

SOUTHERN UNIFORM WINTER WHEAT SCAB NURSERY

2022 NURSERY REPORT

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LOCATION NOTES

Florence, South Carolina,

- Cooperator: Rick Boyles
- Clemson University

Plains, Georgia

- Cooperator: Mohamed Mergoum.
- University of Georgia.

Winnsboro and Alexandria, Louisiana.

- Cooperator: Stephen Harrison.
- Louisiana State University

Fayetteville and Newport, Arkansas

- Cooperator: Eshan Shakiba.
- University of Arkansas.

Kinston, North Carolina

- Cooperator: Paul Murphy
- North Carolina State University

West Lafayette, Indiana

- Cooperator: Sue Cambron
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Control Research

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Warsaw, Virginia

- Cooperator Nicholas Santantonio.
- Virginia Tech.

Champaign, Illinois

- Cooperator: Jana Murche
- KWS Cereals USA.

Urbana, Illinois

- Cooperator: Jessica Rutkoski.
- University of Illinois.

Lexington, Kentucky

- Cooperator: Dave Van Sanford.
- University of Kentucky.

Raleigh, North Carolina

- Cooperator: Gina Brown-Guedira.
- USDA-ARS Eastern Regional Small
Grains Genotyping Lab

Rating for FHB and Heading Date, Hopkinsville KY, 1991 (likely Fred Collins, NK)

(Annual Wheat Newsletter no. 37. <https://wheat.pw.usda.gov/ggpages/awn/37/>)

This is perhaps the first data on resistance to FHB in Southern germplasm in recent times. What is notable about these data is that the infection was consistent over heading date, except maybe for C9803. The long term susceptible Uniform Nursery check, C9835, was very susceptible in this dataset, also. I only discovered these data recently, but wish I had seen it 24 years ago despite it being one location in one year. (I went down the rabbit hole of pedigrees, but found nothing conclusive.)

Genotype	Heading Date April	FHB (0 - 9)	Pedigree
Coker 9803	10-Apr	2	<i>McNair 1003 / Coker 916</i>
Coker 916	14-Apr	8	<i>Purdue 6028A2-5-9 // Coker 61-19 / Blueboy</i>
Coker 9835	14-Apr	8	<i>Coker 68-19 / Coker 61-19 /2/ Blueboy / Coker 65-20 /3/ Pioneer 2550</i>
Fl 302	14-Apr	7	
Coker 983	15-Apr	8	<i>Coker 68-15 /2/ Potomac / Coker 61-19</i>
Saluda	15-Apr	4	<i>Cltr 17449 / Coker 68-15</i>
Coker 9877	18-Apr	1	<i>Coker 65-20 / Blueboy</i>
Coker 9024	18-Apr	1	<i>Coker 65-20 /3/ Blueboy // Coker 68-15 / Chancellor</i>
McNair 1003	18-Apr	8	<i>McNair 2203 / Blueboy</i>
Wakefield	18-Apr	4	
Coker 747	19-Apr	4	<i>Arthur / Coker 68-15</i>
P2548	20-Apr	7	
Caldwell	21-Apr	9	
P2551	21-Apr	2	

LSD (0.05) 3 .

Who Knew???



Estimated mean loss in thousands of bushels of wheat due to scab from 1928 to 1937.

Acknowledgements

This is the 22nd Uniform Southern Winter Wheat Scab Nursery Report. The members of the Southern CP can be congratulated on the advances made in breeding for scab resistance in the region. For example in the first uniform nursery only three entries (11 percent), Coker 9474, Roane and NC-Neuse-sib were statistically similar to the resistant checks Ernie and Futai 8944 for FHB Severity. In contrast, in the 2022 nursery 46 of 60 experimental genotypes (77 percent) were statistically similar to Ernie for FHB Rating.

At the outset of our adventures in breeding for scab resistance, there were many helpful colleagues from outside the Southern CP who advised us, encouraged us and warned us not to drag our feet on this disease. They encouraged giving us financial support, when it was not unanimous that we deserved it. Among those we salute are the following:

University of Minnesota : *Jim Anderson, Kevin Smith, Bob Busch, Ruth Dill-Macky*

North Dakota State University: *Marsha McMullen, Mohamed Mergoum, Rich Horsley.*

Michigan State University: *Rick Ward, Sue Canty.*

University of Illinois; *Fred Kolb.*

Purdue University: *Greg Shaner, Guihua Bai, Herb Ohm.*

University of Missouri; *Ann McKendry.*

University of Kentucky: *Dave Van Sanford.*

Entry List and Pedigrees, 2022 Nursery

ENTRY NO	CULTIVAR/ DESIGNATION	PEDIGREE	CONTRIBUTOR	IN NURSERY SINCE
1	ERNIE	Check	CHECK(RES)	1999-00
2	COKER9835	Check	CHECK(SUS)	2000-01
3	BESS	MO11769/Madison	CHECK(RES)	2006-07
4	JAMESTOWN	Roane / Pioneer 2691	CHECK(RES)	2007-08
5	SS 8641	881130/2*881582 (formally GA96229-3A4)	CHECK(SUS)	2018-19
6	15VDH-FHB-MAS22-14	MD08-26-H2-7-12-9 [SS8641//McCormick*2/ Ning7840] / Featherstone 73 (VA09W-73) // USG 3118"S" (VA12W-54)	CHECK(RES)	2020-21
7	KWS347	Pembroke2014 / LCS19228	Murche	2021-22
8	KWS369	LCS19229 / VA12FHB-8	Murche	2021-22
9	KWS394	11WIO244 / P0762A1-2-8	Murche	2021-22
10	KWS397	KWS023 / P0762A1-2-8	Murche	2021-22
11	KWS403	11WIO244 / P0762A1-2-8	Murche	2021-22
12	KWS407	KWS074 / GL1032-38-2	Murche	2021-22
13	LA13176CBB-50-1-3	MD08-26-H2-7-12-21/LA12001, F1(AGS 2060/GA04570-10E46)	Harrison	2021-22
14	LA13202D-82-1	NC09-22402/LA12238 ,F1(LA841/VA08W-294)	Harrison	2021-22
15	LA14173CBW-30-1-4	LA13059, F1(GK02.10/MD08-26-H2-7-12-21) / LA06146E-P04	Harrison	2021-22
16	LA14261C-45-2	HILLIARD / LA07040D-P01	Harrison	2021-22
17	LA14269C-9-3	VA11W-230 / PIONEER 26R41	Harrison	2021-22
18	LA15005GBB-13-1-1	ARGE07-1347-6-7-9 / NC09-20986 (Fhb1)	Harrison	2021-22
19	LA15005GBB-4-1-3	ARGE07-1347-6-7-9 / NC09-20986 (Fhb1)	Harrison	2021-22
20	LA15092SBBW-25-1-2	LW08090D-18 / NC11-22289	Harrison	2021-22
21	NC13217-W293	Hilliard /MD07026-12-30	Murphy	2021-22
22	NC13955-G125	NC13-20076 /GA06493-13LE6	Murphy	2021-22
23	NC13955-G135	NC13-20076 /GA06493-13LE6	Murphy	2021-22
24	NC15V25-20	MD08-26-H2-7-12-9 / VA11W-278 // Hilliard	Murphy	2021-22
25	NC18-16900	NC09-20986 // SHIRLEY / JAMESTOWN	Murphy	2021-22
26	NC18-16901	NC09-20986 // SHIRLEY / JAMESTOWN	Murphy	2021-22
27	NC18-16920	NC09-20986 // SHIRLEY / JAMESTOWN	Murphy	2021-22
28	NC18-17619	GA03-1086-10E26 / NC-YADKIN	Murphy	2021-22
29	TX20D5032	NC09-20986/4/NC11-21113/3/AGS 2038//WX12D018	Sutton	2021-22
30	TX20D5354	GA 09285-G1-G1-G1-G1 / NC09-20986 (FHB1)	Sutton	2021-22
31	TX20D5363	LA05145D-21 / GA 03564-12E6	Sutton	2021-22
32	TX20D5368	LA05145D-21 / MD08-26-H2-7-12-21	Sutton	2021-22
33	GA131218-1-2-7 -20E15	GA041323-11E63 /GA031134-10E29	Mergoum	2020-21
34	GA151313-LDH-192 -20E48	AGS 2024 / PIO26R41 // JT141	Mergoum	2020-22
35	GA161137LDH-23 -20LE3	GA08199-1-3 / GA071171-14ES8 // MD07026	Mergoum	2021-22
36	GA161240LDH-113 -20LE6	MD07026 / TXGA-13E2	Mergoum	2020-21
37	GA151313-LDH-53 -20E18	AGS 2024 / PIO26R41 // JT141	Mergoum	2021-22
38	GA151313-LDH-95 -20E19	AGS 2024 / PIO26R41 // JT141	Mergoum	2021-22
39	GA12230-1 -6-6-3 -20E36	031134-10E29 / JAMESTOWN	Mergoum	2020-21
40	GA131214-8-5-2 -20LE12	LA 06146E-P05 / JAMESTOWN / 051477-9-1-6	Mergoum	2021-22
41	GA131214-8-5-6 -20LE13	LA 06146E-P05 / JAMESTOWN / 051477-9-1-6	Mergoum	2021-22
42	GA14235-7-2-6 -20LE31	VA10W-119 / PIO 26R94 // 061082-13E24	Mergoum	2020-21
43	18VDH-FHB-MAS07-164-01	TXGA06343-17-3-5-EL2 (011638-G1-G1/ 981592-8-8-1// 991336-47-5W-1W) / MDC07026-F2-19-13-1 (SS8641// McCormick*2/ Ning7840) // USG 3118 (VA11W-279)	Santantonio	2021-22
44	VA20W-142	GA041293-11E37 [Pion26R61/2*SS8641] / '102015123' (VA10W-123) // Hilliard (VA11W-108), F7	Santantonio	2021-22
45	VA20W-171	GA041323-11E63 [GA961565-2E46/ GA961591-3E42] / 12V51 (VA05W-251) // Hilliard (VA11W-108), F7	Santantonio	2021-22
46	VA20W-69	UX1347-1 [McCormick*2]/(IL00-8061// TA5605 (Lr58)/ McCormick)/(SS8641*2// McCormick / KS92WGRC15(Lr21)] / Hilliard (VA11W-108), F7	Santantonio	2021-22
47	VA20W-52	UX1334-4 [Shirley/3/Shirley(VA03W-409)/ Sr26recA//Shirley] / VA12FHB-34 [GA991109-4-1-3 (Ernie/Pion2684// GA901146)/ PIONEER26R15], F7	Santantonio	2021-22
48	18VDH-FHB-MAS06-152-03	TXGA06343-17-3-5-EL2 (011638-G1-G1/ 981592-8-8-1// 991336-47-5W-1W) / MDC07026-F2-19-13-1 (SS8641// McCormick*2 / Ning7840)// Dyna-Gro 9811 (VA11W-108PA)	Santantonio	2021-22

Entry List and Pedigrees, 2022 Nursery

49	DH17SRW136-043	VA12FHB-8 [IL99-27048 (IL90-6364/Pioneer 2571)/ VA04W-486 {ERNIE//INW 9824 (P92823A1-1-4-4-5) /McCormick} // SHIRLEY] / DH11SRW070-14 [GA00067-8E35 (GA921204/AGS2000) /Shirley]	Santantonio	2021-22
50	17VTK6-61	MDC07026-F2-19-13-1 (SS8641// McCormick*2 / Ning7840) / GAJT 141-14E45 (Jamestown/AGS2026)	Santantonio	2021-22
51	UMD-FHBN-1	MD233/SS8641	Tiwari	2021-22
52	UMD-FHBN-2	JAMESTOWN//USG3555/25R42/Hilliard	Tiwari	2021-22
53	UMD-FHBN-3	JAMESTOWN//USG3555/25R42/Hilliard	Tiwari	2021-22
54	UMD-FHBN-4	MD233/SS8641/MD-20	Tiwari	2021-22
55	UMD-FHBN-5	MD233/SS8641/MD-131	Tiwari	2021-22
56	UMD-FHBN-6	JAMESTOWN//USG3555/25R42/MD-133	Tiwari	2021-22
57	UMD-FHBN-7	VA02W713//SS8641/25R42/MD315	Tiwari	2021-22
58	UMD-FHBN-8	JAMESTOWN//USG3555/25R42	Tiwari	2021-22
59	SCGA121098-9-3-7-10	AGS2035 / JAMESTOWN // 04151-11E26	Boyles	2021-22
60	SCGA141638-8-4	VA08W-294 / 2*P26R94 // P26R94*2/051754-1-1-8	Boyles	2021-22
61	SCAR160643LDH-8	MD09W272-8-4-13-3 / AGS2055	Boyles	2021-22
62	SCLA19WF0306	AR01040-4-1 / NC09-20986	Boyles	2021-22
63	SCGA141717-G1-4-1-5	001170 / 021773 // 2*LCS343 /3/ 2*12308	Boyles	2021-22
64	SCGA14317-25-3	JT152 / 04570 -10E46	Boyles	2021-22
65	SCLA18WF0802-8	LA09225C-33/VA12W-68	Boyles	2021-22
66	SCLA18WF0512-11-3	LA12275DH-24 / VA12W-68	Boyles	2021-22

Entry List, 2000 Nursery

ENTRY NO	CULTIVAR/ DESIGNATION	PEDIGREE	CONTRIBUTOR	IN NURSERY SINCE
1	ERNIE	PIKE/3/STODDARD/BLUEBOY//STODDARD/D1707	CHECK	99-00
2	FUTAI 8944	FUNO/TAIWANXIAOMAI	CHECK	99-00
3	SC 921285	SL4/67-78/7/TIFT72-60/ARTHUR 71//GABORA/3/LOVRIN III/4/TIFT72-60/ ARTHUR 71/5/BEAU/6/C76-22/8/BRULE	GRAHAM	99-00
4	SC921299	AS ABOVE	GRAHAM	99-00
5	SC 941292	FL 7925-G47-I10/FL8062-E4-H7-J1	GRAHAM	99-00
6	COKER 9474	IN 7176A4-31-5-48/WHEELER	HANCOCK	99-00
7	B950799	COKER 81-20//MCNAIR 3271/FL 301	HANCOCK	99-00
8	B930390	AL 850046/ COKER 86-23	HANCOCK	99-00
9	B961092	COKER 9907/L870365	HANCOCK	99-00
10	GA89482-E7	PION 2555/PF 84301//FL 302	JOHNSON	99-00
11	GA901146-E15	GA 831127//GA 821264*3/GA 79102	JOHNSON	99-00
12	GA90524-E35	COKER 9835/GA 861278	JOHNSON	99-00
13	GA90552-AE33	GA 831276/GA 861278	JOHNSON	99-00
14	ROANE	SALUDA/4/MASSEY*2/3/MASSEY*3/BALKAN//SALUDA	GRIFFEY	99-00
15	VA96W-329	SC861562/VA87-54-558	GRIFFEY	99-00
16	VA96W-326	SC861562/COKER 9803	GRIFFEY	99-00
17	VA96W-158	FFR 555W/GORE	GRIFFEY	99-00
18	VA96W-348	IN 81401A1-32-2/FFR 555W	GRIFFEY	99-00
19	NC96-13848	COKER 86-29//STELLA/22-5/3/COMBO	MURPHY	99-00
20	NC96-13965	COKER 86-29//STELLA/CHD 45680/3/COKER 86-22	MURPHY	99-00
21	NC96-13374	COKER 86-29//STELLA/CHD 45680/3/COKER 86-27	MURPHY	99-00
22	NC96-14629	STELLA/MV14//NC866	MURPHY	99-00

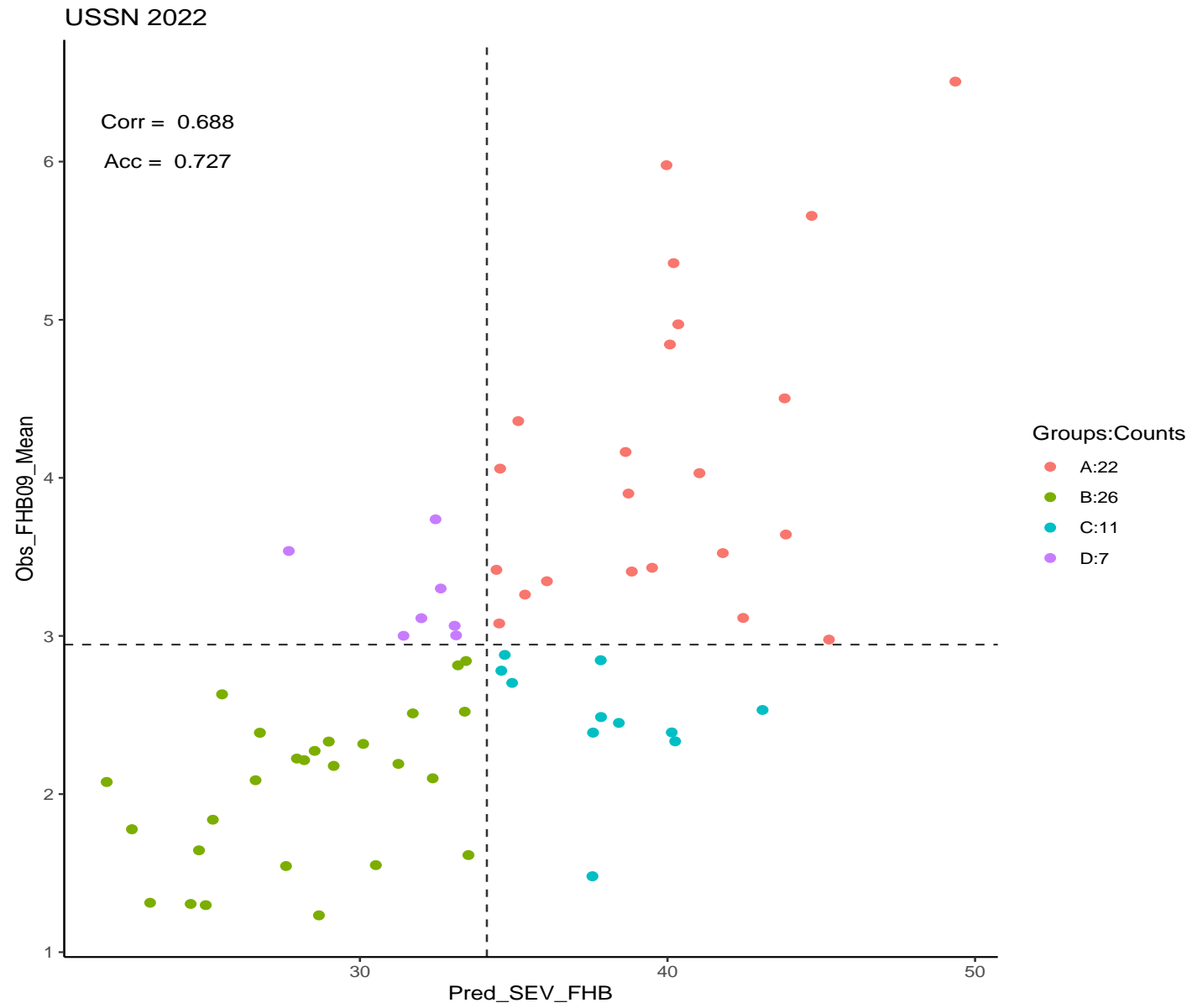
The first Uniform Southern Scab Nursery in 2000 had 22 entries, including two checks. Entries were submitted by Va Tech, NC State, Clemson, The University of Georgia and The Coker Pedigree Seed Company. Five locations returned data for Severity. Ernie and Futai 8944 were the most resistant entries, but were not significantly better than Coker 9474, Roane, and NC-Neuse sib (NC96-13965).

