Report on the 2008-09 Northern Uniform Winter Wheat Scab Nurseries (NUWWSN and PNUWWSN)

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INTRODUCTION

The objective of the Northern Uniform Winter Wheat Scab Nursery (NUWWSN) and the Preliminary Northern Uniform Winter Wheat Scab Nursery (PNUWWSN) is to screen winter wheat genotypes adapted to the northern portion of the eastern US for scab resistance. Breeders submit entries to both tests and then each conducts the trial in inoculated and misted FHB nurseries within their programs. Data is then sent to the coordinator for summation and distribution.

MATERIAL AND METHODS

The traits assessed and locations that reported data are listed in Tables 0 and 1. The 60 entries in the NUWWSN came from 13 programs while the 46 entries in the PNUWWSN entries came from nine programs (Tables 2 and 3). Cooperators collect replicated data and submit means to the coordinator. The means from individual locations are used in an analysis over locations. The genotype x environment interaction (GEI) term is the error and is used to calculate an LSD (0.05). The LSD value is used to determine if a particular entry mean is statistically equal to the lowest entry mean (such values are designated with an "l") or the highest entry mean (such values are designated with an "h") for each trait.

RESULTS

Many entries in the NUWWSN showed very good resistance to FHB. Over 43% (26/60) were not significantly different from the most resistant entry for all seven FHB traits (Tables 7 & 8). Only seven entries though had DON levels <= 5.0 ppm from these inoculated and misted nurseries. There appeared to be relatively less FHB resistance in the PNUWWSN than the NUWWSN (Table 9 and 10): no entry in the PNUWWSN had < 6.6 ppm DON.

Few entries in the NUWWSN or PNUWWSN have the marker alleles from Asian sources at the Fhb1 locus on chromosome 3BS, or other known or postulated QTL according to marker data (Table 22 and 34): 10/56 breeding lines in the NUWWSN and 7/42 breeding lines in the PNUWWSN have marker evidence of the Asian allele at Fhb1.

The GEI can not be tested for significance. The GEI appeared important for all FHB traits except ISK and GHSEV in the NUWWSN as the sum of squares from the GEI was at least 1.5 times greater than the genotype sum of squares (Table 4). The extensive GEI may resulted from varying correlation of FHB traits with heading date, a phenomenon noted in past years as well. INC, SEV, and IND were negatively correlated to heading date in VABLA and MDSAL, but positively correlated to heading date in KYLEX (Table 6). This also happen in the PNUWWWSN thought the GEI was not as important in that trial (Tables 4, & 6). .

Table 0. List of cooperators and test locations for the 2008-2009 NUWWSN and PNUWWSN

CODE	COOPERATOR (S)	INSTITUTE	LOCATION	NUWWSN	PNUWWSN
ILURB	Fred Kolb, Eric Brucker	University of Illinois	Urbana, IL	yes	yes
INBRO	Barton Fogleman, Jennifer Vonderwall	Syngenta, Agripro	Brookston, IN	yes	yes
INLAY	Herb Ohm	Purdue University	Lafayette, IN	yes	yes
KYLEX	David Van Sanford, Nikki Mundell	Unversity of Kentucky	Lexington, KY	yes	yes
MDSAL	Jose Costa	University of Maryland	Salisbury, MD	yes	no
MIELA	Janet Lewis, Lee Siler	Michigan State University	East Lansing, MI	yes	yes
MOCOL	Anne McKendry, David Teague	University of Missouri	Columbia, MO	yes	yes
NEMEA	Stephen Baenziger, S Wegulo	University of Nebraska	Mead, NE	yes	no
NYITH	Mark Sorrells, Gary Bergstrom	Cornell University	Ithaca, NY	yes	no
OHWOO	Clay Sneller, Pierce Paul	The Ohio State University	Wooster, Ohio	yes	yes
ONRID	Lilly Tamburic, Mike Holtzworth	University of Guelph, Ridgetown	Riedgetown, Ontario	yes	yes
ROMAN	Mariana Ittu	National Agricultural Research-Development Institute Fundulea	Calarasi, Romania	yes	yes
VABLA	Carl Griffey, Shuyu Liu	Virginia Tech	Blacksburg, VA	yes	yes

Table 1. List of traits and locations where data was collected for the 2008-2009 NUWWSN and PNUWWSN

Code	Trait	Description	PNUWWSN Locations	NUWWSN Locations
SEV	Disease severity from field tests	% of infected spikelets in an infected head.	IL,IN,IN,KY,MI,MO,ON,VA	IL,IN,IN,KY,MD,MI,MO,NE,NY, OH, ON, VA
INC	Disease incidence	% of heads with at least one infected spikelets	IL,IN,IN,KY,MI,MO,ON,VA	IL,IN,IN,KY,MD,MI,MO,NE,NY, OH, ON, VA
IND	Disease index	IND = (SEVxINC)/100	IL,IN,KY,MI,MO,OH,ON,RO, VA	IL,IN,KY,MD,MI,MO,NE,NY,OH, ON, VA
FDK	Fusarium damaged kernels	Either a visual assessment of the percent infected kernels, or a percent of scabby seed by weight	IL,IN,KY,MO,RO	IL,IN,IN,KY,MD, MO,NE,RO
ISK	Composite of head and kernel traits	ISK Index = .3 (Severity) + .3 (Incidence)+.4 (FDK)	IL,IN,KY,MO	IL,IN,KY,MD,MO,NE
DON	DON (vomitoxin)	PPM of vomitoxin in grain	KY,VA	KY,MD,NE,OH,VA
GH	Greenhouse severity	Same as SEV except from greenhouse	IL	IL,MO
MILL SCORE	Milling score	A relative composite score based on traits that affect milling		IN
BAKE SCORE	Baking score	A relative composite score based on traits that affect baking		IN
TW SCORE	Test weight score	A relative score based on TW		IN
SE SCORE	Softness equivalent score	A relative score based on softness equivalent		IN
TW	Test weight	Test weight in lbs/bu of clean grain		IN
SOFTNESS EQUIVALENT	Softness equivalent	Percentage of flour that passes through a 94 mesh screen		IN
FLOUR PROTEIN	Flour protein	NIR estimate of flour protein percentage (based on 13% moisture)		IN
LACTIC ACID SRC	Lactic acid solvent retention capacity	A measure of gluten strength based on percentage of LA solvent retained by a flour sample after centrifugation		IN
SUCROSE SRC	Sucrose solvent retention capacity	A measure of pentosan content, and thus water absorption, based on percentage of sucrose solvent retained by a flour sample after centrifugation		IN
FLOUR YIELD	Flour yield	The weight of the flour that passes through a 40 mesh screen after milling, adjusted for moisture and SE, expressed as percentage of milled grain.		IN

Table 2. Entries in the 2008-2009 NUWWSN

ENTRY	NAME	PEDIGREE	SOURCE
1	ERNIE	CHECK	
2	TRUMAN	CHECK	
3	FREEDOM	CHECK	
4	PIONEER 2545	CHECK	
5	P.03615A1-4-4	Ernie/INW0316//981358/97462	Purdue, H Ohm
6	P.04704A1-2-1-1	INW0316*2//Ernie/9346	Purdue, H Ohm
7	P.053A1-6-7	2754/INW0412/Truman/INW0303	Purdue, H Ohm
8	P.0537A1-7-12	INW0411/2754//INW0412/98134	Purdue, H Ohm
9	P.0128A1-22-22	L4/Foster/4/Gfd/X117/3/VA54-429//92145	Purdue, H Ohm
10	MOCHA	OH489/OH490	Sunbean Extract, R Fioritto
11	SHAVER	NASW84-345/Coker9835//0H419/OH389	Sunbean Extract, R Fioritto
12	RUBIN	MO800071-56/PION2545//KY88C	Sunbean Extract, R Fioritto
13	ARENA	NASW84-345/Coker9835//0H419/OH389	Sunbean Extract, R Fioritto
14	CANON	MV 17/RUBY	Sunbean Extract, R Fioritto
15	NE06469	Unknown	Univ NE, S Baenziger
16	NI04420	NE96644//PAVON/*3SCOUT66/3/WAHOO SIB	Univ NE, S Baenziger
17	NI04427	KS98HW22//W95-615W/N94L189	Univ NE, S Baenziger
18	NE05459	IN92823A1-1-4-5/NE92458	Univ NE, S Baenziger
19	NE06471	W95-610W (=WI89-282/ARLIN)/WAHOO//NE98574	Univ NE, S Baenziger
20	NY03179FHB-10	NY7387/Caledonia//Caledonia-2///Caledonia	Cornell, M Sorrells
21	NY03180FHB-10	NY7387/Caledonia//Caledonia-2///Caledonia	Cornell, M Sorrells
22	NY03179FHB-12	NY7387/Caledonia//Caledonia-2///Caledonia	Cornell, M Sorrells
23	NYW103-21-9183	Cayuga/ Caledonia	Cornell, M Sorrells
24	NYW103-102-9103	Cayuga/ Caledonia	Cornell, M Sorrells
25	IL02-18228	Pio25R26/9634-24437//95-4162	Univ IL, F Kolb
26	IL04-7874	G65201/ IL98-12212	Univ IL, F Kolb
27	IL04-7942	G65201/ IL98-12212	Univ IL, F Kolb
28	IL04-10721	IL95-4162/ IL97-7010	Univ IL, F Kolb
29	IL04-10741	IL95-4162/ IL97-7010	Univ IL, F Kolb
30	MD02W81-08-2	Freedom/Ning7840//VA97W533	Unv MD, J Costa
31	MD02W81-08-4	Freedom/Ning7840//VA97W533	Unv MD, J Costa
32	ACF213003B	Harding x TF174	Univ Guelph-R, L Tamburic
33	ACF126103	Movokrimka x Arina	Univ Guelph-R, L Tamburic
34	ACF12004	Vienna x Balkan	Univ Guelph-R, L Tamburic
35	RCUOGTr34	TF174 x SD97060	Univ Guelph-R, L Tamburic
36	RCUOGTr35	AC Morley x Vienna	Univ Guelph-R, L Tamburic
37	M05-1531	LA87167-D8-/P92118B4-2	Syngenta, B Fgleman
38	B0390207	BL931167/Pioneer 2643	Syngenta, B Fgleman
39	03M1539#031	GIBSON/92226E2-5-3	Syngenta, B Fgleman
40	03M1599#0007	M99*3038/Pioneer 25R49	Syngenta, B Fgleman
41	MO 050101	Bess reselection	Univ MO, A McKendry
42	MO 050921	Ernie/980521	Univ MO, A McKendry
43	MO 041020	MO 960429/960112	Univ MO, A McKendry
44	MO 050219	MO 010708 RS	Univ MO, A McKendry
45	MO 050144	MO 010708 RS	Univ MO, A McKendry
46	KY00C-2059-19	KY91C-170-3/2552	Univ KY, D Van Sanford
47	KY00C-2515-02	SS 550/KY93C-0721-34	Univ KY, D Van Sanford
48	KY00C-2059-24	KY91C-170-3/2552	Univ KY, D Van Sanford
49	KY00C-2567-01	SS 520/25W33	Univ KY, D Van Sanford
50	KY00C-2143-08	KY90C-048-59/KY90C-160-14	Univ KY, D Van Sanford
51	MSU Line E6003	VA96W-403-WS / W14	MI State Univ, J. Lewis
52	MSU Line E7035R	MSU Line D6234 / W14	MI State Univ, J. Lewis
53	OH04-264-58	OH645/HOPEWELL	Ohio State Univ, C Sneller
54	OH04-268-39	HOPEWELL/VA96-54-372	Ohio State Univ, C Sneller
55	OH05-248-38	OH685/OH686	Ohio State Univ, C Sneller
56	VA07W-580	Goldfield /TRIBUTE//IL4162	VA Tech, C. Griffey
57	VA07W-600	OH 552/SS550//RC-STRATEGY,F8	VA Tech, C. Griffey
58	VA07W-672	REN3260*2//W14/ REN3260 /3/ REN3260	VA Tech, C. Griffey
59	VA06W-558	96W-348/P92823A1-1-4-4-5 //McCORMICK	VA Tech, C. Griffey
60	VA06W-615	ROANE/OH 552//RC STRATEGY	VA Tech, C. Griffey

Table 3. Entries in the 2008-2009 PNUWWSN

ENTRY	NAME	PEDIGREE	SOURCE
1	ERNIE	CHECK	
2	TRUMAN	CHECK	
3	FREEDOM	CHECK	
4	PIONEER 2545	CHECK	
5	P.0513A1-2-3	Truman/INW0731//Fdm/F201R	Purdue, H Ohm
6	P.0527A1-9-15	99751/2754//97462/INW0412	Purdue, H Ohm
7	P.0558A1-5-5	INW0412/L3//F201R/97462	Purdue, H Ohm
8	P.0570A1-7-6	9017/92823//F201R/04302	Purdue, H Ohm
9	P.05218A1-6-31	INW0304/9346//97395/INW0411	Purdue, H Ohm
10	OH02-12686	FOSTER/HOPEWELL//OH581/OH569	Ohio State Univ, C Sneller
11	SILAS	OH546/SE1694-12	Sunbean Extract, R Fioritto
12	LINUS	5-TIEGANMAI/PION 25R26	Sunbean Extract, R Fioritto
13	OKIE	F285N3-111/65343(spelt)	Sunbean Extract, R Fioritto
14	PENZO	5-TIEGANMAI/PION 25R26	Sunbean Extract, R Fioritto
15	AJAX	T63/PION2737W	Sunbean Extract, R Fioritto
16	IL04-11003	IL96-3073/ Roane	Univ IL, F Kolb
17	IL04-17762	IL97-3578/ IL97-7010	Univ IL, F Kolb
18	IL05-15079	NEL-1538/ KY93C-38-17-1	Univ IL, F Kolb
19	IL05-27333	IL96-24851-1/ IL97-3574// IL97-3950	Univ IL, F Kolb
20	IL05-27522	IL96-24851-1/ IL97-3574// IL99-2536	Univ IL, F Kolb
21	MH06-2370	COOPER/SS550	Syngenta, B Fgleman
22	MH06-2410	M98-1660//PATTON/Pioneer 2552	Syngenta, B Fgleman
23	ML07*7571	VA98W-586/HONEY	Syngenta, B Fgleman
24	ML07-7758	COKER 9025/Pioneer 25R57	Syngenta, B Fgleman
25	MO 050771	MO 960120/MO 960304	Univ MO, A McKendry
26	MO 041687	MO 960304/MO 960815	Univ MO, A McKendry
27	MO 071411	MO 980429/P86958RC4-2-1-1-10	Univ MO, A McKendry
28	MO 071722	MO 980429/Ernie	Univ MO, A McKendry
29	MO 071522	MO 003013/MO 980525	Univ MO, A McKendry
30	KY02C-3007-41	25R18/Allegiance	Univ KY, D Van Sanford
31	KY02C-3005-25	25R18/McCormick	Univ KY, D Van Sanford
32	KY03C-2170-24	VA01W-476/Roane	Univ KY, D Van Sanford
33	KY03C-2170-06	VA01W-476/Roane	Univ KY, D Van Sanford
34	KY02C-3007-45	25R18/Allegiance	Univ KY, D Van Sanford
35	MSU Line E5024	MSU Line D6234 / Pioneer Brand 25W33	MI State Univ, J. Lewis
36	VA07W-643	COKER 9474/ McCormick"S"	VA Tech, C. Griffey
37	VA06W-580	Roane / Pion 2684//OH 552	VA Tech, C. Griffey
38	VA07W-591	FREEDOM/NC96-13374 // RC-STRATEGY,F8	VA Tech, C. Griffey
39	VA06W-578	Roane / Pion 2684//OH 552	VA Tech, C. Griffey
40	VA04W-90	SS 520/PION2552//ROANE	VA Tech, C. Griffey
41	OH05-101-1	HOPEWELL/PIONEER 25R26	Ohio State Univ, C Sneller
42	OH05-72-6	PIONEER 25R18/VA97W-375	Ohio State Univ, C Sneller
43	OH05-249-32	OH685/OH686	Ohio State Univ, C Sneller
44	OH05-152-68	OH685/PATTON	Ohio State Univ, C Sneller
45	OH05-164-76	PIONEER 25R18/OH686	Ohio State Univ, C Sneller
46	OH05-200-74	OH629/HOPEWELL	Ohio State Univ, C Sneller

Table 4. Summary of ANOVA for all traits from the 2008-2009 NUWWSN and PNUWWSN

NUWWSN

	R2	CV	% SS Geno	% SS Env	% SS GEI	SS GEI / SS Geno
SEV	0.61	43.4	18.1	39.1	42.8	2.16
INC	0.76	27.4	9.8	66.7	23.5	6.79
IND	0.71	52.6	14.2	30.3	55.5	2.12
FDK	0.77	47.8	13.6	22.8	63.5	1.67
ISK	0.78	26.2	16.6	22.0	61.4	1.33
DON	0.85	65.7	6.4	78.6	15.0	12.37
GHSEV	0.78	53.7	77.5	22.3	0.2	0.29
HD	0.96	1.1	14.8	3.9	81.4	0.26
HGT	0.83	5.6	72.6	17.4	10.1	0.24

PNUWWSN

	R2	CV	% SS Geno	% SS Env	% SS GEI	SS GEI / SS Geno
SEV	0.81	24.1	8.0	20.2	71.9	2.53
INC	0.58	41.1	31.7	42.2	26.1	1.33
IND	0.69	53.8	23.3	31.3	45.4	1.35
FDK	0.64	43.9	28.6	36.3	35.0	1.27
ISK	0.74	23.8	31.1	23.6	45.3	0.76
DON	0.87	54.4	14.3	13.1	72.6	0.91
GHSEV*						
HD	0.96	0.93	15.8	4.0	80.2	0.25
HGT	0.71	8.1	46.9	29.4	23.7	0.63

* one environment for GHSEV in the PNUWWSN

Table 5. Corrleation of entry means over all environments for the 2008-2009 NUWWSN (above diagonal) and PNUWWSN (below diagonal). .

	INC	SEV	IND	FDK	ISK	DON	GHSEV	HD	HGT
INC	1	0.80	0.87	0.75	0.91	0.6	0.35	-0.32	-0.43
SEV	0.75	1	0.97	0.71	0.93	0.48	0.58	-0.34	
IND	0.81	0.97	1	0.78	0.96	0.55	0.5	-0.32	-0.28
FDK	0.65	0.76	0.81	1	0.79	0.56	0.34		-0.3
ISK	0.82	0.92	0.96	0.78	1	0.57	0.49	-0.28	-0.26
DON	0.54	0.49	0.54	0.61	0.51	1	0.36		-0.32
GHSEV	0.36	0.52	0.5	0.48	0.41	0.43	1	0.30	
HD								1	0.54
HGT	-0.38		-0.36		-0.37	-0.32			1

= non-significant correlation at p=0.05

Table 6. Correlation of heading date with all FHB traits by location for the 2008-2009 NUWWSN and PNUWWSN.

NUWWSN

	ILURB	ILBRO	KYLEX	MDSAL	MOCOL	OHWOO	VABLA
INC	NS	-0.27	0.32	-0.38	NS	NS	-0.32
SEV	NS	NS	0.36	-0.42	NS	NS	-0.38
IND	NS	NS	0.39	-0.4	NS	NS	-0.26
FDK			NS	-0.29			
ISK	NS	NS	0.39	-0.39	NS		
DON			NS	NS		NS	NS

PNUWWSN

	ILURB	ILBRO	KYLEX	MDSAL	MOCOL	OHWOO	VABLA
INC	NS	NS	0.36	NS	NS		-0.37
SEV	NS	NS	0.62	NS	NS		-0.47
IND	NS	NS	0.61	NS	NS	NS	-0.38
FDK							
ISK	NS	NS	0.58	NS	NS		
DON			NS				NS

NS = non-significant at p=0.05.

