28	3.3	12	2.3	15
25	NY86003-106	15.0	26	7.0	6	15.0	18	4.3	23	1.3	7
26	NY86003-27	15.0	26	7.0	6	25.0	23	2.7	6	2.3	15
27	Foster	15.0	26	8.0	23	10.0	15	3.0	9	0.0	2
28	KY89C-895-14	1.0	4	9.0	28	5.0	8	3.7	15	2.3	15
	Location Mean	7.8		7.5		14.3		3.5		2.5	

Greenhouse Data - Missouri

		FHB Index (Type II)				Kernel quality (Type III)			
		5 isolates		MO isolate		5 isolates		MO isolate	
			rank		rank		rank		rank
1	Patterson	0.56	24	0.56	21	0.43	19	0.34	20
2	Freedom	0.17	5	0.22	5	0.63	10	0.63	7
3	P2545	0.26	8	0.23	6	0.39	22	0.40	18
4	Ernie	0.17	5	0.17	2	0.71	4	0.71	3
5	M94-1069	0.37	17	0.64	26	0.70	6	0.54	11
6	M95-3349	0.25	6	0.37	15	0.70	6	0.70	5
7	OH544	0.31	12	0.34	14	0.72	3	0.60	9
8	OH552	0.16	3	0.22	5	0.75	2	0.64	6
9	OH609	0.34	15	0.29	9	0.54	13	0.61	8
10	OH657	0.10	1	0.12	1	0.50	16	0.37	19
11	Roane	0.41	19	0.41	16	0.50	16	0.48	14
12	VA96-54-326	0.74	27	0.79	28	0.20	27	0.11	27
13	VA96W-348	0.30	11	0.30	11	0.60	11	0.59	10
14	IL94-1909	0.26	8	0.30	11	0.80	1	0.82	1
15	IL96-24078	0.13	2	0.21	3	0.46	18	0.41	17
16	IL95-4162			0.32	13				
17	P86958RC4	0.41	19	0.30	11	0.39	22	0.50	13
18	P88288C1	0.46	23	0.57	24	0.41	20	0.23	24
19	Goldfield	0.28	9	0.27	7	0.68	8	0.70	5
20	P92823A1	0.41	19	0.57	24	0.39	22	0.16	26
21	Geneva	0.33	14	0.48	18	0.68	8	0.27	22
22	Cayuga	0.35	16	0.45	17	0.49	17	0.51	12
23	NY87048W-7387	0.29	10	0.29	9	0.63	10	0.77	2
24	NY87047W-7405	0.33	14	0.57	24	0.51	14	0.44	15
25	NY86003-106	0.43	22	0.53	19	0.59	12	0.42	16
26	NY86003-27	0.57	25	0.57	24	0.25	26	0.27	22
27	Foster	0.43	22	0.55	20	0.38	24	0.18	25
28	KY89C-895-14	0.68	26	0.70	27	0.30	25	0.25	23
	Mean	0.35		0.41		0.53		0.47	
	LSD (0.05)	0.28		0.28		0.37		0.34	

Notes: Data provided are data collected from single floret inoculations in the greenhouse.

FHB Index (Type II): These data were determined as the number of diseased spikelets/total number of spikelets/head. Data for a given isolate are the mean of 20 heads/isolate. The column entitled MO isolate reflects data collected from just the Missouri isolate which is our most aggressive isolate on our most resistant cultivar, Ernie.

Kernel Quality (Type III): These data reflect the ratio of sound kernels in the inoculated head/mean kernel number in 20 uninoculated heads. Heads were hand threshed and each kernel in the inoculated head was scored on a 5 point scale where 1=sound, 2=slightly shriveled, 3=mod shriveled, 4=very shriveled, 5=tombstone. The total number of sound kernels in the inoculated head is the numberator in the ratio. Two sets of data were also collected for kernel quality: data from individual inoculations with each of 5 isolates and data for the Missouri isolate alone.

IL95-4162 grew poorly in the greenhouse, so it was not entered in the 5 isolate study.