Coker 9474 and Roane were too late in maturity for the South. NC-Neuse was also resistant, but growers were focused on yield and did not regard scab as important. That changed dramatically in 2003 following the FHB epidemic in Maryland, Virginia and North Carolina.

Cowger, C., and Sutton, A. L. 2005. The southeastern U.S. Fusarium head blight epidemic of 2003. Online. Plant Health Progress doi:10.1094/PHP-2005-1026-01-RS.

Fusarium Head Blight Rating (0 - 9)

ENTRY NO	CULTIVAR/ DESIGNATION	C'ARK	U'BANA	N'PORT	F'VLL	L'XTON	K'STON	W'BORO	ALEX	C'STA	PLAINS	KWS	W'SAW	MEAN	GEBV SEVERITY	
		MD	IL	AR	AR	KY	NC	LA	LA	TX	GA	IL	VA	ALL LOC.		
															Rank	
1	ERNIE	1.7	1.1	0.2	0.4	1.0	1.5	1.5	1.0	5.0	1.4	1.3	2.5	1.5	6	28
2	COKER9835	3.5	8.4	4.3	5.8	6.5	9.0	5.0	8.3	6.0	3.0	6.5	5.5	6.0	65	40
3	BESS	1.9	3.1	0.2	0.4	4.5	2.5	0.5	0.5	3.0	.	1.5	1.5	1.6	7	23
4	JAMESTOWN	2.6	1.9	0.4	1.7	2.5	2.5	2.0	1.8	5.5	2.6	1.5	3.0	2.3	19	29
5	SS 8641	4.1	8.3	6.9	7.5	7.0	9.0	1.5	6.3	8.5	.	6.6	6.0	6.4	66	49
6	15VDH-FHB-MAS22-14	0.7	1.1	0.6	0.4	3.0	2.0	1.0	1.0	5.0	.	0.5	1.0	1.4	5	38
7	KWS347	2.4	3.4	0.6	0.0	2.5	4.0	1.0	3.0	5.5	.	0.9	3.0	2.3	19	38
8	KWS369	1.3	2.7	1.5	1.7	4.0	4.5	0.0	0.3	3.5	.	2.5	2.0	2.1	12	29
9	KWS394	0.4	0.3	0.2	0.4	1.5	5.5	0.0	0.5	5.0	0.2	0.1	1.5	1.3	2	25
10	KWS397	1.5	0.6	0.0	1.3	4.0	3.0	0.5	1.3	5.0	0.4	0.1	1.0	1.6	7	31
11	KWS403	0.8	1.0	0.2	0.0	1.0	4.5	0.5	0.5	2.5	.	0.1	2.5	1.1	1	29
12	KWS407	2.0	3.1	0.7	0.4	2.0	.	1.0	0.5	4.5	0.2	1.3	2.0	1.7	10	34
13	LA13176CBB-50-1-3	1.3	1.4	0.6	0.8	2.5	3.5	1.5	2.0	4.5	9.0	1.3	2.0	2.5	27	33
14	LA13202D-82-1	2.4	4.2	0.6	2.9	4.0	1.5	1.0	5.0	6.0	9.0	2.3	2.0	3.4	48	39
15	LA14173CBW-30-1-4	2.2	1.1	0.4	1.7	1.5	3.5	1.5	0.8	6.5	5.0	0.7	2.0	2.2	16	28
16	LA14261C-45-2	2.5	4.7	0.9	2.1	4.0	2.0	1.0	3.0	7.5	2.4	2.7	4.5	3.1	41	42
17	LA14269C-9-3	3.2	2.7	1.3	2.9	4.0	2.5	2.5	1.8	6.5	7.8	2.5	1.5	3.3	45	35
18	LA15005GBB-13-1-1	2.2	1.0	0.7	0.8	2.0	3.5	2.0	1.5	5.0	4.2	0.4	1.5	2.1	12	22
19	LA15005GBB-4-1-3	0.5	0.6	0.4	0.8	1.5	6.0	3.5	0.0	6.0	6.2	0.1	1.0	2.2	16	28
20	LA15092SBBW-25-1-2	0.8	2.2	0.7	0.4	4.5	4.0	2.0	2.0	6.0	1.4	1.7	1.5	2.3	19	29
21	NC13217-W293	2.6	6.2	2.2	2.5	5.5	5.0	0.0	1.5	4.0	0.2	2.9	2.0	2.9	37	35
22	NC13955-G125	0.7	6.1	1.9	1.3	1.5	1.0	1.0	4.5	7.5	1.4	4.1	2.5	2.8	33	35
23	NC13955-G135	1.5	5.7	2.4	2.9	3.5	2.0	2.0	3.8	5.5	4.6	4.4	4.0	3.5	51	42
24	NC15V25-20	1.1	1.6	0.6	0.8	1.5	3.5	1.0	3.3	6.5	3.4	1.0	1.0	2.1	12	32
25	NC18-16900	1.4	0.6	0.2	0.0	3.0	3.5	0.5	0.5	4.0	0.6	0.4	1.0	1.3	2	25
26	NC18-16901	0.9	0.9	0.2	0.4	4.5	2.0	0.5	0.5	4.0	0.2	0.6	1.0	1.3	2	23
27	NC18-16920	1.6	1.1	0.2	0.4	4.5	3.0	0.5	1.0	6.0	0.0	0.5	1.0	1.6	7	25
28	NC18-17619	3.6	6.2	1.5	1.3	4.0	4.0	0.5	1.5	5.5	0.4	3.8	2.0	2.8	34	38
29	TX20D5032	1.4	3.1	0.6	0.4	2.0	3.0	0.5	1.3	5.5	1.4	1.5	1.5	1.8	11	25
30	TX20D5354	3.6	3.2	2.0	2.1	1.5	7.5	3.5	5.0	4.0	0.4	2.8	4.0	3.3	45	33
31	TX20D5363	4.2	5.7	2.8	3.8	4.0	4.5	3.5	5.3	5.0	2.4	3.9	5.0	4.2	58	39
32	TX20D5368	2.8	2.5	1.7	3.8	3.5	4.0	1.0	2.0	6.5	2.2	3.4	3.5	3.1	41	33
33	GA131218-1-2-7 -20E15	6.7	4.6	4.1	7.1	5.5	8.0	2.5	5.5	7.5	0.2	6.2	6.5	5.4	63	40
34	GA151313-LDH-192 -20E48	4.9	6.5	1.9	4.6	3.5	5.0	2.5	5.3	6.0	0.6	4.2	3.5	4.0	56	41
35	GA161137LDH-23 -20LE3	6.5	8.2	4.3	4.6	4.5	3.5	1.0	5.0	6.5	0.2	5.8	4.0	4.5	60	44
36	GA161240LDH-113 -20LE6	3.5	1.9	1.1	2.1	2.0	5.0	1.5	3.3	3.5	0.2	1.8	2.0	2.3	19	30
37	GA151313-LDH-53 -20E18	3.2	2.2	0.9	3.8	3.5	3.5	2.5	1.0	4.0	0.2	2.1	3.5	2.5	27	43
38	GA151313-LDH-95 -20E19	2.4	5.3	0.7	1.3	4.5	3.5	1.0	2.3	3.0	0.6	2.1	2.0	2.4	24	40
39	GA12230-1 -6-6-3 -20E36	3.1	5.0	0.9	3.3	6.0	3.0	2.5	4.3	4.5	1.2	3.7	3.5	3.4	48	34
40	GA131214-8-5-2 -20LE12	3.3	2.6	0.9	2.9	5.5	5.0	2.0	3.3	6.0	0.6	5.1	4.0	3.4	48	40
41	GA131214-8-5-6 -20LE13	4.1	4.0	1.7	3.8	4.5	6.5	2.0	3.3	7.0	1.0	5.1	4.0	3.9	55	39
42	GA14235-7-2-6 -20LE31	10.8	6.8	4.3	5.4	6.0	8.0	1.5	5.8	6.0	1.2	5.2	7.0	5.7	64	45
43	18VDH-FHB-MAS07-164-01	9.5	7.2	2.6	6.7	4.0	4.5	2.0	5.0	7.0	0.4	4.3	5.0	4.8	61	40
44	VA20W-142	5.0	6.4	1.9	2.1	5.5	2.0	0.5	1.0	5.5	1.0	2.4	2.5	3.0	39	45
45	VA20W-171	3.4	4.1	1.5	2.9	2.0	6.0	3.0	2.5	5.0	1.0	3.5	2.5	3.1	41	32
46	VA20W-69	3.7	2.5	1.5	2.1	6.0	5.0	1.0	3.3	5.5	0.4	2.7	2.5	3.0	39	33
47	VA20W-52	4.0	2.7	1.3	2.5	3.5	6.0	1.0	1.5	5.0	0.4	2.6	2.0	2.7	32	35
48	18VDH-FHB-MAS06-152-03	3.4	2.2	0.6	1.7	5.0	4.5	1.0	2.8	6.0	1.2	2.3	3.5	2.8	34	33
49	DH17SRW136-043	4.7	3.9	1.9	2.9	3.5	4.0	1.5	3.8	6.5	0.6	3.0	4.0	3.3	45	36
50	17VTK6-61	3.2	4.7	2.8	2.1	3.5	6.0	3.0	3.8	5.5	0.4	4.1	3.5	3.5	51	28
51	UMD-FHBN-1	4.4	3.6	0.9	0.8	2.0	4.5	1.0	1.8	6.5	0.4	2.0	2.0	2.5	27	38
52	UMD-FHBN-2	4.4	3.6	1.5	1.7	4.0	1.5	3.0	4.0	5.0	1.0	3.8	3.5	3.1	41	35
53	UMD-FHBN-3	4.5	1.9	0.4	1.7	3.5	6.0	0.5	1.0	4.0	1.2	2.7	2.0	2.4	24	38
54	UMD-FHBN-4	1.5	5.9	1.9	1.3	2.5	4.0	1.0	1.3	4.0	0.4	1.9	2.5	2.3	19	40
55	UMD-FHBN-5	5.8	7.8	2.6	4.2	5.0	5.5	1.0	5.5	6.5	0.4	4.1	4.0	4.4	59	35
56	UMD-FHBN-6	2.3	2.3	0.6	1.3	3.5	5.0	0.5	1.5	5.5	0.2	3.6	2.5	2.4	24	27
57	UMD-FHBN-7	1.7	1.2	0.0	1.3	5.0	4.5	1.5	2.0	4.5	0.2	0.7	2.5	2.1	12	27
58	UMD-FHBN-8	4.2	2.3	0.2	1.7	2.5	4.0	1.0	3.8	5.0	0.2	2.3	4.5	2.6	31	26
59	SCGA121098-9-3-7-10	2.0	2.3	0.4	0.8	2.0	2.0	2.0	2.8	6.0	1.2	3.3	1.5	2.2	16	31
60	SCGA141638-8-4	5.0	6.3	2.4	2.1	1.0	6.5	3.0	4.5	4.0	1.4	4.0	3.5	3.6	53	44
61	SCAR160643LDH-8	9.0	1.5	0.4	0.8	3.5	5.5	1.5	1.0	4.0	0.2	1.3	1.5	2.5	27	32
62	SCLA19WF0306	5.0	4.7	2.4	2.5	5.5	5.0	3.0	2.3	5.0	1.4	5.6	2.5	3.7	54	32
63	SCGA141717-G1-4-1-5	.	7.7	2.8	4.2	3.5	7.0	5.0	6.3	5.5	2.0	5.3	5.5	5.0	62	40
64	SCGA14317-25-3	8.0	4.9	2.4	2.5	5.0	5.5	3.0	3.3	6.0	0.8	3.9	3.5	4.1	57	35
65	SCLA18WF0802-8	3.0	4.5	1.1	2.5	2.5	3.0	3.0	1.5	5.0	0.8	3.4	3.5	2.8	34	33
66	SCLA18WF0512-11-3	8.0	1.7	1.1	1.3	4.0	3.5	1.0	3.8	5.0	.	2.2	1.5	2.9	37	31
Mean		3.3	3.6	1.4	2.2	3.6	4.0	1.6	2.7	5.3	1.6	2.7	2.9	2.9		
CV%		.	.	56.0	55.0	34.9	33.6	37.5	36.7	22.5	.	.	24.7	45.3		
LSD(0.05)		.	.	1.1	1.6	2.5	3.0	1.0	1.7	4.3	.	.	1.4	1.1		
R-Square		.	.	0.81	0.76	0.74	0.77	0.87	0.87	0.61		
Correl w/ GEBV		0.45	0.72	0.65	0.65	0.37	0.27	0.24	0.55	0.36	0.01	0.63	0.61	0.69		



FHB Incidence (1-100)

ENTRY NO	CULTIVAR/ DESIGNATION	U'BANA IL	C'ARK MD	MEAN ALL LOC.	GEBV SEVERITY	
					Rank	
1	ERNIE	56	40	48	14	28
2	COKER9835	91	70	81	58	40
3	BESS	51	70	61	28	23
4	JAMESTOWN	76	60	68	40	29
5	SS 8641	97	80	88	62	49
6	15VDH-FHB-MAS22-14	61	15	38	10	38
7	KWS347	94	60	77	52	38
8	KWS369	81	40	60	25	29
9	KWS394	13	10	11	1	25
10	KWS397	25	50	37	9	31
11	KWS403	41	20	31	7	29
12	KWS407	73	45	59	24	34
13	LA13176CBB-50-1-3	30	20	25	5	33
14	LA13202D-82-1	77	40	58	23	39
15	LA14173CBW-30-1-4	75	45	60	25	28
16	LA14261C-45-2	75	60	67	38	42
17	LA14269C-9-3	81	70	75	48	35
18	LA15005GBB-13-1-1	17	30	24	4	22
19	LA15005GBB-4-1-3	10	20	15	3	28
20	LA15092SBBW-25-1-2	72	40	56	22	29
21	NC13217-W293	96	40	68	40	35
22	NC13955-G125	49	35	42	11	35
23	NC13955-G135	89	60	74	47	42
24	NC15V25-20	55	40	48	14	32
25	NC18-16900	3	20	11	1	25
26	NC18-16901	60	40	50	19	23
27	NC18-16920	15	40	28	6	25
28	NC18-17619	87	80	83	60	38
29	TX20D5032	55	40	47	13	25
30	TX20D5354	37	60	48	14	33
31	TX20D5363	83	70	76	49	39
32	TX20D5368	74	70	72	45	33
33	GA131218-1-2-7 -20E15	94	90	92	66	40
34	GA151313-LDH-192 -20E48	89	40	65	35	41
35	GA161137LDH-23 -20LE3	91	90	90	63	44
36	GA161240LDH-113 -20LE6	72	60	66	36	30
37	GA151313-LDH-53 -20E18	72	60	66	36	43
38	GA151313-LDH-95 -20E19	66	40	53	21	40
39	GA12230-1 -6-6-3 -20E36	58	45	52	20	34
40	GA131214-8-5-2 -20LE12	87	70	78	54	40
41	GA131214-8-5-6 -20LE13	74	50	62	30	39
42	GA14235-7-2-6 -20LE31	97	85	91	65	45
43	18VDH-FHB-MAS07-164-01	90	90	90	63	40
44	VA20W-142	79	65	72	45	45
45	VA20W-171	52	70	61	28	32
46	VA20W-69	76	50	63	32	33
47	VA20W-52	93	60	77	52	35
48	18VDH-FHB-MAS06-152-03	66	70	68	40	33
49	DH17SRW136-043	93	60	76	49	36
50	17VTK6-61	88	50	69	43	28
51	UMD-FHBN-1	58	40	49	18	38
52	UMD-FHBN-2	90	70	80	57	35
53	UMD-FHBN-3	87	70	79	55	38
54	UMD-FHBN-4	61	30	45	12	40
55	UMD-FHBN-5	92	65	79	55	35
56	UMD-FHBN-6	88	40	64	33	27
57	UMD-FHBN-7	51	45	48	14	27
58	UMD-FHBN-8	79	50	64	33	26
59	SCGA121098-9-3-7-10	35	30	33	8	31
60	SCGA141638-8-4	79	60	70	44	44
61	SCAR160643LDH-8	91	70	81	58	32
62	SCLA19WF0306	93	40	67	38	32
63	SCGA141717-G1-4-1-5	82	90	86	61	40
64	SCGA14317-25-3	72	80	76	49	35
65	SCLA18WF0802-8	84	40	62	31	33
66	SCLA18WF0512-11-3	61	60	60	25	31

Mean	69	53	61
CV%	8.7	.	22.3
LSD(0.05)	24	.	27
R-Square	.	.	0.83
Correl w/ GEBV	0.58	0.51	0.60

FHB Severity (1-100)