Table 7. Mean of FHB traits for the 2008-2009 NUWWSN. "l" and "h" indicate means that are not significantly different from the low and high mean in each column, respectively

ENTRY	NAME	INC		SEV		IND		FDK		ISK		DON		GHSEV		#l	#h
1	ERNIE	50.8	hl	22.5	l	14.9	l	20.5	l	33.3	l	10.3	hl	19.8	l	7	2
2	TRUMAN	41.3	l	15.4	l	9.4	l	12.9	l	28.1	l	7.9	hl	4.4	l	7	1
3	FREEDOM	56.9	hl	20.3	l	14.6	l	29.6	h	38.5	l	9.8	hl	8.2	l	6	3
4	PIONEER 2545	72.4	h	43.7	h	37.4	h	44.2	h	58.6	h	13.6	h	53.1		0	6
5	P.03615A1-4-4	67.5	h	35.7	h	26.0	h	29.5	h	51.4	h	12.2	hl	11.5	l	2	6
6	P.04704A1-2-1-1	63.2	h	41.0	h	31.3	h	24.3	l	48.7	h	10.0	hl	28.4	l	3	5
7	P.053A1-6-7	63.3	h	36.3	h	29.8	h	27.4	h	51.0	h	11.9	hl	21.5	l	2	6
8	P.0537A1-7-12	58.0	hl	22.8	l	16.1	l	17.0	l	38.5	l	8.6	hl	27.9	l	7	2
9	P.0128A1-22-22	52.4	hl	22.3	l	12.0	l	11.1	l	33.8	l	3.8	l	15.9	l	7	1
10	MOCHA	68.2	h	38.8	h	31.4	h	39.8	h	52.5	h	10.4	hl	21.9	l	2	6
11	SHAVER	72.0	h	42.3	h	32.7	h	36.4	h	53.0	h	9.3	hl	32.1	l	2	6
12	RUBIN	59.3	hl	37.9	h	27.4	h	35.4	h	49.0	h	8.7	hl	60.8		2	6
13	ARENA	73.9	h	37.3	h	30.9	h	36.6	h	51.4	h	15.3	h	47.1		0	6
14	CANON	69.4	h	35.9	h	28.5	h	31.1	h	50.4	h	7.1	l	24.6	l	2	5
15	NE06469	57.8	hl	25.7	hl	18.5	l	34.4	h	41.6	h	15.9	h	50.1		3	5
16	NI04420	69.9	h	35.8	h	29.9	h	38.9	h	52.7	h	15.8	h	28.2	l	1	6
17	NI04427	70.4	h	33.8	h	27.3	h	34.9	h	49.7	h	9.8	hl	27.7	l	2	6
18	NE05459	67.9	h	33.9	h	26.9	h	35.9	h	50.4	h	9.5	hl	40.0		1	6
19	NE06471	62.0	h	30.7	h	23.8	hl	30.0	h	49.2	h	8.2	hl	28.0	l	3	6
20	NY03179FHB-10	55.8	hl	25.3	hl	20.5	hl	23.1	l	40.5	l	11.5	hl	31.8	l	7	4
21	NY03180FHB-10	52.1	hl	29.0	hl	20.0	hl	23.4	l	39.3	l	6.2	l	24.8	l	7	3
22	NY03179FHB-12	61.6	h	34.0	h	26.9	h	25.1	hl	47.5	h	10.2	hl	32.3	l	3	6
23	NYW103-21-9183	57.3	hl	31.6	h	22.4	hl	23.7	l	44.0	h	5.0	l	20.8	l	5	4
24	NYW103-102-9103	40.6	l	22.7	l	13.7	l	16.2	l	29.4	l	5.2	l	10.0	l	7	0
25	IL02-18228	35.4	l	19.0	l	12.3	l	9.9	l	25.1	l	2.4	l	35.0	l	7	0
26	IL04-7874	50.0	hl	25.9	hl	19.1	l	16.3	l	32.4	l	10.8	hl	25.6	l	7	3
27	IL04-7942	46.2	l	24.8	hl	17.3	l	19.4	l	32.3	l	8.1	hl	16.5	l	7	2
28	IL04-10721	52.8	hl	25.8	hl	19.0	l	16.5	l	34.9	l	6.6	l	20.1	l	7	2
29	IL04-10741	43.4	l	24.5	hl	15.3	l	18.0	l	32.1	l	6.2	l	23.5	l	7	1
30	MD02W81-08-2	47.3	l	17.9	l	12.1	l	17.0	l	29.6	l	6.0	l	11.3	l	7	0
31	MD02W81-08-4	43.6	l	14.2	l	9.1	l	18.9	l	27.6	l	3.4	l	14.1	l	7	0
32	ACF213003B	60.1	hl	30.3	hl	22.3	hl	30.2	h	40.5	l	10.3	hl	35.0	l	6	5
33	ACF126103	62.1	h	29.9	hl	23.2	hl	26.7	hl	43.2	h	15.6	h	29.5	l	4	6
34	ACF12004	64.8	h	31.1	h	23.5	hl	35.8	h	43.9	h	8.3	hl	45.5		2	6
35	RCUOGTr34	42.3	l	19.7	l	12.8	l	19.6	l	33.3	l	5.8	l	28.4	l	7	0
36	RCUOGTr35	47.3	l	26.1	hl	15.4	l	23.9	l	36.9	l	3.7	l	32.0	l	7	1
37	M05-1531	53.9	hl	25.5	hl	17.9	l	23.0	l	38.2	l	4.7	l	12.3	l	7	2
38	B0390207	62.3	h	40.7	h	30.9	h	30.2	h	50.7	h	13.0	h	80.4		0	6
39	03M1539#031	49.2	hl	30.2	hl	18.6	l	17.4	l	38.3	l	8.3	hl	41.6		6	3
40	03M1599#0007	70.4	h	44.2	h	34.6	h	33.4	h	52.3	h	7.8	hl	67.3		1	6
41	MO050101	48.0	l	18.2	l	12.9	l	9.1	l	31.3	l	6.0	l	6.8	l	7	0
42	MO050921	42.9	l	19.3	l	11.3	l	14.8	l	27.7	l	10.8	hl	10.5	l	7	1
43	MO041020	52.2	hl	18.9	l	13.5	l	15.8	l	34.9	l	11.6	hl	10.9	l	7	2
44	MO050219	55.1	hl	22.2	l	17.1	l	15.5	l	37.6	l	11.4	hl	27.0	l	7	2
45	MO050144	56.2	hl	17.7	l	13.5	l	17.3	l	32.4	l	7.0	l	12.1	l	7	1
46	KY00C-2059-19	70.4	h	32.3	h	25.4	h	27.9	h	45.5	h	17.0	h	42.8		0	6
47	KY00C-2515-02	64.0	h	37.2	h	27.4	h	35.6	h	50.8	h	12.9	h	67.4		0	6
48	KY00C-2059-24	68.4	h	34.0	h	26.9	h	26.9	hl	48.7	h	17.7	h	66.5		1	6
49	KY00C-2567-01	61.9	h	32.3	h	23.3	hl	25.1	hl	44.0	h	13.3	h	35.5	l	3	6
50	KY00C-2143-08	62.2	h	32.7	h	22.4	hl	27.6	h	40.9	l	8.8	hl	61.5		3	5
51	MSU Line E6003	40.0	l	10.3	l	6.2	l	7.9	l	23.9	l	4.7	l	19.6	l	7	0
52	MSU Line E7035R	67.7	h	23.0	l	18.5	l	18.7	l	40.6	l	6.0	l	12.6	l	6	1
53	OH04-264-58	65.1	h	28.4	hl	22.7	hl	21.0	l	42.1	h	9.7	hl	40.8		4	5
54	OH04-268-39	52.7	hl	27.9	hl	21.3	hl	27.6	h	40.9	l	8.9	hl	11.1	l	6	5
55	OH05-248-38	69.0	h	40.0	h	30.4	h	36.0	h	51.3	h	13.1	h	84.6		0	6
56	VA07W-580	51.7	hl	22.4	l	15.3	l	22.9	l	35.6	l	10.0	hl	55.8		6	2
57	VA07W-600	53.0	hl	20.2	l	14.4	l	15.5	l	34.9	l	11.0	hl	14.3	l	7	2
58	VA07W-672	51.2	hl	35.3	h	21.8	hl	24.3	l	44.8	h	8.5	hl	128.0	h	4	6
59	VA06W-558	52.9	hl	24.5	hl	16.9	l	21.0	l	33.4	l	5.1	l	17.3	l	7	2
60	VA06W-615	59.6	hl	26.0	hl	18.6	l	22.4	l	38.1	l	7.6	l	14.3	l	7	2
	AVERAGE	57.3		28.5		20.9		24.5		40.9		9.3		32.1			
	MINUMUM	35.4		10.3		6.2		7.9		23.9		2.4		4.4			
	MAXIMUM	73.9		44.2		37.4		44.2		58.6		17.7		128.0			
	LSD(0.05)	25.6		20.2		18.0		19.2		17.5		10.0		34.5			
	# environs	8		11		11		8		6		5		2			

Table 8. Best (top of the table) and worst (bottom of table) entries in the 2008-2009 NUWWSN.

ENTRY	NAME	INC		SEV		IND		FDK		ISK		DON		GHSEV		#l	#h
51	MSU Line E6003	40.0	l	10.3	l	6.2	l	7.9	l	23.9	l	4.7	l	19.6	l	7	0
31	MD02W81-08-4	43.6	l	14.2	l	9.1	l	18.9	l	27.6	l	3.4	l	14.1	l	7	0
30	MD02W81-08-2	47.3	l	17.9	l	12.1	l	17.0	l	29.6	l	6.0	l	11.3	l	7	0
25	IL02-18228	35.4	l	19.0	l	12.3	l	9.9	l	25.1	l	2.4	l	35.0	l	7	0
35	RCUOGTr34	42.3	l	19.7	l	12.8	l	19.6	l	33.3	l	5.8	l	28.4	l	7	0
41	MO050101	48.0	l	18.2	l	12.9	l	9.1	l	31.3	l	6.0	l	6.8	l	7	0
24	NYW103-102-9103	40.6	l	22.7	l	13.7	l	16.2	l	29.4	l	5.2	l	10.0	l	7	0
2	TRUMAN	41.3	l	15.4	l	9.4	l	12.9	l	28.1	l	7.9	hl	4.4	l	7	1
42	MO050921	42.9	l	19.3	l	11.3	l	14.8	l	27.7	l	10.8	hl	10.5	l	7	1
9	P.0128A1-22-22	52.4	hl	22.3	l	12.0	l	11.1	l	33.8	l	3.8	l	15.9	l	7	1
45	MO050144	56.2	hl	17.7	l	13.5	l	17.3	l	32.4	l	7.0	l	12.1	l	7	1
29	IL04-10741	43.4	l	24.5	hl	15.3	l	18.0	l	32.1	l	6.2	l	23.5	l	7	1
36	RCUOGTr35	47.3	l	26.1	hl	15.4	l	23.9	l	36.9	l	3.7	l	32.0	l	7	1
43	MO041020	52.2	hl	18.9	l	13.5	l	15.8	l	34.9	l	11.6	hl	10.9	l	7	2
57	VA07W-600	53.0	hl	20.2	l	14.4	l	15.5	l	34.9	l	11.0	hl	14.3	l	7	2
1	ERNIE	50.8	hl	22.5	l	14.9	l	20.5	l	33.3	l	10.3	hl	19.8	l	7	2
8	P.0537A1-7-12	58.0	hl	22.8	l	16.1	l	17.0	l	38.5	l	8.6	hl	27.9	l	7	2
59	VA06W-558	52.9	hl	24.5	hl	16.9	l	21.0	l	33.4	l	5.1	l	17.3	l	7	2
44	MO050219	55.1	hl	22.2	l	17.1	l	15.5	l	37.6	l	11.4	hl	27.0	l	7	2
27	IL04-7942	46.2	l	24.8	hl	17.3	l	19.4	l	32.3	l	8.1	hl	16.5	l	7	2
37	M05-1531	53.9	hl	25.5	hl	17.9	l	23.0	l	38.2	l	4.7	l	12.3	l	7	2
60	VA06W-615	59.6	hl	26.0	hl	18.6	l	22.4	l	38.1	l	7.6	l	14.3	l	7	2
28	IL04-10721	52.8	hl	25.8	hl	19.0	l	16.5	l	34.9	l	6.6	l	20.1	l	7	2
26	IL04-7874	50.0	hl	25.9	hl	19.1	l	16.3	l	32.4	l	10.8	hl	25.6	l	7	3
21	NY03180FHB-10	52.1	hl	29.0	hl	20.0	hl	23.4	l	39.3	l	6.2	l	24.8	l	7	3
20	NY03179FHB-10	55.8	hl	25.3	hl	20.5	hl	23.1	l	40.5	l	11.5	hl	31.8	l	7	4
52	MSU Line E7035R	67.7	h	23.0	l	18.5	l	18.7	l	40.6	l	6.0	l	12.6	l	6	1
56	VA07W-580	51.7	hl	22.4	l	15.3	l	22.9	l	35.6	l	10.0	hl	55.8		6	2
3	FREEDOM	56.9	hl	20.3	l	14.6	l	29.6	h	38.5	l	9.8	hl	8.2	l	6	3
39	03M1539#031	49.2	hl	30.2	hl	18.6	l	17.4	l	38.3	l	8.3	hl	41.6		6	3
34	ACF12004	64.8	h	31.1	h	23.5	hl	35.8	h	43.9	h	8.3	hl	45.5		2	6
5	P.03615A1-4-4	67.5	h	35.7	h	26.0	h	29.5	h	51.4	h	12.2	hl	11.5	l	2	6
17	NI04427	70.4	h	33.8	h	27.3	h	34.9	h	49.7	h	9.8	hl	27.7	l	2	6
12	RUBIN	59.3	hl	37.9	h	27.4	h	35.4	h	49.0	h	8.7	hl	60.8		2	6
7	P.053A1-6-7	63.3	h	36.3	h	29.8	h	27.4	h	51.0	h	11.9	hl	21.5	l	2	6
10	MOCHA	68.2	h	38.8	h	31.4	h	39.8	h	52.5	h	10.4	hl	21.9	l	2	6
11	SHAVER	72.0	h	42.3	h	32.7	h	36.4	h	53.0	h	9.3	hl	32.1	l	2	6
18	NE05459	67.9	h	33.9	h	26.9	h	35.9	h	50.4	h	9.5	hl	40.0		1	6
48	KY00C-2059-24	68.4	h	34.0	h	26.9	h	26.9	hl	48.7	h	17.7	h	66.5		1	6
16	NI04420	69.9	h	35.8	h	29.9	h	38.9	h	52.7	h	15.8	h	28.2	l	1	6
40	03M1599#0007	70.4	h	44.2	h	34.6	h	33.4	h	52.3	h	7.8	hl	67.3		1	6
46	KY00C-2059-19	70.4	h	32.3	h	25.4	h	27.9	h	45.5	h	17.0	h	42.8		0	6
47	KY00C-2515-02	64.0	h	37.2	h	27.4	h	35.6	h	50.8	h	12.9	h	67.4		0	6
55	OH05-248-38	69.0	h	40.0	h	30.4	h	36.0	h	51.3	h	13.1	h	84.6		0	6
13	ARENA	73.9	h	37.3	h	30.9	h	36.6	h	51.4	h	15.3	h	47.1		0	6
38	B0390207	62.3	h	40.7	h	30.9	h	30.2	h	50.7	h	13.0	h	80.4		0	6
4	PIONEER 2545	72.4	h	43.7	h	37.4	h	44.2	h	58.6	h	13.6	h	53.1		0	6
	AVERAGE	57.3		28.5		20.9		24.5		40.9		9.3		32.1			
	MINUMUM	35.4		10.3		6.2		7.9		23.9		2.4		4.4			
	MAXIMUM	73.9		44.2		37.4		44.2		58.6		17.7		128.0			
	LSD(0.05)	25.6		20.2		18.0		19.2		17.5		10.0		34.5			
	# environs	8		11		11		8		6		5		2			

Table 9. Mean of FHB traits for the 2008-2009 PNUWWSN. "l" and "h" indicate means that are not significantly different from the lowest and highest mean in each column, respectively.

ENTRY	NAME	INC	SEV	IND	FDK	ISK	DON	GHSEV	#l	#h
1	ERNIE	53.4	23.9 l	14.1 l	21.6 l	34.6 l	21.7 hl	27.3	4	1
2	TRUMAN	35.3 l	20.1 l	11.3 l	18.1 l	29.5 l	8.9 l	3.5	6	0
3	FREEDOM	62.0	27.1 l	18.8	34.6 hl	45.8	21.3 hl	5.7	3	2
4	PIONEER 2545	77.3 h	46.3	36.9 h	46.8 hl	63.0 h	31.0 hl	82.4	2	5
5	P.0513A1-2-3	57.8	25.7 l	16.7 l	26.6 hl	41.5	12.5 hl	57.3	4	2
6	P.0527A1-9-15	72.1 h	35.4	28.5	44.6 hl	61.4 h	21.4 hl	34.0	2	4
7	P.0558A1-5-5	69.2 h	31.9	23.2	35.0 hl	51.5	19.6 hl	8.5	2	3
8	P.0570A1-7-6	68.7 h	39.6	29.6	33.7 hl	55.4	20.3 hl	59.3	2	3
9	P.05218A1-6-31	63.3	27.7 l	17.7 l	36.4 hl	41.7	21.4 hl	9.2	4	2
10	OH02-12686	60.5	34.6	26.1	42.5 hl	56.4	11.2 l	5.0	2	1
11	SILAS	61.6	38.4	24.0	29.9 hl	50.9	21.6 hl	4.5	2	2
12	LINUS	82.1 h	59.2 h	46.5 h	65.2 h	75.8 h	20.7 hl	81.4	1	6
13	OKIE	57.8	40.0	23.2	45.7 hl	48.4	14.8 hl	80.6	2	2
14	PENZO	75.0 h	55.5 h	41.8 h	46.8 hl	66.9 h	21.5 hl	41.5	2	6
15	AJAX	70.1 h	49.1 h	36.4 h	51.0 h	63.1 h	37.1 h	45.7	0	6
16	IL04-11003	55.4	25.3 l	14.5 l	34.5 hl	42.2	11.6 hl	15.2	4	2
17	IL04-17762	54.3	22.6 l	12.3 l	24.5 l	37.2 l	11.9 hl	43.2	5	1
18	IL05-15079	63.5	28.8	19.1	20.1 l	42.5	15.5 hl	10.2	2	1
19	IL05-27333	60.3	22.4 l	15.7 l	22.7 l	38.1 l	12.1 hl	9.2	5	1
20	IL05-27522	49.6 l	18.0 l	11.0 l	23.5 l	24.6 l	13.2 hl	13.7	6	1
21	MH06-2370	62.3	32.6	22.0	43.6 hl	47.7	12.6 hl	30.7	2	2
22	MH06-2410	53.9	21.2 l	14.3 l	25.0 l	41.3	16.6 hl	13.7	4	1
23	ML07*7571	64.3	24.2 l	16.7 l	40.6 hl	43.4	20.6 hl	7.6	4	2
24	ML07-7758	56.3	22.9 l	12.9 l	30.3 hl	33.8 l	9.7 l	2.7	5	1
25	MO 050771	50.1	20.7 l	10.9 l	22.0 l	33.4 l	20.9 hl	17.0	5	1
26	MO 041687	62.7	35.2	23.0	24.9 l	46.6	20.2 hl	42.8	2	1
27	MO 071411	54.4	19.1 l	11.0 l	24.5 l	31.4 l	15.4 hl	37.8	5	1
28	MO 071722	66.0	35.7	22.7	26.9 hl	45.0	13.8 hl	33.2	2	2
29	MO 071522	49.5 l	28.8	20.8	17.2 l	47.3	7.0 l	5.3	3	0
30	KY02C-3007-41	53.6	17.1 l	10.6 l	20.5 l	36.3 l	13.4 hl	3.4	5	1
31	KY02C-3005-25	47.8 l	15.9 l	8.2 l	8.6 l	28.7 l	8.4 l	6.2	6	0
32	KY03C-2170-24	58.1	28.3 l	14.3 l	35.1 hl	35.0 l	13.4 hl	24.2	5	2
33	KY03C-2170-06	60.3	25.9 l	14.8 l	14.1 l	39.2 l	6.7 l	7.7	5	0
34	KY02C-3007-45	52.3	16.2 l	10.3 l	19.1 l	35.6 l	12.3 hl	6.2	5	1
35	MSU Line E5024	59.0	25.1 l	18.5 l	30.0 hl	40.9	36.9 h	75.3	3	1
36	VA07W-643	66.4	23.8 l	17.4 l	24.8 l	43.4	10.8 l	3.3	4	0
37	VA06W-580	54.2	26.9 l	14.3 l	22.0 l	38.7 l	12.9 hl	2.6	5	1
38	VA07W-591	73.3 h	31.5	21.8	36.1 hl	46.9	24.7 hl	28.2	2	3
39	VA06W-578	69.5 h	32.6	24.0	36.9 hl	49.8	22.7 hl	25.2	2	3
40	VA04W-90	57.2	28.8	17.5 l	27.0 hl	42.2	16.9 hl	10.0	3	2
41	OH05-101-1	61.9	22.4 l	13.3 l	28.4 hl	36.2 l	8.9 l	23.3	6	2
42	OH05-72-6	59.3	28.5 l	14.5 l	36.8 hl	40.7	15.0 hl	23.5	4	2
43	OH05-249-32	53.2	25.7 l	15.6 l	37.6 hl	36.4 l	13.7 hl	97.2	5	2
44	OH05-152-68	56.4	32.1	20.1	41.6 hl	46.6	16.5 hl	28.0	2	2
45	OH05-164-76	63.3	24.2 l	16.3 l	29.2 hl	44.2	16.5 hl	5.4	4	2
46	OH05-200-74	57.5	22.0 l	13.8 l	36.9 hl	40.1	15.0 hl	3.3	4	2
	AVERAGE	60.3	29.1	19.3	31.4	43.9	16.8	26.1		
	MINUMUM	35.3	15.9	8.2	8.6	24.6	6.7	2.6		
	MAXIMUM	82.1	59.2	46.5	65.2	75.8	37.1	97.2		
	LSD(0.05)	14.6	12.8	10.4	38.9	14.8	25.8	.		
	# ENVIRONMENTS	8	7	8	5	4	2	1		

Table 10. Best (top of the table) and worst (bottom of the table) entries in the 2008-2009 PNUWWSN

ENTRY	NAME	INC	SEV	IND	FDK	ISK	DON	GHSEV	#l	#h
31	KY02C-3005-25	47.8 l	15.9 l	8.2 l	8.6 l	28.7 l	8.4 l	6.2	6	0
20	IL05-27522	49.6 l	18.0 l	11.0 l	23.5 l	24.6 l	13.2 hl	13.7	6	1
2	TRUMAN	35.3 l	20.1 l	11.3 l	18.1 l	29.5 l	8.9 l	3.5	6	0
34	KY02C-3007-45	52.3	16.2 l	10.3 l	19.1 l	35.6 l	12.3 hl	6.2	5	1
30	KY02C-3007-41	53.6	17.1 l	10.6 l	20.5 l	36.3 l	13.4 hl	3.4	5	1
25	MO 050771	50.1	20.7 l	10.9 l	22.0 l	33.4 l	20.9 hl	17.0	5	1
27	MO 071411	54.4	19.1 l	11.0 l	24.5 l	31.4 l	15.4 hl	37.8	5	1
17	IL04-17762	54.3	22.6 l	12.3 l	24.5 l	37.2 l	11.9 hl	43.2	5	1
24	ML07-7758	56.3	22.9 l	12.9 l	30.3 hl	33.8 l	9.7 l	2.7	5	1
41	OH05-101-1	61.9	22.4 l	13.3 l	28.4 hl	36.2 l	8.9 l	23.3	5	1
32	KY03C-2170-24	58.1	28.3 l	14.3 l	35.1 hl	35.0 l	13.4 hl	24.2	5	2
37	VA06W-580	54.2	26.9 l	14.3 l	22.0 l	38.7 l	12.9 hl	2.6	5	1
33	KY03C-2170-06	60.3	25.9 l	14.8 l	14.1 l	39.2 l	6.7 l	7.7	5	0
43	OH05-249-32	53.2	25.7 l	15.6 l	37.6 hl	36.4 l	13.7 hl	97.2	5	2
19	IL05-27333	60.3	22.4 l	15.7 l	22.7 l	38.1 l	12.1 hl	9.2	5	1
4	PIONEER 2545	77.3 h	46.3	36.9 h	46.8 hl	63.0 h	31.0 hl	82.4	2	5
15	AJAX	70.1 h	49.1 h	36.4 h	51.0 h	63.1 h	37.1 h	45.7	0	6
14	PENZO	75.0 h	55.5 h	41.8 h	46.8 hl	66.9 h	21.5 hl	41.5	2	6
12	LINUS	82.1 h	59.2 h	46.5 h	65.2 h	75.8 h	20.7 hl	81.4	1	6
	AVERAGE	60.3	29.1	19.3	31.4	43.9	16.8	26.1		
	MINUMUM	35.3	15.9	8.2	8.6	24.6	6.7	2.6		
	MAXIMUM	82.1	59.2	46.5	65.2	75.8	37.1	97.2		
	LSD(0.05)	14.6	12.8	10.4	38.9	14.8	25.8	.		
	# ENVIRONMENTS	8	7	8	5	4	2	1		