Means Across Locations

		Heading Date (Julian)		FHB Incidence (0-100)		FHB Severity (0-100)		FHB Index (0-100)		Kernel Rating* (0-100)		Scabby Seed (%)		DON-Vomitoxin (ppm)		Height (in)	
			rank		rank		rank		rank		rank		rank		rank		rank
1	Patterson	128.6	4	49.5	19	24.6	27	15.0	28	24.0	15	6.3	3	5.7	15	39.3	20
2	Freedom	132.9	20	44.5	18	15.5	11	7.5	14	30.9	23	15.0	27	8.4	24	38.2	14
3	P2545	134.2	21	61.0	27	19.9	23	13.6	25	34.8	26	15.2	28	10.4	28	37.8	13
4	Ernie	127.7	2	36.1	6	8.6	1	4.3	3	15.0	5	9.8	17	3.8	4	34.0	1
5	M94-1069	131.1	14	38.5	11	15.0	9	6.7	12	14.5	4	6.8	5	4.2	7	35.8	8
6	M95-3349	130.1	9	43.5	15	19.8	22	10.4	20	14.0	3	6.6	4	5.0	12	38.5	16
7	OH544	135.6	24	19.8	1	13.5	5	3.8	1	35.5	27	9.4	14	6.2	17	43.7	28
8	OH552	129.5	8	53.9	24	11.8	4	6.5	11	29.1	21	9.4	13	4.7	10	38.3	15
9	OH609	129.5	7	35.4	5	15.9	13	6.0	8	29.3	22	6.9	7	2.7	1	38.7	18
10	OH657	135.2	23	37.6	9	13.9	6	6.1	9	19.0	11	11.3	24	7.6	22	41.8	25
11	Roane	129.4	6	57.5	25	23.5	26	14.2	26	27.0	19	10.7	22	5.1	13	35.3	4
12	VA96-54-326	128.5	3	37.2	8	17.0	16	6.4	10	31.5	24	7.3	8	4.5	9	35.3	4
13	VA96W-348	130.3	11	61.4	28	20.7	25	12.5	24	40.1	28	9.7	16	3.9	5	34.2	2
14	IL94-1909	130.3	10	28.3	2	9.1	3	3.9	2	9.0	1	6.8	6	5.6	14	41.3	23
15	IL96-24078	127.5	1	32.0	3	15.3	10	5.4	5	21.9	13	9.5	15	2.8	2	37.8	13
16	IL95-4162	129.1	5	34.5	4	17.6	18	5.7	6	17.5	8	5.5	1	3.2	3	38.7	18
17	P86958RC4	132.7	19	51.8	22	20.3	24	9.2	19	17.6	10	10.3	20	6.7	19	37.5	10
18	P88288C1	130.7	12	42.1	13	15.6	12	7.5	13	24.1	16	8.8	12	5.7	16	35.8	8
19	Goldfield	131.2	16	38.1	10	14.1	7	6.0	7	16.6	7	6.0	2	3.9	6	40.2	22
20	P92823A1	131.1	15	37.0	7	18.1	19	8.0	16	32.9	25	7.8	9	4.4	8	37.2	9
21	Geneva	134.2	22	51.3	20	17.6	17	10.9	21	22.5	14	11.7	25	9.3	27	39.7	21
22	Cayuga	138.1	28	42.1	14	18.6	21	8.4	17	25.5	17	9.8	18	7.0	20	43.7	28
23	NY87048W-7387	137.6	27	39.9	12	8.9	2	5.2	4	14.0	3	8.0	10	6.2	18	41.5	24
24	NY87047W-7405	132.3	18	58.9	26	16.4	14	10.9	22	29.1	21	10.8	23	7.7	23	35.3	4
25	NY86003-106	136.3	26	44.1	16	14.7	8	7.7	15	17.6	10	10.1	19	8.5	25	39.3	20
26	NY86003-27	135.9	25	51.6	21	18.3	20	11.5	23	16.5	6	12.4	26	9.3	27	42.3	26
27	Foster	131.6	17	44.3	17	16.7	15	8.4	18	21.9	13	8.1	11	4.8	11	37.7	11
28	KY89C-895-14	131.0	13	53.1	23	25.7	28	14.8	27	26.0	18	10.5	21	7.6	21	35.7	6
	Mean	131.9		43.7		16.7		8.4		23.5		9.3		5.8		38.4	
	Number of locations with data	7		7		8		8		2		2		3		2	

* See Kernel Rating table for notes on where data have been converted to be standardized across locations.