ENTRY NO	CULTIVAR/ DESIGNATION	U'BANA KWS		MEAN		GEBV SEVERITY
		IL	IL	ALL LOC.	Rank	
1	ERNIE	12	14	13	12	28
2	COKER9835	92	71	82	65	40
3	BESS	34	17	25	23	23
4	JAMESTOWN	21	17	19	16	29
5	SS 8641	92	72	82	65	49
6	15VDH-FHB-MAS22-14	13	5	9	8	38
7	KWS347	38	10	24	20	38
8	KWS369	30	28	29	30	29
9	KWS394	3	1	2	1	25
10	KWS397	7	1	4	2	31
11	KWS403	11	1	6	4	29
12	KWS407	34	15	24	20	34
13	LA13176CBB-50-1-3	15	14	14	13	33
14	LA13202D-82-1	46	26	36	37	39
15	LA14173CBW-30-1-4	12	8	10	10	28
16	LA14261C-45-2	52	30	41	39	42
17	LA14269C-9-3	30	27	28	28	35
18	LA15005GBB-13-1-1	11	5	8	6	22
19	LA15005GBB-4-1-3	7	1	4	2	28
20	LA15092SBBW-25-1-2	24	19	22	19	29
21	NC13217-W293	68	32	50	50	35
22	NC13955-G125	67	45	56	54	35
23	NC13955-G135	63	48	56	54	42
24	NC15V25-20	18	11	14	13	32
25	NC18-16900	7	4	6	4	25
26	NC18-16901	10	7	8	6	23
27	NC18-16920	12	5	9	8	25
28	NC18-17619	68	41	55	53	38
29	TX20D5032	34	16	25	23	25
30	TX20D5354	35	31	33	36	33
31	TX20D5363	63	43	53	52	39
32	TX20D5368	27	38	32	34	33
33	GA131218-1-2-7 -20E15	51	68	59	58	40
34	GA151313-LDH-192 -20E48	72	46	59	58	41
35	GA161137LDH-23 -20LE3	90	64	77	64	44
36	GA161240LDH-113 -20LE6	21	20	20	17	30
37	GA151313-LDH-53 -20E18	25	23	24	20	43
38	GA151313-LDH-95 -20E19	59	23	41	39	40
39	GA12230-1 -6-6-3 -20E36	55	41	48	46	34
40	GA131214-8-5-2 -20LE12	29	56	42	42	40
41	GA131214-8-5-6 -20LE13	44	56	50	50	39
42	GA14235-7-2-6 -20LE31	75	57	66	62	45
43	18VDH-FHB-MAS07-164-01	79	47	63	60	40
44	VA20W-142	71	26	49	49	45
45	VA20W-171	45	38	42	42	32
46	VA20W-69	27	30	28	28	33
47	VA20W-52	29	29	29	30	35
48	18VDH-FHB-MAS06-152-03	24	26	25	23	33
49	DH17SRW136-043	42	33	38	38	36
50	17VTK6-61	52	45	48	46	28
51	UMD-FHBN-1	39	22	31	32	38
52	UMD-FHBN-2	40	42	41	39	35
53	UMD-FHBN-3	21	30	26	27	38
54	UMD-FHBN-4	65	20	43	44	40
55	UMD-FHBN-5	86	45	65	61	35
56	UMD-FHBN-6	25	40	32	34	27
57	UMD-FHBN-7	14	7	10	10	27
58	UMD-FHBN-8	25	26	25	23	26
59	SCGA121098-9-3-7-10	26	36	31	32	31
60	SCGA141638-8-4	69	44	57	56	44
61	SCAR160643LDH-8	16	14	15	15	32
62	SCLA19WF0306	51	62	57	56	32
63	SCGA141717-G1-4-1-5	84	59	71	63	40
64	SCGA14317-25-3	53	43	48	46	35
65	SCLA18WF0802-8	49	37	43	44	33
66	SCLA18WF0512-11-3	19	24	21	18	31

Mean 40 30 35
CV% 10.7 6.2 30.3
LSD(0.05) 17 3.9 22
R-Square . . 0.89

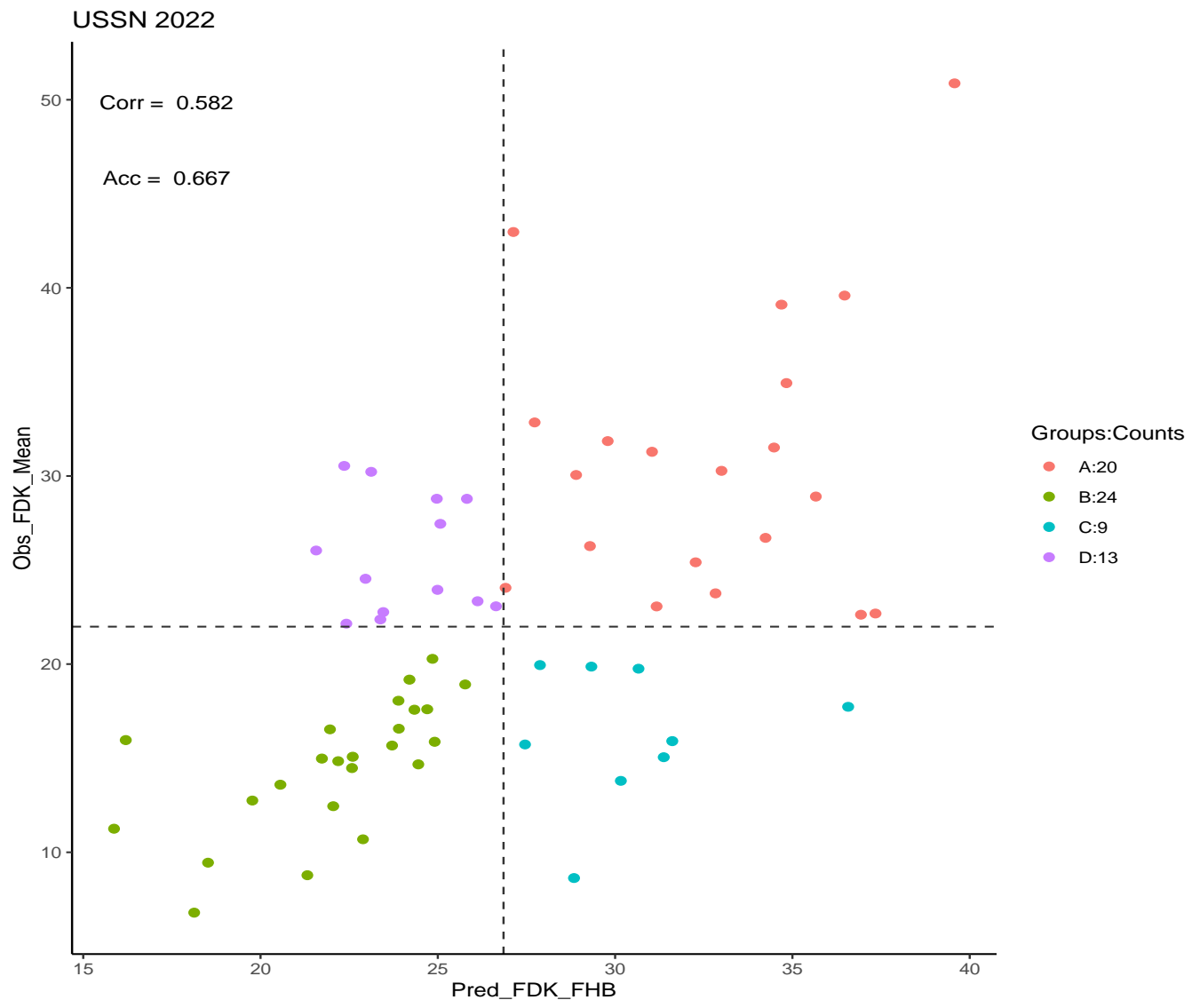
FHB Index (1-100)

	CULTIVAR/ DESIGNATION	URBANA IL	RANK
1	ERNIE	7	10
2	COKER9835	84	65
3	BESS	17	22
4	JAMESTOWN	16	20
5	SS 8641	89	66
6	15VDH-FHB-MAS22-14	8	12
7	KWS347	36	42
8	KWS369	24	33
9	KWS394	0	1
10	KWS397	2	4
11	KWS403	5	7
12	KWS407	25	35
13	LA13176CBB-50-1-3	5	7
14	LA13202D-82-1	35	41
15	LA14173CBW-30-1-4	9	13
16	LA14261C-45-2	39	45
17	LA14269C-9-3	24	33
18	LA15005GBB-13-1-1	2	4
19	LA15005GBB-4-1-3	1	3
20	LA15092SBBW-25-1-2	17	22
21	NC13217-W293	65	59
22	NC13955-G125	33	40
23	NC13955-G135	56	55
24	NC15V25-20	10	15
25	NC18-16900	0	1
26	NC18-16901	6	9
27	NC18-16920	2	4
28	NC18-17619	59	57
29	TX20D5032	19	25
30	TX20D5354	13	17
31	TX20D5363	52	53
32	TX20D5368	20	27
33	GA131218-1-2-7 -20E15	48	51
34	GA151313-LDH-192 -20E48	64	58
35	GA161137LDH-23 -20LE3	81	64
36	GA161240LDH-113 -20LE6	15	18
37	GA151313-LDH-53 -20E18	18	24
38	GA151313-LDH-95 -20E19	39	45
39	GA12230-1 -6-6-3 -20E36	32	38
40	GA131214-8-5-2 -20LE12	25	35
41	GA131214-8-5-6 -20LE13	32	38
42	GA14235-7-2-6 -20LE31	73	62
43	18VDH-FHB-MAS07-164-01	72	61
44	VA20W-142	56	55
45	VA20W-171	23	31
46	VA20W-69	21	29
47	VA20W-52	27	37
48	18VDH-FHB-MAS06-152-03	16	20
49	DH17SRW136-043	39	45
50	17VTK6-61	46	50
51	UMD-FHBN-1	23	31
52	UMD-FHBN-2	36	42
53	UMD-FHBN-3	19	25
54	UMD-FHBN-4	39	45
55	UMD-FHBN-5	80	63
56	UMD-FHBN-6	22	30
57	UMD-FHBN-7	7	10
58	UMD-FHBN-8	20	27
59	SCGA121098-9-3-7-10	9	13
60	SCGA141638-8-4	55	54
61	SCAR160643LDH-8	15	18
62	SCLA19WF0306	48	51
63	SCGA141717-G1-4-1-5	69	60
64	SCGA14317-25-3	38	44
65	SCLA18WF0802-8	42	49
66	SCLA18WF0512-11-3	12	16

Mean 31
 CV% .
 LSD(0.05) .
 R-Square .

Percent Fusarium Damaged Kernels

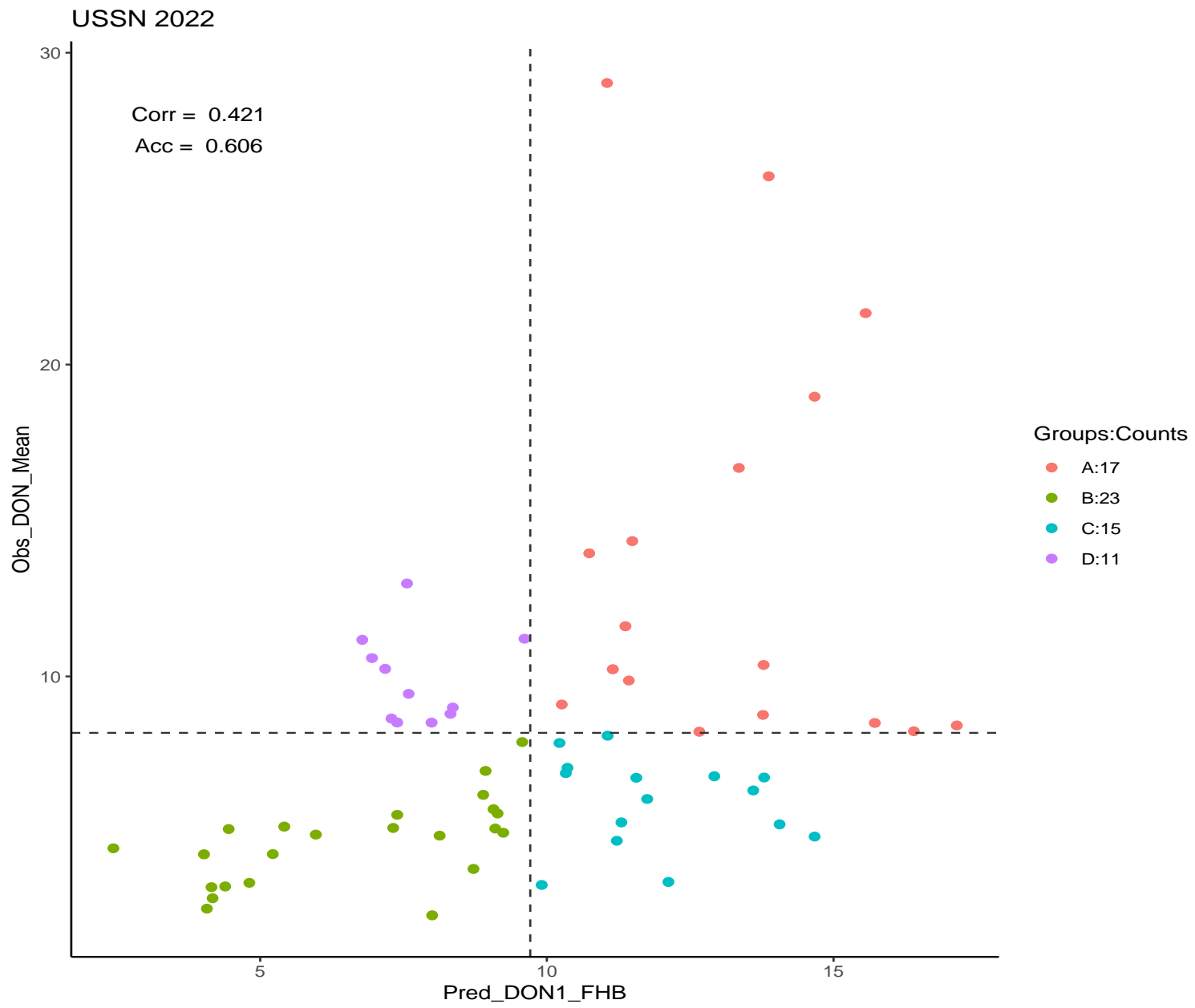
ENTRY NO	CULTIVAR/ DESIGNATION	C'ARK MD	U'BANA IL	LX'TON KY	F'VIL AR	FL'NCE SC	K'STON NC	W'BORO LA	ALEX LA	C'STA TX	W'SAW VA	MEAN ALL LOC.	GEBV SEVERITY	
													Rank	Rank
1	ERNIE	4	19	7	5	11	13	8	13	4	25	11	5	23
2	COKER9835	30	84	22	55	6	65	20	50	6	58	40	64	36
3	BESS	9	33	10	9	11	5	3	13	3	18	11	5	16
4	JAMESTOWN	9	30	12	12	10	5	15	18	6	19	14	9	21
5	SS 8641	44	92	52	83	25	50	40	70	16	36	51	66	40
6	15VDH-FHB-MAS22-14	16	20	10	12	6	0	5	10	0	7	9	2	29
7	KWS347	7	54	15	25	7	8	10	23	3	25	18	24	24
8	KWS369	6	60	20	33	9	3	13	13	0	21	18	24	25
9	KWS394	12	20	10	16	17	38	8	10	1	18	15	12	22
10	KWS397	8	29	20	15	8	8	13	18	3	18	14	9	30
11	KWS403	19	21	7	17	14	10	5	10	1	21	12	7	22
12	KWS407	8	23	17	37	15	.	10	10	2	27	16	17	22
13	LA13176CBB-50-1-3	8	53	2	23	10	20	8	10	0	24	16	17	27
14	LA13202D-82-1	10	39	15	20	8	3	10	28	3	24	16	17	25
15	LA14173CBW-30-1-4	4	31	42	17	9	23	10	15	2	13	17	23	24
16	LA14261C-45-2	8	61	20	30	10	25	18	30	3	28	23	36	26
17	LA14269C-9-3	14	67	17	31	8	3	18	18	2	23	20	30	28
18	LA15005GBB-13-1-1	6	47	30	33	10	5	10	5	1	13	16	17	16
19	LA15005GBB-4-1-3	3	26	17	35	15	35	6	6	0	8	15	12	23
20	LA15092SBBW-25-1-2	11	33	17	18	7	8	10	8	2	37	15	12	22
21	NC13217-W293	11	44	7	39	5	5	15	15	4	12	16	17	24
22	NC13955-G125	12	62	15	43	19	3	15	35	4	20	23	36	23
23	NC13955-G135	20	65	20	40	6	3	20	28	4	33	24	42	33
24	NC15V25-20	7	17	7	14	8	50	5	20	1	16	14	9	23
25	NC18-16900	4	12	10	21	8	10	6	5	1	12	9	2	21
26	NC18-16901	6	11	12	13	8	0	5	5	1	7	7	1	18
27	NC18-16920	6	18	12	14	7	3	10	13	1	11	9	2	19
28	NC18-17619	8	57	10	28	14	18	5	10	3	8	16	17	32
29	TX20D5032	7	34	32	18	8	0	8	13	1	7	13	8	20
30	TX20D5354	7	31	37	37	5	50	15	20	1	28	23	36	27
31	TX20D5363	12	58	47	60	7	30	33	30	6	30	31	57	31
32	TX20D5368	12	47	72	48	23	38	18	20	5	24	31	57	22
33	GA131218-1-2-7 -20E15	33	60	47	62	14	50	43	63	5	54	43	65	27
34	GA151313-LDH-192 -20E48	16	83	22	41	15	20	18	43	3	40	30	54	29
35	GA161137LDH-23 -20LE3	25	83	37	61	12	50	18	35	5	23	35	62	35
36	GA161240LDH-113 -20LE6	15	54	22	39	11	30	15	20	1	17	22	34	23
37	GA151313-LDH-53 -20E18	12	42	37	31	13	13	15	23	1	11	20	30	31
38	GA151313-LDH-95 -20E19	15	34	22	23	12	0	10	25	3	6	15	12	31
39	GA12230-1 -6-6-3 -20E36	15	68	22	36	11	3	28	35	5	23	25	45	23
40	GA131214-8-5-2 -20LE12	25	68	15	33	5	23	25	20	2	25	24	42	27
41	GA131214-8-5-6 -20LE13	28	55	10	40	6	40	38	25	3	44	29	51	25
42	GA14235-7-2-6 -20LE31	31	78	32	58	16	35	45	55	4	37	39	63	35
43	18VDH-FHB-MAS07-164-01	21	70	57	52	8	5	25	45	5	16	30	54	33
44	VA20W-142	18	70	25	42	11	3	20	18	5	17	23	36	37
45	VA20W-171	29	69	22	43	15	23	40	25	5	17	29	51	26
46	VA20W-69	18	43	17	32	9	10	20	23	3	15	19	28	26
47	VA20W-52	24	58	47	48	20	23	30	30	9	30	32	59	30
48	18VDH-FHB-MAS06-152-03	16	50	12	27	7	23	13	20	5	31	20	30	25
49	DH17SRW136-043	23	82	15	48	9	35	33	38	7	39	33	61	28
50	17VTK6-61	13	60	37	53	14	18	23	38	6	14	27	49	25
51	UMD-FHBN-1	15	61	27	18	10	10	13	18	3	6	18	24	24
52	UMD-FHBN-2	33	56	25	32	12	3	23	23	4	31	24	42	25
53	UMD-FHBN-3	12	46	25	26	9	28	18	13	1	23	20	30	29
54	UMD-FHBN-4	18	69	15	48	9	30	20	23	5	30	27	49	34
55	UMD-FHBN-5	23	74	30	50	11	40	28	28	7	25	32	59	34
56	UMD-FHBN-6	24	70	30	30	8	28	13	13	6	40	26	47	22
57	UMD-FHBN-7	13	48	22	25	24	13	15	20	0	12	19	28	24
58	UMD-FHBN-8	17	45	27	26	16	5	20	30	4	31	22	34	22
59	SCGA121098-9-3-7-10	14	40	17	25	10	3	10	20	4	4	15	12	24
60	SCGA141638-8-4	28	51	10	35	5	28	18	33	2	18	23	36	37
61	SCAR160643LDH-8	32	56	37	31	16	40	50	28	2	10	30	54	23
62	SCLA19WF0306	25	50	37	42	15	23	13	20	1	38	26	47	29
63	SCGA141717-G1-4-1-5	35	58	22	33	4	50	18	28	4	38	29	51	36
64	SCGA14317-25-3	28	48	7	36	2	45	18	20	4	23	23	36	31
65	SCLA18WF0802-8	17	46	15	35	12	5	18	15	1	13	18	24	37
66	SCLA18WF0512-11-3	24	49	27	47	22	23	18	25	3	17	25	45	32
Mean		16	50	25	11	11	19.0	17.5	23.0	3.3	22.3	21.9		
CV%		.	9.3	.	44.0	.	25.6	30.0	23.5	22.5	31.3	44.2		
LSD(0.05)		.	18	.	6	.	17.0	8.7	9.0	4.3	14.0	8.6		
R-Square		.	.	0.76	.	.	0.89	0.89	0.92	.	.	0.72		
Correl w/ GEBV		0.58	0.58	0.22	0.60	0.02	0.37	0.39	0.54	0.41	0.30	0.58		