Table 11. Summary of incidence (INC, %) data from 2008-2009 NUWWSN

ENTRY	NAME	AVG		ILURB	INBRO	INLAY	KYLEX	MDSAL	MIELA	MOCOL	NEMEA	NYITH	OHWOO	ONRID	VABLA
1	ERNIE	50.8	hl	66.7	52.0	15.0	60.0	12.5	65.2	95	86.7	15.0	43.3	73.3	25.0
2	TRUMAN	41.3	l	63.3	5.0	10.0	90.0	3.5	45.2	90	73.3	13.8	61.7	30.0	10.0
3	FREEDOM	56.9	hl	88.3	90.0	10.0	65.0	15.0	74.4	100	75.2	37.5	80.0	35.0	12.5
4	PIONEER 2545	72.4	h	98.3	95.0	4.0	95.0	40.0	80.3	100	100.0	31.3	96.7	88.3	40.0
5	P.03615A1-4-4	67.5	h	96.7	22.0	30.0	95.0	10.0	96.8	100	100.0	60.0	88.3	86.7	25.0
6	P.04704A1-2-1-1	63.2	h	98.3	41.0	5.0	70.0	37.5	96.6	100	96.7	28.8	70.0	90.0	25.0
7	P.053A1-6-7	63.3	h	95.0	55.0	5.0	85.0	60.0	84.5	100	100.0	21.3	53.3	83.3	17.5
8	P.0537A1-7-12	58.0	hl	71.7	71.0	3.0	80.0	10.0	75.3	100	93.3	12.5	85.0	76.7	17.5
9	P.0128A1-22-22	52.4	hl	60.0	34.0	40.0	80.0	9.0	60.8	100	96.7	11.3	43.3	68.3	25.0
10	MOCHA	68.2	h	95.0	78.0	15.0	85.0	62.5	93.2	100	63.3	28.8	63.3	86.7	47.5
11	SHAVER	72.0	h	91.7	55.0	60.0	85.0	55.0	83.2	100	76.7	43.8	98.3	80.0	35.0
12	RUBIN	59.3	hl	96.3	46.0	20.0	80.0	32.5	82.7	100	66.7	16.3	70.0	76.7	25.0
13	ARENA	73.9	h	95.0	91.0	60.0	85.0	60.0	77.6	100	66.7	41.3	93.3	80.0	37.5
14	CANON	69.4	h	95.0	72.0	60.0	80.0	27.5	89.1	100	96.7	35.0	83.3	76.7	17.5
15	NE06469	57.8	hl	79.7	84.0	2.0	35.0	75.0	72.0	100	56.7	36.3	45.0	83.3	25.0
16	NI04420	69.9	h	95.0	95.0	4.0	75.0	65.0	88.8	100	66.7	28.8	93.3	85.0	42.5
17	NI04427	70.4	h	83.3	91.0	60.0	90.0	27.5	79.3	100	73.3	17.5	93.3	76.7	52.5
18	NE05459	67.9	h	96.7	81.0	25.0	95.0	57.5	80.3	100	53.3	26.3	81.7	53.3	65.0
19	NE06471	62.0	h	91.7	54.0	3.0	90.0	75.0	73.7	100	73.3	11.3	66.7	80.0	25.0
20	NY03179FHB-10	55.8	hl	88.3	20.0	15.0	100.0	7.5	72.8	100	66.7	42.5	76.7	60.0	20.0
21	NY03180FHB-10	52.1	hl	66.7	15.0	50.0	100.0	15.0	70.5	100	50.0	25.0	56.7	63.3	12.5
22	NY03179FHB-12	61.6	h	91.7	29.0	40.0	100.0	7.5	82.5	100	73.3	25.0	85.0	80.0	25.0
23	NYW103-21-9183	57.3	hl	83.3	40.0	60.0	90.0	7.5	66.9	100	70.0	28.8	68.3	60.0	12.5
24	NYW103-102-9103	40.6	l	63.3	10.0	40.0	65.0	20.0	65.4	100	30.0	13.8	15.0	60.0	5.0
25	IL02-18228	35.4	l	36.7	32.0	5.0	40.0	7.5	35.1	97	73.3	2.5	26.7	56.7	12.5
26	IL04-7874	50.0	hl	75.0	12.0	7.0	75.0	12.5	57.0	87	100.0	21.3	38.3	90.0	25.0
27	IL04-7942	46.2	l	80.0	16.0	3.0	70.0	22.5	55.7	95	66.7	12.5	41.7	81.7	10.0
28	IL04-10721	52.8	hl	81.7	18.0	5.0	60.0	32.5	76.3	100	86.7	8.8	51.7	83.3	30.0
29	IL04-10741	43.4	l	45.0	17.0	25.0	75.0	15.0	48.8	100	76.7	7.5	21.7	76.7	12.5
30	MD02W81-08-2	47.3	l	58.3	6.0	60.0	80.0	5.0	51.2	100	66.7	13.8	46.7	60.0	20.0
31	MD02W81-08-4	43.6	l	90.0	4.0	15.0	45.0	15.0	53.3	98	66.7	11.3	51.7	53.3	20.0
32	ACF213003B	60.1	hl	90.0	46.0	40.0	70.0	10.0	86.3	100	66.7	28.8	85.0	83.3	15.0
33	ACF126103	62.1	h	93.3	18.0	40.0	75.0	22.5	83.4	100	96.7	47.5	73.3	73.3	22.5
34	ACF12004	64.8	h	93.3	18.0	80.0	60.0	25.0	73.1	100	100.0	37.5	96.7	86.7	7.5
35	RCUOGTr34	42.3	l	65.0	14.0	20.0	95.0	15.0	74.0	100	53.3	2.5	40.0	21.7	7.5
36	RCUOGTr35	47.3	l	85.0	22.0	30.0	70.0	22.5	57.1	100	70.0	21.3	21.7	60.0	7.5
37	M05-1531	53.9	hl	80.0	21.0	50.0	75.0	15.0	65.0	100	76.7	23.8	36.7	76.7	27.5
38	B0390207	62.3	h	93.3	52.0	40.0	95.0	55.0	81.1	100	66.7	22.5	40.0	86.7	15.0
39	03M1539#031	49.2	hl	86.7	31.0	10.0	65.0	27.5	51.0	100	76.7	27.5	40.0	60.0	15.0
40	03M1599#0007	70.4	h	95.0	45.0	60.0	65.0	72.5	78.8	100	80.0	43.8	70.0	80.0	55.0
41	MO050101	48.0	l	71.7	50.0	25.0	80.0	7.5	53.3	100	70.0	15.0	35.0	53.3	15.0
42	MO050921	42.9	l	56.7	6.0	35.0	60.0	25.0	66.2	100	40.0	16.3	40.0	60.0	10.0
43	MO041020	52.2	hl	80.0	50.0	35.0	85.0	17.5	72.5	100	46.7	13.8	53.3	65.0	7.5
44	MO050219	55.1	hl	88.3	5.0	15.0	100.0	21.0	74.7	100	66.7	27.5	80.0	60.0	22.5
45	MO050144	56.2	hl	88.3	50.0	20.0	50.0	17.5	84.0	100	63.3	20.0	80.0	76.7	25.0
46	KY00C-2059-19	70.4	h	100.0	45.0	50.0	90.0	35.0	94.4	100	56.7	40.0	96.7	90.0	47.5
47	KY00C-2515-02	64.0	h	96.7	40.0	50.0	95.0	35.0	86.4	100	73.3	26.3	70.0	60.0	35.0
48	KY00C-2059-24	68.4	h	98.3	35.0	60.0	100.0	45.0	80.5	100	56.7	40.0	78.3	86.7	40.0
49	KY00C-2567-01	61.9	h	88.3	30.0	35.0	95.0	42.5	92.7	100	66.7	23.8	78.3	63.3	27.5
50	KY00C-2143-08	62.2	h	83.3	10.0	40.0	90.0	47.5	81.3	93	70.0	35.0	61.7	86.7	47.5
51	MSU Line E6003	40.0	l	20.0	6.0	80.0	100.0	12.5	48.8	100	30.0	3.8	26.7	50.0	2.5
52	MSU Line E7035R	67.7	h	83.3	82.0	80.0	90.0	15.0	83.8	100	73.3	16.3	93.3	80.0	15.0
53	OH04-264-58	65.1	h	95.0	27.0	40.0	95.0	25.0	88.0	100	73.3	35.0	88.3	66.7	47.5
54	OH04-268-39	52.7	hl	85.0	15.0	7.0	90.0	17.5	82.1	100	66.7	30.0	61.7	70.0	7.5
55	OH05-248-38	69.0	h	88.3	64.0	85.0	85.0	62.5	92.5	100	33.3	21.3	93.3	80.0	22.5
56	VA07W-580	51.7	hl	75.0	25.0	5.0	75.0	25.0	73.0	100	66.7	13.8	71.7	70.0	20.0
57	VA07W-600	53.0	hl	81.7	10.0	5.0	75.0	32.5	83.2	100	76.7	22.5	65.0	60.0	25.0
58	VA07W-672	51.2	hl	95.0	10.0	7.0	95.0	22.5	64.5	100	80.0	8.8	41.7	70.0	20.0
59	VA06W-558	52.9	hl	63.3	65.0	70.0	40.0	12.5	40.1	100	70.0	25.0	41.7	90.0	17.5
60	VA06W-615	59.6	hl	83.3	75.0	20.0	75.0	17.5	70.0	93	73.3	26.3	75.0	76.7	30.0
100	AVERAGE	57.3		82.0	40.0	31.5	79.3	28.4	73.3	99	71.4	24.1	63.8	71.3	23.9
101	MINUMUM	35.4		20.0	4.0	2.0	35.0	3.5	35.1	87	30.0	2.5	15.0	21.7	2.5
102	MAXIMUM	73.9		100.0	95.0	85.0	100.0	75.0	96.8	100	100.0	60.0	98.3	90.0	65.0
103	LSD(0.05)	25.6		.	.	.	.	.	.	.	.	.	.	.	.

Table 12. Summary of severity (SEV, %) data from 2008-2009 NUWWSN

ENTRY	NAME	AVG		ILURB	INBRO	KYLEX	MDSAL	MIELA	MOCOL	NEMEA	NYITH	OHWOO	ONRID	VABLA	INLAY*
1	ERNIE	22.5	l	46.2	12.0	29.9	8.5	25.6	20.6	43.0	5.8	7.5	21.0	27.5	0.9
2	TRUMAN	15.4	l	26.1	1.0	54.8	1.0	16.6	13.2	10.3	11.3	8.6	16.3	10.0	1.8
3	FREEDOM	20.3	l	49.6	11.0	32.3	7.5	26.9	42.5	4.1	12.5	9.9	11.7	15.0	3.3
4	PIONEER 2545	43.7	h	80.4	62.0	59.5	22.5	35.0	52.9	42.3	15.3	24.3	38.7	47.5	8.5
5	P.03615A1-4-4	35.7	h	42.9	100.0	53.7	5.0	12.0	45.5	64.0	10.5	10.3	29.0	20.0	1.6
6	P.04704A1-2-1-1	41.0	h	58.4	72.0	63.9	22.5	35.6	42.7	59.7	11.0	10.6	49.7	25.0	2.4
7	P.053A1-6-7	36.3	h	70.3	25.0	49.8	30.0	31.9	51.0	64.3	17.0	11.5	29.0	20.0	1.3
8	P.0537A1-7-12	22.8	l	34.1	16.0	45.0	6.0	15.5	34.0	38.0	6.5	6.6	16.3	32.5	2.8
9	P.0128A1-22-22	22.3	l	20.7	90.0	26.7	3.0	10.0	27.7	16.3	8.5	5.9	14.0	22.5	0.9
10	MOCHA	38.8	h	59.1	52.0	61.5	40.0	37.0	51.5	5.7	7.5	10.1	55.3	47.5	1.3
11	SHAVER	42.3	h	74.7	76.0	61.5	22.5	42.2	60.8	30.7	14.3	13.6	29.0	40.0	8.8
12	RUBIN	37.9	h	71.3	63.0	44.6	23.0	32.5	48.9	36.3	19.5	11.8	30.7	35.0	9.2
13	ARENA	37.3	h	67.2	47.0	32.8	27.5	42.8	66.6	26.3	15.5	14.2	33.0	35.0	10.0
14	CANON	35.9	h	58.5	58.0	52.8	15.0	30.7	54.9	44.3	11.0	15.2	25.0	30.0	7.3
15	NE06469	25.7	hl	46.9	22.0	33.0	45.0	35.2	33.8	8.0	10.3	8.2	25.0	15.0	4.6
16	NI04420	35.8	h	72.9	13.0	40.4	37.5	37.8	62.3	45.0	8.3	22.4	29.0	25.0	1.4
17	NI04427	33.8	h	48.2	40.0	40.5	22.5	35.4	63.3	32.0	12.0	14.3	18.7	45.0	7.0
18	NE05459	33.9	h	55.3	15.0	44.1	30.0	35.3	66.3	25.3	28.8	17.0	18.7	37.5	3.0
19	NE06471	30.7	h	56.5	32.0	41.9	37.5	29.3	57.6	12.7	9.3	13.6	25.0	22.5	1.2
20	NY03179FHB-10	25.3	hl	56.5	3.0	54.5	3.0	32.3	56.0	16.3	10.5	7.5	18.7	20.0	5.8
21	NY03180FHB-10	29.0	hl	57.6	2.0	69.4	5.5	35.7	46.5	11.3	22.3	8.8	25.0	35.0	7.6
22	NY03179FHB-12	34.0	h	63.8	28.0	86.3	5.0	27.5	55.2	37.3	10.0	17.4	21.0	25.0	5.1
23	NYW103-21-9183	31.6	h	61.8	50.0	71.4	3.0	28.4	45.9	9.7	17.0	15.0	33.0	12.5	4.7
24	NYW103-102-9103	22.7	l	47.9	5.0	39.0	10.0	25.9	40.0	6.7	7.5	13.2	50.0	5.0	5.0
25	IL02-18228	19.0	l	28.3	17.0	13.5	3.5	27.1	23.0	65.3	1.5	6.1	14.0	10.0	1.0
26	IL04-7874	25.9	hl	37.9	7.0	26.9	3.5	30.6	22.0	79.0	7.0	12.2	29.0	30.0	1.0
27	IL04-7942	24.8	hl	37.5	12.0	26.1	13.5	30.4	26.2	59.7	8.5	9.4	26.7	22.5	1.3
28	IL04-10721	25.8	hl	35.1	5.0	31.8	18.5	30.0	29.6	65.7	4.5	7.6	21.0	35.0	0.5
29	IL04-10741	24.5	hl	30.3	12.0	25.2	8.5	26.7	38.4	58.3	13.5	5.6	16.3	35.0	0.5
30	MD02W81-08-2	17.9	l	39.7	5.0	33.9	2.0	7.9	34.1	10.3	6.8	6.5	33.0	17.5	1.0
31	MD02W81-08-4	14.2	l	22.7	5.0	20.9	7.5	5.7	37.1	12.3	5.8	5.6	18.7	15.0	0.8
32	ACF213003B	30.3	hl	69.0	37.0	25.6	5.0	35.3	49.2	27.0	22.0	11.2	25.0	27.5	0.9
33	ACF126103	29.9	hl	70.5	22.0	40.9	7.5	31.8	52.1	44.0	13.5	7.9	18.7	20.0	3.2
34	ACF12004	31.1	h	68.5	15.0	46.8	17.5	29.2	46.8	43.7	14.0	11.1	34.7	15.0	1.5
35	RCUOGTr34	19.7	l	36.3	26.0	41.2	5.0	31.7	32.8	11.3	3.0	10.3	11.7	7.5	5.3
36	RCUOGTr35	26.1	hl	52.5	44.0	43.3	12.5	33.3	37.1	10.3	9.8	10.9	21.0	12.5	1.5
37	M05-1531	25.5	hl	34.7	32.0	33.0	6.0	25.3	38.2	51.0	6.5	11.6	22.7	20.0	4.2
38	B0390207	40.7	h	70.2	47.0	42.0	55.0	32.6	42.8	62.7	13.3	26.6	38.7	17.5	9.2
39	03M1539#031	30.2	hl	37.2	43.0	32.7	18.0	33.8	39.8	46.3	16.3	18.8	18.7	27.5	6.0
40	03M1599#0007	44.2	h	74.2	44.0	55.4	47.5	40.4	52.7	58.7	15.5	14.6	45.7	37.5	10.0
41	MO050101	18.2	l	27.4	3.0	24.8	3.0	11.4	33.3	47.3	9.3	6.5	18.7	15.0	2.7
42	MO050921	19.3	l	33.0	3.0	34.9	10.0	18.8	41.5	8.7	11.0	8.6	33.0	10.0	3.7
43	MO041020	18.9	l	26.7	10.0	42.8	10.0	20.2	44.1	9.0	7.0	9.1	21.0	7.5	1.9
44	MO050219	22.2	l	30.7	10.0	55.7	6.0	21.2	42.4	21.0	10.3	8.6	18.7	20.0	1.8
45	MO050144	17.7	l	44.7	5.0	15.1	5.5	10.1	37.9	24.3	9.0	6.6	21.0	15.0	0.8
46	KY00C-2059-19	32.3	h	59.2	50.0	48.1	22.5	27.6	44.6	10.7	9.0	20.2	33.0	30.0	5.8
47	KY00C-2515-02	37.2	h	73.7	45.0	64.9	22.5	28.4	62.5	16.7	30.5	13.5	21.0	30.0	3.0
48	KY00C-2059-24	34.0	h	63.5	20.0	59.8	27.5	39.4	58.4	15.7	11.0	12.7	29.0	37.5	6.3
49	KY00C-2567-01	32.3	h	54.9	30.0	48.1	25.0	35.6	54.0	28.0	20.8	14.8	18.7	25.0	6.0
50	KY00C-2143-08	32.7	h	39.5	50.0	34.4	27.5	27.9	27.5	58.7	9.5	15.3	34.7	35.0	6.3
51	MSU Line E6003	10.3	l	20.2	4.0	36.5	5.0	**-11.0**	15.5	7.7	3.0	6.3	21.0	5.0	1.8
52	MSU Line E7035R	23.0	l	25.5	17.0	56.0	7.5	23.0	37.4	25.7	8.3	9.1	29.0	15.0	0.8
53	OH04-264-58	28.4	hl	50.3	17.0	48.3	12.5	29.9	45.9	32.0	12.0	9.6	25.0	30.0	7.4
54	OH04-268-39	27.9	hl	51.2	15.0	79.9	10.0	40.6	39.1	12.7	13.0	5.3	33.0	7.5	9.2
55	OH05-248-38	40.0	h	76.0	43.0	53.2	35.0	51.0	69.2	8.3	20.5	16.2	33.0	35.0	9.3
56	VA07W-580	22.4	l	53.0	30.0	18.7	7.5	21.3	49.2	18.7	10.5	11.6	16.3	10.0	8.5
57	VA07W-600	20.2	l	32.9	5.0	39.6	15.0	21.5	30.3	28.3	9.5	9.0	16.3	15.0	2.4
58	VA07W-672	35.3	h	52.5	90.0	43.9	10.0	25.7	45.4	44.0	9.3	11.4	30.7	25.0	10.0
59	VA06W-558	24.5	hl	36.8	10.0	15.9	5.0	25.6	45.0	47.3	7.8	24.3	26.7	25.0	4.4
60	VA06W-615	26.0	hl	34.0	20.0	49.8	12.5	25.2	31.1	34.0	10.5	7.4	29.0	32.5	2.3
100	AVERAGE	28.5		49.3	29.1	43.3	15.7	27.7	43.3	31.6	11.6	11.7	26.1	23.8	4.1
101	MINUMUM	10.3		20.2	1.0	13.5	1.0	**-11.0**	13.2	4.1	1.5	5.3	11.7	5.0	0.5
102	MAXIMUM	44.2		80.4	100.0	86.3	55.0	51.0	69.2	79.0	30.5	26.6	55.3	47.5	10.0
103	LSD(0.05)	20.2		.	.	.	.	.	.	.	.	.	.	.	.

negative value from LS estimate

* # Syptomatic florets folliwing SPI in th

Table 13. Summary of index (IND, %) data from 2008-2009 NUWWSN.