Standard Deviations Across Locations

		Heading Date (Julian)	rank	FHB Incidence (0-100)	rank	FHB Severity (0-100)	rank	FHB Index (0-100)	rank	Kernel Rating* (0-100)	rank	Scabby Seed (%)	rank	DON-Vomitoxin (ppm)	rank	Height (in)	rank
1	Patterson	13.8	16	25.0	17	13.7	25	10.6	28	33.9	17	2.5	19	5.3	27	1.9	5
2	Freedom	14.7	24	25.2	18	5.9	5	4.9	16	41.2	23	2.4	18	4.6	21	4.5	25
3	P2545	11.3	10	28.4	28	8.0	14	7.5	24	47.0	26	0.3	3	2.3	6	4.0	24
4	Ernie	16.3	27	26.9	25	5.2	3	3.5	8	21.2	5	0.1	1	3.1	10	2.8	15
5	M94-1069	13.8	15	19.0	6	7.9	13	2.9	3	19.1	2	1.9	12	2.5	8	1.2	3
6	M95-3349	13.6	14	27.4	26	11.5	23	8.2	27	19.8	4	0.6	5	4.1	18	2.1	8
7	OH544	11.4	11	14.5	1	10.0	20	3.1	5	48.8	27	3.9	23	5.1	24	3.8	23
8	OH552	14.1	19	24.1	16	4.9	2	2.9	2	40.8	22	2.1	15	4.2	19	4.7	26
9	OH609	16.9	28	21.8	11	8.8	17	3.3	6	40.7	20	3.4	20	1.0	1	3.8	23
10	OH657	10.5	6	22.3	12	8.4	16	4.9	17	26.9	11	5.2	26	3.8	17	1.2	3
11	Roane	16.2	26	18.0	4	13.9	26	4.0	11	36.8	19	2.0	13	1.7	4	3.3	20
12	VA96-54-326	14.7	22	15.1	2	7.8	12	2.9	4	44.5	24	2.0	14	3.5	15	3.3	20
13	VA96W-348	14.7	23	23.1	14	8.9	18	4.7	14	56.4	28	4.3	24	1.9	5	3.1	17
14	IL94-1909	13.8	17	21.6	10	6.6	8	3.6	9	12.7	1	1.4	7	5.7	28	0.5	1
15	IL96-24078	14.0	18	16.1	3	7.3	10	2.7	1	29.9	14	2.2	17	1.6	3	5.4	28
16	IL95-4162	14.3	21	19.3	7	14.4	28	4.1	12	24.7	10	1.4	8	3.3	11	2.4	12
17	P86958RC4	9.4	1	23.0	13	13.3	24	4.8	15	24.6	9	0.4	4	4.6	22	2.1	8
18	P88288C1	11.1	9	24.0	15	11.4	22	6.7	21	33.8	15	1.4	10	5.2	26	2.6	14
19	Goldfield	9.6	3	18.1	5	8.2	15	3.5	7	23.2	6	0.3	2	4.6	23	3.1	17
20	P92823A1	12.3	12	19.4	8	6.8	9	3.8	10	45.4	25	2.1	16	3.4	13	3.1	17
21	Geneva	10.9	8	25.3	21	7.6	11	7.2	22	29.0	12	1.4	10	2.3	7	5.2	27
22	Cayuga	9.4	2	25.2	19	11.1	21	7.2	23	34.6	18	3.7	22	4.5	20	2.4	12
23	NY87048W-7387	10.2	5	26.3	23	5.5	4	4.4	13	19.8	4	6.6	28	5.1	25	2.1	8
24	NY87047W-7405	12.7	13	26.1	22	9.2	19	7.9	25	40.8	22	5.8	27	2.7	9	1.9	5
25	NY86003-106	9.9	4	25.2	20	6.6	7	5.2	18	24.6	9	1.8	11	3.7	16	3.3	20
26	NY86003-27	10.6	7	27.8	27	6.6	6	5.9	20	23.3	7	0.9	6	1.6	2	1.9	5
27	Foster	14.1	20	26.5	24	4.9	1	5.4	19	29.9	14	3.6	21	3.4	14	2.4	12
28	KY89C-895-14	15.9	25	21.3	9	14.4	27	8.2	26	33.9	17	4.9	25	3.3	12	2.4	12
	Mean	12.9		22.7		8.9		5.1		32.4		2.5		3.5		2.9	
	Number of locations w ith data	7		7		8		8		2		2		3		2	