DON (ppm)

ENTRY NO	CULTIVAR/ DESIGNATION	C'ARK			LX'TON C. STA		KINSTON	W'BORO	ALEX	MEAN	GEBV DON
		MD	KY	TX	NC	LA	LA	ALL LOC.			
<i>Rank</i>											
1	ERNIE	7	2	0	2	2	5	3	2	10	
2	COKER9835	45	4	1	20	5	9	17	62	13	
3	BESS	11	2	1	1	1	4	4	9	9	
4	JAMESTOWN	13	3	1	2	2	6	5	13	6	
5	SS 8641	62	3	3	15	10	41	26	65	14	
6	15VDH-FHB-MAS22-14	6	0	0	1	2	3	2	1	8	
7	KWS347	27	3	2	2	2	12	9	42	10	
8	KWS369	26	2	1	1	2	4	7	31	10	
9	KWS394	9	1	0	1	1	5	3	2	4	
10	KWS397	16	2	1	2	2	4	5	13	11	
11	KWS403	17	2	1	2	1	4	5	13	5	
12	KWS407	19	2	1	.	2	4	5	13	12	
13	LA13176CBB-50-1-3	42	1	0	1	2	3	9	42	8	
14	LA13202D-82-1	3	1	1	1	3	9	3	2	12	
15	LA14173CBW-30-1-4	13	1	1	0	3	4	4	9	4	
16	LA14261C-45-2	22	2	1	1	4	10	8	36	10	
17	LA14269C-9-3	26	3	1	1	4	7	8	36	11	
18	LA15005GBB-13-1-1	12	1	0	1	1	2	3	2	5	
19	LA15005GBB-4-1-3	17	2	0	0	1	1	4	9	5	
20	LA15092SBBW-25-1-2	17	2	0	2	2	3	5	13	4	
21	NC13217-W293	37	1	1	2	5	6	10	51	7	
22	NC13955-G125	19	1	1	0	3	8	6	25	9	
23	NC13955-G135	12	2	1	1	4	7	5	13	14	
24	NC15V25-20	15	1	1	4	1	5	5	13	9	
25	NC18-16900	11	0	1	1	1	2	3	2	4	
26	NC18-16901	10	0	0	0	1	1	3	2	4	
27	NC18-16920	10	0	1	1	1	4	3	2	4	
28	NC18-17619	18	0	2	2	1	3	5	13	9	
29	TX20D5032	15	1	1	1	2	3	4	9	2	
30	TX20D5354	30	1	1	1	6	6	9	42	7	
31	TX20D5363	10	5	1	1	8	11	7	31	9	
32	TX20D5368	43	1	1	1	5	7	11	55	7	
33	GA131218-1-2-7 -20E15	81	3	2	9	16	36	29	66	11	
34	GA151313-LDH-192 -20E48	30	4	1	4	3	9	10	51	11	
35	GA161137LDH-23 -20LE3	18	5	1	3	3	13	9	42	16	
36	GA161240LDH-113 -20LE6	56	1	0	2	2	4	13	59	8	
37	GA151313-LDH-53 -20E18	22	2	0	1	3	3	6	25	12	
38	GA151313-LDH-95 -20E19	19	3	1	1	2	7	6	25	14	
39	GA12230-1 -6-6-3 -20E36	20	3	1	0	7	10	8	36	10	
40	GA131214-8-5-2 -20LE12	48	3	0	8	4	9	14	60	11	
41	GA131214-8-5-6 -20LE13	36	2	1	3	6	11	12	58	11	
42	GA14235-7-2-6 -20LE31	62	3	1	11	9	22	22	64	16	
43	18VDH-FHB-MAS07-164-01	28	4	1	3	6	15	11	55	10	
44	VA20W-142	20	1	1	5	3	5	7	31	14	
45	VA20W-171	25	4	1	1	6	9	9	42	8	
46	VA20W-69	14	1	1	2	2	7	5	13	7	
47	VA20W-52	51	5	3	6	6	27	19	63	15	
48	18VDH-FHB-MAS06-152-03	31	1	1	1	3	7	9	42	7	
49	DH17SRW136-043	29	3	3	6	4	10	10	51	14	
50	17VTK6-61	35	2	1	3	4	9	11	55	7	
51	UMD-FHBN-1	23	1	1	1	2	7	7	31	10	
52	UMD-FHBN-2	30	2	1	1	3	8	9	42	8	
53	UMD-FHBN-3	13	2	2	2	3	4	5	13	11	
54	UMD-FHBN-4	22	2	4	4	2	12	9	42	14	
55	UMD-FHBN-5	23	3	2	1	3	11	8	36	13	
56	UMD-FHBN-6	40	3	3	19	2	5	14	60	11	
57	UMD-FHBN-7	20	1	1	1	1	4	6	25	7	
58	UMD-FHBN-8	28	3	2	2	2	9	9	42	8	
59	SCGA121098-9-3-7-10	16	1	1	0	2	5	5	13	8	
60	SCGA141638-8-4	20	3	1	5	3	10	8	36	16	
61	SCAR160643LDH-8	25	2	2	6	4	14	10	51	11	
62	SCLA19WF0306	21	1	1	1	1	5	6	25	9	
63	SCGA141717-G1-4-1-5	23	4	2	2	5	8	8	36	17	
64	SCGA14317-25-3	21	1	1	4	2	6	7	31	13	
65	SCLA18WF0802-8	12	4	1	1	3	5	5	13	15	
66	SCLA18WF0512-11-3	13	3	1	1	2	9	6	25	9	

Mean	24	2	1.1	3.0	3.3	8.2	8
CV%	.	.	42.5	88.3	40.0	38.0	78
LSD(0.05)	.	.	0.9	5	2	5	8
R-Square	.	0.77	.	0.85	0.88	0.91	0.75
Correl w/ GEBV	0.28	0.60	0.46	0.42	0.34	0.47	0.42



Genotypic Analyses of Regions Associated with FHB Resistance and Other Pertinent Loci

DESIGNATION	Rht-B1	Rht-D1	Fhb1	Fhb Massey 3BL	Fhb_1B_Jamesto wn	Fhb_1A_Neuse	Fhb_6A_Neuse	Fhb_2B_Bess	Fhb_3B_Bess	Yr_4BL	Yr17/Lr37/Sr38	Lr9	Lr18	H13	HF_7D	Bdv2/3	Pm1a	Pm54
1 ERNIE	B1b	D1a		Yes		Yes	Yes			Yes								
2 COKER9835	B1a	D1b										Yes						Yes
3 BESS	B1b	D1a			Yes	Yes	Yes	Yes	Yes									
4 JAMESTOWN	B1a	D1b		Yes	Yes					Yes			Yes					
5 SS 8641	B1a	D1b									Yes	Yes					Yes	
6 15VDH-FHB-MAS22-14	B1a	D1b	Fhb1	Het						Het	Yes	Yes					Het	
7 KWS347	B1b	D1a	Fhb1							Yes								
8 KWS369	B1b	D1a		Yes	Yes					Yes								
9 KWS394	B1b	D1a	Fhb1			Het				Yes						Yes	Yes	
10 KWS397	B1b	D1a	Fhb1			Yes				Yes	Yes					Yes		
11 KWS403	B1b	D1a	Fhb1							Yes	Yes					Yes	Het	
12 KWS407	B1b	D1a		Yes	Yes					Yes								Yes
13 LA13176CBB-50-1-3	B1a	D1b	Fhb1							Yes	Yes	Yes	Yes					
14 LA13202D-82-1	B1a	D1b								Yes	Yes	Yes	Yes					
15 LA14173CBW-30-1-4			Fhb1			Yes				Yes	Yes	Yes	Yes		Het			
16 LA14261C-45-2	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
17 LA14269C-9-3	B1a	D1b				Yes				Yes	Yes		het	Yes		ND		
18 LA15005GBB-13-1-1	B1b	D1a	Fhb1		Yes	Yes	Yes							Het			Het	
19 LA15005GBB-4-1-3	B1b	D1a	Fhb1		Yes	Yes					Yes			Yes				
20 LA15092SBBW-25-1-2					Yes					Yes	Yes	Yes						Yes
21 NC13217-W293	B1a	D1b	Fhb1										Yes					
22 NC13955-G125	B1a	D1b								Yes	Yes		Yes					
23 NC13955-G135	B1a	D1b								Het			Yes					
24 NC15V25-20	B1a	D1b	Fhb1		Yes					Het	Yes	Yes						
25 NC18-16900	B1b	D1a	Fhb1	Yes	Yes	Yes					Yes	Yes	Yes	Yes			Yes	
26 NC18-16901	B1b	D1a	Fhb1	Yes	Yes	Yes					Yes	Yes	Yes	Yes			Yes	
27 NC18-16920	B1b	D1a	Fhb1	Yes	Yes	Yes	Het				Yes	Yes	Yes	Yes			Yes	
28 NC18-17619						Yes					Yes							
29 TX20D5032			Fhb1		Yes	Yes	Yes			Yes	Yes			Yes				
30 TX20D5354	B1a	D1b	Fhb1								Yes		Yes					
31 TX20D5363	B1a	D1b			Yes	Yes					Yes				Yes			
32 TX20D5368	B1a	D1b	Fhb1		Yes					Yes							Yes	
33 GA131218-1-2-7 -20E15	B1a	D1b			Yes						Yes			Yes				
34 GA151313-LDH-192 -20E4	B1a	D1b			Yes	Yes					Yes		Yes	Yes				
35 GA161137LDH-23 -20LE3	B1a	D1b								Yes	Yes			Yes				Yes
36 GA161240LDH-113 -20LE6	B1a	D1b	Fhb1			Yes				Yes	Yes						Yes	
37 GA151313-LDH-53 -20E18	B1a	D1b			Yes						Yes	Yes	Yes	Yes				
38 GA151313-LDH-95 -20E19	B1a	D1b			Yes						Yes	Yes	Yes	Yes				
39 GA12230-1 -6-6-3 -20E36	B1a	D1b				Yes					Yes	Yes	Yes	Yes				
40 GA131214-8-5-2 -20LE12	B1a	D1b			Yes						Yes		Yes					
41 GA131214-8-5-6 -20LE13	B1a	D1b			Yes						Yes		Yes					
42 GA14235-7-2-6 -20LE31	B1a	D1b			Yes						Yes	Yes						
43 18VDH-FHB-MAS07-164-0	B1a	D1b					Yes			Yes	Yes	Yes	Yes	Yes				Yes
44 VA20W-142	B1a	D1b			Yes						Yes	Yes	Yes					
45 VA20W-171	B1a	D1b		Het	Yes	Yes		Het		Yes	Yes	Yes	Het					
46 VA20W-69	B1a	D1b			Yes					Yes	Yes	Yes	Yes					
47 VA20W-52	B1b	D1a								Yes		Yes					Yes	
48 18VDH-FHB-MAS06-152-0	B1a	D1b	Fhb1				Yes			Yes		Yes						
49 DH17SRW136-043	B1b	D1a									Yes							
50 17VTK6-61	B1a	D1b			Yes	Yes	Yes				Yes	Yes	Yes	Yes			Yes	
51 UMD-FHBN-1	B1a	D1b					Yes				Yes	Yes	?					
52 UMD-FHBN-2	B1a	D1b			Yes	Yes				Yes			Yes					
53 UMD-FHBN-3	B1a	D1b					Yes			Yes								
54 UMD-FHBN-4	B1b	D1a								Yes							Yes	
55 UMD-FHBN-5	B1a	D1b			Yes	Het				Yes		Yes						
56 UMD-FHBN-6	B1b	D1a			Yes												Yes	
57 UMD-FHBN-7	B1a	D1b	Fhb1							Yes	Yes		Yes					
58 UMD-FHBN-8	B1a	D1b				Yes				Yes	Yes		Het					
59 SCGA121098-9-3-7-10	B1a	D1b			Yes	Yes				Yes	Yes							
60 SCGA141638-8-4	B1a	D1b									Yes			Yes				
61 SCAR160643LDH-8	B1a	D1b	Fhb1			Yes					Yes						Yes	
62 SCLA19WF0306	B1b	D1a			Yes	Yes					Yes			Het			Yes	
63 SCGA141717-G1-4-1-5	B1a	D1b								Yes	Yes				Yes		Yes	Yes
64 SCGA14317-25-3	B1a	D1b				Yes					Yes		Yes					
65 SCLA18WF0802-8	B1a	D1b		Yes						Yes	Yes				Yes			Yes
66 SCLA18WF0512-11-3	B1a	D1b		Yes						Yes	Yes	Yes	Yes	Yes				

SSR MARKER GENOTYPES

CULTIVAR/ DESIGNATION	Sumai 3 allele at	
	Xgwm 493 Locus	Xgwm533 Locus
1 ERNIE	NO	NO
2 COKER 9835	NO	NO
3 COKER 9474	YES	SIMILAR (144 bp) ²
4 B950943	NO	NO
5 B960208	SIMILAR (192 bp) ¹	NO
6 B961378	SIMILAR (190 bp)	NO
7 GA90524E1	NO	NO
8 GA921188E43	NO	NO
9 GA921221E16	SIMILAR (191 bp)	NO
10 GA92485E15	NO	NO
11 VA96-54-326	SIMILAR (190 bp)	NO
12 VA98W-591	NO	NO
13 VA98W-593	SIMILAR (190 bp)	NO
14 VA99W-550	SIMILAR (190 bp)	NO
15 VA99W-562	SIMILAR (190 bp)	NO
16 VA99W-565	NO	NO
17 VA99W-566	SIMILAR (190 bp)	NO
18 AW-D97-6075	SIMILAR (190 bp)	NO
19 AW-D97*6940	NO	NO
20 AW-D97*6961	NO	NO
21 AW-D97-6740	SIMILAR (190 bp)	NO
22 MDV 36-17	SIMILAR (191 bp)	NO
23 NC96-13155	SIMILAR (190 bp)	NO
24 NC96-13156	SIMILAR (190 bp)	NO
25 NC96-13965	SIMILAR (190 bp)	NO
26 AR93048-8-2	NO	NO
27 AR93035-4-2	SIMILAR (190bp)	NO
28 AR93052-1-1	NO	NO
29 AR908-8-2	SIMILAR (190bp)	NO

¹ FRAGMENT OF 194 bp OBSERVED IN SUMAI 3.

² FRAGMENT OF 142 bp OBSERVED IN SUMAI 3.

The Southern Coordinated Project has been greatly assisted by Gina Brown-Guedira's USDA-ARS Eastern Genotyping Lab. But she actually started assisting us when still in Kansas! This is the first nursery marker report in the USWBSI based on the 2001 entries in the Uniform Southern Scab Nursery.

Genotypic Analyses and Machine Learning Estimation of Regions Associated with FHB Resistance

Entry	DESIGNATION	Fhb1	Fhb1 ML*	Fhb_3BL_Massey	Fhb 3B Massey ML*	Fhb_1B_Jamesto wn	Fhb 1B Jamestown ML*	Fhb_1A_Neuse	Fhb 1A Neuse ML*	Fhb_4A_Neuse	Fhb 4A Neuse ML*	Fhb_6A_Neuse	Fhb 6A Neuse ML*	Fhb_2B_Bess	Fhb 2B Bess ML*	Fhb_3B_Bess	Fhb 3B Bess ML*
1	ERNIE			Yes	Yes			Yes	Yes	Het		Yes	Yes				
2	COKER9835									Yes	Yes						
3	BESS					Yes	Yes	Yes	Yes			Yes		Yes	Yes	Yes	Yes
4	JAMESTOWN					Yes	Yes	Yes	Yes								
5	SS 8641																
6	15VDH-FHB-MAS22-14	Fhb1		Het	Yes												
7	KWS347	Fhb1															
8	KWS369			Yes	Yes	Yes	Yes										
9	KWS394	Fhb1	Fhb1					Het	Yes								
10	KWS397	Fhb1	Fhb1					Yes		Yes	Yes						
11	KWS403	Fhb1	Fhb1														
12	KWS407			Yes	Yes	Yes	Yes	Yes									
13	LA13176CBB-50-1-3	Fhb1	Fhb1														
14	LA13202D-82-1									Yes	Yes						
15	LA14173CBW-30-1-4	Fhb1	Fhb1					Yes	Yes								
16	LA14261C-45-2	ND		ND		ND		ND		ND							ND
17	LA14269C-9-3							Yes	Yes	Yes	Yes						
18	LA15005GBB-13-1-1	Fhb1	Fhb1			Yes	Yes	Yes	Yes			Yes	Yes				
19	LA15005GBB-4-1-3	Fhb1	?			Yes	Yes	Yes	Yes								
20	LA15092SBBW-25-1-2					Yes	Yes			Yes	Yes						
21	NC13217-W293	Fhb1	Fhb1														
22	NC13955-G125																
23	NC13955-G135																
24	NC15V25-20	Fhb1				Yes	Yes										
25	NC18-16900	Fhb1	Fhb1	Yes	Yes	Yes	Yes	Yes	Yes			Yes					
26	NC18-16901	Fhb1	Fhb1	Yes	Yes	Yes	Yes	Yes	Yes			Yes					
27	NC18-16920	Fhb1	Fhb1	Yes	Yes	Yes	Yes	Yes	Yes			Het	Yes				
28	NC18-17619							Yes	Yes	Yes	Yes						
29	TX20D5032	Fhb1	Fhb1			Yes	Yes	Yes	Yes			Yes	Yes				
30	TX20D5354	Fhb1	Fhb1							Yes							
31	TX20D5363					Yes	Yes	Yes	Yes	Yes	Yes						
32	TX20D5368	Fhb1	Fhb1			Yes	Yes			Yes	Yes						
33	GA131218-1-2-7 -20E15					Yes	Yes			Yes	Yes						
34	GA151313-LDH-192 -20E48					Yes	Yes	Yes	Yes								
35	GA161137LDH-23 -20LE3																
36	GA161240LDH-113 -20LE6	Fhb1						Yes	Yes								
37	GA151313-LDH-53 -20E18					Yes	Yes										
38	GA151313-LDH-95 -20E19					Yes	Yes										
39	GA12230-1 -6-6-3 -20E36							Yes	Yes								
40	GA131214-8-5-2 -20LE12					Yes	Yes										
41	GA131214-8-5-6 -20LE13					Yes	Yes										
42	GA14235-7-2-6 -20LE31					Yes	Yes			Yes	Yes						
43	18VDH-FHB-MAS07-164-01											Yes	Yes				
44	VA20W-142					Yes	Yes	Yes	Yes	Het	Yes			Het			
45	VA20W-171			Het	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
46	VA20W-69					Yes	Yes										
47	VA20W-52							Yes									
48	18VDH-FHB-MAS06-152-03	Fhb1	Fhb1									Yes	Yes				
49	DH17SRW136-043																
50	17VTK6-61					Yes	Yes	Yes	Yes			Yes	Yes				
51	UMD-FHBN-1											Yes					
52	UMD-FHBN-2					Yes	Yes	Yes	Yes			Yes					
53	UMD-FHBN-3									Yes	?	Yes	Yes				
54	UMD-FHBN-4							Yes									
55	UMD-FHBN-5	Fhb1						Yes	Yes			Het					
56	UMD-FHBN-6							Yes	Yes								
57	UMD-FHBN-7	Fhb1	Fhb1							Yes							
58	UMD-FHBN-8	Fhb1						Yes	Yes	Het							
59	SCGA121098-9-3-7-10					Yes	Yes	Yes	Yes								
60	SCGA141638-8-4																
61	SCAR160643LDH-8	Fhb1	Fhb1					Yes	Yes	Yes	Yes						
62	SCLA19WF0306					Yes	Yes	Yes	?								
63	SCGA141717-G1-4-1-5																
64	SCGA14317-25-3							Yes	Yes	Yes	Yes						
65	SCLA18WF0802-8			Yes	Yes												
66	SCLA18WF0512-11-3			Yes	Yes												