ENTRY	NAME	AVG		ILURB	INBRO	KYLEX	MDSAL	MIELA	MOCOL	NEMEA	NYITH	OHWOO	ONRID	VABLA	ROMAN NSF*	ROMAN AUDPC
1	ERNIE	14.9	l	30.9	6.2	17.9	1.6	17.8	19.6	42.0	0.9	3.3	15.4	8.1	47.8	373
2	TRUMAN	9.4	l	16.9	0.1	49.4	0.0	3.5	11.9	8.3	1.5	5.6	5.1	1.0	44.8	309
3	FREEDOM	14.6	l	44.0	9.9	21.0	1.3	19.4	42.5	2.7	4.7	8.0	4.8	2.3	51.9	355
4	PIONEER 2545	37.4	h	79.0	58.9	56.5	10.5	28.0	52.9	42.3	4.8	23.6	34.3	20.1	94.4	626
5	P.03615A1-4-4	26.0	h	42.0	22.0	51.0	0.5	15.5	45.5	64.0	6.3	9.2	25.0	5.0	10.7	116
6	P.04704A1-2-1-1	31.3	h	57.6	29.5	44.7	12.4	35.0	42.7	58.7	3.2	8.3	45.5	6.5	72.8	611
7	P.053A1-6-7	29.8	h	66.8	13.8	42.3	22.5	27.8	51.0	64.3	3.6	6.7	24.3	4.3	91.3	806
8	P.0537A1-7-12	16.1	l	24.1	11.4	36.0	0.8	10.4	34.0	36.3	0.8	5.6	12.4	5.5	28.3	201
9	P.0128A1-22-22	12.0	l	12.4	30.6	21.3	0.3	4.2	27.7	16.0	1.0	2.8	9.6	5.8	10.3	109
10	MOCHA	31.4	h	56.6	40.6	52.2	25.0	31.8	51.5	3.7	2.2	6.4	48.1	27.4	52.2	380
11	SHAVER	32.7	h	68.9	41.8	52.3	14.3	35.1	80.8	29.0	6.2	13.2	23.6	14.5	69.8	458
12	RUBIN	27.4	h	68.8	29.0	35.7	13.5	26.2	48.9	36.3	3.2	7.9	22.9	9.3	57.0	412
13	ARENA	30.9	h	84.5	42.6	27.9	19.0	33.0	68.6	24.7	6.4	13.3	26.4	13.5	85.0	555
14	CANON	28.5	h	55.6	41.8	42.2	5.4	29.4	54.9	43.3	3.9	12.4	19.3	5.5	75.2	498
15	NE06469	18.5	l	39.1	18.5	11.6	34.0	25.1	33.8	7.7	3.7	4.1	21.1	4.5	84.5	735
16	NI04420	29.9	h	69.2	12.4	30.3	24.8	31.7	62.3	38.3	2.4	21.5	24.9	10.8	91.1	609
17	NI04427	27.3	h	41.6	36.4	36.5	8.4	27.8	63.4	30.7	2.1	13.3	14.2	25.5	83.8	578
18	NE05459	26.9	h	53.8	12.2	41.9	17.5	28.1	66.3	18.7	7.5	13.8	10.5	25.5	100.0	668
19	NE06471	23.8	hl	52.0	17.3	37.7	28.5	21.8	57.6	11.0	1.0	8.7	20.4	5.8	64.9	494
20	NY03179FHB-10	20.5	hl	49.8	0.6	54.5	0.3	23.4	56.0	14.7	4.5	5.8	11.4	4.0	54.0	419
21	NY03180FHB-10	20.0	hl	38.3	0.3	69.4	1.3	25.2	46.5	7.7	5.6	4.9	16.1	4.3	100.0	676
22	NY03179FHB-12	26.9	h	58.6	7.5	86.3	0.4	24.3	55.2	23.0	2.5	15.0	16.8	6.3	42.4	324
23	NYW103-21-9183	22.4	hl	51.3	20.0	64.2	0.3	19.1	45.9	8.3	4.9	10.6	19.8	1.5	100.0	705
24	NYW103-102-9103	13.7	l	30.7	0.5	25.4	2.0	15.3	40.0	4.3	1.0	1.6	30.0	0.3	76.1	700
25	IL02-18228	12.3	l	10.5	5.4	5.4	0.2	16.2	23.0	64.0	0.0	1.7	7.9	1.3	62.3	503
26	IL04-7874	19.1	l	28.0	0.8	20.2	0.5	20.9	19.1	79.0	1.5	5.5	28.1	8.5	28.9	311
27	IL04-7942	17.3	l	30.9	1.9	18.3	4.5	19.9	24.9	59.7	1.1	4.2	22.5	2.1	69.3	640
28	IL04-10721	19.0	l	29.3	0.9	19.1	8.9	23.0	29.6	64.3	0.4	4.2	17.5	11.3	32.3	258
29	IL04-10741	15.3	l	14.8	2.0	18.9	1.3	16.7	38.4	56.7	1.0	1.3	12.6	5.0	93.5	765
30	MD02W81-08-2	12.1	l	33.7	0.3	27.1	0.1	1.5	34.1	9.0	0.9	2.8	19.8	4.3	20.6	134
31	MD02W81-08-4	9.1	l	20.4	0.2	9.4	1.3	0.5	37.6	12.3	0.6	2.9	10.3	4.5	14.4	102
32	ACF213003B	22.3	hl	61.7	17.0	17.9	0.5	30.3	49.2	27.0	6.3	9.3	21.1	5.0	28.5	251
33	ACF126103	23.2	hl	66.0	4.0	30.7	1.9	26.4	52.1	42.7	6.4	5.8	13.3	5.8	100.0	655
34	ACF12004	23.5	hl	63.8	2.7	28.1	4.8	21.4	46.8	43.7	5.3	10.7	30.1	1.0	77.5	551
35	RCUOGTr34	12.8	l	23.1	3.6	39.2	0.8	22.5	32.8	9.7	0.1	4.3	3.9	0.6	57.0	384
36	RCUOGTr35	15.4	l	44.5	9.7	30.3	2.9	17.5	37.1	8.7	2.1	2.6	12.6	1.0	70.2	473
37	M05-1531	17.9	l	27.9	6.7	24.7	1.1	17.9	38.2	49.3	1.5	4.8	18.1	6.3	67.0	462
38	B0390207	30.9	h	65.3	24.4	39.9	29.8	25.3	42.6	62.7	3.0	10.7	33.7	2.8	96.0	745
39	03M1539#031	18.6	l	32.8	13.3	21.2	8.8	17.5	39.8	45.3	4.5	7.5	10.7	3.5	79.0	697
40	03M1599#0007	34.6	h	70.5	19.8	36.0	34.6	32.3	52.7	57.7	6.8	11.0	37.5	21.3	55.8	474
41	MO050101	12.9	l	20.9	1.5	19.9	0.3	4.1	33.3	46.0	1.4	2.3	10.0	2.5	27.1	215
42	MO050821	11.3	l	16.1	0.2	20.9	2.5	11.6	41.5	6.0	1.8	3.2	19.8	1.0	31.9	273
43	MO041020	13.5	l	21.3	5.0	36.3	1.8	15.2	44.1	5.3	1.0	4.8	13.7	0.5	47.4	391
44	MO050219	17.1	l	27.5	0.5	55.7	1.6	14.1	42.4	21.0	2.8	6.6	11.4	4.5	24.0	170
45	MO050144	13.5	l	39.9	2.5	7.5	1.5	8.1	37.9	23.7	1.8	5.3	16.1	4.5	21.5	176
46	KY00C-2059-19	25.4	h	59.2	22.5	43.3	8.3	24.8	44.6	9.0	3.6	19.9	29.7	14.4	68.4	491
47	KY00C-2515-02	27.4	h	70.9	18.0	61.7	8.0	24.3	62.5	14.7	8.0	9.5	12.6	11.0	82.3	569
48	KY00C-2059-24	26.9	h	62.6	7.0	59.8	12.8	30.7	58.4	9.7	4.4	10.4	25.0	15.0	67.5	557
49	KY00C-2567-01	23.3	hl	48.3	9.0	45.7	10.6	30.2	54.0	21.7	4.9	11.7	12.1	7.8	100.0	742
50	KY00C-2143-08	22.4	hl	33.7	5.0	31.0	14.8	21.8	25.7	52.3	3.3	9.8	30.5	18.5	82.3	595
51	MSU Line E6003	6.2	l	4.8	0.2	36.5	0.6	-6.0	15.5	3.3	0.1	2.0	10.5	0.3	8.0	83
52	MSU Line E7035R	18.5	l	22.1	13.9	50.4	1.3	18.3	37.4	24.3	1.3	8.7	23.2	2.3	11.1	113
53	OH04-264-58	22.7	hl	48.2	4.6	45.9	3.5	27.2	45.9	30.7	4.2	8.8	16.4	14.3	15.7	184
54	OH04-268-39	21.3	hl	43.4	2.3	71.9	1.8	34.7	39.1	10.7	3.9	3.3	23.1	0.5	100.0	662
55	OH05-248-38	30.4	h	66.8	27.5	45.3	21.9	45.1	69.2	3.0	4.4	14.7	26.4	9.8	61.1	480
56	VA07W-580	15.3	l	40.4	7.5	14.0	1.9	14.6	49.2	18.7	1.4	7.4	11.4	2.0	27.4	308
57	VA07W-600	14.4	l	27.0	0.5	29.7	5.0	17.3	30.3	27.3	2.1	5.8	9.6	4.0	15.1	118
58	VA07W-672	21.6	hl	49.7	9.0	41.7	2.3	18.8	45.4	42.0	0.8	5.0	20.5	5.0	89.5	679
59	VA06W-558	16.9	l	23.5	6.5	6.4	0.6	15.1	45.0	46.0	1.9	10.2	24.0	6.3	77.8	500
60	VA06W-615	18.6	l	28.3	15.0	37.3	2.4	18.4	29.0	32.7	2.8	5.6	22.1	10.6	53.9	477
100	AVERAGE	20.9		42.5	12.9	35.9	7.5	21.0	43.1	29.6	3.0	7.8	19.5	7.3	59.2	448
101	MINUMUM	6.2		4.8	0.1	5.4	0.0	-6.0	11.9	2.7	0.0	1.3	3.9	0.3	8.0	83
102	MAXIMUM	37.4		79.0	58.9	86.3	34.6	45.1	69.2	79.0	8.0	23.6	48.1	27.4	100.0	806
103	LSD(0.05)	18.0														

* Number of scabby florets

Table 14. Summary of fusarium damaged kernels (FDK, %) data from 2008-2009 NUWWSN.

ENTRY	NAME	AVG		ILURB	INBRO	INLAY	KYLEX	MDSAL	MOCOL	NEMEA	ROMAN
1	ERNIE	20.5	l	30.0	20.0	3.0	32.0	4.5	15.0	8.0	51.8
2	TRUMAN	12.9	l	11.7	14.0	3.0	22.6	7.0	8.0	3.0	33.8
3	FREEDOM	29.6	h	46.7	22.0	6.0	35.0	4.5	50.0	6.0	66.4
4	PIONEER 2545	44.2	h	83.3	22.0	22.5	84.6	23.0	40.0	6.0	72.0
5	P.03615A1-4-4	29.5	h	80.0	30.0	2.5	33.5	9.0	40.0	4.0	36.8
6	P.04704A1-2-1-1	24.3	l	50.0	10.0	1.5	35.1	7.5	20.0	3.0	67.5
7	P.053A1-6-7	27.4	h	53.3	16.0	4.0	28.9	11.0	20.0	2.0	83.7
8	P.0537A1-7-12	17.0	l	30.0	24.0	2.5	23.7	2.0	15.0	2.0	36.6
9	P.0128A1-22-22	11.1	l	20.0	6.0	3.5	11.2	6.5	20.0	2.0	20.0
10	MOCHA	39.8	h	80.0	10.0	23.5	53.5	26.0	50.0	3.0	72.6
11	SHAVER	36.4	h	66.7	12.0	7.0	61.7	11.5	60.0	0.0	72.5
12	RUBIN	35.4	h	83.3	24.0	10.0	25.5	9.5	50.0	2.0	78.9
13	ARENA	36.6	h	60.0	20.0	7.0	37.7	17.5	75.0	1.0	75.0
14	CANON	31.1	h	56.7	24.0	4.0	36.6	8.5	50.0	4.0	65.0
15	NE06469	34.4	h	55.0	30.0	3.5	29.7	24.5	50.0	4.0	78.4
16	NI04420	38.9	h	81.7	26.0	16.5	30.7	14.0	60.0	1.0	80.9
17	NI04427	34.9	h	76.7	22.0	3.5	37.0	11.0	60.0	2.0	66.7
18	NE05459	35.9	h	63.3	26.0	5.5	33.5	19.0	60.0	0.0	79.7
19	NE06471	30.0	h	60.0	16.0	8.0	24.6	22.5	50.0	2.0	56.9
20	NY03179FHB-10	23.1	l	35.0	24.7	5.0	21.0	6.0	40.0	3.0	49.8
21	NY03180FHB-10	23.4	l	46.7	8.0	4.5	18.6	10.5	40.0	4.0	55.3
22	NY03179FHB-12	25.1	hl	40.0	12.0	7.0	29.8	6.0	40.0	6.0	60.0
23	NYW103-21-9183	23.7	l	38.3	28.0	3.5	15.3	3.0	10.0	6.0	85.7
24	NYW103-102-9103	16.2	l	23.3	14.0	2.5	5.4	6.0	20.0	5.0	53.5
25	IL02-18228	9.9	l	6.7	8.0	1.5	4.7	3.0	20.0	3.0	32.6
26	IL04-7874	16.3	l	33.3	4.5	2.0	17.0	3.5	10.0	2.0	58.0
27	IL04-7942	19.4	l	30.0	5.0	1.5	15.5	12.5	10.0	0.0	80.6
28	IL04-10721	16.5	l	40.0	5.5	2.0	21.7	6.5	25.0	0.0	31.6
29	IL04-10741	18.0	l	30.0	7.5	2.5	12.4	6.0	20.0	4.0	61.6
30	MD02W81-08-2	17.0	l	25.0	26.0	2.0	14.6	6.0	25.0	41.4	.
31	MD02W81-08-4	18.9	l	23.3	16.0	2.0	15.6	2.5	60.0	6.0	26.0
32	ACF213003B	30.2	h	68.3	14.0	3.0	29.0	8.5	60.0	3.0	56.1
33	ACF126103	26.7	hl	61.7	12.0	6.0	27.6	7.0	40.0	3.0	56.3
34	ACF12004	35.8	h	65.0	22.0	4.0	24.1	14.0	90.0	7.0	59.9
35	RCUOGTr34	19.6	l	25.0	20.0	2.0	11.8	8.5	20.0	3.0	66.3
36	RCUOGTr35	23.9	l	31.7	16.0	1.5	20.7	6.5	60.0	5.0	49.8
37	M05-1531	23.0	l	45.0	28.0	2.0	20.0	10.0	10.0	5.0	64.1
38	B0390207	30.2	h	56.7	16.0	3.5	18.8	19.0	40.0	1.0	86.8
39	03M1539#031	17.4	l	30.0	16.0	2.0	16.4	12.0	10.0	3.0	49.5
40	03M1599#0007	33.4	h	65.0	10.0	4.5	45.7	21.5	60.0	6.0	54.3
41	MO050101	9.1	l	15.0	8.0	3.0	14.7	3.0	10.0	2.0	16.9
42	MO050921	14.8	l	23.3	4.0	3.0	29.5	7.0	20.0	4.0	27.2
43	MO041020	15.8	l	31.7	6.0	3.0	16.1	10.5	15.0	3.0	40.9
44	MO050219	15.5	l	36.7	8.0	4.5	16.5	7.0	25.0	4.0	22.2
45	MO050144	17.3	l	36.7	10.0	5.0	16.9	11.5	25.0	6.0	27.4
46	KY00C-2059-19	27.9	h	61.7	12.0	4.5	28.2	13.0	20.0	11.0	72.5
47	KY00C-2515-02	35.6	h	63.3	10.0	4.5	32.9	13.0	60.0	8.0	93.0
48	KY00C-2059-24	26.9	hl	53.3	14.0	6.5	23.6	29.5	25.0	5.0	58.3
49	KY00C-2567-01	25.1	hl	26.7	12.0	8.0	24.1	14.5	20.0	10.0	85.7
50	KY00C-2143-08	27.6	h	55.0	14.0	3.0	16.1	12.0	40.0	2.0	78.9
51	MSU Line E6003	7.9	l	20.0	14.0	1.5	12.8	1.5	3.0	3.0	7.5
52	MSU Line E7035R	18.7	l	46.7	4.0	3.5	30.8	5.0	50.0	11.6	.
53	OH04-264-58	21.0	l	56.7	6.0	3.0	27.8	8.5	25.0	3.0	38.1
54	OH04-268-39	27.6	h	35.0	14.0	3.0	30.8	8.0	40.0	9.0	81.0
55	OH05-248-38	36.0	h	80.0	10.0	11.5	39.2	19.5	40.0	7.0	80.5
56	VA07W-580	22.9	l	30.0	12.0	1.0	19.1	17.0	50.0	4.0	50.3
57	VA07W-600	15.5	l	30.0	22.0	5.0	21.6	13.5	10.0	3.0	18.7
58	VA07W-672	24.3	l	41.7	14.0	3.0	22.9	6.5	20.0	7.0	79.1
59	VA06W-558	21.0	l	33.3	24.0	1.5	9.0	5.5	25.0	4.0	65.3
60	VA06W-615	22.4	l	38.3	12.0	3.0	27.5	3.0	40.0	3.0	52.0
100	AVERAGE	24.5		45.4	15.3	4.7	25.7	10.4	34.4	4.7	57.4
101	MINUMUM	7.9		6.7	4.0	1.0	4.7	1.5	3.0	0.0	7.5
102	MAXIMUM	44.2		83.3	30.0	23.5	84.6	29.5	90.0	41.4	93.0
103	LSD(0.05)	19.2		.	.	.	.	.	.	.	.

Table 15. Summary of incidence x severity x FDK ratings (ISK, %) data from 2008-2009 NUWWSN.

ENTRY	NAME	AVG		ILURB	INBRO	KYLEX	MDSAL	MOCOL	NEMEA
1	ERNIE	33.3	l	45.9	27.2	34.1	8.1	42.5	42.1
2	TRUMAN	28.1	l	31.5	7.4	63.2	4.2	35.7	26.3
3	FREEDOM	38.5	l	60.0	39.1	37.6	8.6	59.8	26.2
4	PIONEER 2545	58.6	h	86.9	55.9	68.9	28.0	67.0	45.1
5	P.03615A1-4-4	51.4	h	73.9	48.6	65.0	8.1	61.8	50.8
6	P.04704A1-2-1-1	48.7	h	67.0	37.9	58.1	21.0	59.9	48.1
7	P.053A1-6-7	51.0	h	70.9	30.4	57.4	31.4	65.7	50.1
8	P.0537A1-7-12	38.5	l	43.7	35.7	51.9	5.6	53.8	40.2
9	P.0128A1-22-22	33.8	l	32.3	39.6	40.5	6.2	49.4	34.7
10	MOCHA	52.5	h	78.2	43.0	64.8	41.2	66.1	21.9
11	SHAVER	53.0	h	76.6	44.1	64.8	27.9	72.6	32.2
12	RUBIN	49.0	h	83.6	42.3	51.6	20.5	64.2	31.7
13	ARENA	51.4	h	72.6	49.4	46.5	33.3	78.0	28.3
14	CANON	50.4	h	68.7	48.6	56.7	16.2	68.4	43.9
15	NE06469	41.6	h	60.0	43.8	25.0	45.8	53.7	21.0
16	NI04420	52.7	h	83.0	42.8	46.7	36.4	73.6	33.9
17	NI04427	49.7	h	70.1	48.1	53.8	19.4	74.4	32.4
18	NE05459	50.4	h	70.9	39.2	58.5	33.9	76.4	23.6
19	NE06471	49.2	h	68.4	32.2	54.7	42.8	70.4	26.6
20	NY03179FHB-10	40.5	l	57.4	16.8	68.1	5.6	69.2	26.1
21	NY03180FHB-10	39.3	l	56.0	8.3	78.6	10.4	62.5	20.0
22	NY03179FHB-12	47.5	h	62.7	21.3	90.4	6.2	68.6	35.6
23	NYW103-21-9183	44.0	h	58.9	38.2	74.1	4.4	62.1	26.3
24	NYW103-102-9103	29.4	l	42.7	10.1	41.4	11.4	58.0	13.0
25	IL02-18228	25.1	l	22.1	17.9	18.2	4.5	45.1	42.8
26	IL04-7874	32.4	l	47.2	7.5	38.7	6.2	40.2	54.5
27	IL04-7942	32.3	l	47.3	10.4	36.1	15.8	46.3	37.9
28	IL04-10721	34.9	l	51.1	9.1	35.2	17.9	50.7	45.7
29	IL04-10741	32.1	l	34.6	11.7	37.6	9.5	56.9	42.1
30	MD02W81-08-2	29.6	l	39.4	13.7	45.0	4.5	53.9	.
31	MD02W81-08-4	27.6	l	43.2	9.1	23.5	7.8	55.7	26.1
32	ACF213003B	40.5	l	75.0	30.5	35.8	7.9	64.4	29.3
33	ACF126103	43.2	h	73.8	16.8	47.0	11.8	66.5	43.4
34	ACF12004	43.9	h	74.5	18.7	43.3	18.4	62.7	45.9
35	RCUOGTr34	33.3	l	40.4	20.0	56.5	9.4	53.0	20.6
36	RCUOGTr35	36.9	l	53.9	26.2	46.1	13.1	56.0	26.1
37	M05-1531	38.2	l	52.4	27.1	42.3	10.3	56.7	40.3
38	B0390207	50.7	h	71.7	36.1	57.1	40.6	59.8	39.2
39	03M1539#031	38.3	l	49.2	28.6	37.8	18.5	57.9	38.1
40	03M1599#0007	52.3	h	76.8	30.7	50.5	44.6	66.9	44.0
41	MO050101	31.3	l	35.7	19.1	39.4	4.4	53.3	36.0
42	MO050921	27.7	l	36.2	4.3	36.8	13.3	59.1	16.2
43	MO041020	34.9	l	44.7	20.4	52.9	12.5	60.9	17.9
44	MO050219	37.6	l	50.4	7.7	69.0	10.9	59.7	27.9
45	MO050144	32.4	l	54.6	20.5	22.5	11.5	56.5	28.7
46	KY00C-2059-19	45.5	h	72.4	33.3	58.8	22.5	61.2	24.6
47	KY00C-2515-02	50.8	h	76.4	29.5	72.6	22.5	73.7	30.2
48	KY00C-2059-24	48.7	h	69.9	22.1	71.9	33.6	70.9	23.7
49	KY00C-2567-01	44.0	h	53.6	22.8	61.2	26.1	67.8	32.4
50	KY00C-2143-08	40.9	l	58.8	23.6	49.7	27.3	46.5	39.4
51	MSU Line E6003	23.9	l	20.1	8.6	55.6	5.9	40.9	12.5
52	MSU Line E7035R	40.6	l	51.3	31.3	64.0	8.8	56.2	.
53	OH04-264-58	42.1	h	66.3	15.6	61.4	14.7	62.1	32.8
54	OH04-268-39	40.9	l	54.9	14.6	79.8	11.5	57.4	27.4
55	OH05-248-38	51.3	h	81.3	36.1	59.6	37.1	78.4	15.3
56	VA07W-580	35.6	l	50.4	21.3	33.7	16.6	64.4	27.2
57	VA07W-600	34.9	l	46.4	13.3	46.3	19.7	51.2	32.7
58	VA07W-672	44.8	h	60.9	35.6	58.4	12.4	61.8	40.0
59	VA06W-558	33.4	l	43.4	32.1	19.3	7.5	61.5	36.8
60	VA06W-615	38.1	l	50.5	33.3	52.4	10.2	48.9	33.4
100	AVERAGE	40.9		57.5	26.8	51.1	17.4	60.0	32.6
101	MINUMUM	23.9		20.1	4.3	18.2	4.2	35.7	12.5
102	MAXIMUM	58.6		86.9	55.9	90.4	45.8	78.4	54.5
103	LSD(0.05)	17.5		.	.	.	.	.	.

Table 16. Summary of deoxynivalenol (DON, ppm) data from 2008-2009 NUWWSN.