* See Kernel Rating table for notes on where data have been converted to be standardized across locations.

Testing Trait Differences Between Entries and Locations - Results from Analyses of Variance

			FHB	FHB	FHB	Kernel	Scabby	DON-	
		Heading Date	Incidence	Severity	Index	Rating*	Seed	Vomitoxin	Height
		(Julian)	(0-100)	(0-100)	(0-100)	(0-100)	(%)	(ppm)	(in)
Entries	d.f.	27	27	27	27	27	27	27	27
	Mean Square	62.4	727.8	145.5	89.8	121.8	12.2	11.6	14.6
	F-value	6.6	4.6	3.5	4.7	1.1	2.0	5.0	10.2
	p-value	0.0001	0.0001	0.0001	0.0001	0.4409	0.0430	0.0001	0.0001
Locations	d.f.	6	6	7	7	1	1	1	1
	Mean Square	4518.2	10590.7	1320.0	336.7	29405.9	83.1	299.6	229.4
	F-value	475.9	66.7	31.6	17.5	255.8	13.4	129.2	160.4
	p-value	0.0001	0.0001	0.0001	0.0001	0.0001	0.0011	0.0001	0.0001

Correlations between Traits*
(within each location)

Most locations had strong correlations between FHB incidence, FHB severity and FHB index. Other strong (|r| $ 0.45) correlations are listed below.

<u>Arkansas</u>	
Heading date with FHB severity	r= -0.45, p=0.0163
Heading date with Vomitoxin (DON)	r= 0.75, p=0.0001
<u>Kentucky</u>	
Heading date with Height	r= 0.71, p=0.0001
FHB incidence with Height	r= -0.57, p=0.0016
<u>Ohio</u>	
Heading date with Scabby Seed	r= 0.58, p=0.0011
Heading date with Vomitoxin (DON)	r= 0.68, p=0.0003
FHB incidence with Scabby Seed	r= 0.57, p=0.0017
FHB incidence with Vomitoxin (DON)	r= 0.55, p=0.0051
Kernel Rating with Scabby Seed	r= 0.58, p=0.0011
Scabby Seed with Vomitoxin (DON)	r= 0.64, p=0.0008
<u>Virginia</u>	
FHB incidence with Scabby Seed	r= 0.52, p=0.0045
FHB incidence with Vomitoxin (DON)	r= 0.86, p=0.0001
FHB index with Scabby Seed	r= 0.56, p=0.0018
FHB index with Vomitoxin (DON)	r= 0.77, p=0.0001
Scabby Seed with Vomitoxin (DON)	r= 0.69, p=0.0001

*The following locations had data for each of the following variables:

Heading <u>Date</u>	FHB <u>Incidence</u>	FHB <u>Severity</u>	FHB <u>Index</u>	Kernel <u>Rating</u>	Scabby <u>Seed</u>	Vomitoxin <u>(DON)</u>	<u>Yield</u>	<u>Height</u>
AR	AR	AR	AR	IL	OH	AR	KY	KY
IL	IL	IL	IL	OH	VA	OH		VA
KS	KY	IN	KS			VA		
KY	MI	KY	KY					
MI	OH	MI	MI					
OH	ON	OH	OH					
VA	VA	ON	ON					
		VA	VA					