*Estimates for the presence of QTL of interest by machine learning (Winn, Zachary J., Jeanette Lyerly, Brian Ward, Gina Brown-Guedira, Richard E. Boyles, Mohamed Mergoum, Jerry Johnson et al. "Profiling of Fusarium head blight resistance QTL haplotypes through molecular markers, genotyping-by-sequencing, and machine learning." Theoretical

Genotypic Analyses and Machine Learning Estimation of Regions Associated with Other Pertinent Loci

Entry	DESIGNATION	Rht-B1	Rht-D1	Yr_4BL	Yr17/Lr37/Sr38	Yr17 Lr37 Sr38 ML*	Lr9	Lr18	Lr18 ML*	H13	H13 ML*	HF_7D	Bdv2/3	Pm1a	Pm1a ML*	Pm54	Pm54 ML*
1	ERNIE	B1b	D1a	Yes													
2	COKER9835	B1a	D1b				Yes										Yes Yes
3	BESS	B1b	D1a	Yes													
4	JAMESTOWN	B1a	D1b	Yes				Yes Yes									
5	SS 8641	B1a	D1b		Yes	Yes		Yes Yes						Yes	Yes		
6	15VDH-FHB-MAS22-14	B1a	D1b	Het	Yes	Yes		Yes Yes						Het	Yes		
7	KWS347	B1b	D1a	Yes													
8	KWS369	B1b	D1a	Yes													
9	KWS394	B1b	D1a	Yes									Yes	Yes	Yes		
10	KWS397	B1b	D1a	Yes	Yes	Yes							Yes				
11	KWS403	B1b	D1a	Yes	Yes	Yes							Yes	Het	Yes		
12	KWS407	B1b	D1a	Yes												Yes	Yes
13	LA13176CBB-50-1-3	B1a	D1b	Yes	Yes	Yes	Yes	Yes Yes									
14	LA13202D-82-1	B1a	D1b	Yes			Yes	Yes Yes									
15	LA14173CBW-30-1-4			Yes	Yes	Yes	Yes	Yes Yes				Het					
16	LA14261C-45-2	ND	ND	ND	ND	ND	ND	Yes	ND	Yes	ND			ND		ND	
17	LA14269C-9-3	B1a	D1b	Yes	Yes	Yes		het		Yes	Yes		ND				
18	LA15005GGB-13-1-1	B1b	D1a			Yes			Het					Het	Yes		
19	LA15005GGB-4-1-3	B1b	D1a		Yes	Yes				Yes	Yes						
20	LA15092SBBW-25-1-2			Yes	Yes	Yes	Yes									Yes	Yes
21	NC13217-W293	B1a	D1b					Yes Yes									
22	NC13955-G125	B1a	D1b	Yes	Yes	Yes		Yes Yes									
23	NC13955-G135	B1a	D1b	Het				Yes Yes									
24	NC15V25-20	B1a	D1b	Het	Yes	Yes		Yes Yes									
25	NC18-16900	B1b	D1a		Yes	Yes		Yes Yes	Yes	Yes				Yes	Yes		
26	NC18-16901	B1b	D1a		Yes	Yes		Yes Yes	Yes	Yes				Yes	Yes		
27	NC18-16920	B1b	D1a		Yes	Yes		Yes Yes	Yes	Yes				Yes	Yes		
28	NC18-17619				Yes	Yes		Yes		Yes	Yes						
29	TX20D5032			Yes	Yes	Yes				Yes	Yes						
30	TX20D5354	B1a	D1b		Yes	Yes				Yes	Yes						
31	TX20D5363	B1a	D1b		Yes	Yes						Yes					
32	TX20D5368	B1a	D1b	Yes													
33	GA131218-1-2-7 -20E15	B1a	D1b		Yes	Yes				Yes	Yes						
34	GA151313-LDH-192 -20E4	B1a	D1b		Yes	Yes		Yes Yes		Yes	Yes						
35	GA161137LDH-23 -20LE3	B1a	D1b	Yes	Yes	Yes				Yes	Yes					Yes	Yes
36	GA161240LDH-113 -20LE	B1a	D1b	Yes	Yes	Yes											
37	GA151313-LDH-53 -20E18	B1a	D1b		Yes	Yes		Yes Yes		Yes	Yes						
38	GA151313-LDH-95 -20E19	B1a	D1b		Yes	Yes		Yes Yes		Yes	Yes						
39	GA12230-1 -6-6-3 -20E36	B1a	D1b	Yes	Yes	Yes		Yes Yes		Yes	Yes						
40	GA131214-8-5-2 -20LE12	B1a	D1b	Yes				Yes Yes									
41	GA131214-8-5-6 -20LE13	B1a	D1b	Yes				Yes Yes									
42	GA14235-7-2-6 -20LE31	B1a	D1b		Yes	Yes		Yes Yes									
43	18VDH-FHB-MAS07-164-C	B1a	D1b	Yes	Yes	Yes		Yes Yes	Yes	Yes						Yes	Yes
44	VA20W-142	B1a	D1b		Yes	Yes		Yes Yes									
45	VA20W-171	B1a	D1b	Yes	Yes	Yes	Yes	Het Yes									
46	VA20W-69	B1a	D1b	Yes	Yes	Yes	Yes	Yes Yes									
47	VA20W-52	B1b	D1a	Yes				Yes Yes									
48	18VDH-FHB-MAS06-152-C	B1a	D1b	Yes				Yes Yes									
49	DH17SRW136-043	B1b	D1a		Yes	Yes											
50	17VTK6-61	B1a	D1b		Yes	Yes		Yes Yes	Yes	Yes				Yes	Yes		
51	UMD-FHBN-1	B1a	D1b		Yes	Yes	Yes	? Yes									
52	UMD-FHBN-2	B1a	D1b	Yes				Yes Yes									
53	UMD-FHBN-3	B1a	D1b	Yes													
54	UMD-FHBN-4	B1b	D1a	Yes													
55	UMD-FHBN-5	B1a	D1b	Yes				Yes Yes									
56	UMD-FHBN-6	B1b	D1a														
57	UMD-FHBN-7	B1a	D1b	Yes	Yes	Yes		Yes Yes									
58	UMD-FHBN-8	B1a	D1b	Yes	Yes	Yes		Het Yes									
59	SCGA121098-9-3-7-10	B1a	D1b	Yes	Yes	Yes											
60	SCGA141638-8-4	B1a	D1b		Yes	Yes											
61	SCAR160643LDH-8	B1a	D1b		Yes	Yes				Yes	Yes						
62	SCLA19WF0306	B1b	D1a		Yes	Yes				Het	Yes			Yes	Yes		
63	SCGA141717-G1-4-1-5	B1a	D1b	Yes	Yes	Yes						Yes		Yes	Yes	Yes	?
64	SCGA14317-25-3	B1a	D1b		Yes	Yes		Yes Yes		Yes							
65	SCLA18WF0802-8	B1a	D1b	Yes	Yes	Yes						Yes					
66	SCLA18WF0512-11-3	B1a	D1b	Yes	Yes	Yes		Yes Yes	Yes	Yes						Yes	Yes

*Estimates for the presence of QTL of interest by machine learning (Winn, Zachary J., Jeanette Lyerly, Brian Ward, Gina Brown-Guedira, Richard E. Boyles, Mohamed Mergoum, Jerry Johnson et al. "Profiling of Fusarium head blight resistance QTL haplotypes through molecular markers, genotyping-by-sequencing, and machine

Efficacy of Selected FHB Resistance QTL

Mean Incidence (INC), Severity (SEV), Fusarium Damaged Kernels (FDK), and DON for entries in the 2013-2022 Uniform Southern Winter Wheat Scab Nurseries with and without resistance alleles at quantitative trait loci (QTL) associated with resistance to (FHB). FHB Rating (RAT) data included for 2018-2022 nurseries only

With data as of 11/06/22

Mean Incidence, Severity, Fusarium Damaged Kernels (FDK), and DON for entries in the 2013-2022 Uniform Southern Winter Wheat Scab Nurseries with and without

QTL†	Allele‡	n§	INC	SEV	FDK	DON	RAT (2018-22)
<i>Qfhb.nc-2B.1 (Bess)</i>	S	416	55.6	32.5	28.5	8.1	3.5
	R	37	55.1	31.2	27.1	7.3	3.3
<i>Qfhb.nc-3B.2 (Bess)</i>	S	446	55.6	32.4	28.7	8.1	3.5
	R	15	53.1	28.3	22.6	8.1	2.8
Ning_5A	S	412	55.4	32.3	29.8	8.5	3.5
	R	15	49.5	27.7	23.0	5.8	3.3
Ernie_5A	S	402	54.8	31.5	29.2	8.3	3.5
	R	23	57.3	34.2	35.5	9.6	2.8
Wuhan-1_2DL	S	413	55.7	32.1	29.8	8.5	3.5
	R	13	52.4	27.1	22.1	5.0	3.3
Sumai 3_Fhb1	S	364	57.6	34.8	29.7	8.7	3.7
	R	90	48.1	23.8	24.1	5.9	2.8
<i>QTL_3BL (Massey)</i>	S	422	56.1	32.9	28.6	8.2	3.5
	R	35	50.4	27.4	27.6	7.0	2.9
<i>QTL_1A (Neuse)</i>	S	231	56.3	33.9	29.3	8.5	3.5
	R	198	54.3	31.0	27.2	7.4	3.3
<i>QTL_6A (Neuse)</i>	S	318	55.4	32.3	28.7	8.4	3.5
	R	115	56.2	32.4	28.9	7.2	3.2
<i>QTL_1B (Jamestown)</i>	S	215	55.6	33.2	27.7	8.3	3.5
	R	126	53.0	30.5	26.3	7.0	3.4

† QTL, quantitative trait loci.

‡ Indicates presence of resistance allele (R) or susceptibility allele (S) at the respective QTL.

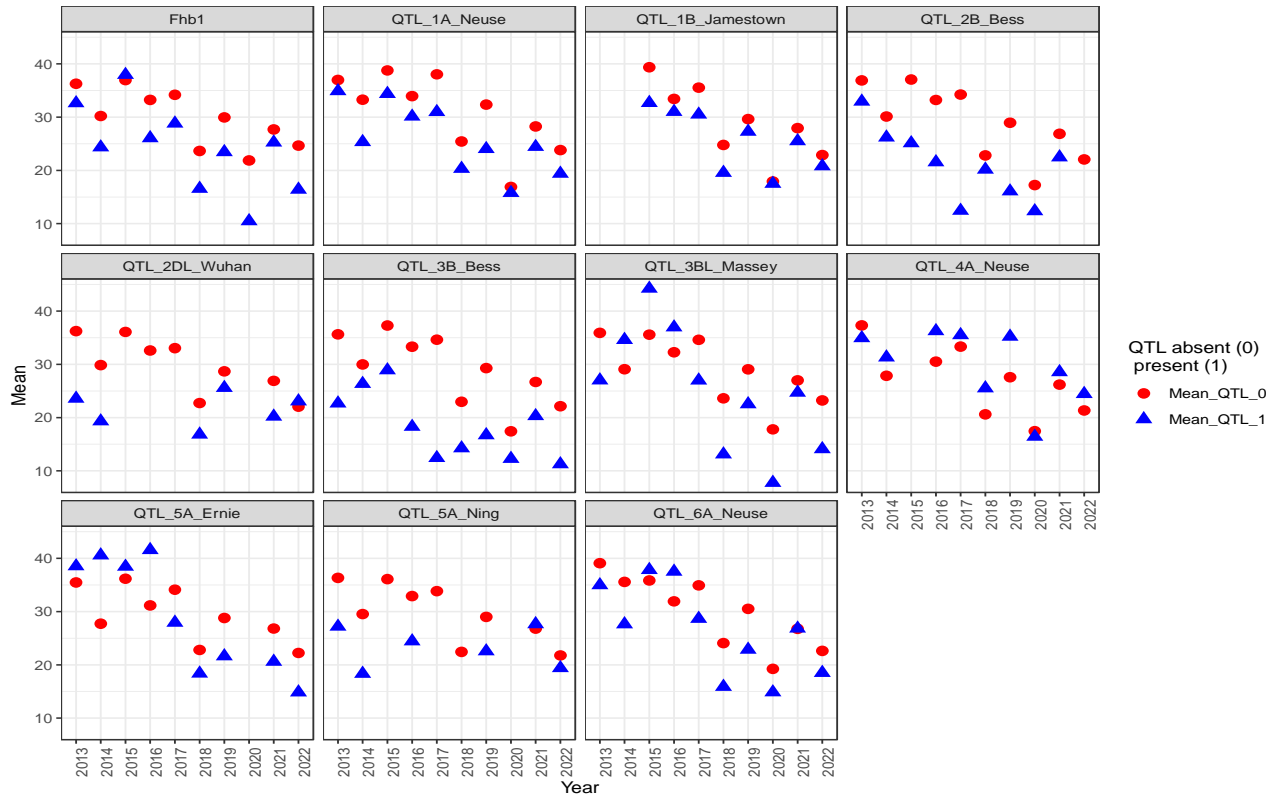
§ n indicates the number of lines in the allele group.

¶ Significance levels of mean comparisons are indicated as: NS (P > 0.05), * (P < 0.05), ** (P < 0.01), *** (P < 0.001).

Efficacy of Selected FHB Resistance QTL For FDK (Top) and DON (Bottom), by year, for 2013 through 2021.