ENTRY	NAME	AVG		KYLEX	MDSAL	NEMEA	OHWOO	VABLA
1	ERNIE	10.3	hl	41.5	2.3	0.3	5.3	2.4
2	TRUMAN	7.9	hl	33.2	1.4	0.3	3.5	1.3
3	FREEDOM	9.8	hl	37.2	2.8	1.2	6.4	1.5
4	PIONEER 2545	13.6	h	40.7	9.7	1.1	12.1	4.6
5	P.03615A1-4-4	12.2	hl	49.2	3.8	0.8	4.5	2.9
6	P.04704A1-2-1-1	10.0	hl	43.0	1.3	0.6	4.0	1.0
7	P.053A1-6-7	11.9	hl	51.7	1.9	0.6	4.5	1.0
8	P.0537A1-7-12	8.6	hl	32.7	1.0	0.3	6.6	2.7
9	P.0128A1-22-22	3.8	l	15.7	0.9	0.3	2.1	0.3
10	MOCHA	10.4	hl	34.8	5.8	0.3	9.2	1.8
11	SHAVER	9.3	hl	27.4	5.1	0.7	10.7	2.6
12	RUBIN	8.7	hl	31.0	3.3	0.3	7.9	1.3
13	ARENA	15.3	h	50.3	6.4	1.5	16.8	1.3
14	CANON	7.1	l	24.6	2.4	0.6	5.8	2.2
15	NE06469	15.9	h	56.0	7.7	1.2	11.4	3.4
16	NI04420	15.8	h	56.3	4.2	0.5	16.4	1.6
17	NI04427	9.8	hl	33.2	2.5	0.3	11.6	1.5
18	NE05459	9.5	hl	27.3	6.4	0.3	9.7	3.6
19	NE06471	8.2	hl	20.4	8.0	0.3	9.6	2.6
20	NY03179FHB-10	11.5	hl	45.1	4.2	0.7	4.7	3.0
21	NY03180FHB-10	6.2	l	18.2	4.3	0.6	4.7	3.0
22	NY03179FHB-12	10.2	hl	40.4	2.5	0.8	3.7	3.6
23	NYW103-21-9183	5.0	l	15.7	2.7	0.3	3.3	3.1
24	NYW103-102-9103	5.2	l	15.3	6.3	0.3	1.4	2.6
25	IL02-18228	2.4	l	7.3	0.2	0.3	3.0	1.4
26	IL04-7874	10.8	hl	45.9	0.9	0.3	5.2	1.9
27	IL04-7942	8.1	hl	31.7	1.9	0.3	5.8	0.9
28	IL04-10721	6.6	l	24.8	2.3	0.3	3.9	1.7
29	IL04-10741	6.2	l	24.5	2.2	0.3	2.7	1.2
30	MD02W81-08-2	6.0	l	26.5	0.8	0.3	1.9	0.3
31	MD02W81-08-4	3.4	l	11.1	0.8	0.7	3.1	1.3
32	ACF213003B	10.3	hl	37.4	4.3	0.3	6.4	3.0
33	ACF126103	15.6	h	67.3	2.3	0.3	7.2	1.1
34	ACF12004	8.3	hl	28.7	3.3	0.5	6.1	2.9
35	RCUOGTr34	5.8	l	17.7	2.6	0.3	5.7	2.7
36	RCUOGTr35	3.7	l	11.1	3.7	0.3	1.2	2.2
37	M05-1531	4.7	l	14.1	1.9	0.3	5.1	2.3
38	B0390207	13.0	h	48.0	9.3	0.3	5.9	1.4
39	03M1539#031	8.3	hl	31.6	3.2	0.3	4.5	1.9
40	03M1599#0007	7.8	hl	21.4	7.0	0.3	9.2	1.2
41	MO050101	6.0	l	23.9	1.2	0.3	3.4	1.1
42	MO050921	10.8	hl	45.6	4.3	0.3	3.0	1.0
43	MO041020	11.6	hl	46.7	2.8	0.9	5.3	2.3
44	MO050219	11.4	hl	44.7	2.9	0.3	7.0	2.4
45	MO050144	7.0	l	25.5	2.4	0.3	4.2	2.6
46	KY00C-2059-19	17.0	h	63.9	5.0	0.3	11.6	4.4
47	KY00C-2515-02	12.9	h	46.9	5.5	0.6	9.8	1.5
48	KY00C-2059-24	17.7	h	40.8	22.9	0.6	17.1	7.3
49	KY00C-2567-01	13.3	h	48.9	9.1	0.3	6.2	2.2
50	KY00C-2143-08	8.8	hl	29.3	6.2	0.3	6.8	1.4
51	MSU Line E6003	4.7	l	17.7	1.2	0.3	2.7	1.7
52	MSU Line E7035R	6.0	l	20.5	1.8	0.3	5.7	1.9
53	OH04-264-58	9.7	hl	36.6	2.0	0.3	8.3	1.1
54	OH04-268-39	8.9	hl	36.3	2.9	0.5	2.5	2.3
55	OH05-248-38	13.1	h	45.3	6.5	2.0	8.0	3.6
56	VA07W-580	10.0	hl	39.0	3.0	0.6	4.3	3.2
57	VA07W-600	11.0	hl	44.4	3.6	0.5	5.0	1.3
58	VA07W-672	8.5	hl	35.4	1.5	0.3	3.7	1.6
59	VA06W-558	5.1	l	19.0	1.1	0.3	3.9	1.1
60	VA06W-615	7.6	l	29.4	1.3	0.3	5.1	1.9
100	AVERAGE	9.3		33.8	3.8	0.5	6.3	2.1
101	MINUMUM	2.4		7.3	0.2	0.3	1.2	0.3
102	MAXIMUM	17.7		67.3	22.9	2.0	17.1	7.3
103	LSD(0.05)	10.0		.	.	.	.	.

Table 17. Summary of greenhouse severity from SPI (GHSEV, %) data from 2008-2009 NUWWSN.

ENTRY	NAME	AVG		ILURB	MOCOL
1	ERNIE	19.8	l	17.6	22.0
2	TRUMAN	4.4	l	4.5	4.3
3	FREEDOM	8.2	l	6.0	10.4
4	PIONEER 2545	53.1		80.0	26.2
5	P.03615A1-4-4	11.5	l	13.0	10.0
6	P.04704A1-2-1-1	28.4	l	49.8	7.0
7	P.053A1-6-7	21.5	l	11.5	31.4
8	P.0537A1-7-12	27.9	l	20.5	35.2
9	P.0128A1-22-22	15.9	l	5.3	26.4
10	MOCHA	21.9	l	29.3	14.4
11	SHAVER	32.1	l	39.0	25.2
12	RUBIN	60.8		82.4	39.1
13	ARENA	47.1		59.0	35.2
14	CANON	24.6	l	9.0	40.1
15	NE06469	50.1		65.3	34.9
16	NI04420	28.2	l	25.0	31.3
17	NI04427	27.7	l	22.0	33.3
18	NE05459	40.0		44.8	35.1
19	NE06471	28.0	l	28.0	28.0
20	NY03179FHB-10	31.8	l	28.8	34.8
21	NY03180FHB-10	24.8	l	5.0	44.6
22	NY03179FHB-12	32.3	l	35.7	28.9
23	NYW103-21-9183	20.8	l	9.0	32.6
24	NYW103-102-9103	10.0	l	9.0	11.0
25	IL02-18228	35.0	l	34.0	36.1
26	IL04-7874	25.6	l	38.0	13.1
27	IL04-7942	16.5	l	14.0	19.1
28	IL04-10721	20.1	l	8.2	32.0
29	IL04-10741	23.5	l	20.7	26.3
30	MD02W81-08-2	11.3	l	5.5	17.0
31	MD02W81-08-4	14.1	l	12.8	15.4
32	ACF213003B	35.0	l	39.6	30.4
33	ACF126103	29.5	l	38.7	20.3
34	ACF12004	45.5		49.2	41.8
35	RCUOGTr34	28.4	l	28.2	28.6
36	RCUOGTr35	32.0	l	34.0	30.0
37	M05-1531	12.3	l	5.8	18.8
38	B0390207	80.4		65.8	95.0
39	03M1539#031	41.6		61.2	22.0
40	03M1599#0007	67.3		66.0	68.5
41	MO050101	6.8	l	3.4	10.2
42	MO050921	10.5	l	6.8	14.2
43	MO041020	10.9	l	3.4	18.4
44	MO050219	27.0	l	38.0	16.0
45	MO050144	12.1	l	9.8	14.5
46	KY00C-2059-19	42.8		12.7	73.0
47	KY00C-2515-02	67.4		44.6	90.2
48	KY00C-2059-24	66.5		72.8	60.3
49	KY00C-2567-01	35.5	l	24.0	47.0
50	KY00C-2143-08	61.5		39.8	83.2
51	MSU Line E6003	19.6	l	4.0	35.1
52	MSU Line E7035R	12.6	l	7.5	17.7
53	OH04-264-58	40.8		23.2	58.5
54	OH04-268-39	11.1	l	8.8	13.3
55	OH05-248-38	84.6		100.0	69.2
56	VA07W-580	55.8		45.8	65.9
57	VA07W-600	14.3	l	13.0	15.6
58	VA07W-672	128.0	h	162.5	93.5
59	VA06W-558	17.3	l	20.0	14.5
60	VA06W-615	14.3	l	6.3	22.3
100	AVERAGE	32.1		31.1	33.1
101	MINUMUM	4.4		3.4	4.3
102	MAXIMUM	128.0		162.5	95.0
103	LSD(0.05)	34.5		.	.

Table 18. Summary of heading date (HD,julian days) data from 2008-2009 NUWWSN.

ENTRY	NAME	AVG		ILURB	INBRO	KYLEX	MOCOL	OHWOO	ROMAN	VABLA
1	ERNIE	134	l	136	141	128	139	139	131	123
2	TRUMAN	141		145	150	142	146	144	135	129
3	FREEDOM	137		141	144	132	141	141	135	128
4	PIONEER 2545	136		139	142	132	140	141	133	128
5	P.03615A1-4-4	137		141	144	130	141	141	132	128
6	P.04704A1-2-1-1	135	l	137	141	130	140	139	131	125
7	P.053A1-6-7	135	l	138	142	132	139	139	130	125
8	P.0537A1-7-12	136		137	143	131	140	141	132	126
9	P.0128A1-22-22	136		138	143	132	140	139	130	127
10	MOCHA	134	l	135	139	128	139	138	131	127
11	SHAVER	137		140	144	133	140	140	133	128
12	RUBIN	136		139	146	130	139	141	131	128
13	ARENA	137		139	141	133	141	141	133	128
14	CANON	137		141	143	132	141	141	133	128
15	NE06469	135	l	139	139	130	140	138	132	125
16	NI04420	135		137	141	131	141	140	131	126
17	NI04427	137		139	143	134	144	141	132	127
18	NE05459	136		139	141	131	140	141	132	127
19	NE06471	134	l	137	141	128	139	139	130	126
20	NY03179FHB-10	139		142	145	137	145	143	135	129
21	NY03180FHB-10	140		144	144	139	142	143	136	129
22	NY03179FHB-12	139		142	145	137	146	143	134	129
23	NYW103-21-9183	143	h	148	149	142	147	145	136	133
24	NYW103-102-9103	144	h	147	148	145	147	147	139	134
25	IL02-18228	133	l	135	141	127	138	138	129	126
26	IL04-7874	135		138	140	131	139	139	131	127
27	IL04-7942	133	l	136	138	128	137	138	130	126
28	IL04-10721	134	l	137	139	130	139	139	130	127
29	IL04-10741	134	l	135	140	130	139	138	130	126
30	MD02W81-08-2	137		139	143	134	143	141	131	126
31	MD02W81-08-4	138		140	146	134	143	141	136	128
32	ACF213003B	138		141	144	134	142	143	135	129
33	ACF126103	138		141	143	132	141	142	136	128
34	ACF12004	136		140	142	130	139	142	134	129
35	RCUOGTr34	141		143	143	142	147	143	136	130
36	RCUOGTr35	141		143	145	143	147	144	135	130
37	M05-1531	135		138	143	129	140	138	131	127
38	B0390207	133	l	136	139	129	138	138	129	125
39	03M1539#031	135	l	138	139	131	139	139	131	128
40	03M1599#0007	134	l	136	139	130	139	140	131	127
41	MO050101	137		139	143	133	142	141	132	127
42	MO050921	142		145	146	141	147	147	136	132
43	MO041020	139		143	145	135	143	144	136	129
44	MO050219	138		141	143	136	143	143	135	128
45	MO050144	137		140	146	128	142	141	135	128
46	KY00C-2059-19	137		141	142	135	139	141	132	128
47	KY00C-2515-02	137		140	142	135	141	141	133	128
48	KY00C-2059-24	138		141	144	135	140	142	133	128
49	KY00C-2567-01	135	l	138	141	130	139	140	130	126
50	KY00C-2143-08	134	l	136	139	127	137	138	136	126
51	MSU Line E6003	142	h	147	144	143	148	146	137	131
52	MSU Line E7035R	135		138	141	131	140	141	130	127
53	OH04-264-58	137		141	144	131	141	141	134	129
54	OH04-268-39	142	h	145	148	143	149	144	137	130
55	OH05-248-38	136		138	141	131	139	141	132	127
56	VA07W-580	138		142	143	134	141	143	134	128
57	VA07W-600	135	l	138	140	129	139	139	132	127
58	VA07W-672	135	l	137	142	131	139	139	132	124
59	VA06W-558	134	l	137	139	127	140	139	131	126
60	VA06W-615	135	l	137	140	130	139	140	131	125
100	AVERAGE	137		140	142	133	141	141	133	128
101	MINUMUM	133		135	138	127	137	138	129	123
102	MAXIMUM	144		148	150	145	149	147	139	134
103	LSD(0.05)	2								

Table 19. Summary of plant height (HGT, inches) data from 2008-2009 NUWWSN.

ENTRY	NAME	AVG	KYLEX	MOCOL	ROMAN
1	ERNIE	35	36	31	38
2	TRUMAN	39	42	39	36
3	FREEDOM	36	38	35	34
4	PIONEER 2545	34	36	35	32
5	P.03615A1-4-4	36	37	35	36
6	P.04704A1-2-1-1	33 l	35	31	34
7	P.053A1-6-7	35	38	32	36
8	P.0537A1-7-12	33 l	35	32	32
9	P.0128A1-22-22	34	36	32	36
10	MOCHA	35	38	33	34
11	SHAVER	37	39	34	37
12	RUBIN	36	38	35	36
13	ARENA	33 l	37	34	28
14	CANON	30 l	35	30	26
15	NE06469	37	40	35	36
16	NI04420	35	38	35	32
17	NI04427	34	39	34	30
18	NE05459	36	38	35	36
19	NE06471	37	39	36	36
20	NY03179FHB-10	38	40	37	37
21	NY03180FHB-10	38	41	37	36
22	NY03179FHB-12	35	39	35	32
23	NYW103-21-9183	46 h	51	47	41
24	NYW103-102-9103	49 h	52	50	45
25	IL02-18228	38	40	36	39
26	IL04-7874	34	38	33	32
27	IL04-7942	37	38	33	39
28	IL04-10721	35	36	35	34
29	IL04-10741	39	40	37	39
30	MD02W81-08-2	35	36	35	36
31	MD02W81-08-4	41	42	37	43
32	ACF213003B	36	42	33	34
33	ACF126103	37	40	36	36
34	ACF12004	36	38	33	37
35	RCUOGTr34	49 h	49	49	47
36	RCUOGTr35	49 h	50	49	49
37	M05-1531	35	38	34	34
38	B0390207	35	37	32	36
39	03M1539#031	34	38	34	32
40	03M1599#0007	36	38	34	36
41	MO050101	34 l	36	34	32
42	MO050921	33 l	38	35	28
43	MO041020	38	40	39	36
44	MO050219	36	38	36	34
45	MO050144	36	39	33	36
46	KY00C-2059-19	34 l	36	32	34
47	KY00C-2515-02	37	38	35	37
48	KY00C-2059-24	37	38	35	39
49	KY00C-2567-01	38	37	34	43
50	KY00C-2143-08	34	35	33	34
51	MSU Line E6003	35	40	33	32
52	MSU Line E7035R	31 l	32	30	32
53	OH04-264-58	34	35	32	36
54	OH04-268-39	41	42	41	39
55	OH05-248-38	34	34	31	37
56	VA07W-580	35	38	32	36
57	VA07W-600	34	35	31	37
58	VA07W-672	32 l	33	35	30
59	VA06W-558	35	35	31	37
60	VA06W-615	33 l	35	32	34
100	AVERAGE	36	38	35	36
101	MINUMUM	30	32	30	26
102	MAXIMUM	49	52	50	49
103	LSD(0.05)	4	.	.	.

Table 20. Quality data for entries in the 2008-2009 NUWWSN. Grain was from Lafayette IN provided by Herb Ohm. Data from the USDA Soft Wheat Quality Lab, Wooster OH.

NAME	MILLING QUALITY SCORE		BAKING QUALITY SCORE		SOFT. EQUIV. SCORE		TEST WT. LB/BU	FLOUR YIELD %	SOFT. EQUIV. %		FLOUR PROT. %		LACTIC ACID SRC	SUCROSE SRC %
STD=Freedom	61.43	C	54.53	D	64.83	C	59.23	67.48	56.34		8.52		80.35	89.32
ERNIE	66.1	C	51.1	D	56.7	D	60.5	68.4	53.5		8.37		80.6	89.1
TRUMAN	64.5	C	55.0	D	64.7	C	60.7	68.1	56.3		8.51		86.7	89.1
FREEDOM	61.4	C	54.5	D	64.8	C	59.2	67.5	56.3		8.52		80.4	89.3
PIONEER 24R45	58.2	D	48.1	E	67.8	C	60.6	66.8	57.4		8.88		81.0	92.1
P03615A1-4-4	53.5	D	39.1	F	61.4	C	61.2	65.9	55.1		9.50	*	66.0	93.0
P04704A1-2-1-1	71.9	B	52.5	D	59.2	D	61.0	69.6	54.4		8.69		76.8	88.5
P053A1-6-7	82.7	A	64.9	C	65.9	C	62.2	71.7	56.7		7.71		88.2	86.8
P05377A1-7-12	71.2	B	46.0	E	70.7	B	62.5	69.4	58.4		9.50	*	84.4	92.4
P0128A1-22-22	56.5	D	51.9	D	59.3	D	60.9	66.5	54.4		9.38	*	86.9	87.3
MOCHA	67.5	C	59.8	D	69.5	C	61.3	68.7	58.0		8.83		92.8	87.5
SHAVER	63.2	C	52.9	D	64.3	C	61.4	67.8	56.2		8.71		101.6	89.5
RUBIN	66.0	C	36.8	F	51.6	D	61.5	68.4	51.7	*	10.41	Q	70.3	89.8
ARENA	61.3	C	36.4	F	63.3	C	61.6	67.5	55.8		9.32		96.8	95.1
CANON	54.3	D	22.1	F	36.4	F	61.3	66.1	46.4	Q	9.34		97.3	94.5
NE06469	74.7	B	25.1	F	26.8	F	61.6	70.1	43.0	Q	9.41	*	96.6	90.8
NI04420	70.7	B	32.6	F	30.4	F	62.8	69.3	44.3	Q	8.62		96.2	90.1
NI04427	72.3	B	13.8	F	17.4	F	64.0	69.6	39.7	Q	9.54	*	89.0	93.0
NE05459	79.1	B	36.5	F	17.2	F	63.7	71.0	39.7	Q	9.36	*	92.3	83.6
NE06471	79.6	B	18.5	F	20.1	F	63.0	71.1	40.7	Q	10.27	Q	95.9	90.2
NY03179FHB-10	77.3	B	75.6	B	78.8	B	60.0	70.6	61.2		8.17		88.7	84.4
NY03189FHB-10	73.7	B	78.8	B	83.6	A	59.1	69.9	62.9		8.18		95.2	84.2
NY03179FHB-12	73.9	B	77.8	B	92.2	A	57.4	* 70.0	65.9		7.48		94.8	88.2
NYW103-21-9183	64.8	C	52.7	D	81.2	A	61.8	68.2	62.1		9.70	*	96.3	91.7
NYW103-102-9103	69.3	C	63.8	C	77.8	B	59.0	69.1	60.9		9.33		86.5	86.8
IL02-18228	63.6	C	33.7	F	40.9	E	63.7	67.9	48.0	Q	10.04	*	88.3	89.2
IL04-7874	81.0	A	72.8	B	74.4	B	61.3	71.4	59.7		8.37		102.3	84.1
IL04-7842	75.2	B	63.6	C	65.8	C	60.9	70.2	56.7		9.14		97.7	84.4
IL04-10721	64.1	C	61.7	C	66.3	C	61.7	68.0	56.9		8.48		95.2	86.7
IL04-10741	69.2	C	66.3	C	57.7	D	63.8	69.0	53.9		8.74		88.3	82.1
MD02W81-08-2	57.8	D	43.8	E	49.0	E		66.8	50.8	*	10.20	Q	80.0	86.6
MD02W81-08-4	59.7	D	17.7	F	21.9	F	60.3	67.1	41.3	Q	10.45	Q	70.1	90.6
ACF213003B	68.8	C	48.1	E	68.0	C	59.9	68.9	57.4		9.37	*	79.3	91.1
ACF126103	69.0	C	47.1	E	67.4	C	60.2	69.0	57.2		9.51	*	78.9	91.1
ACF12004	69.0	C	10.4	F	10.3	F	62.4	69.0	37.2	Q	10.10	*	97.0	91.6
RCUOGTR34	66.5	C	41.7	E	44.5	E		68.5	49.2	Q	10.91	Q	82.6	84.9
RCUOGTR35	62.3	C	41.7	E	57.9	D	61.2	67.6	53.9		9.39	*	85.0	91.3
M05-1531	67.7	C	42.5	E	60.3	C	60.9	68.7	54.8		8.85		83.6	92.7
B0390207	61.6	C	41.8	E	60.6	C	63.4	67.5	54.9		8.82		94.2	93.1
03M1539#031	79.0	B	66.4	C	79.0	B	60.7	71.0	61.3		8.44		99.6	87.8
03M1599#0007	74.6	B	58.1	D	70.4	B	62.5	70.1	58.3		8.12		95.7	90.0
MO050101	66.4	C	43.1	E	54.7	D	62.7	68.5	52.8	*	8.66		87.3	91.4
MO050921	69.8	C	53.7	D	69.4	C	59.2	69.2	57.9		8.89		92.0	90.0
MO041020	67.2	C	56.9	D	61.8	C	61.3	68.6	55.3		9.06		82.8	86.5
MO050219	63.4	C	32.7	F	62.0	C	63.6	67.9	55.4		8.91		95.4	97.2
MO050144	61.9	C	32.0	F	61.5	C	62.9	67.6	55.2		8.20		95.9	98.8
KY00C-2059-19	63.4	C	41.7	E	73.0	B	61.0	67.9	59.2		8.57		99.4	96.7
KY00C-2515-02	56.5	D	46.5	E	55.9	D	60.8	66.5	53.2	*	9.08		82.4	89.4
KY00C-2059-24	68.3	C	44.8	E	70.8	B	61.8	68.8	58.4		8.51		91.9	95.0
KY00C-2567-01	62.3	C	41.2	E	59.0	D	62.4	67.7	54.3		9.71	*	108.1	91.1
KY00C-2143-08	67.1	C	37.3	F	41.4	E	62.8	68.6	48.1	Q	9.32		79.2	89.3
MSU LINE E6003	66.8	C	57.0	D	58.4	D	61.2	68.6	54.1		9.73	*	101.2	84.2
MSU LINE E7035R	59.2	D	55.6	D	68.3	C	60.6	67.0	57.5		8.80		84.9	89.1
OH04-264-58	67.7	C	38.6	F	67.3	C	58.9	68.7	57.2		9.29		118.1	95.2
OH04-264-58	67.5	C	49.6	E	78.7	B	61.1	68.7	61.2		8.49		104.1	94.9
OH05-248-38	66.5	C	51.6	D	57.4	D	61.0	68.5	53.7		8.37		93.1	89.0
VA07W-580	67.7	C	45.8	E	56.7	D	62.3	68.7	53.5		8.17		98.7	91.8
VA07W-600	72.4	B	65.6	C	73.0	B	61.5	69.7	59.2		8.30		100.2	87.0
VA07W-672	73.3	B	58.6	D	62.2	C	63.0	69.9	55.4		8.56		107.7	86.8
VA06W-558	64.4	C	43.5	E	55.3	D	63.2	68.1	53.0	*	8.65		90.8	91.4
VA06W-615	67.9	C	52.5	D	61.7	C	61.3	68.8	55.3		9.26		91.2	87.9
AVERAGE	67.4		47.5		58.7		61.4	68.7	54.2		9.0		90.7	89.8
MINIMUM	53.5		10.4		10.3		57.4	65.9	37.2		7.5		66.0	82.1
MAXIMUM	82.7		78.8		92.2		64.0	71.7	65.9		10.9		118.1	98.8

Table 21. Means for other traits collected on entries in the 2008-2009 NUWWSN.