Means Across Locations for Entries in both the 98 and 99 Nurseries

			1998 Trait Means										1999 Trait Means									
			FHB Incidence (0-100)	rank	FHB Severity (0-100)	rank	FHB Index (0-100)	rank	Kernel Rating (0-100)	rank	DON (ppm)	rank	FHB Incidence (0-100)	rank	FHB Severity (0-100)	rank	FHB Index (0-100)	rank	Kernel Rating (0-100)	rank	DON (ppm)	rank
99 no.	98 no.																					
1	1	Patterson	59.5	15	54.3	14	36.2	14	31.5	2	10.0	16	49.5	11	24.6	17	15.0	17	24.0	8	5.7	9
2	2	Freedom	58.0	13	39.9	7	25.3	8	49.4	16	8.0	11	44.5	10	15.5	7	7.5	8	30.9	14	8.4	15
3	3	P2545	59.5	15	54.6	15	37.8	15	53.2	17	9.8	15	61.0	17	19.9	14	13.6	15	34.8	16	10.4	17
4	4	Ernie	48.5	2	26.0	1	13.0	1	31.5	2	9.1	13	36.1	3	8.6	1	4.3	3	15.0	3	3.8	1
7	9	OH544	55.8	6	43.3	10	31.9	11	46.9	15	9.4	14	19.8	1	13.5	5	3.8	1	35.5	17	6.2	11
8	7	OH552	56.2	7	28.1	2	17.8	3	44.7	12	6.5	6	53.9	14	11.8	4	6.5	6	29.1	13	4.7	4
11	12	Roane	62.3	17	35.4	6	23.1	6	35.3	7	11.6	17	57.5	15	23.5	16	14.2	16	27.0	11	5.1	6
14	14	IL94-1909	57.2	10	33.9	4	24.0	7	31.6	3	6.8	7	28.3	2	9.1	3	3.9	2	9.0	1	5.6	7
17	19	P86958RC4	57.0	9	46.0	11	29.1	10	41.7	9	5.6	4	51.8	13	20.3	15	9.2	12	17.6	5	6.7	12
18	20	P88288C1	53.6	5	42.8	9	26.6	9	43.5	10	4.4	1	42.1	8	15.6	8	7.5	8	24.1	9	5.7	9
19	18	Goldfield	50.4	3	32.2	3	15.1	2	33.5	4	6.3	5	38.1	5	14.1	6	6.0	5	16.6	4	3.9	2
20	16	P92823A1	46.7	1	40.1	8	21.1	4	34.3	6	5.0	3	37.0	4	18.1	12	8.0	9	32.9	15	4.4	3
21	23	Geneva	57.3	12	58.9	17	38.2	16	45.7	13	6.9	8	51.3	12	17.6	11	10.9	14	22.5	7	9.3	16
22	24	Cayuga	56.5	8	57.9	16	38.3	17	38.8	8	7.3	9	42.1	8	18.6	13	8.4	11	25.5	10	7.0	13
23	26	NY87048W-7387	52.4	4	35.1	5	22.9	5	34.0	5	5.0	3	39.9	6	8.9	2	5.2	4	14.0	2	6.2	11
24	27	NY87047W-7405	60.6	16	50.1	12	32.6	12	46.0	14	8.0	11	58.9	16	16.4	9	10.9	14	29.1	13	7.7	14
27	29	Foster	57.3	12	51.4	13	34.0	13	44.3	11	8.0	11	44.3	9	16.7	10	8.4	11	21.9	6	4.8	5
		Mean	55.8		42.9		27.5		40.3		7.5		44.5		16.0		8.4		24.1		6.2	
		Number of locations with data	11		9		9		5		2		7		8		8		2		3	