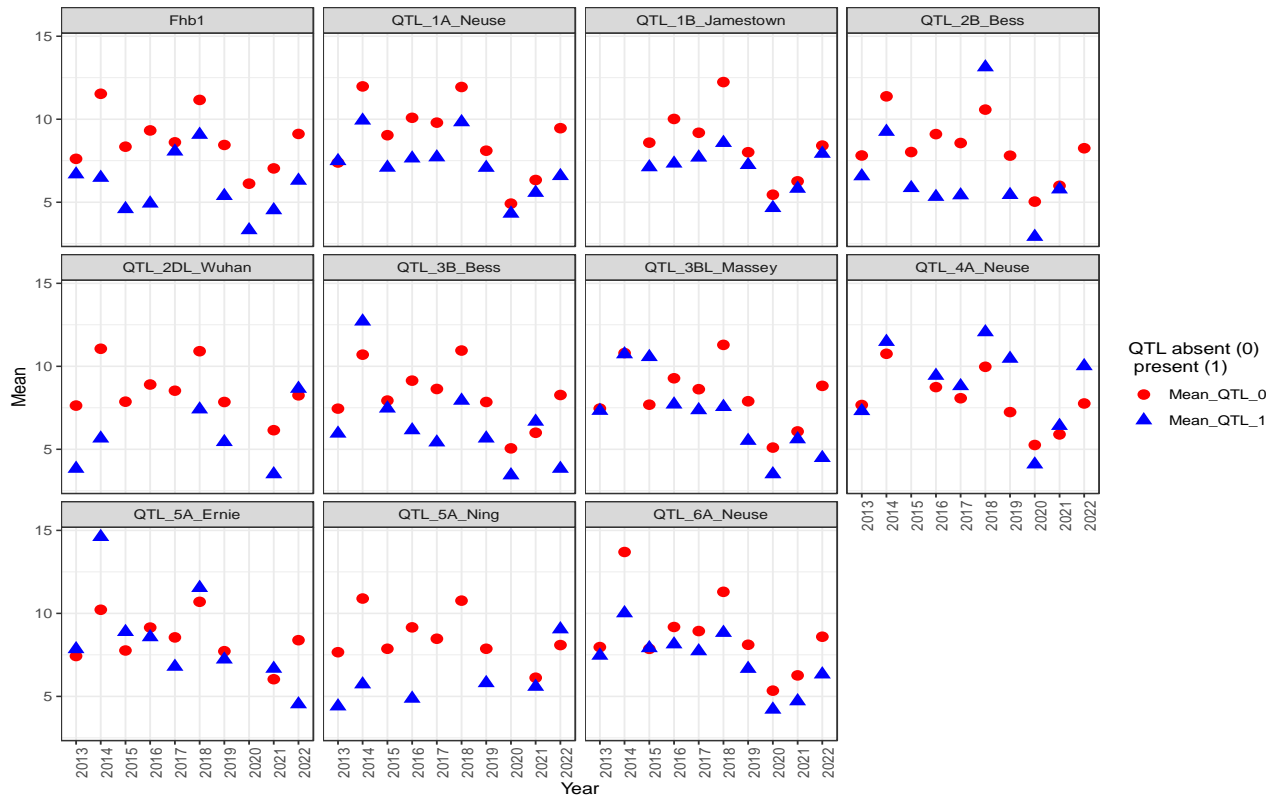
FHB mean FDK in each year for each QTL

QTL absent = 0, QTL present = 1



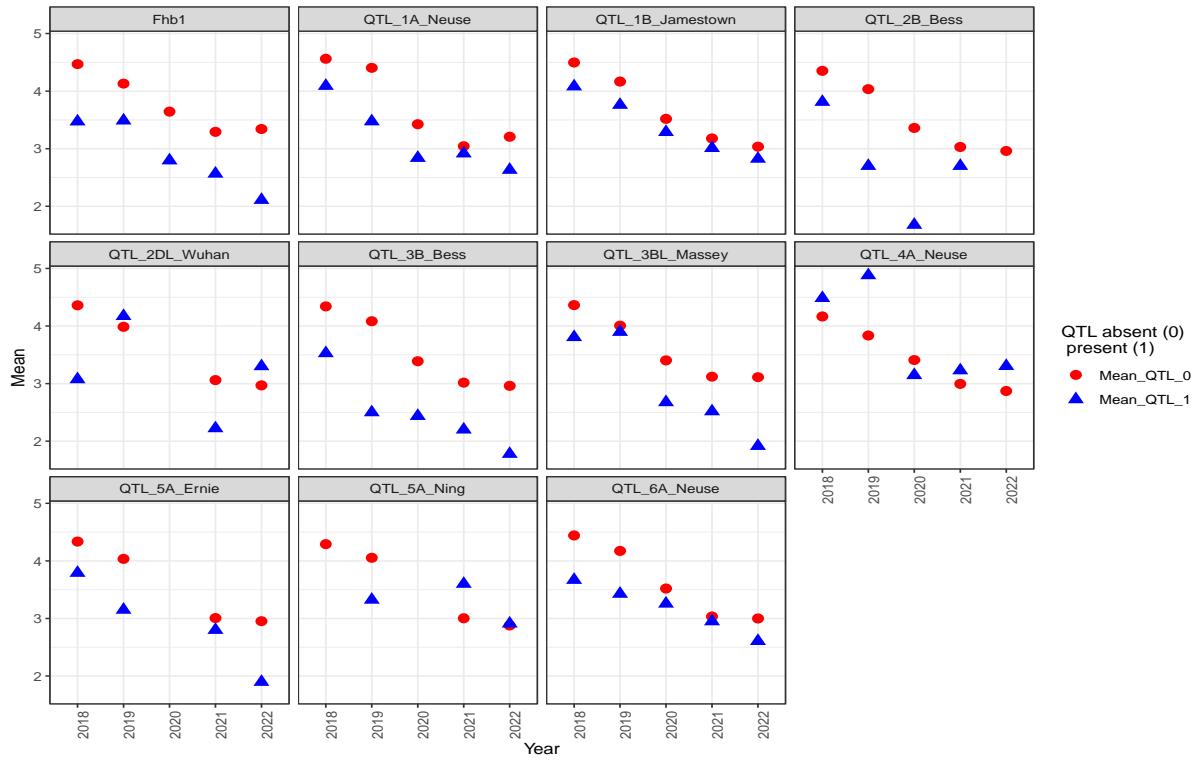
FHB mean DON in each year for each QTL

QTL absent = 0, QTL present = 1

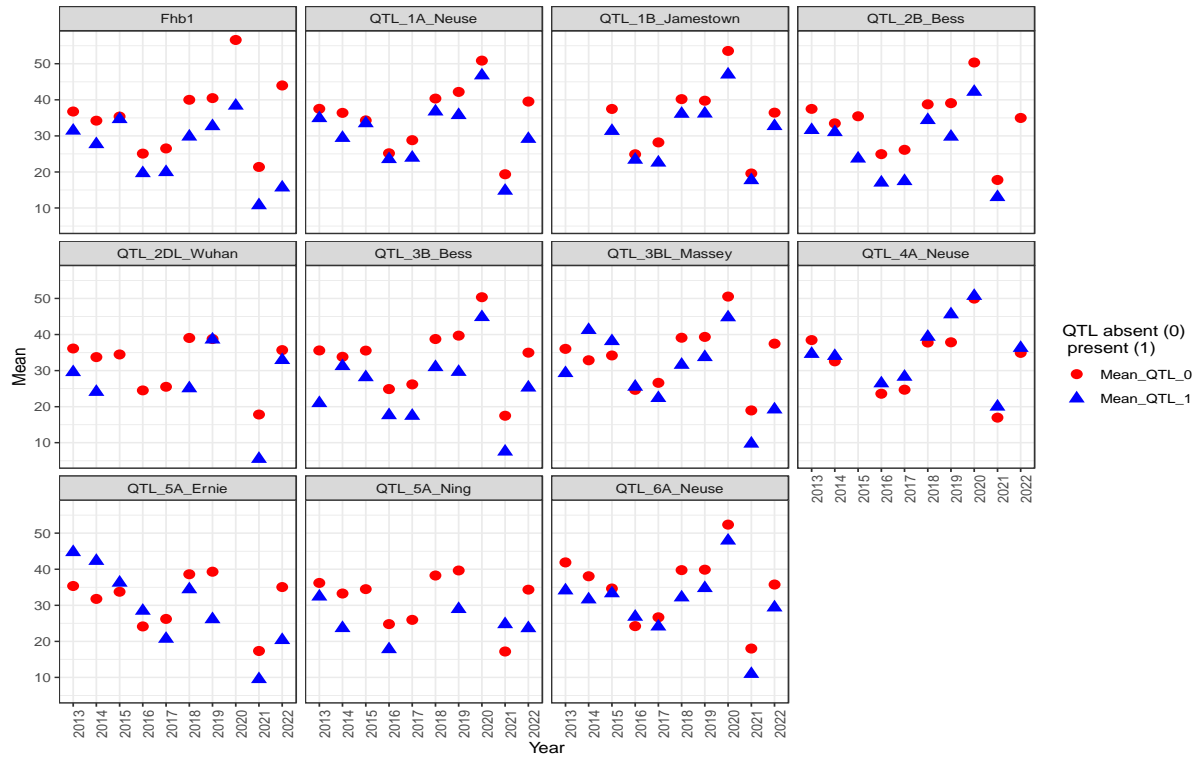


Efficacy of Selected FHB Resistance QTL For FHB Rating (Top) and Severity (Bottom), by year, for 2013 through 2021.

FHB mean RATING in each year for each QTL
 QTL absent = 0, QTL present = 1



FHB mean SEV in each year for each QTL
 QTL absent = 0, QTL present = 1



Heading Date (Julian Days*)

ENTRY NO	CULTIVAR/ DESIGNATION	C'STA TX	U'BANA IL	L'XTON KY	FLOR'CE SC	K'STON NC	W'BORO LA	ALEX LA	KWS IL	W'SAW VA	MEAN ALL LOC.	Rank
1	ERNIE	103	135	124	98	95	104	101	137	115	112	20
2	COKER9835	96	139	131	92	98	101	90	140	116	111	9
3	BESS	110	138	126	103	105	109	108	138	117	117	50
4	JAMESTOWN	100	136	123	94	97	98	99	137	114	111	9
5	SS 8641	104	138	126	98	100	106	105	139	116	114	32
6	15VDH-FHB-MAS22-14	103	138	126	94	92	104	98	139	111	111	9
7	KWS347	109	138	129	103	106	109	104	138	118	117	50
8	KWS369	116	139	129	105	105	115	110	140	118	120	65
9	KWS394	100	138	130	105	105	112	111	139	118	117	50
10	KWS397	112	137	126	103	102	113	110	139	117	118	60
11	KWS403	103	139	131	104	107	113	110	139	119	118	60
12	KWS407	115	138	132	107	109	113	108	139	118	120	65
13	LA13176CBB-50-1-3	97	141	131	97	98	99	92	142	121	113	25
14	LA13202D-82-1	99	137	124	98	98	105	103	138	114	113	25
15	LA14173CBW-30-1-4	100	134	122	93	92	99	97	136	111	109	1
16	LA14261C-45-2	106	137	126	97	94	105	102	138	114	113	25
17	LA14269C-9-3	99	136	125	93	93	101	98	137	114	111	9
18	LA15005GBB-13-1-1	97	140	126	93	94	97	92	140	115	110	5
19	LA15005GBB-4-1-3	99	138	129	98	92	94	88	139	116	110	5
20	LA15092SBBW-25-1-2	95	136	126	98	99	96	91	138	115	110	5
21	NC13217-W293	112	137	128	103	105	113	112	140	116	118	60
22	NC13955-G125	105	139	127	101	97	108	106	142	114	115	39
23	NC13955-G135	98	138	126	100	98	103	100	140	116	113	25
24	NC15V25-20	108	138	129	102	103	105	101	139	116	116	45
25	NC18-16900	108	137	128	103	105	109	112	138	116	117	50
26	NC18-16901	106	136	129	103	105	108	108	138	114	116	45
27	NC18-16920	107	137	129	103	104	109	111	139	118	117	50
28	NC18-17619	112	137	127	103	102	113	108	138	117	117	50
29	TX20D5032	100	138	125	102	101	108	109	138	117	115	39
30	TX20D5354	94	139	130	91	90	94	89	140	114	109	1
31	TX20D5363	104	136	125	91	88	96	96	138	111	109	1
32	TX20D5368	104	138	125	101	100	108	105	138	114	115	39
33	GA131218-1-2-7 -20E15	102	136	125	98	95	105	104	139	114	113	25
34	GA151313-LDH-192 -20E48	101	138	126	102	100	102	98	139	119	114	32
35	GA161137LDH-23 -20LE3	107	137	124	101	102	108	103	138	115	115	39
36	GA161240LDH-113 -20LE6	96	140	129	92	94	100	92	140	115	111	9
37	GA151313-LDH-53 -20E18	97	138	127	94	92	99	98	141	114	111	9
38	GA151313-LDH-95 -20E19	104	137	130	99	98	105	106	139	116	115	39
39	GA12230-1 -6-6-3 -20E36	101	138	127	96	94	104	100	140	114	112	20
40	GA131214-8-5-2 -20LE12	105	138	127	100	97	105	104	139	116	114	32
41	GA131214-8-5-6 -20LE13	105	139	127	98	97	105	106	139	116	114	32
42	GA14235-7-2-6 -20LE31	105	137	126	98	98	105	103	139	114	114	32
43	18VDH-FHB-MAS07-164-01	105	134	124	101	98	105	104	136	114	113	25
44	VA20W-142	110	136	128	103	107	108	111	139	116	117	50
45	VA20W-171	101	140	124	95	92	96	96	140	113	111	9
46	VA20W-69	108	135	128	103	98	108	102	137	116	115	39
47	VA20W-52	111	136	127	103	105	109	108	136	115	117	50
48	18VDH-FHB-MAS06-152-03	107	137	128	101	104	109	103	138	114	116	45
49	DH17SRW136-043	106	137	127	98	101	106	102	137	114	114	32
50	17VTK6-61	100	137	126	95	95	101	99	139	114	112	20
51	UMD-FHBN-1	106	139	130	103	103	109	103	139	114	116	45
52	UMD-FHBN-2	100	136	124	95	94	101	99	139	114	111	9
53	UMD-FHBN-3	116	136	128	105	105	113	112	137	117	119	64
54	UMD-FHBN-4	105	138	130	104	101	112	109	140	116	117	50
55	UMD-FHBN-5	103	138	129	104	104	110	110	138	116	117	50
56	UMD-FHBN-6	111	138	131	101	106	113	111	139	116	118	60
57	UMD-FHBN-7	102	138	126	98	97	101	98	140	116	113	25
58	UMD-FHBN-8	106	136	124	98	97	107	104	137	115	114	32
59	SCGA121098-9-3-7-10	98	140	129	95	95	101	99	141	116	112	20
60	SCGA141638-8-4	97	138	128	97	92	96	93	139	116	111	9
61	SCAR160643LDH-8	103	138	128	102	102	108	109	139	116	116	45
62	SCLA19WF0306	98	136	126	97	97	96	97	137	114	111	9
63	SCGA141717-G1-4-1-5	97	138	127	96	92	96	90	140	113	110	5
64	SCGA14317-25-3	101	137	126	98	96	96	92	139	116	111	9
65	SCLA18WF0802-8	97	137	125	91	92	96	92	138	114	109	1
66	SCLA18WF0512-11-3	98	139	127	97	95	101	99	138	114	112	20
Mean		103	137	127	99	98	104	102	139	116	114	
CV%		2.5	0.23	1.1	3.0	1.9	2.0	1.5	1.93	1.1	2.8	
LSD(0.05)		5	1.31	.	4.1	4.0	3.5	2.5	5.4	3.8	3	
R-Square		.	.	0.83	.	0.94	0.94	0.98	.	.	0.96	

Plant Height (in)

ENTRY NO	CULTIVAR/ DESIGNATION	LX'TON			KWS		W'SAW		MEAN	
		KY	IL	VA	IL	VA	ALL LOC.	Rank		
1	ERNIE	31	34	32	32	31				
2	COKER9835	28	30	31	29	3				
3	BESS	33	39	32	35	63				
4	JAMESTOWN	27	32	28	29	3				
5	SS 8641	28	32	36	32	31				
6	15VDH-FHB-MAS22-14	28	30	29	29	3				
7	KWS347	33	35	34	34	58				
8	KWS369	28	34	32	31	14				
9	KWS394	29	34	34	32	31				
10	KWS397	31	33	34	33	48				
11	KWS403	28	34	31	31	14				
12	KWS407	30	32	32	31	14				
13	LA13176CBB-50-1-3	32	33	33	33	48				
14	LA13202D-82-1	29	32	32	31	14				
15	LA14173CBW-30-1-4	30	33	35	32	31				
16	LA14261C-45-2	29	34	30	31	14				
17	LA14269C-9-3	29	31	29	30	10				
18	LA15005GBB-13-1-1	29	31	32	30	10				
19	LA15005GBB-4-1-3	28	31	33	31	14				
20	LA15092SBBW-25-1-2	32	34	32	33	48				
21	NC13217-W293	30	35	30	32	31				
22	NC13955-G125	29	33	32	31	14				
23	NC13955-G135	33	36	32	34	58				
24	NC15V25-20	29	33	29	30	10				
25	NC18-16900	34	36	34	35	63				
26	NC18-16901	32	38	35	35	63				
27	NC18-16920	29	34	36	33	48				
28	NC18-17619	33	37	37	36	66				
29	TX20D5032	32	35	36	34	58				
30	TX20D5354	29	29	27	28	1				
31	TX20D5363	31	34	32	32	31				
32	TX20D5368	31	35	34	33	48				
33	GA131218-1-2-7 -20E15	31	30	27	29	3				
34	GA151313-LDH-192 -20E48	28	31	29	29	3				
35	GA161137LDH-23 -20LE3	31	30	33	31	14				
36	GA161240LDH-113 -20LE6	30	31	32	31	14				
37	GA151313-LDH-53 -20E18	30	32	31	31	14				
38	GA151313-LDH-95 -20E19	28	33	32	31	14				
39	GA12230-1 -6-6-3 -20E36	29	32	25	29	3				
40	GA131214-8-5-2 -20LE12	30	33	33	32	31				
41	GA131214-8-5-6 -20LE13	30	32	31	31	14				
42	GA14235-7-2-6 -20LE31	30	28	29	29	3				
43	18VDH-FHB-MAS07-164-01	31	33	31	32	31				
44	VA20W-142	28	36	34	32	31				
45	VA20W-171	31	32	33	32	31				
46	VA20W-69	30	37	32	33	48				
47	VA20W-52	34	35	32	34	58				
48	18VDH-FHB-MAS06-152-03	31	33	28	31	14				
49	DH17SRW136-043	31	33	32	32	31				
50	17VTK6-61	28	29	28	28	1				
51	UMD-FHBN-1	32	35	29	32	31				
52	UMD-FHBN-2	30	33	32	32	31				
53	UMD-FHBN-3	31	36	32	33	48				
54	UMD-FHBN-4	32	33	35	34	58				
55	UMD-FHBN-5	31	32	31	31	14				
56	UMD-FHBN-6	31	34	32	32	31				
57	UMD-FHBN-7	31	31	33	31	14				
58	UMD-FHBN-8	29	32	30	30	10				
59	SCGA121098-9-3-7-10	32	33	33	32	31				
60	SCGA141638-8-4	31	33	36	33	48				
61	SCAR160643LDH-8	31	33	31	31	14				
62	SCLA19WF0306	31	35	32	32	31				
63	SCGA141717-G1-4-1-5	33	34	32	33	48				
64	SCGA14317-25-3	30	35	32	32	31				
65	SCLA18WF0802-8	31	32	32	31	14				
66	SCLA18WF0512-11-3	32	36	31	33	48				

Mean	30	33.1	32.5	32
CV%	6.3	9.8	3.7	4.8
LSD(0.05)	.	7	4	2
R-Square	0.72	.	.	0.73

Leaf Disease Ratings

CULTIVAR/ DESIGNATION	Powdery	Leaf	Septoria	Frost
	Mildew	Rust	tritici	Winter
	Reaction	Reaction	Reaction	Kill
	0-9	0-9	0-9	0-9
	Warsaw	KWS	KWS	KWS
	VA	IL	IL	IL
1 ERNIE	3	4.4	4.5	1.4
2 COKER9835	1	0.4	8.0	2.4
3 BESS	3	5.4	6.0	1.5
4 JAMESTOWN	6	1.4	5.5	1.5
5 SS 8641	2	0.4	5.4	2.1
6 15VDH-FHB-MAS22-14	1	0.4	5.4	2.7
7 KWS347	3	5.5	5.8	1.6
8 KWS369	2	2.1	5.8	1.5
9 KWS394	1	4.7	3.8	1.3
10 KWS397	6	4.3	4.2	2.2
11 KWS403	5	4.4	3.7	1.0
12 KWS407	2	0.9	4.1	0.9
13 LA13176CBB-50-1-3	7	1.0	2.5	6.3
14 LA13202D-82-1	1	1.1	6.4	3.7
15 LA14173CBW-30-1-4	2	1.2	6.3	4.6
16 LA14261C-45-2	5	1.3	6.6	1.5
17 LA14269C-9-3	6	1.4	4.0	1.9
18 LA15005GBB-13-1-1	0	1.5	7.9	4.3
19 LA15005GBB-4-1-3	2	1.5	7.9	4.1
20 LA15092SBBW-25-1-2	5	1.5	6.4	1.2
21 NC13217-W293	5	1.5	5.4	1.8
22 NC13955-G125	5	1.5	5.9	3.3
23 NC13955-G135	5	1.5	6.9	3.4
24 NC15V25-20	3	1.5	4.5	2.4
25 NC18-16900	1	1.4	7.1	1.0
26 NC18-16901	0	1.3	7.2	1.1
27 NC18-16920	0	1.2	7.8	3.1
28 NC18-17619	2	1.2	7.9	1.1
29 TX20D5032	0	1.6	5.0	2.6
30 TX20D5354	8	1.0	3.1	5.6
31 TX20D5363	7	0.9	6.2	3.6
32 TX20D5368	2	3.9	9.3	1.1
33 GA131218-1-2-7 -20E15	7	1.3	4.3	3.6
34 GA151313-LDH-192 -20E48	3	0.7	3.9	1.1
35 GA161137LDH-23 -20LE3	5	1.1	5.9	5.2
36 GA161240LDH-113 -20LE6	0	1.0	4.0	5.2
37 GA151313-LDH-53 -20E18	5	0.5	2.5	3.8
38 GA151313-LDH-95 -20E19	3	0.6	3.0	1.3
39 GA12230-1 -6-6-3 -20E36	6	0.6	6.0	2.8
40 GA131214-8-5-2 -20LE12	3	0.6	6.5	1.3
41 GA131214-8-5-6 -20LE13	5	0.6	6.5	1.3
42 GA14235-7-2-6 -20LE31	2	0.6	6.9	4.9
43 18VDH-FHB-MAS07-164-01	0	0.7	6.9	1.2
44 VA20W-142	2	0.8	3.9	1.1
45 VA20W-171	5	0.9	2.8	4.5
46 VA20W-69	6	1.0	3.8	0.9
47 VA20W-52	0	1.0	5.7	0.9
48 18VDH-FHB-MAS06-152-03	5	1.1	7.2	1.8
49 DH17SRW136-043	2	6.2	8.1	0.8
50 17VTK6-61	0	1.2	3.5	3.8
51 UMD-FHBN-1	5	1.3	2.9	0.8
52 UMD-FHBN-2	3	1.4	7.8	1.3
53 UMD-FHBN-3	3	1.9	8.7	0.8
54 UMD-FHBN-4	3	1.5	8.0	1.2
55 UMD-FHBN-5	3	2.0	8.6	1.4
56 UMD-FHBN-6	0	2.5	6.6	1.4
57 UMD-FHBN-7	2	1.5	6.2	2.9
58 UMD-FHBN-8	3	1.4	7.7	1.4
59 SCGA121098-9-3-7-10	1	1.4	6.2	4.9
60 SCGA141638-8-4	4	1.4	3.2	4.9
61 SCAR160643LDH-8	5	1.3	7.4	2.2
62 SCLA19WF0306	1	1.2	2.5	3.3
63 SCGA141717-G1-4-1-5	1	1.2	3.1	4.3
64 SCGA14317-25-3	6	1.1	3.6	2.8
65 SCLA18WF0802-8	6	3.1	7.2	1.8
66 SCLA18WF0512-11-3	1	1.0	5.3	2.9
Mean	3	1.6	5.6	2.4
CV%	33	169.5	32.7	133.1
LSD(0.05)	3	5.5	3.7	6.5
R-Square