ENTRY	NAME	VABLA Leaf Rust 0 to 9	INBRO Winterkill 0 to 9	MOCOL Yield bu/acre	MOCOL Test Wgt lbs/bu	MOCOL Seed Wgt grams	MDSAL 100 Seed wgt grams	INLAY Lodging 0 to 9
1	ERNIE	7.0	2.5	42.0	42.1	184	4.6	7
2	TRUMAN	8.0	2.5	76.1	53.0	333	3.3	6
3	FREEDOM	5.5	3.5	52.8	45.9	231	3.4	5
4	PIONEER 2545	7.5	2.0	70.1	48.5	307	3.3	5
5	P.03615A1-4-4	0.0	3.0	57.3	50.8	251	3.7	3
6	P.04704A1-2-1-1	7.5	2.9	68.3	51.2	299	3.7	2
7	P.053A1-6-7	6.0	3.0	38.4	.	168	3.5	4
8	P.0537A1-7-12	2.0	4.5	74.5	53.4	326	3.6	5
9	P.0128A1-22-22	2.5	4.2	74.7	55.6	327	3.6	3
10	MOCHA	8.0	3.2	53.9	47.4	236	4.1	2
11	SHAVER	8.0	3.0	37.7	.	165	3.3	5
12	RUBIN	7.5	4.0	48.9	.	214	3.5	5
13	ARENA	7.5	2.0	42.3	.	185	3.5	4
14	CANON	6.5	2.5	43.2	.	189	3.6	4
15	NE06469	4.5	2.0	57.3	51.4	251	3.4	4
16	NI04420	6.5	3.5	48.0	44.6	210	3.3	4
17	NI04427	7.5	3.5	44.3	.	194	3.1	3
18	NE05459	6.5	2.5	32.4	.	142	3.2	4
19	NE06471	7.5	2.0	45.0	42.1	197	3.6	6
20	NY03179FHB-10	8.0	4.5	44.8	.	196	3.6	4
21	NY03180FHB-10	7.5	4.0	51.6	44.1	226	3.6	4
22	NY03179FHB-12	7.5	4.0	35.6	.	156	3.5	3
23	NYW103-21-9183	6.5	4.5	50.3	41.8	220	4.1	4
24	NYW103-102-9103	8.0	3.0	50.5	44.6	221	3.5	6
25	IL02-18228	4.5	3.5	60.3	57.9	264	3.5	7
26	IL04-7874	6.0	2.5	75.6	52.8	331	3.6	4
27	IL04-7942	1.5	1.9	67.2	52.5	294	3.7	6
28	IL04-10721	5.0	1.9	72.4	54.3	317	3.6	7
29	IL04-10741	2.5	2.5	85.9	57.3	376	3.5	6
30	MD02W81-08-2	7.5	2.5	70.4	52.5	308	3.0	5
31	MD02W81-08-4	7.5	3.0	56.2	50.7	246	4.0	7
32	ACF213003B	7.0	2.5	45.0	41.7	197	3.7	5
33	ACF126103	8.5	2.5	50.3	46.7	220	3.8	4
34	ACF12004	7.5	2.5	53.0	43.1	232	3.7	4
35	RCUOGTr34	8.0	2.0	66.0	54.6	289	3.7	7
36	RCUOGTr35	6.5	2.0	58.0	51.5	254	3.1	7
37	M05-1531	7.0	2.5	68.8	51.4	301	3.9	6
38	B0390207	6.5	3.0	55.5	50.4	243	3.7	5
39	03M1539#031	6.5	3.0	41.6	.	182	3.7	5
40	03M1599#0007	5.5	2.0	57.8	48.4	253	2.9	4
41	MO050101	8.0	3.5	88.4	54.6	387	3.4	5
42	MO050921	3.0	4.0	60.5	50.8	265	3.4	6
43	MO041020	5.5	3.0	63.3	54.1	277	3.6	5
44	MO050219	5.0	3.0	56.4	50.8	247	3.5	4
45	MO050144	6.5	3.0	60.8	51.8	266	3.5	7
46	KY00C-2059-19	5.5	3.0	71.7	52.2	314	4.1	3
47	KY00C-2515-02	6.0	2.0	51.9	44.9	227	3.9	3
48	KY00C-2059-24	6.5	3.5	47.1	42.4	206	3.7	4
49	KY00C-2567-01	6.0	2.0	64.9	51.3	284	3.8	3
50	KY00C-2143-08	4.5	3.0	80.0	56.3	350	4.3	3
51	MSU Line E6003	9.0	3.0	33.6	.	147	2.9	3
52	MSU Line E7035R	7.0	4.5	37.2	.	163	3.4	3
53	OH04-264-58	4.0	3.0	54.4	49.2	238	3.6	3
54	OH04-268-39	5.0	3.0	74.7	51.3	327	3.2	4
55	OH05-248-38	6.5	3.0	45.7	.	200	3.6	3
56	VA07W-580	7.5	4.0	64.0	49.2	280	3.7	5
57	VA07W-600	3.5	2.5	72.2	53.4	316	3.8	6
58	VA07W-672	6.0	4.5	60.5	54.4	265	3.6	4
59	VA06W-558	4.0	2.5	82.9	55.7	363	3.8	4
60	VA06W-615	6.5	3.5	53.7	50.1	235	4.0	3
100	AVERAGE	6.1	3.0	57.5	50.1	252	3.6	4.5
101	MINUMUM	0.0	1.9	32.4	41.7	142	2.9	2.0
102	MAXIMUM	9.0	4.5	88.4	57.9	387	4.6	7.0
103	LSD(0.05)							

Table 22. Presence or absence of genes for entries in the 2008-2009 NUWWSN based on marker analysis performed by the USDA Small Grains Genotyping Lab, Raleigh NC.

Name	D1a	Fhb1	3BSc	2DL	5AS	5AS	2B	4B	Sr24	1RS trans	Sr36	H13	H9	Yr17/	2/3	Yr18	O.E.	Glu-D1
ERNIE	mix	no	yes	no	yes	no	yes	yes	no		yes	no	no		no	no	no	het
TRUMAN	no	no	no	no	no	no	no	no	no		no	no	no	no	no	no	no	2+12
FREEDOM	no	no	yes	no	no	no	yes	no	no	1RS:1BL	yes	no	no	no	no	no	no	2+12
PIONEER 2545	yes	no	no	no	no	no	no	no	no		no	no	no	no	no	no	no	2+12
P.03615A1-4-4	no	yes	no	no	no	no	yes	no	no	1RS:1BL	yes	no	no	yes	no	no	yes	2+12
P.04704A1-2-1-1	no	no	no	no	no	no	yes	no	no	1RS:1BL	yes	no	no	no	yes	no	yes	5+10
P.053A1-6-7	het	no	no	no	no	no	no	no	no		no	no	no	yes	het	no	no	2+12
P.0537A1-7-12	yes	het?	no	no	no	no	yes	no	no		yes	no	no	yes	het	no	no	5+10
P.0128A1-22-22	no	yes	no	no	yes?	no	no	no	no		no	no	no	no	no	no	no	2+12
MOCHA	yes	no	no	no	no	no	no	no	no		no	no	no	no	no	no	no	het
SHAVER	yes	no	no	no	no	no	no	het	no		no	no	no	no	no	no	no	2+12
RUBIN	no	no	no	no	no	no	no	no	no	1RS:1BL	no	no	no	no	no	no	no	2+12
ARENA	yes	no	no	no	no	no	het	no	no		no	no	no	no	no	no	no	het
CANON	yes	no	?	no	no	no	no	no	no		no	no	no	no	no	no	no	2+12
NE06469	yes	no	no	no	no	no	no	no	yes		no	no	no	no	no	no	no	5+10
NI04420	het	no	?	no	no	no	no	no	no	1RS:1BL	no	no	no	no	no	no	no	2+12
NI04427	no	no	no	no	no	no	no	no	no		no	no	no	no	no	no	no	5+10
NE05459	yes	no	no	no	no	no	no	no	no		no	no	no	no	no	no	no	5+10
NE06471	yes	no	no	no	no	no	no	no	yes		no	no	no	no	no	no	no	het
NY03179FHB-10	no	het?	no	no	no	no	no	no	no		no	no	no	no	no	no	no	2+12
NY03180FHB-10	no	yes	no	no	no	no	no	no	no		no	no	no	no	no	no	no	2+12
NY03179FHB-12	no	yes	no	no	no	no	no	no	no		no	no	no	no	no	no	no	2+12
NYW103-21-9183	no	no	no	no	no	no	no	no	no		no	no	no	no	no	no	no	2+12
NYW103-102-9103	no	no	no	no	no	no	?	no	no		no	no	no	no	no	no	no	2+12
IL02-18228	no	no	?	no	no	no	no	no	no		no	no	no	no	no	no	no	5+10
IL04-7874	no	no	?	no	no	no	no	no	no		no	no	no	no	no	no	no	5+10
IL04-7942	no	no	?	no	no	no	no	no	no		no	no	no	no	no	no	no	het
IL04-10721	no	no	?	no	no	no	no	no	no		no	no	no	no	no	no	no	5+10
IL04-10741	no	no	no	no	no	no	no	no	no		no	no	no	no	no	no	no	5+10
MD02W81-08-2	no	yes	yes	no	no	yes	yes	no	no	1RS:1BL	yes	no	no	no	no	no	no	2+12
MD02W81-08-4	no	yes	yes	no	no	yes	yes	no	no	1RS:1BL	yes	no	no	no	no	het?	no	2+12
ACF213003B	no	no	no	no	no	no	yes	no	no	1RS:1BL	het	no	no	no	no	no	no	5+10
ACF126103	het	no	no	no	no	no	no	no	no	1RS:1BL	no	no	no	no	no	no	no	5+10
ACF12004	yes	no	no	no	no	no	no	no	no		no	no	no	no	no	no	no	5+10
RCUOGTr34	no	no	no	no	no	no	no	no	no		no	no	no	no	no	no	no	5+10
RCUOGTr35	no	no	het	no	no	no	no	no	no	1RS:1AL	no	no	no	no	no	no	no	2+12
M05-1531	no	no	yes	no	yes	no	no	no	no	1RS:1BL	no	no	no	no	no	no	no	2+12
B0390207	yes	no	no	no	no	no	no	no	no		no	no	no	no	no	no	no	2+12
03M1539#031	yes	no	yes	no	no	no	no	no	no		no	no	no	no	no	no	no	2+12
03M1599#0007	yes	no	no	no	no	no	no	no	no		no	no	no	yes	no	no	no	2+12
MO050101	no	no	no	no	no	no	no	no	no		no	no	no	no	no	no	no	2+12
MO050921	no	no	yes	no	no	no	yes	no	no		no	no	no	no	no	no	no	2+12
MO041020	no	no	no	no	no	no	no	no	no		no	no	no	no	no	no	no	2+12
MO050219	no	no	no	no	no	no	no	no	no		no	no	no	no	no	no	no	2+12
MO050144	no	no	no	no	no	no	no	no	no		no	no	no	no	no	no	no	2+12
KY00C-2059-19	yes	no	no	no	no	no	no	no	no		no	no	no	no	no	yes	no	2+12
KY00C-2515-02	no	no	no	no	no	no	yes	no	no	1RS:1BL	no	no	no	no	no	no	no	2+12
KY00C-2059-24	yes	no	no	no	het	no	no	no	no		no	no	no	no	no	no	yes	het
KY00C-2567-01	yes	no	no	no	het	no	no	no	no		no	no	no	no	no	no	no	5+10
KY00C-2143-08	het	no	no	no	no	no	yes	no	no	1RS:1BL	yes	no	no	no	no	no	no	het
MSU Line E6003	no	yes	no	no	no	?	no	no	no		no	no	no	no	no	no	no	2+12
MSU Line E7035R	yes	het?	no	no	no	no	no	no	no	1RS:1BL	no	no	no	no	no	no	no	2+12
OH04-264-58	het	no	?	no	het	no	no	no	no		no	no	no	no	no	no	het	het
OH04-268-39	no	no	no	no	no	no	no	no	no		no	no	no	no	no	no	no	2+12
OH05-248-38	yes	no	no	no	no	no	no	no	no		no	no	no	no	no	no	no	2+12
VA07W-580	no	no	no	no	no	no	no	no	no	1RS:1AL	no	no	no	no	no	no	no	5+10
VA07W-600	no	no	yes	no	het	no	yes	no	no		no	no	no	no	no	no	no	2+12
VA07W-672	yes	no	no	no	het	no	yes	no	no		yes	no	no	no	no	no	no	het
VA06W-558	no	no	no	no	yes?	no	no	no	yes	1RS:1AL	no	no	no	no	no	no	no	2+12
VA06W-615	yes	no	no	no	het	no	yes	no	no		no	no	no	no	no	no	no	2+12

Table 23. Summary of incidence (INC, %) data from 2008-2009 PNUWWSN.

ENTRY	NAME	AVG		ILURB	INBRO	INLAY	KYLEX	MIELA	MOCOL	ONRID	VABLA
1	ERNIE	53.4	hl	71.7	45.0	3.0	70.0	57.5	70	85.0	25.0
2	TRUMAN	35.3	l	56.7	5.0	5.0	75.0	30.9	60	40.0	10.0
3	FREEDOM	62.0	hl	93.3	24.0	75.0	80.0	61.4	100	50.0	12.5
4	PIONEER 2545	77.3	h	96.7	71.0	80.0	75.0	87.5	100	83.3	25.0
5	P.0513A1-2-3	57.8	hl	83.3	45.0	5.0	70.0	66.9	90	80.0	22.5
6	P.0527A1-9-15	72.1	hl	100.0	75.0	10.0	100.0	91.8	100	80.0	20.0
7	P.0558A1-5-5	69.2	hl	93.3	40.0	30.0	95.0	88.0	100	85.0	22.5
8	P.0570A1-7-6	68.7	hl	93.3	37.0	20.0	80.0	83.1	100	93.3	42.5
9	P.05218A1-6-31	63.3	hl	85.0	41.0	60.0	50.0	68.0	90	80.0	32.5
10	OH02-12686	60.5	hl	85.0	4.0	40.0	95.0	77.6	100	70.0	12.5
11	SILAS	61.6	hl	88.3	46.0	20.0	90.0	75.3	100	53.3	20.0
12	LINUS	82.1	h	99.7	55.0	90.0	95.0	85.1	100	76.7	55.0
13	OKIE	57.8	hl	93.3	15.0	35.0	65.0	65.4	90	73.3	25.0
14	PENZO	75.0	hl	93.3	71.0	70.0	90.0	71.8	100	76.7	27.5
15	AJAX	70.1	hl	100.0	64.0	50.0	60.0	72.9	100	86.7	27.5
16	IL04-11003	55.4	hl	80.0	36.0	25.0	65.0	51.2	100	73.3	12.5
17	IL04-17762	54.3	hl	61.7	35.0	35.0	80.0	34.9	100	70.0	17.5
18	IL05-15079	63.5	hl	78.3	64.0	10.0	90.0	44.7	100	88.3	32.5
19	IL05-27333	60.3	hl	88.3	10.0	10.0	95.0	83.6	100	83.3	12.5
20	IL05-27522	49.6	hl	60.0	5.0	20.0	70.0	77.2	60	86.7	17.5
21	MH06-2370	62.3	hl	78.3	28.0	40.0	85.0	79.3	100	70.0	17.5
22	MH06-2410	53.9	hl	85.0	34.0	10.0	70.0	69.3	100	50.0	12.5
23	ML07*7571	64.3	hl	86.7	22.0	40.0	90.0	91.6	100	66.7	17.5
24	ML07-7758	56.3	hl	80.0	27.0	35.0	50.0	50.4	100	83.3	25.0
25	MO 050771	50.1	hl	66.7	28.0	30.0	60.0	57.4	100	43.3	15.0
26	MO 041687	62.7	hl	86.7	37.0	15.0	95.0	60.9	100	86.7	20.0
27	MO 071411	54.4	hl	76.7	6.0	35.0	50.0	64.4	100	83.3	20.0
28	MO 071722	66.0	hl	91.7	23.0	70.0	70.0	54.8	100	83.3	35.0
29	MO 071522	49.5	hl	70.0	5.0	15.0	100.0	100.0	37	12.5	.
30	KY02C-3007-41	53.6	hl	80.0	10.0	40.0	80.0	62.8	100	43.3	12.5
31	KY02C-3005-25	47.8	hl	66.7	4.0	50.0	80.0	30.6	100	43.3	7.5
32	KY03C-2170-24	58.1	hl	75.0	21.0	80.0	55.0	69.0	80	70.0	15.0
33	KY03C-2170-06	60.3	hl	70.0	24.0	35.0	85.0	64.9	100	83.3	20.0
34	KY02C-3007-45	52.3	hl	86.7	5.0	40.0	65.0	72.3	100	36.7	12.5
35	MSU Line E5024	59.0	hl	91.7	4.0	35.0	75.0	94.0	100	60.0	12.5
36	VA07W-643	66.4	hl	88.3	17.0	60.0	95.0	74.5	100	76.7	20.0
37	VA06W-580	54.2	hl	81.7	13.0	15.0	80.0	56.2	100	60.0	27.5
38	VA07W-591	73.3	hl	95.0	48.0	60.0	85.0	83.2	100	80.0	35.0
39	VA06W-578	69.5	hl	91.7	48.0	25.0	95.0	77.9	100	83.3	35.0
40	VA04W-90	57.2	hl	83.3	10.0	60.0	60.0	53.1	100	63.3	27.5
41	OH05-101-1	61.9	hl	71.7	18.0	70.0	70.0	72.0	100	73.3	20.0
42	OH05-72-6	59.3	hl	91.7	5.0	85.0	55.0	70.3	100	60.0	7.5
43	OH05-249-32	53.2	hl	88.3	25.0	40.0	70.0	48.0	60	81.7	12.5
44	OH05-152-68	56.4	hl	40.0	42.0	50.0	90.0	79.9	100	36.7	12.5
45	OH05-164-76	63.3	hl	73.3	12.0	60.0	95.0	76.1	100	70.0	20.0
46	OH05-200-74	57.5	hl	83.3	17.0	25.0	85.0	76.6	100	63.3	10.0
100	AVERAGE	60.3		82.2	28.7	39.4	77.8	68.8	94.3	69.1	20.9
101	MINUMUM	35.3		40.0	28.4	40.2	78.0	69.0	94.8	68.8	20.9
102	MAXIMUM	82.1		100.0	28.9	41.0	78.1	69.9	95.6	69.4	21.1
103	LSD(0.05)	41.3		.	.	.	.	.	.	.	.

Table 24. Summary of severity (SEV, %) data from 2008-2009 PNUWWSN.