Hessian Fly Screening
(Resistant - Susceptible Plants)¹

ENTRY NO	CULTIVAR/ DESIGNATION	R-S Bio B	R-S Bio C	R-S Bio D	R-S Bio O	R-S Bio L	H9	H13	HF_7D
1	ERNIE	0-16	0-16	0-11	0-12	0-13			
2	COKER9835	0-15	0-16	0-18	0-14	0-17			
3	BESS	0-15	0-15	0-18	0-15	0-21			
4	JAMESTOWN	17-0	17-0	14-0	0-17	0-17			
5	SS 8641	7-11	0-17	0-11	0-14	0-17			
6	15VDH-FHB-MAS22-14	0-17	0-17	0-13	0-18	0-18			
7	KWS347	9-6	0-17	0-15	14-0	0-18			
8	KWS369	14-4	0-20	0-16	16-0	0-21			
9	KWS394	0-16	0-19	0-18	0-14	0-17			
10	KWS397	0-16	0-20	0-15	12-5	0-16			
11	KWS403	0-14	15-0	0-16	0-15	0-18			
12	KWS407	9-3	0-14	0-15	0-16	0-18			
13	LA13176CBB-50-1-3	16-0	18-0	16-0	0-15	0-15			
14	LA13202D-82-1	0-15	0-16	0-16	0-15	0-18			
15	LA14173CBW-30-1-4	16-0	18-0	13-0	14-0	0-16			Het
16	LA14261C-45-2	15-0	0-19	0-17	12-3	0-20			ND
17	LA14269C-9-3	15-0	15-0	16-0	18-0	14-0	Het		H13
18	LA15005GBB-13-1-1	14-0	17-0	19-0	19-0	19-0			Het
19	LA15005GBB-4-1-3	15-0	18-0	15-0	18-0	15-0			H13
20	LA15092SBBW-25-1-2	0-14	0-14	0-17	0-15	0-19			
21	NC13217-W293	18-0	0-18	0-15	0-15	0-18			
22	NC13955-G125	12-0	20-0	14-0	13-0	0-15			
23	NC13955-G135	7-10	5-12	9-5	0-15	0-15			
24	NC15V25-20	17-0	19-0	16-0	15-0	0-14			
25	NC18-16900	20-0	17-0	12-0	15-0	19-0			H13
26	NC18-16901	17-0	20-0	16-0	18-0	14-0			H13
27	NC18-16920	17-0	17-0	15-0	15-0	14-0			H13
28	NC18-17619	0-18	0-15	0-16	15-0	0-18			
29	TX20D5032	17-0	17-0	16-0	18-0	16-0			H13
30	TX20D5354	18-0	20-0	17-0	15-0	18-0			H13
31	TX20D5363	13-2	15-0	17-0	8-6	0-14			HF_7D
32	TX20D5368	0-12	0-18	0-14	0-14	0-10			
33	GA131218-1-2-7 -20E15	15-0	15-2	15-0	14-0	14-0			H13
34	GA151313-LDH-192 -20E48	14-0	17-0	15-0	14-0	18-0			H13
35	GA161137LDH-23 -20LE3	12-0	15-0	15-0	17-0	17-0			H13
36	GA161240LDH-113 -20LE6	0-15	0-17	0-18	0-15	0-16			
37	GA151313-LDH-53 -20E18	15-0	17-0	17-0	15-0	21-0			H13
38	GA151313-LDH-95 -20E19	16-0	18-0	18-0	15-0	16-0			H13
39	GA12230-1 -6-6-3 -20E36	16-0	19-0	17-0	16-0	17-0			H13
40	GA131214-8-5-2 -20LE12	0-15	0-16	0-17	0-17	0-14			
41	GA131214-8-5-6 -20LE13	11-4	0-17	0-15	0-15	0-19			
42	GA14235-7-2-6 -20LE31	13-3	14-2	15-2	0-15	0-16			
43	18VDH-FHB-MAS07-164-01	15-0	12-0	19-0	16-0	18-0			H13
44	VA20W-142	14-0	16-0	18-0	0-17	0-15			
45	VA20W-171	17-0	0-16	0-17	0-14	0-15			
46	VA20W-69	17-0	0-20	0-18	17-0	0-17			
47	VA20W-52	0-15	0-17	0-17	0-18	0-17			
48	18VDH-FHB-MAS06-152-03	16-0	18-1	0-17	16-0	0-17			
49	DH17SRW136-043	14-2	19-1	2-13	15-1	0-17			
50	17VTK6-61	19-0	18-0	19-0	16-0	18-0			H13
51	UMD-FHBN-1	19-0	15-0	16-0	15-1	0-17			
52	UMD-FHBN-2	15-0	16-0	14-0	0-11	0-15			
53	UMD-FHBN-3	0-16	0-17	0-15	0-13	0-16			
54	UMD-FHBN-4	13-0	18-0	15-0	0-12	0-14			
55	UMD-FHBN-5	17-0	0-18	15-0	16-0	19-0	H9		
56	UMD-FHBN-6	15-0	12-4	19-0	0-13	0-16			
57	UMD-FHBN-7	14-0	16-0	18-0	0-14	0-17			
58	UMD-FHBN-8	17-0	14-0	19-0	0-16	0-19			
59	SCGA121098-9-3-7-10	17-0	0-17	18-0	14-0	13-0	H9?		
60	SCGA141638-8-4	13-0	0-15	14-0	13-0	12-0	H9?		H13
61	SCAR160643LDH-8	14-0	15-1	13-1	12-5	0-14			
62	SCLA19WF0306	7-0	11-1	10-1	11-0	11-0			Het
63	SCGA141717-G1-4-1-5	0-11	0-12	0-13	14-0	0-15			HF_7D
64	SCGA14317-25-3	0-14	0-15	0-13	15-0	0-14			
65	SCLA18WF0802-8	0-16	0-19	0-15	0-15	0-16			HF_7D
66	SCLA18WF0512-11-3	14-0	13-1	17-0	14-0	14-0			H13

¹ Sue Cambron, USDA-ARS, Dept Entomology, Purdue Univ.

Grain Yield and Test Weight

ENTRY NO	CULTIVAR/ DESIGNATION	W'SAW		Test Weight lb/ bu
		VA bu/ ac	Rank	
1	ERNIE	70	50	56.5
2	COKER9835	83	24	56.0
3	BESS	68	52	57.3
4	JAMESTOWN	61	59	56.1
5	SS 8641	90	11	57.9
6	15VDH-FHB-MAS22-14	86	19	60.4
7	KWS347	79	33	56.1
8	KWS369	95	8	54.9
9	KWS394	104	3	56.2
10	KWS397	87	17	54.8
11	KWS403	88	15	55.7
12	KWS407	90	11	55.8
13	LA13176CBB-50-1-3	54	65	.
14	LA13202D-82-1	105	2	59.1
15	LA14173CBW-30-1-4	59	61	.
16	LA14261C-45-2	71	49	55.7
17	LA14269C-9-3	63	58	56.1
18	LA15005GGB-13-1-1	80	28	57.1
19	LA15005GGB-4-1-3	85	21	57.4
20	LA15092SBBW-25-1-2	64	57	56.9
21	NC13217-W293	59	61	58.1
22	NC13955-G125	80	28	56.3
23	NC13955-G135	60	60	56.5
24	NC15V25-20	80	28	56.9
25	NC18-16900	79	33	56.0
26	NC18-16901	88	15	58.7
27	NC18-16920	91	10	56.6
28	NC18-17619	80	28	57.8
29	TX20D5032	67	55	58.0
30	TX20D5354	36	66	.
31	TX20D5363	58	63	55.9
32	TX20D5368	84	23	56.0
33	GA131218-1-2-7 -20E15	68	52	56.6
34	GA151313-LDH-192 -20E48	87	17	56.1
35	GA161137LDH-23 -20LE3	89	14	54.4
36	GA161240LDH-113 -20LE6	101	6	57.9
37	GA151313-LDH-53 -20E18	138	1	57.9
38	GA151313-LDH-95 -20E19	81	27	57.2
39	GA12230-1 -6-6-3 -20E36	65	56	53.8
40	GA131214-8-5-2 -20LE12	76	42	56.5
41	GA131214-8-5-6 -20LE13	69	51	55.5
42	GA14235-7-2-6 -20LE31	73	48	56.6
43	18VDH-FHB-MAS07-164-01	102	5	58.2
44	VA20W-142	86	19	57.9
45	VA20W-171	79	33	55.0
46	VA20W-69	74	46	54.7
47	VA20W-52	103	4	56.9
48	18VDH-FHB-MAS06-152-03	58	63	54.2
49	DH17SRW136-043	82	26	57.0
50	17VTK6-61	85	21	58.7
51	UMD-FHBN-1	74	46	59.2
52	UMD-FHBN-2	78	36	56.4
53	UMD-FHBN-3	78	36	57.0
54	UMD-FHBN-4	95	8	58.1
55	UMD-FHBN-5	76	42	55.8
56	UMD-FHBN-6	97	7	58.4
57	UMD-FHBN-7	77	41	56.8
58	UMD-FHBN-8	80	28	56.5
59	SCGA121098-9-3-7-10	76	42	58.6
60	SCGA141638-8-4	78	36	58.3
61	SCAR160643LDH-8	78	36	57.5
62	SCLA19WF0306	78	36	56.4
63	SCGA141717-G1-4-1-5	90	11	61.1
64	SCGA14317-25-3	68	52	56.9
65	SCLA18WF0802-8	75	45	57.4
66	SCLA18WF0512-11-3	83	24	57.7

Mean	77.6	56.8
CV%	6.3	1.2
LSD(0.05)	14.8	2.0
R-Square		

Means Across Locations 2021-22

Cultivar/ Designation	FHB Rating		FHB Incidence		FHB Severity		FHB Index		FDK		DON		Head. Date		Plant Ht.	
	Rank		Rank		Rank		Rank		Rank		Rank		Rank		Rank	
1 ERNIE	2	6	48	14	13	12	7	10	11	5	3	2	112	20	32	31
2 COKER9835	6	65	81	58	82	65	84	65	40	64	17	62	111	9	29	3
3 BESS	2	7	61	28	25	23	17	22	11	5	4	9	117	50	35	63
4 JAMESTOWN	2	19	68	40	19	16	16	20	14	9	5	13	111	9	29	3
5 SS 8641	6	66	88	62	82	65	89	66	51	66	26	65	114	32	32	31
6 15VDH-FHB-MAS22-14	1	5	38	10	9	8	8	12	9	2	2	1	111	9	29	3
7 KWS347	2	19	77	52	24	20	36	42	18	24	9	42	117	50	34	58
8 KWS369	2	12	60	25	29	30	24	33	18	24	7	31	120	65	31	14
9 KWS394	1	2	11	1	2	1	0	1	15	12	3	2	117	50	32	31
10 KWS397	2	7	37	9	4	2	2	4	14	9	5	13	118	60	33	48
11 KWS403	1	1	31	7	6	4	5	7	12	7	5	13	118	60	31	14
12 KWS407	2	10	59	24	24	20	25	35	16	17	5	13	120	65	31	14
13 LA13176CBB-50-1-3	3	27	25	5	14	13	5	7	16	17	9	42	113	25	33	48
14 LA13202D-82-1	3	48	58	23	36	37	35	41	16	17	3	2	113	25	31	14
15 LA14173CBW-30-1-4	2	16	60	25	10	10	9	13	17	23	4	9	109	1	32	31
16 LA14261C-45-2	3	41	67	38	41	39	39	45	23	36	8	36	113	25	31	14
17 LA14269C-9-3	3	45	75	48	28	28	24	33	20	30	8	36	111	9	30	10
18 LA15005GBB-13-1-1	2	12	24	4	8	6	2	4	16	17	3	2	110	5	30	10
19 LA15005GBB-4-1-3	2	16	15	3	4	2	1	3	15	12	4	9	110	5	31	14
20 LA15092SBBW-25-1-2	2	19	56	22	22	19	17	22	15	12	5	13	110	5	33	48
21 NC13217-W293	3	37	68	40	50	50	65	59	16	17	10	51	118	60	32	31
22 NC13955-G125	3	33	42	11	56	54	33	40	23	36	6	25	115	39	31	14
23 NC13955-G135	4	51	74	47	56	54	56	55	24	42	5	13	113	25	34	58
24 NC15V25-20	2	12	48	14	14	13	10	15	14	9	5	13	116	45	30	10
25 NC18-16900	1	2	11	1	6	4	0	1	9	2	3	2	117	50	35	63
26 NC18-16901	1	2	50	19	8	6	6	9	7	1	3	2	116	45	35	63
27 NC18-16920	2	7	28	6	9	8	2	4	9	2	3	2	117	50	33	48
28 NC18-17619	2	34	83	60	55	53	59	57	16	17	5	13	117	50	36	66
29 TX20D5032	3	11	47	13	25	23	19	25	13	8	4	9	115	39	34	58
30 TX20D5354	3	45	48	14	33	36	13	17	23	36	9	42	109	1	28	1
31 TX20D5363	4	58	76	49	53	52	52	53	31	57	7	31	109	1	32	31
32 TX20D5368	3	41	72	45	32	34	20	27	31	57	11	55	115	39	33	48
33 GA131218-1-2-7 -20E15	5	63	92	66	59	58	48	51	43	65	29	66	113	25	29	3
34 GA151313-LDH-192 -20E48	4	56	65	35	59	58	64	58	30	54	10	51	114	32	29	3
35 GA161137LDH-23 -20LE3	5	60	90	63	77	64	81	64	35	62	9	42	115	39	31	14
36 GA161240LDH-113 -20LE6	2	19	66	36	20	17	15	18	22	34	13	59	111	9	31	14
37 GA151313-LDH-53 -20E18	3	27	66	36	24	20	18	24	20	30	6	25	111	9	31	14
38 GA151313-LDH-95 -20E19	2	24	53	21	41	39	39	45	15	12	6	25	115	39	31	14
39 GA12230-1 -6-6-3 -20E36	3	48	52	20	48	46	32	38	25	45	8	36	112	20	29	3
40 GA131214-8-5-2 -20LE12	3	48	78	54	42	42	25	35	24	42	14	60	114	32	32	31
41 GA131214-8-5-6 -20LE13	4	55	62	30	50	50	32	38	29	51	12	58	114	32	31	14
42 GA14235-7-2-6 -20LE31	6	64	91	65	66	62	73	62	39	63	22	64	114	32	29	3
43 18VDH-FHB-MAS07-164-01	5	61	90	63	63	60	72	61	30	54	11	55	113	25	32	31
44 VA20W-142	3	39	72	45	49	49	56	55	23	36	7	31	117	50	32	31
45 VA20W-171	3	41	61	28	42	42	23	31	29	51	9	42	111	9	32	31
46 VA20W-69	3	39	63	32	28	28	21	29	19	28	5	13	115	39	33	48
47 VA20W-52	3	32	77	52	29	30	27	37	32	59	19	63	117	50	34	58
48 18VDH-FHB-MAS06-152-03	3	34	68	40	25	23	16	20	20	30	9	42	116	45	31	14
49 DH17SRW136-043	3	45	76	49	38	38	39	45	33	61	10	51	114	32	32	31
50 17VTK6-61	4	51	69	43	48	46	46	50	27	49	11	55	112	20	28	1
51 UMD-FHBN-1	2	27	49	18	31	32	23	31	18	24	7	31	116	45	32	31
52 UMD-FHBN-2	3	41	80	###	41	39	36	42	24	42	9	42	111	9	32	31
53 UMD-FHBN-3	2	24	79	55	26	27	19	25	20	30	5	13	119	64	33	48
54 UMD-FHBN-4	2	19	45	12	43	44	39	45	27	49	9	42	117	50	34	58
55 UMD-FHBN-5	4	59	79	55	65	61	80	63	32	59	8	36	117	50	31	14
56 UMD-FHBN-6	2	24	64	33	32	34	22	30	26	47	14	60	118	60	32	31
57 UMD-FHBN-7	2	12	48	14	10	10	7	10	19	28	6	25	113	25	31	14
58 UMD-FHBN-8	3	31	64	33	25	23	20	27	22	34	9	42	114	32	30	10
59 SCGA121098-9-3-7-10	2	16	33	8	31	32	9	13	15	12	5	13	112	20	32	31
60 SCGA141638-8-4	4	53	70	44	57	56	55	54	23	36	8	36	111	9	33	48
61 SCAR160643LDH-8	3	27	81	58	15	15	15	18	30	54	10	51	116	45	31	14
62 SCLA19WF0306	4	54	67	38	57	56	48	51	26	47	6	25	111	9	32	31
63 SCGA141717-G1-4-1-5	5	62	86	61	71	63	69	60	29	51	8	36	110	5	33	48
64 SCGA14317-25-3	4	57	76	49	48	46	38	44	23	36	7	31	111	9	32	31
65 SCLA18WF0802-8	3	34	62	31	43	44	42	49	18	24	5	13	109	1	31	14
66 SCLA18WF0512-11-3	3	37	60	25	21	18	12	16	25	45	6	25	112	20	33	48

Mean	3	61	35	31	22	8	114	32
CV%	45.3	22.3	30.3	.	44.2	78.0	2.8	4.8
LSD(0.05)	1	27	22	.	9	8	3	2
R-Square	0.61	0.83	0.89	.	0.72	0.75	0.96	0.73

Means Across Locations for the 2001-02 Uniform Southern Scab Nursery

Note the performance of VA01W476. This was the first wheat doubled haploid produced in the Southern CP, thanks to Jianli Chen and Carl Griffey at VA. Tech. Its pedigree is CJ W14 (PI641164) and Roane (PI 612958). CJ W14 is a Chinese spring wheat containing *Fhb1* and a resistance QTL on chromosome 5AS. Roane is a soft red winter wheat with partial resistance to FHB. VA01W476 was a very important parent in the initial development of FHB resistant germplasm in the Southern CP.

CULTIVAR/ DESIGNATION	FHB Incidence (0-100)		FHB Severity (0-100)		FHB Index (0-100)		Scabby Seed %		Vomitoxin DON (ppm)		Heading Date (Julian)	
		RANK		RANK		RANK		RANK		RANK		RANK
1 ERNIE	52.6	3	13.5	2	12.2	3	14.5	4	12.6	9	125	3
2 COKER 9835	86.5	30	45.1	27	43.4	26	37.2	28	17.9	20	129	24
3 AR93095-4-1	60.1	9	18.8	9	16.4	9	18.2	7	9.0	5	129	25
4 AR93035-4-2	61.2	10	20.6	10	17.0	10	21.6	11	13.3	11	129	26
5 AR93035-7-1	61.3	11	21.3	11	19.0	12	23.1	15	14.4	14	128	16
6 AR922-5-1	56.2	6	16.4	7	14.5	7	23.5	16	13.2	10	126	5
7 B961378	55.7	5	15.8	6	12.2	4	15.7	6	7.8	4	129	27
8 B980416	52.2	2	14.0	4	12.5	6	14.5	5	7.2	3	128	17
9 B980582	56.3	7	13.7	3	11.1	2	13.7	3	6.2	2	124	2
10 D98*9762	82.7	29	42.7	26	43.7	27	36.3	27	31.6	29	128	18
11 D98*9764	77.6	25	36.4	24	33.0	23	32.2	24	28.4	28	127	9
12 D98*9770	80.2	27	53.0	30	45.6	28	40.7	30	27.0	27	128	19
13 D98-9213	70.8	19	32.7	21	29.9	21	30.1	21	18.5	21	128	20
14 D97-6075	74.4	23	34.7	22	33.4	24	34.7	25	19.0	23	127	10
15 GA931241E16	79.5	26	41.5	25	38.0	25	30.0	20	23.1	26	129	28
16 GA93052E42	77.0	24	52.1	29	52.4	30	36.2	26	34.7	30	127	11
17 GA931463E27	70.1	17	27.8	18	24.4	18	31.4	23	13.3	12	127	12
18 GA931470E62	82.0	28	48.9	28	46.5	29	39.9	29	17.7	19	125	4
19 GA921233E17	64.2	12	36.2	23	29.9	22	31.1	22	16.0	16	126	6
20 MDV11-52	72.2	20	29.0	19	22.6	16	27.0	18	16.3	17	127	13
21 NC98-22251	70.3	18	31.4	20	27.2	20	28.1	19	13.5	13	128	21
22 NC98-26189	68.9	15	21.6	12	20.0	13	19.6	8	12.2	8	127	14
23 NC98-26192	72.6	21	23.6	14	22.5	15	20.0	9	16.8	18	127	15
24 NC98-27513	57.7	8	17.1	8	16.1	8	11.3	1	9.2	6	129	29
25 VA01W447	69.6	16	21.7	13	17.3	11	20.0	10	10.2	7	126	7
26 VA01W461	55.4	4	14.7	5	12.3	5	23.0	14	15.9	15	128	22
27 VA01W462	74.1	22	25.5	16	20.9	14	23.7	17	19.1	24	126	8
28 VA01W476	35.0	1	9.9	1	9.0	1	12.2	2	2.5	1	123	1
29 VA00W566	67.6	14	25.2	15	24.6	19	22.0	12	18.5	22	128	23
30 VA00W562	67.4	13	26.5	17	23.8	17	22.1	13	21.1	25	129	30

Mean:	67.0	27.7	25.0	25.2	16.1	127
L.S.D. (0.05)	12.3	8.1	9.4	10.6	9.5	2
C.V. (%)	18.4	36.3	41.7	40.5	56.7	1.28

Means and Variances of Genotypic Estimated Breeding Values for Severity of progenies from selected crosses between entries in the 2020-21 and 2021-22 nurseries, plus the means for the 10 % most resistant progeny in each cross.

Parent 1	Year in Nursery	Parent 2	Year in Nursery	Severity Genotype Estimated Breeding Values of Cross Progenies		
				Mean	Variance	Mean lowest 10%
ARDH14002-22-0260N	USSN21	LA15005GBB-13-1-1	USSN22	21	15.9	14
ARDH14002-22-0260N	USSN21	NC18-16901	USSN22	19	8.8	14
ARDH14002-22-0260N	USSN21	NC18-16920	USSN22	20	10.7	14
ARDH14002-22-0260N	USSN21	ARFDH160665-139	USSN21	20	10.4	14
BESS	USSN21	NC18-16901	USSN22	21	13.7	14
ARDH14002-22-0260N	USSN21	NC18-16900	USSN22	20	10.1	14
BESS	USSN21	ARFDH160665-139	USSN21	22	15.8	15
BESS	USSN21	NC18-16900	USSN22	22	14.7	15
15VDH-FHB-MAS38-01	USSN21	ARDH14002-22-0260N	USSN21	22	15.3	15
BESS	USSN21	NC18-16920	USSN22	22	14.1	15
ARFDH160665-139	USSN21	NC18-16901	USSN22	20	7.1	15
ARFDH160665-139	USSN21	LA15005GBB-13-1-1	USSN22	21	12.6	15
ARFDH160665-139	USSN21	NC18-16920	USSN22	20	8.5	15
BESS	USSN21	ARDH14002-22-0260N	USSN21	21	10.5	16
15VDH-FHB-MAS38-01	USSN21	NC18-16901	USSN22	22	11.7	16
LA15005GBB-13-1-1	USSN22	NC18-16901	USSN22	21	8.7	16
ARFDH160665-139	USSN21	NC18-16900	USSN22	20	7.6	16
15VDH-FHB-MAS38-01	USSN21	ARFDH160665-139	USSN21	22	12.8	16
15VDH-FHB-MAS22-14	USSN21	NC18-16901	USSN22	22	13.2	16
GA161240LDH-113-20LE6	USSN21	NC18-16901	USSN22	22	9.8	16
15VDH-FHB-MAS38-01	USSN21	NC18-16900	USSN22	22	12.6	16
ARDH14002-22-0260N	USSN21	TX20D5032	USSN22	23	17.0	16
LA15005GBB-13-1-1	USSN22	NC18-16920	USSN22	21	8.8	16
ERNIE	USSN21	NC18-16901	USSN22	23	14.8	16
ARDH14002-22-0260N	USSN21	LA15005GBB-4-1-3	USSN22	23	14.6	16
15VDH-FHB-MAS22-14	USSN21	ARFDH160665-139	USSN21	23	15.2	16
16VDH-SRW05-205	USSN21	NC18-16901	USSN22	22	10.6	16
15VDH-FHB-MAS38-01	USSN21	NC18-16920	USSN22	22	11.9	16
BESS	USSN21	LA15005GBB-13-1-1	USSN22	23	12.6	16
ARDH14002-22-0260N	USSN21	UMD-FHBN-8	USSN22	22	11.5	16
BESS	USSN21	16VDH-SRW05-205	USSN21	24	18.1	16
ARFDH160665-139	USSN21	GA161240LDH-113-20LE6	USSN21	22	11.8	16
ARDH14002-22-0260N	USSN21	GA161240LDH-113-20LE6	USSN21	22	10.2	16
ARDH14002-22-0260N	USSN21	17VTK6-61	USSN22	23	13.3	16
GA161240LDH-113-20LE6	USSN21	NC18-16920	USSN22	22	11.0	16
LA15005GBB-13-1-1	USSN22	NC18-16900	USSN22	21	8.1	16
15VDH-FHB-MAS22-14	USSN21	ARDH14002-22-0260N	USSN21	23	12.8	16
ERNIE	USSN21	ARFDH160665-139	USSN21	24	16.2	17
15VDH-FHB-MAS22-14	USSN21	NC18-16920	USSN22	23	14.0	17
15VDH-FHB-MAS22-14	USSN21	NC18-16900	USSN22	23	14.0	17
16VDH-SRW05-205	USSN21	NC18-16920	USSN22	23	12.2	17
NC18-16901	USSN22	UMD-FHBN-8	USSN22	22	9.9	17
ERNIE	USSN21	NC18-16920	USSN22	24	16.2	17
NC15V25-20	USSN21	ARDH14002-22-0260N	USSN21	23	12.0	17
16VDH-SRW05-205	USSN21	NC18-16900	USSN22	23	11.3	17
16VDH-SRW05-205	USSN21	LA15005GBB-13-1-1	USSN22	23	15.4	17
ARDH14002-22-0260N	USSN21	GAMD-13W-254-6-2-4--21	USSN21	22	10.3	17
GA161240LDH-113-20LE6	USSN21	NC18-16900	USSN22	22	9.6	17
ERNIE	USSN21	NC18-16900	USSN22	24	15.3	17
NC18-16901	USSN22	17VTK6-61	USSN22	22	10.7	17
ARFDH160665-139	USSN21	UMD-FHBN-8	USSN22	23	11.2	17
ARDH14002-22-0260N	USSN21	LA14173CBW-30-1-4	USSN22	24	16.5	17

Means and Variances of Genotypic Estimated Breeding Values for FDK of progenies from selected crosses between entries in the 2020-21 and 2021-22 nurseries, plus the means for the 10 % most resistant progeny in each cross.

Parent 1	Year in Nursery	Parent 2	Year in Nursery	FDK Genotype Estimated Breeding Values of Cross Progenies		
				Mean	Variance	Mean lowest 10%
BESS	USSN21	LA15005GBB-13-1-1	USSN22	16	8.5	10
ERNIE	USSN21	BESS	USSN21	17	11.1	12
BESS	USSN21	TX20D5032	USSN22	18	11.3	12
BESS	USSN21	15VDH-FHB-MAS38-01	USSN21	18	10.7	12
BESS	USSN21	JAMESTOWN	USSN21	18	10.9	12
BESS	USSN21	15VDH-FHB-MAS22-14	USSN21	18	10.7	12
ERNIE	USSN21	LA15005GBB-13-1-1	USSN22	18	8.8	12
BESS	USSN21	LA13173D-WN26-4	USSN21	18	10.0	13
BESS	USSN21	AR15V25-19-2174N	USSN21	18	8.4	13
BESS	USSN21	GA161240LDH-113-20LE6	USSN21	18	11.4	13
BESS	USSN21	LA14173CBW-30-1-4	USSN22	19	13.8	13
15VDH-FHB-MAS38-01	USSN21	LA15005GBB-13-1-1	USSN22	18	7.6	13
AR15V25-19-2174N	USSN21	LA15005GBB-13-1-1	USSN22	18	7.8	13
BESS	USSN21	NC18-16920	USSN22	18	8.6	13
15VDH-FHB-MAS22-14	USSN21	LA15005GBB-13-1-1	USSN22	18	8.7	13
BESS	USSN21	SCLA19WF2110	USSN21	19	10.6	13
BESS	USSN21	ARDH14002-22-0260N	USSN21	18	8.5	13
BESS	USSN21	NC18-16901	USSN22	18	9.2	13
ARDH14002-22-0260N	USSN21	LA15005GBB-13-1-1	USSN22	18	7.6	13
BESS	USSN21	LA15005GBB-4-1-3	USSN22	19	10.9	13
BESS	USSN21	TX20D5368	USSN22	19	10.6	13
BESS	USSN21	ARFDH160665-139	USSN21	19	11.4	13
BESS	USSN21	15VDH-FHB-MAS33-13	USSN21	20	13.5	13
ERNIE	USSN21	TX20D5032	USSN22	20	13.3	13
VA19FHB-05	USSN21	LA15005GBB-13-1-1	USSN22	19	9.0	13
LA13173D-WN26-4	USSN21	LA15005GBB-13-1-1	USSN22	18	7.1	13
BESS	USSN21	NC15V25-20	USSN21	19	9.8	13
GA161240LDH-113-20LI	USSN21	LA15005GBB-13-1-1	USSN22	19	8.6	13
LA15005GBB-13-1-1	USSN22	TX20D5032	USSN22	18	6.0	13
SCLA19WF2110	USSN21	LA15005GBB-13-1-1	USSN22	18	8.4	13
BESS	USSN21	GA12230-1-6-6-3-20E36	USSN21	19	9.4	13
BESS	USSN21	UMD-FHBN-8	USSN22	19	8.6	14
BESS	USSN21	18VDH-FHB-MAS06-152-0	USSN22	20	13.6	14
JAMESTOWN	USSN21	LA15005GBB-13-1-1	USSN22	18	5.7	14
BESS	USSN21	NC13217-W293	USSN22	19	11.2	14
ERNIE	USSN21	15VDH-FHB-MAS38-01	USSN21	20	11.7	14
BESS	USSN21	16VTK19-201	USSN21	19	11.5	14
ERNIE	USSN21	AR15V25-19-2174N	USSN21	19	11.0	14
ERNIE	USSN21	NC18-16920	USSN22	20	12.5	14
LA15005GBB-13-1-1	USSN22	LA15092SBBW-25-1-2	USSN22	19	8.6	14
BESS	USSN21	LA15092SBBW-25-1-2	USSN22	19	8.3	14
AR15V25-19-2174N	USSN21	TX20D5032	USSN22	20	11.0	14
BESS	USSN21	SCAR160643LDH-8	USSN22	20	11.3	14
LA15005GBB-13-1-1	USSN22	TX20D5368	USSN22	19	7.6	14
BESS	USSN21	NC18-16900	USSN22	19	10.0	14
ARDH14002-22-0260N	USSN21	TX20D5032	USSN22	20	11.2	14
GA12230-1-6-6-3-20E36	USSN21	LA15005GBB-13-1-1	USSN22	19	7.4	14
BESS	USSN21	TX20D5354	USSN22	20	11.5	14
BESS	USSN21	LA13045D-121	USSN21	19	10.0	14
BESS	USSN21	GA161240LDH-59-20E7	USSN21	20	12.5	14
ERNIE	USSN21	LA15092SBBW-25-1-2	USSN22	21	15.3	14
NC15V25-20	USSN21	LA15005GBB-13-1-1	USSN22	19	7.5	14

Means and Variances of Genotypic Estimated Breeding Values for DON of progenies from selected crosses between entries in the 2020-21 and 2021-22 nurseries, plus the means for the 10 % most resistant progeny in each cross.

Parent 1	Year in Nursery	Parent 2	Year in Nursery	DON (ppm)		
				Genotype Estimated Breeding Values of Cross Progenies		
				Mean	Variance	Mean lowest 10%
NC13220-37	USSN21	TX20D5032	USSN22	5	1.9	2
LA15005GBB-13-1-1	USSN22	TX20D5032	USSN22	4	1.4	2
NC13220-37	USSN21	LA15005GBB-13-1-1	USSN22	5	2.4	3
GA161240LDH-113-20LE6	USSN21	TX20D5032	USSN21	5	2.8	3
TX20D5032	USSN22	VA20W-69	USSN22	5	2.1	3
ARFDH160665-139	USSN21	TX20D5032	USSN22	5	2.2	3
15VDH-FHB-MAS22-14	USSN21	TX20D5032	USSN21	5	2.7	3
NC12164-200T	USSN21	TX20D5032	USSN22	5	2.3	3
NC18-16920	USSN22	TX20D5032	USSN21	5	1.3	3
15VDH-FHB-MAS38-01	USSN21	TX20D5032	USSN22	5	1.4	3
NC18-16900	USSN22	TX20D5032	USSN22	5	1.4	3
NC18-16901	USSN22	TX20D5032	USSN22	5	1.4	3
TX20D5032	USSN22	TX20D5368	USSN22	5	2.0	3
ARDH14002-22-0260N	USSN21	TX20D5032	USSN21	5	2.2	3
NC13217-W293	USSN22	TX20D5032	USSN22	5	2.1	3
LA14173CBW-30-1-4	USSN22	TX20D5032	USSN22	5	1.4	3
TX20D5032	USSN22	VA20W-171	USSN22	6	2.8	3
NC13206-40	USSN21	TX20D5032	USSN21	5	2.0	3
TX20D5032	USSN22	18VDH-FHB-MAS06-152-0	USSN22	6	2.2	3
LA15092SBBW-25-1-2	USSN22	TX20D5032	USSN22	5	1.8	3
NC13220-37	USSN21	LA15092SBBW-25-1-2	USSN22	6	3.3	3
ARFDH160665-139	USSN21	LA15005GBB-13-1-1	USSN22	6	2.5	3
NC13220-37	USSN21	NC13206-40	USSN22	6	3.2	3
LA15005GBB-4-1-3	USSN22	TX20D5032	USSN22	5	1.4	3
NC15V25-20	USSN21	TX20D5032	USSN22	6	2.0	3
15VDH-FHB-MAS22-14	USSN21	LA15005GBB-13-1-1	USSN21	6	3.0	3
LA13045D-121	USSN21	TX20D5032	USSN22	6	2.5	3
NC13220-37	USSN21	NC18-16920	USSN22	6	1.8	3
15VDH-FHB-MAS38-01	USSN21	NC13220-37	USSN22	6	2.1	3
NC13220-37	USSN21	LA15005GBB-4-1-3	USSN22	6	2.7	3
GA161240LDH-113-20LE6	USSN21	LA15005GBB-13-1-1	USSN21	6	2.8	3
LA15005GBB-13-1-1	USSN22	TX20D5368	USSN21	6	2.6	3
JAMESTOWN	USSN21	TX20D5032	USSN21	5	1.7	3
TX20D5032	USSN22	TX20D5354	USSN22	6	2.8	3
NC13220-37	USSN21	NC18-16900	USSN22	6	1.9	3
LA14173C-54	USSN21	TX20D5032	USSN22	6	2.0	3
GA161125NCDH-117-20LE	USSN21	TX20D5032	USSN21	6	2.2	3
BESS	USSN21	TX20D5032	USSN21	6	2.8	3
NC13220-37	USSN21	VA20W-69	USSN22	6	2.3	3
AR15V25-19-2174N	USSN21	TX20D5032	USSN22	6	1.9	3
LA15005GBB-13-1-1	USSN22	VA20W-69	USSN22	6	2.0	3
NC13220-37	USSN21	NC18-16901	USSN22	6	1.8	3
LA14173CBW-30-1-4	USSN22	LA15005GBB-13-1-1	USSN22	6	1.8	3
TX20D5032	USSN22	17VTK6-61	USSN21	6	2.1	3
ERNIE	USSN21	TX20D5032	USSN22	6	2.5	3
TX20D5032	USSN22	UMD-FHBN-8	USSN22	6	2.3	3
15VDH-FHB-MAS38-01	USSN21	LA15005GBB-13-1-1	USSN21	6	1.5	3
TX20D5032	USSN22	UMD-FHBN-1	USSN22	6	2.4	3
VA19W-31	USSN21	TX20D5032	USSN22	7	3.5	3
NC13220-37	USSN21	LA14173CBW-30-1-4	USSN22	6	1.9	3
ARDH13216-12	USSN21	TX20D5032	USSN22	6	2.5	3
15VDH-FHB-MAS22-14	USSN21	NC18-16920	USSN22	6	3.0	3