ENTRY	NAME	AVG		ILURB	INBRO	KYLEX	MIELA	MOCOL	ONRID	VABLA	INLAY*
1	ERNIE	23.9	l	43.5	10.0	33.1	12.1	13.6	25.0	30.0	4.3
2	TRUMAN	20.1	l	28.5	4.0	46.2	22.8	8.8	22.7	7.5	6.6
3	FREEDOM	27.1	hl	36.0	11.0	37.1	22.9	44.0	21.0	17.5	3.7
4	PIONEER 2545	46.3	hl	69.2	54.0	55.0	32.2	61.9	29.0	22.5	3.9
5	P.0513A1-2-3	25.7	hl	40.8	10.0	31.8	20.1	23.2	29.0	25.0	4.3
6	P.0527A1-9-15	35.4	hl	46.3	4.0	59.7	31.7	48.8	34.7	22.5	4.0
7	P.0558A1-5-5	31.9	hl	54.0	10.0	43.8	26.2	26.1	30.7	32.5	0.6
8	P.0570A1-7-6	39.6	hl	50.2	22.0	65.0	25.4	51.8	33.0	30.0	0.8
9	P.05218A1-6-31	27.7	hl	33.8	16.0	32.5	21.7	32.0	33.0	25.0	0.4
10	OH02-12686	34.6	hl	48.7	3.0	64.3	26.8	64.0	22.7	12.5	3.9
11	SILAS	38.4	hl	44.0	76.0	44.7	26.5	32.4	25.0	20.0	0.8
12	LINUS	59.2	h	65.6	50.0	87.6	47.0	87.0	34.7	42.5	8.3
13	OKIE	40.0	hl	74.2	38.0	37.8	35.8	31.8	25.0	37.5	1.9
14	PENZO	55.5	h	70.5	96.0	38.9	35.1	81.2	29.0	37.5	1.8
15	AJAX	49.1	hl	72.7	60.0	50.1	32.6	69.6	29.0	30.0	2.2
16	IL04-11003	25.3	l	31.1	31.0	24.1	14.2	40.3	16.3	20.0	3.1
17	IL04-17762	22.6	l	33.1	20.0	31.7	12.3	18.6	25.0	17.5	4.4
18	IL05-15079	28.8	hl	37.8	21.0	48.6	19.0	11.5	38.7	25.0	2.5
19	IL05-27333	22.4	l	33.0	5.0	39.2	17.7	22.9	18.7	20.0	3.3
20	IL05-27522	18.0	l	19.1	5.0	30.5	31.3	4.0	21.0	15.0	2.9
21	MH06-2370	32.6	hl	42.1	16.0	49.7	28.8	42.9	29.0	20.0	5.1
22	MH06-2410	21.2	l	24.4	5.0	32.9	15.5	44.4	16.3	10.0	1.8
23	ML07*7571	24.2	l	30.3	3.0	41.0	21.0	30.5	16.3	27.5	0.5
24	ML07-7758	22.9	l	45.7	12.0	24.1	17.2	10.5	21.0	30.0	0.5
25	MO 050771	20.7	l	28.8	14.0	29.9	14.7	22.2	20.3	15.0	0.9
26	MO 041687	35.2	hl	47.1	64.0	42.6	15.1	18.6	29.0	30.0	5.2
27	MO 071411	19.1	l	36.8	7.0	33.3	14.4	11.3	21.0	10.0	1.3
28	MO 071722	35.7	hl	45.8	14.0	46.9	20.8	35.9	38.7	47.5	1.9
29	MO 071522	28.8	hl	31.7	5.0	94.6	22.5	18.7	7.5		2.3
30	KY02C-3007-41	17.1	l	19.7	3.0	41.3	15.6	16.3	14.0	10.0	0.6
31	KY02C-3005-25	15.9	l	19.1	4.0	32.3	16.6	9.0	20.3	10.0	2.9
32	KY03C-2170-24	28.3	hl	45.4	32.0	33.2	21.2	18.5	33.0	15.0	2.0
33	KY03C-2170-06	25.9	hl	27.4	44.0	38.0	10.5	20.0	29.0	12.5	0.8
34	KY02C-3007-45	16.2	l	12.0	3.0	30.3	9.8	34.8	16.3	7.5	0.6
35	MSU Line E5024	25.1	l	42.2	5.0	43.3	28.4	30.9	18.7	7.5	2.4
36	VA07W-643	23.8	l	32.7	4.0	43.5	14.0	34.1	21.0	17.5	0.5
37	VA06W-580	26.9	hl	28.5	27.0	42.1	15.6	21.3	16.3	37.5	2.5
38	VA07W-591	31.5	hl	37.5	34.0	44.1	25.0	20.4	34.7	25.0	0.8
39	VA06W-578	32.6	hl	52.6	19.0	40.5	22.0	41.7	22.7	30.0	0.6
40	VA04W-90	28.8	hl	54.3	5.0	46.4	21.6	33.1	16.3	25.0	1.6
41	OH05-101-1	22.4	l	35.8	17.0	18.2	20.8	22.6	25.0	17.5	0.8
42	OH05-72-6	28.5	hl	50.7	50.0	23.1	17.1	21.0	25.0	12.5	4.8
43	OH05-249-32	25.7	hl	60.5	6.0	38.4	15.8	18.9	25.0	15.0	2.8
44	OH05-152-68	32.1	hl	26.7	24.0	72.3	48.6	23.1	22.7	7.5	3.8
45	OH05-164-76	24.2	l	24.7	9.0	52.0	16.6	26.9	22.7	17.5	2.4
46	OH05-200-74	22.0	l	37.4	16.0	37.7	16.2	11.9	25.0	10.0	2.0
100	AVERAGE	29.1		40.7	21.5	42.9	22.1	30.7	24.6	21.3	2.5
101	MINUMUM	15.9		12.0	3.0	18.2	9.8	4.0	7.5	7.5	0.4
102	MAXIMUM	59.2		74.2	96.0	94.6	48.6	87.0	38.7	47.5	8.3
103	LSD(0.05)	33.8									

* # Syptomatic florets folliwing SPI in the field.

Table 25. Summary of index (IND, %) data from 2008-2009 PNUWWSN.

ENTRY	NAME	AVG		ILURB	INBRO	KYLEX	MIELA	MOCOL	OHWOO	ONRID	VABLA	ROMAN	ROMAN
1	ERNIE	14.1	l	31.2	4.5	23.2	7.3	9.5	7.9	21.5	8.0	NSF*	AUDPC
2	TRUMAN	11.3	l	15.2	0.2	34.7	6.2	5.3	19.4	8.8	0.9	30.3	246
3	FREEDOM	18.8	hl	33.9	2.6	29.7	13.9	44.0	13.6	10.5	2.1	20.4	184
4	PIONEER 2545	36.9	hl	67.0	38.3	41.2	28.0	61.9	28.9	23.9	5.6	100.0	860
5	P.0513A1-2-3	16.7	l	33.9	4.5	22.2	13.6	20.9	9.2	23.6	5.6	30.1	290
6	P.0527A1-9-15	28.5	hl	46.3	3.0	59.7	29.8	48.8	9.1	26.8	4.5	33.2	360
7	P.0558A1-5-5	23.2	hl	50.3	4.0	41.6	23.4	26.1	4.8	27.0	8.3	70.8	566
8	P.0570A1-7-6	29.6	hl	47.0	8.1	52.0	22.2	51.8	13.7	30.8	11.3	63.1	427
9	P.05218A1-6-31	17.7	hl	28.6	6.6	16.2	15.2	28.8	8.1	26.4	11.5	23.6	178
10	OH02-12686	26.1	hl	42.1	0.1	61.0	20.7	64.0	3.0	15.5	2.1	48.4	341
11	SILAS	24.0	hl	38.7	35.0	40.2	20.9	32.4	7.6	12.8	4.0	32.6	294
12	LINUS	46.5	h	65.4	27.5	83.2	39.9	87.0	20.0	27.0	22.3	82.7	618
13	OKIE	23.2	hl	70.0	5.7	24.6	23.8	28.6	4.6	18.2	10.0	96.7	755
14	PENZO	41.8	h	66.1	68.2	35.0	24.7	81.2	25.6	22.5	11.3	71.3	529
15	AJAX	36.4	hl	72.7	38.4	30.1	23.8	69.6	22.4	25.4	9.0	75.3	701
16	IL04-11003	14.5	l	24.5	11.2	15.7	7.8	40.3	2.2	12.1	2.3	92.9	714
17	IL04-17762	12.3	l	20.6	7.0	25.4	4.3	18.6	1.1	17.9	3.3	85.0	630
18	IL05-15079	19.1	hl	30.0	13.4	43.8	9.1	11.5	1.1	34.3	9.9	78.2	549
19	IL05-27333	15.7	l	29.5	0.5	37.2	14.4	22.9	2.7	15.4	2.8	32.7	234
20	IL05-27522	11.0	l	11.7	0.3	21.4	24.0	2.4	7.1	18.2	3.0	84.8	611
21	MH06-2370	22.0	hl	33.0	4.5	42.2	23.1	42.9	5.0	21.5	3.8	92.8	674
22	MH06-2410	14.3	l	20.1	1.7	23.1	11.0	44.4	4.8	8.2	1.3	51.8	331
23	ML07*7571	16.7	l	26.5	0.7	36.9	19.3	30.5	3.7	11.0	4.6	49.0	356
24	ML07-7758	12.9	l	37.0	3.2	12.0	10.8	10.5	3.8	17.5	8.0	92.3	576
25	MO 050771	10.9	l	19.0	3.9	17.9	8.9	22.2	1.4	11.8	2.3	88.4	565
26	MO 041687	23.0	hl	40.7	23.7	40.4	9.7	18.6	15.9	25.0	9.8	61.2	504
27	MO 071411	11.0	l	28.0	0.4	16.7	8.5	11.3	3.3	17.5	2.0	65.7	482
28	MO 071722	22.7	hl	42.5	3.2	32.8	12.9	35.9	4.7	31.5	17.9	56.3	359
29	MO 071522	20.8	hl	22.0	0.3	94.6	22.5	2.2	6.5	1.0		44.0	308
30	KY02C-3007-41	10.6	l	15.4	0.3	33.0	10.4	16.3	2.3	6.1	1.3	43.9	265
31	KY02C-3005-25	8.2	l	13.2	0.2	25.9	3.2	9.0	1.4	11.8	0.8	22.7	148
32	KY03C-2170-24	14.3	l	32.4	6.7	18.3	14.5	14.8	2.0	23.1	2.5	59.1	513
33	KY03C-2170-06	14.8	l	19.2	10.6	32.3	7.0	20.0	2.4	24.3	2.5	9.9	110
34	KY02C-3007-45	10.3	l	10.6	0.2	19.7	7.6	34.8	2.6	5.8	1.0	18.4	156
35	MSU Line E5024	18.5	hl	39.3	0.2	32.5	26.7	30.9	5.6	11.9	1.0	45.1	284
36	VA07W-643	17.4	hl	28.9	0.7	41.3	10.1	34.1	3.3	16.1	4.3	56.8	382
37	VA06W-580	14.3	l	23.0	3.5	33.7	9.4	21.3	2.2	10.3	11.3	40.0	391
38	VA07W-591	21.8	hl	35.7	16.3	37.5	21.8	20.4	5.2	27.2	10.3	86.6	547
39	VA06W-578	24.0	hl	48.4	9.1	38.5	17.7	41.7	6.1	18.8	11.5	61.0	389
40	VA04W-90	17.5	hl	44.7	0.5	27.8	11.4	33.1	4.3	11.0	6.9	52.4	401
41	OH05-101-1	13.3	l	25.4	3.1	12.8	15.1	22.6	5.2	18.6	3.8	54.2	409
42	OH05-72-6	14.5	l	46.5	2.5	12.7	11.9	21.0	4.0	16.2	0.8	49.6	349
43	OH05-249-32	15.6	l	53.4	1.5	26.9	7.6	11.3	0.9	20.8	2.6	100.0	747
44	OH05-152-68	20.1	hl	11.5	10.1	65.0	37.8	23.1	3.2	9.2	1.0	65.1	436
45	OH05-164-76	16.3	l	18.0	1.1	49.4	12.9	26.9	1.8	16.7	3.5	20.1	170
46	OH05-200-74	13.8	l	31.6	2.7	32.0	12.4	11.9	3.4	15.7	1.0	31.8	248
100	AVERAGE	19.3		34.6	8.5	34.7	16.0	29.7	6.9	18.0	5.6	57.1	426
101	MINUMUM	8.2		10.6	0.1	12.0	3.2	2.2	0.9	1.0	0.8	9.9	110
102	MAXIMUM	46.5		72.7	68.2	94.6	39.9	87.0	28.9	34.3	22.3	100.0	860
103	LSD(0.05)	29.3		.	.	.	.	.	.	.	.	.	.

* Number of scabby florets

Table 26. Summary of fusarium damaged kernel (FDK, %) data from 2008-2009 PNUWWSN.

ENTRY	NAME	AVG		ILURB	INBRO	KYLEX	MOCOL	ROMAN
1	ERNIE	21.6	l	30.0	16.0	9.0	15.0	38.2
2	TRUMAN	18.1	l	8.3	34.0	4.3	5.0	39.0
3	FREEDOM	34.6	hl	45.0	20.0	19.3	60.0	28.5
4	PIONEER 2545	46.8	hl	73.3	16.0	28.4	60.0	56.2
5	P.0513A1-2-3	26.6	hl	40.0	36.0	8.9	25.0	22.9
6	P.0527A1-9-15	44.6	hl	86.7	18.0	16.5	50.0	51.6
7	P.0558A1-5-5	35.0	hl	66.7	34.0	17.5	25.0	31.7
8	P.0570A1-7-6	33.7	hl	53.3	22.0	18.4	40.0	34.6
9	P.05218A1-6-31	36.4	hl	66.7	20.0	14.6	60.0	20.6
10	OH02-12686	42.5	hl	26.7	64.0	22.4	60.0	39.3
11	SILAS	29.9	hl	35.0	10.0	14.9	60.0	29.4
12	LINUS	65.2	h	80.0	28.0	48.7	90.0	79.3
13	OKIE	45.7	hl	76.7	20.0	12.1	50.0	69.9
14	PENZO	46.8	hl	66.7	6.0	23.2	75.0	62.9
15	AJAX	51.0	h	86.7	12.0	35.2	80.0	41.3
16	IL04-11003	34.5	hl	36.7	24.0	11.5	40.0	60.1
17	IL04-17762	24.5	l	25.0	18.0	10.1	10.0	59.4
18	IL05-15079	20.1	l	25.0	6.0	8.5	10.0	51.0
19	IL05-27333	22.7	l	20.0	6.0	12.8	40.0	34.8
20	IL05-27522	23.5	l	21.7	10.0	6.4	25.0	54.3
21	MH06-2370	43.6	hl	40.0	20.0	21.9	60.0	76.1
22	MH06-2410	25.0	l	33.3	16.0	14.4	25.0	36.3
23	ML07*7571	40.6	hl	48.3	16.0	10.5	80.0	48.4
24	ML07-7758	30.3	hl	33.3	20.0	11.3	40.0	46.8
25	MO 050771	22.0	l	20.0	12.0	15.3	25.0	37.6
26	MO 041687	24.9	l	35.0	4.0	12.3	20.0	53.3
27	MO 071411	24.5	l	31.7	14.0	12.1	20.0	44.5
28	MO 071722	26.9	hl	38.3	22.0	17.0	25.0	32.1
29	MO 071522	17.2	l	16.7	18.0	10.8	10.0	30.7
30	KY02C-3007-41	20.5	l	33.3	18.0	12.6	25.0	13.5
31	KY02C-3005-25	8.6	l	9.7	6.0	1.8	10.0	15.7
32	KY03C-2170-24	35.1	hl	36.7	10.0	13.7	50.0	64.9
33	KY03C-2170-06	14.1	l	13.3	20.0	4.6	20.0	12.7
34	KY02C-3007-45	19.1	l	38.3	10.0	9.3	20.0	17.7
35	MSU Line E5024	30.0	hl	41.7	10.0	20.7	25.0	52.4
36	VA07W-643	24.8	l	33.3	14.0	7.3	25.0	44.2
37	VA06W-580	22.0	l	28.3	8.0	8.6	25.0	39.9
38	VA07W-591	36.1	hl	45.0	18.0	23.7	50.0	43.6
39	VA06W-578	36.9	hl	41.7	10.0	15.4	75.0	42.3
40	VA04W-90	27.0	hl	35.0	32.0	17.4	20.0	30.7
41	OH05-101-1	28.4	hl	40.0	22.0	4.6	25.0	50.6
42	OH05-72-6	36.8	hl	43.3	32.0	11.3	40.0	57.6
43	OH05-249-32	37.6	hl	45.0	6.0	16.5	25.0	95.6
44	OH05-152-68	41.6	hl	40.0	24.0	27.7	60.0	56.4
45	OH05-164-76	29.2	hl	33.3	38.0	13.4	25.0	36.1
46	OH05-200-74	36.9	hl	40.0	26.0	18.1	60.0	40.4
100	AVERAGE	31.4		40.5	18.8	15.1	38.4	44.0
101	MINUMUM	8.6		8.3	4.0	1.8	5.0	12.7
102	MAXIMUM	65.2		86.7	64.0	48.7	90.0	95.6
103	LSD(0.05)	38.9						

Table 27. Summary of incidence x severity x FDK (ISK, %) data from 2008-2009 PNUWWSN.

ENTRY	NAME	AVG		ILURB	INBRO	KYLEX	MOCOL
1	ERNIE	34.6	l	46.5	22.9	40.2	28.9
2	TRUMAN	29.5	l	28.9	16.3	50.2	22.8
3	FREEDOM	45.8	l	56.8	18.5	47.0	60.8
4	PIONEER 2545	63.0	h	79.1	43.9	55.5	73.4
5	P.0513A1-2-3	41.5	l	53.3	30.9	39.4	42.3
6	P.0527A1-9-15	61.4	h	78.6	30.9	71.8	64.1
7	P.0558A1-5-5	51.5	hl	70.9	28.6	58.3	48.3
8	P.0570A1-7-6	55.4	h	64.4	26.5	64.3	66.2
9	P.05218A1-6-31	41.7	l	62.3	25.1	31.2	48.1
10	OH02-12686	56.4	h	50.8	27.7	72.2	74.8
11	SILAS	50.9	hl	53.7	40.6	56.5	52.7
12	LINUS	75.8	h	81.6	42.7	88.1	90.9
13	OKIE	48.4	hl	80.9	23.9	40.7	48.0
14	PENZO	66.9	h	75.8	52.5	52.6	86.8
15	AJAX	63.1	h	86.5	42.0	45.1	78.7
16	IL04-11003	42.2	l	48.0	29.7	33.0	58.2
17	IL04-17762	37.2	l	38.4	23.7	43.7	43.0
18	IL05-15079	42.5	l	44.9	27.9	59.1	38.1
19	IL05-27333	38.1	l	44.4	6.9	55.2	46.0
20	IL05-27522	24.6	l	32.4	7.0	38.7	20.2
21	MH06-2370	47.7	hl	52.1	21.2	57.3	60.1
22	MH06-2410	41.3	l	46.1	18.1	40.1	61.1
23	ML07*7571	43.4	l	54.4	13.9	54.1	51.3
24	ML07-7758	33.8	l	51.1	19.7	27.0	37.4
25	MO 050771	33.4	l	36.6	17.4	34.2	45.6
26	MO 041687	46.6	hl	54.1	31.9	57.4	43.0
27	MO 071411	31.4	l	46.7	9.5	31.7	37.9
28	MO 071722	45.0	l	56.6	19.9	48.2	55.1
29	MO 071522	47.3	hl	37.2	10.2	96.2	45.8
30	KY02C-3007-41	36.3	l	43.3	11.1	49.6	41.4
31	KY02C-3005-25	28.7	l	29.6	4.8	44.0	36.3
32	KY03C-2170-24	35.0	l	50.8	19.9	33.8	35.5
33	KY03C-2170-06	39.2	l	34.6	28.4	49.8	44.0
34	KY02C-3007-45	35.6	l	45.0	6.4	36.5	54.4
35	MSU Line E5024	40.9	l	56.8	6.7	48.5	51.6
36	VA07W-643	43.4	l	49.7	11.9	58.1	53.9
37	VA06W-580	38.7	l	44.4	15.2	50.1	44.9
38	VA07W-591	46.9	hl	57.8	31.8	53.7	44.3
39	VA06W-578	49.8	hl	60.0	24.1	56.0	59.2
40	VA04W-90	42.2	l	55.3	17.3	43.1	53.2
41	OH05-101-1	36.2	l	48.2	19.3	31.6	45.8
42	OH05-72-6	40.7	l	60.1	29.3	28.5	44.7
43	OH05-249-32	36.4	l	62.6	11.7	43.3	28.2
44	OH05-152-68	46.6	hl	36.0	29.4	74.7	46.2
45	OH05-164-76	44.2	l	42.7	21.5	63.9	48.8
46	OH05-200-74	40.1	l	52.2	20.3	49.6	38.3
100	AVERAGE	43.9		53.1	22.6	50.1	50.0
101	MINUMUM	24.6		28.9	4.8	27.0	20.2
102	MAXIMUM	75.8		86.5	52.5	96.2	90.9
103	LSD(0.05)	29.5		.	.	.	.

Table 28. Summary of deoxynivalenol (DON, ppm) data from 2008-2009 PNUWWSN.

ENTRY	NAME	AVG		KYLEX	VABLA
1	ERNIE	21.7	hl	42.0	1.4
2	TRUMAN	8.9	l	15.8	1.9
3	FREEDOM	21.3	hl	40.9	1.7
4	PIONEER 2545	31.0	hl	59.3	2.8
5	P.0513A1-2-3	12.5	hl	23.1	2.0
6	P.0527A1-9-15	21.4	hl	39.5	3.3
7	P.0558A1-5-5	19.6	hl	38.0	1.2
8	P.0570A1-7-6	20.3	hl	38.5	2.2
9	P.05218A1-6-31	21.4	hl	41.5	1.4
10	OH02-12686	11.2	l	21.2	1.3
11	SILAS	21.6	hl	42.0	1.3
12	LINUS	20.7	hl	38.6	2.8
13	OKIE	14.8	hl	27.9	1.7
14	PENZO	21.5	hl	40.3	2.8
15	AJAX	37.1	h	70.1	4.1
16	IL04-11003	11.6	hl	22.1	1.1
17	IL04-17762	11.9	hl	22.6	1.2
18	IL05-15079	15.5	hl	29.1	2.0
19	IL05-27333	12.1	hl	23.3	1.0
20	IL05-27522	13.2	hl	24.8	1.7
21	MH06-2370	12.6	hl	23.6	1.7
22	MH06-2410	16.6	hl	31.2	2.1
23	ML07*7571	20.6	hl	40.4	0.8
24	ML07-7758	9.7	l	18.1	1.3
25	MO 050771	20.9	hl	40.2	1.6
26	MO 041687	20.2	hl	39.0	1.4
27	MO 071411	15.4	hl	29.1	1.7
28	MO 071722	13.8	hl	25.7	1.8
29	MO 071522	7.0	l	12.9	1.1
30	KY02C-3007-41	13.4	hl	25.8	1.1
31	KY02C-3005-25	8.4	l	15.1	1.6
32	KY03C-2170-24	13.4	hl	25.1	1.8
33	KY03C-2170-06	6.7	l	11.7	1.7
34	KY02C-3007-45	12.3	hl	23.4	1.3
35	MSU Line E5024	36.9	h	71.8	1.9
36	VA07W-643	10.8	l	18.9	2.6
37	VA06W-580	12.9	hl	24.7	1.1
38	VA07W-591	24.7	hl	47.4	2.0
39	VA06W-578	22.7	hl	44.2	1.2
40	VA04W-90	16.9	hl	32.0	1.8
41	OH05-101-1	8.9	l	16.3	1.5
42	OH05-72-6	15.0	hl	28.8	1.1
43	OH05-249-32	13.7	hl	26.2	1.2
44	OH05-152-68	16.5	hl	31.1	1.9
45	OH05-164-76	16.5	hl	31.1	1.9
46	OH05-200-74	15.0	hl	28.6	1.3
100	AVERAGE	16.8		31.8	1.7
101	MINUMUM	6.7		11.7	0.8
102	MAXIMUM	37.1		71.8	4.1
103	LSD(0.05)	25.8			

Table 29. Summary of greenhouse severity from SPI (GHSEV, %) data from 2008-2009 PNUWWSN.

ENTRY	NAME	ILURB
1	ERNIE	27.3
2	TRUMAN	3.5
3	FREEDOM	5.7
4	PIONEER 2545	82.4
5	P.0513A1-2-3	57.3
6	P.0527A1-9-15	34.0
7	P.0558A1-5-5	8.5
8	P.0570A1-7-6	59.3
9	P.05218A1-6-31	9.2
10	OH02-12686	5.0
11	SILAS	4.5
12	LINUS	81.4
13	OKIE	80.6
14	PENZO	41.5
15	AJAX	45.7
16	IL04-11003	15.2
17	IL04-17762	43.2
18	IL05-15079	10.2
19	IL05-27333	9.2
20	IL05-27522	13.7
21	MH06-2370	30.7
22	MH06-2410	13.7
23	ML07*7571	7.6
24	ML07-7758	2.7
25	MO 050771	17.0
26	MO 041687	42.8
27	MO 071411	37.8
28	MO 071722	33.2
29	MO 071522	5.3
30	KY02C-3007-41	3.4
31	KY02C-3005-25	6.2
32	KY03C-2170-24	24.2
33	KY03C-2170-06	7.7
34	KY02C-3007-45	6.2
35	MSU Line E5024	75.3
36	VA07W-643	3.3
37	VA06W-580	2.6
38	VA07W-591	28.2
39	VA06W-578	25.2
40	VA04W-90	10.0
41	OH05-101-1	23.3
42	OH05-72-6	23.5
43	OH05-249-32	97.2
44	OH05-152-68	28.0
45	OH05-164-76	5.4
46	OH05-200-74	3.3
100	AVERAGE	26.1
101	MINUMUM	2.6
102	MAXIMUM	97.2
103	LSD(0.05)	.

Table 30. Summary of heading date (HD, julian days) data from 2008-2009 PNUWWSN.

ENTRY	NAME	AVG	ILURB	INBRO	KYLEX	MOCOL	OHWOO	ROMAN	VABLA
1	ERNIE	134	135	141	130	138	139	131	124
2	TRUMAN	141 h	143	147	142	146	145	135	130
3	FREEDOM	137	140	143	131	141	142	135	128
4	PIONEER 2545	136	138	142	132	140	141	131	129
5	P.0513A1-2-3	134	136	141	127	139	137	130	126
6	P.0527A1-9-15	138	140	145	133	141	141	135	129
7	P.0558A1-5-5	134	137	141	130	138	139	130	126
8	P.0570A1-7-6	136	138	142	132	140	139	133	128
9	P.05218A1-6-31	136	139	142	130	141	141	135	127
10	OH02-12686	142 h	144	148	142	146	144	136	132
11	SILAS	138	141	144	133	141	142	135	129
12	LINUS	138	141	147	134	141	142	136	128
13	OKIE	136	139	142	131	140	139	131	128
14	PENZO	136	138	140	131	141	141	134	128
15	AJAX	136	139	141	129	141	142	131	128
16	IL04-11003	135	138	142	128	141	141	130	128
17	IL04-17762	134	135	140	130	139	139	130	126
18	IL05-15079	134	136	138	130	139	139	129	125
19	IL05-27333	136	139	141	133	140	141	131	129
20	IL05-27522	132 l	133	137	126	135	137	129	125
21	MH06-2370	135	138	142	130	139	140	130	127
22	MH06-2410	137	141	142	132	141	141	134	128
23	ML07*7571	136	139	141	131	141	141	131	126
24	ML07-7758	135	139	141	128	140	140	133	126
25	MO 050771	135	137	142	130	140	140	130	127
26	MO 041687	132 l	134	138	126	138	137	129	124
27	MO 071411	135	138	141	130	140	141	130	128
28	MO 071722	135	137	139	130	140	140	132	127
29	MO 071522	141 h	144	147	142	146	144	135	132
30	KY02C-3007-41	138	142	144	133	141	142	133	129
31	KY02C-3005-25	139	142	143	135	142	143	135	130
32	KY03C-2170-24	134	138	139	129	138	138	130	127
33	KY03C-2170-06	133 l	135	139	127	138	139	130	124
34	KY02C-3007-45	138	141	143	134	140	142	135	130
35	MSU Line E5024	138	142	142	134	141	142	136	129
36	VA07W-643	136	137	141	130	140	140	134	127
37	VA06W-580	135	138	141	131	141	140	133	124
38	VA07W-591	135	137	141	131	140	140	132	127
39	VA06W-578	135	137	139	129	141	140	131	125
40	VA04W-90	135	138	140	130	140	141	132	127
41	OH05-101-1	134	136	141	128	138	139	130	125
42	OH05-72-6	137	139	143	130	140	141	135	129
43	OH05-249-32	134 l	135	138	129	138	139	130	126
44	OH05-152-68	142 h	145	146	142	146	144	138	133
45	OH05-164-76	137	139	142	132	140	141	135	127
46	OH05-200-74	138	140	142	134	141	142	135	129
100	AVERAGE	136	139	142	131	140	141	133	128
101	MINUMUM	132	133	137	126	135	137	129	124
102	MAXIMUM	142	145	148	142	146	145	138	133
103	LSD(0.05)	2	.	.	.	.	.	.	.

Table 31. Summary of plant height (HGT, inches) data from 2008-2009 PNUWWSN.

ENTRY	NAME	AVG		KYLEX	ROMAN
1	ERNIE	33	l	34	32
2	TRUMAN	37	hl	42	32
3	FREEDOM	40	h	40	39
4	PIONEER 2545	35	l	36	34
5	P.0513A1-2-3	34	l	39	30
6	P.0527A1-9-15	32	l	36	28
7	P.0558A1-5-5	33	l	35	32
8	P.0570A1-7-6	32	l	34	30
9	P.05218A1-6-31	35	hl	39	32
10	OH02-12686	34	l	41	28
11	SILAS	38	h	41	36
12	LINUS	33	l	38	28
13	OKIE	36	hl	41	32
14	PENZO	38	h	39	37
15	AJAX	38	h	38	37
16	IL04-11003	36	hl	37	36
17	IL04-17762	40	h	40	39
18	IL05-15079	37	hl	36	37
19	IL05-27333	37	h	39	36
20	IL05-27522	35	hl	37	34
21	MH06-2370	39	h	40	37
22	MH06-2410	36	hl	37	36
23	ML07*7571	38	h	39	37
24	ML07-7758	40	h	40	39
25	MO 050771	36	hl	41	32
26	MO 041687	38	h	39	37
27	MO 071411	40	h	39	41
28	MO 071722	34	l	35	34
29	MO 071522	34	l	41	28
30	KY02C-3007-41	38	h	38	37
31	KY02C-3005-25	41	h	40	41
32	KY03C-2170-24	40	h	42	37
33	KY03C-2170-06	37	hl	40	34
34	KY02C-3007-45	36	hl	40	32
35	MSU Line E5024	33	l	36	30
36	VA07W-643	35	l	36	34
37	VA06W-580	35	hl	35	36
38	VA07W-591	31	l	33	30
39	VA06W-578	31	l	33	30
40	VA04W-90	36	hl	36	36
41	OH05-101-1	38	h	42	34
42	OH05-72-6	37	h	37	37
43	OH05-249-32	38	h	37	39
44	OH05-152-68	39	h	43	36
45	OH05-164-76	35	hl	39	32
46	OH05-200-74	41	h	40	41
100	AVERAGE	36		38	34
101	MINUMUM	31		33	28
102	MAXIMUM	41		43	41
103	LSD(0.05)	6		.	.

Table 32. Means for other traits collected on the 2008-2009 PNUWWSN

ENTRY	NAME	VABLA Leaf Rust 0 to 9
1	ERNIE	6.5
2	TRUMAN	7.5
3	FREEDOM	2.0
4	PIONEER 2545	8.0
5	P.0513A1-2-3	4.5
6	P.0527A1-9-15	0.0
7	P.0558A1-5-5	0.0
8	P.0570A1-7-6	1.5
9	P.05218A1-6-31	6.0
10	OH02-12686	1.0
11	SILAS	6.0
12	LINUS	0.5
13	OKIE	7.0
14	PENZO	6.5
15	AJAX	7.0
16	IL04-11003	7.5
17	IL04-17762	5.0
18	IL05-15079	2.0
19	IL05-27333	1.0
20	IL05-27522	5.5
21	MH06-2370	6.0
22	MH06-2410	8.0
23	ML07*7571	8.0
24	ML07-7758	4.5
25	MO 050771	8.0
26	MO 041687	7.5
27	MO 071411	3.0
28	MO 071722	0.0
29	MO 071522	8.0
30	KY02C-3007-41	6.0
31	KY02C-3005-25	0.0
32	KY03C-2170-24	8.0
33	KY03C-2170-06	5.5
34	KY02C-3007-45	8.5
35	MSU Line E5024	7.5
36	VA07W-643	0.0
37	VA06W-580	5.5
38	VA07W-591	6.5
39	VA06W-578	3.5
40	VA04W-90	6.0
41	OH05-101-1	6.5
42	OH05-72-6	2.5
43	OH05-249-32	7.5
44	OH05-152-68	6.0
45	OH05-164-76	7.5
46	OH05-200-74	9.0
100	AVERAGE	5.1
101	MINUMUM	0.0
102	MAXIMUM	9.0

Table 33. Quality data for entries in the 2008-2009 PNUWWSN. Grain was from Lafayette IN provided by Herb Ohm. Data from the USDA Soft Wheat Quality Lab, Wooster OH.

NAME	MILLING QUALITY SCORE	BAKING QUALITY SCORE	SOFT. EQUIV. SCORE	TEST WT. LB/BU	FLOUR YIELD %	SOFT. EQUIV. %	FLOUR PROT. %	LACTIC ACID SRC	SUCROSE SRC %
STD=Freedom	61.4 C	54.5 D	64.8 C	60.0	68.6	55.9	8.0	82.8	86.8
ERNIE	47.8 E	34.5 F	53.4 D	61.1	65.9 Q	51.9 *	9.5	95.7	89.3
TRUMAN	60.5 C	45.8 E	64.5 C	60.9	68.4	55.8	8.6	86.3	89.1
FREEDOM	61.4 C	54.5 D	64.8 C	60.0	68.6	55.9	8.0	82.8	86.8
PIONEER 24R45	56.5 D	47.9 E	74.4 B	60.3	67.6 *	59.3	8.2	88.0	91.4
P0513A1-2-3	62.4 C	41.7 E	62.5 C	62.6	68.8	55.1	7.8	87.2	92.1
P0527A1-9-15	53.2 D	17.7 F	66.1 C	60.5	67.0 Q	56.4	8.9	87.9	101.0
P0558A1-5-5	55.6 D	34.9 F	59.4 D	60.6	67.5 *	54.0	8.9	90.4	91.9
P0570A1-7-6	66.7 C	34.7 F	70.5 B	61.1	69.7	57.9	8.3	101.9	96.0
P0518A1-6-31	52.1 D	39.2 F	63.9 C	58.8	66.8 Q	55.6	8.7	86.2	91.6
OH02-12686	52.9 D	41.1 E	62.1 C	58.5	66.9 Q	55.0	9.7	76.6	88.3
SILAS	61.6 C	48.9 E	79.0 B	61.9	68.7	60.9	8.4	83.9	91.7
LINUS	52.3 D	46.4 E	78.0 B	59.0	66.8 Q	60.5	9.1	110.1	91.1
OKIE	58.4 D	26.9 F	53.9 D	61.8	68.0	52.1 *	9.7	74.3	92.5
MO05219	57.6 D	41.6 E	62.8 C	61.3	67.9 *	55.2	8.9	103.4	89.9
AJAX	58.9 D	47.0 E	68.7 C	59.8	68.1	57.3	8.5	96.4	89.8
IL04-11003	72.4 B	63.7 C	79.2 B	62.0	70.8	60.9	8.0	97.6	86.3
IL04-17762	59.7 D	51.3 D	82.5 A	62.7	68.3	62.1	7.9	98.2	92.5
IL05-15079	65.7 C	57.3 D	73.8 B	62.2	69.5	59.1	7.1	87.8	89.5
IL05-27333	74.4 B	61.8 C	85.5 A	60.0	71.2	63.2	7.8	93.8	89.2
IL05-27522	67.0 C	55.8 D	75.0 B	62.8	69.7	59.5	7.7	97.9	89.4
MH06-2370	51.5 D	25.9 F	66.6 C	62.9	66.6 Q	56.5	8.7	84.0	98.0
MH06-2410	50.8 D	12.3 F	62.9 C	63.3	66.5 Q	55.2	7.8	81.3	104.8
ML07*7571	63.8 C	46.8 E	81.5 A	59.8	69.1	61.8	7.9	92.3	94.3
ML07-7758	59.9 C	52.1 D	69.0 C	61.9	68.3	57.4	7.5	82.9	89.8
MO050771	60.9 C	44.0 E	61.2 C	62.0	68.5	54.7	8.1	78.5	90.2
MO041687	64.4 C	51.9 D	67.6 C	62.6	69.2	56.9	7.7	97.4	89.2
MO071411	72.8 B	53.3 D	65.7 C	60.8	70.9	56.2	8.2	89.1	87.0
MO071722	60.8 C	54.2 D	67.7 C	61.1	68.5	56.9	8.5	90.9	86.6
MO071522	62.8 C	54.9 D	83.4 A	59.9	68.9	62.4	8.3	102.8	90.4
KY02C-3007-41	48.1 E	49.3 E	78.8 B	60.3	66.0 Q	60.8	8.5	91.1	91.5
KY02C-3005-25	54.4 D	33.9 F	57.0 D	62.6	67.2 *	53.2	9.4	78.5	90.9
KY03C-2170-24	58.2 D	37.6 F	69.3 C	63.0	68.0	57.5	9.3	81.9	92.5
KY03C-2170-06	45.4 E	26.8 F	58.1 D	63.0	65.4 Q	53.6	9.4	95.7	94.0
KY02C-3007-45	59.4 D	46.0 E	73.1 B	61.8	68.2	58.8	8.2	84.1	91.9
MSU LINE 5024	68.1 C	43.6 E	64.3 C	61.0	69.9	55.7	8.9	80.2	89.5
VA07W-643	58.3 D	40.4 E	59.1 D	62.9	68.0	53.9	9.2	87.6	88.9
VA06W-580	62.5 C	34.4 F	51.1 D	64.1	68.8	51.1 *	9.5	85.1	89.0
VA07W-591	49.1 E	18.9 F	45.6 E	62.9	66.2 Q	49.2 Q	9.4	93.2	94.4
VA06W-578	56.7 D	30.6 F	60.4 C	63.3	67.7 *	54.4	8.9	88.6	93.9
VA04W-90	61.8 C	40.1 E	74.4 B	61.5	68.7	59.3	8.4	94.2	94.4
OH05-101-1	55.5 D	14.3 F	55.5 D	62.2	67.4 *	52.7 *	9.3	109.1	99.0
OH05-72-6	53.1 D	27.9 F	62.8 C	62.7	67.0 Q	55.2	9.0	81.2	95.6
OH05-249-32	58.0 D	35.7 F	48.2 E	61.6	67.9	50.1 *	9.0	93.7	88.6
OH05-152-68	50.8 D	38.3 F	80.2 A	57.6	66.5 Q	61.3	9.2	79.2	95.0
OH05-164-76	39.1 F	16.5 F	66.9 C	58.8	64.2 Q	56.7	9.2	95.7	101.1
OH05-200-74	51.1 D	32.5 F	69.5 C	60.8	66.6 Q	57.6	9.0	95.9	95.3
AVERAGE	58.1	40.3	67.0	61.4	68.0	56.7	8.6	90.0	92.1
MINIMUM	39.1	12.3	45.6	57.6	64.2	49.2	7.1	74.3	86.3
MAXIMUM	74.4 0.0	63.7	85.5	64.1	71.2	63.2	9.7	110.1	104.8

Table 34. Presence or absence of genes for entries in the 2008-2009 PNUWWSN based on marker analysis performed by the USDA Small Grains Genotyping Lab, Raleigh NC.

Name	Ppd-D1a	Fhb1	Ernie 3BSc	Wuhan-1 2DL	Ernie 5AS	Ning7840 5AS	Ernie 2B	Ernie 4B	Lr24/ Sr24	1RS trans	Sr36	H13	H9	Lr37/ Yr17/ Sr26	BYVD 2/3	Lr34/ Yr18	Bx7 O.E.	Glu-D1
ERNIE	no	no	yes	no	yes	no	yes	no	no		yes	no	no	no	no	no	no	2+12
TRUMAN	no	no	no	no	no	no	yes	no	no		no	no	no	no	no	no	no	2+12
FREEDOM	no	no	yes	no	no	no	yes	no	no	1RS:1BL	yes	no	no	no	no	no	no	2+12
PIONEER 2545	yes	no	no	no	no	no	no	no	no		no	no	no	no	no	no	no	2+12
P.0513A1-2-3	het	no	no	no	no	no	yes	no	no		no	no	no	yes	het	no	no	het
P.0527A1-9-15	yes	no	no	no	no	no	no	no	no	1RS:1BL	no	no	no	yes	no	no	no	2+12
P.0558A1-5-5	yes	no	no	no	no	no	yes	no	no		yes	no	no	no	no	no	no	2+12
P.0570A1-7-6	yes	no	no	no	yes?	no	yes	no	no		yes	no	no	no	het	no	no	5+10
P.05218A1-6-31	yes	het?	no	no	het	no	yes	no	no		het	no	no	no	het	no	no	2+12
OH02-12686	no	no	?	no	no	no	no	yes?	no	1RS:1AL	no	no	no	no	no	no	no	2+12
SILAS	no	no	no	no	no	no	no	no	no		no	no	no	no	no	no	no	2+12
LINUS	het	no	no	no	no	no	no	no	no		no	no	no	no	no	no	het	2+12
OKIE	het	no	no	no	no	no	no	no	no	1RS:1BL	no	no	no	no	no	no	no	het
PENZO	yes	no	no	no	no	no	no	no	no		no	no	no	no	no	no	no	2+12
AJAX	yes	no	no	no	no	no	yes	no	no		het	no	no	no	no	no	het	2+12
IL04-11003	no	no	no	no	no	no	no	no	no		no	no	no	no	no	no	no	5+10
IL04-17762	no	no	no	no	no	no	no	no	no		no	no	no	no	no	no	no	5+10
IL05-15079	no	no	?	no	no	no	no	no	no	1RS:1BL	no	no	no	no	no	no	no	2+12
IL05-27333	no	no	no	no	no	no	no	no	no		no	no	no	no	no	no	no	5+10
IL05-27522	no	no	no	no	yes?	no	no	no	no		no	no	no	no	no	no	no	5+10
MH06-2370	yes	no	no	no	no	no	no	no	no	1RS:1BL	no	no	no	no	no	no	no	2+12
MH06-2410	yes	no	no	no	no	no	no	no	no	1RS:1BL	no	no	no	no	no	no	no	2+12
ML07*7571	no	no	no	no	no	no	no	het	no		no	no	no	no	no	no	no	2+12
ML07-7758	no	het	no	no	no	no	no	no	no		no	no	no	no	no	no	no	5+10
MO 050771	no	no	no	no	no	no	no	no	no		no	no	no	no	no	no	no	2+12
MO 041687	no	no	no	no	no	no	no	no	no		no	no	no	no	no	no	no	het
MO 071411	het	no	yes	no	yes	no	no	no	no		no	no	no	no	no	no	no	2+12
MO 071722	no	no	no	no	no	no	yes	no	no		yes	no	no	yes	no	no	no	het
MO 071522	no	no	no	no	no	no	no	no	no		no	no	no	no	no	no	no	5+10
KY02C-3007-41	no	yes	no	?	no	no	no	no	no		no	no	no	no	no	?	no	5+10
KY02C-3005-25	no	yes	no	?	no	no	no	no	yes	1RS:1AL	no	no	no	no	no	het?	no	5+10
KY03C-2170-24	het	no	no	het	no	no	yes	no	no	1RS:1BL	het	no	no	no	no	no	no	het
KY03C-2170-06	yes	yes	?	no	no	no	no	no	no		no	no	no	no	no	no	no	2+12
KY02C-3007-45	het	yes	no	?	no	no	no	no	no	1RS:1BL	no	no	no	no	no	no?	no	5+10
MSU Line E5024	yes	no	no	no	yes	no	no	no	no	1RS:1BL	no	no	no	no	no	no	no	5+10
VA07W-643	no	no	no	no	yes	no	no	no	no	1RS:1AL	no	no	no	no	no	no	no	5+10
VA06W-580	yes	no	no	no	no	no	yes	no	no		yes	no	no	no	no	no	no	2+12
VA07W-591	no	no	no	no	no	no	yes	no	no	1RS:1BL	yes	no	no	no	no	no	no	5+10
VA06W-578	yes	no	no	no	no	no	yes	no	no		yes	no	no	no	no	no	no	2+12
VA04W-90	yes	no	?	no	no	no	no	no	no		no	no	no	no	no	no	no	het
OH05-101-1	yes	no	no	no	no	no	no	no	no		no	no	no	no	no	no	no	5+10
OH05-72-6	yes	no	no	no	no	no	yes	no	no	1RS:1BL	yes	no	no	no	no	het	no	2+12
OH05-249-32	yes	no	yes	no	no	no	no	no	no		no	no	no	no	no	no	no	2+12
OH05-152-68	no	no	yes	no	no	no	no	no	no		no	no	no	no	no	no	no	2+12
OH05-164-76	yes	het	yes	no	no	no	no	no	no	1RS:1BL	no	no	no	no	no	het	no	5+10
OH05-200-74	no	no	no	no	no	no	no	no	no	1RS:1AL	no	no	no	no	no	no	no	2+12