2009 ANNUAL PROGRESS REPORT

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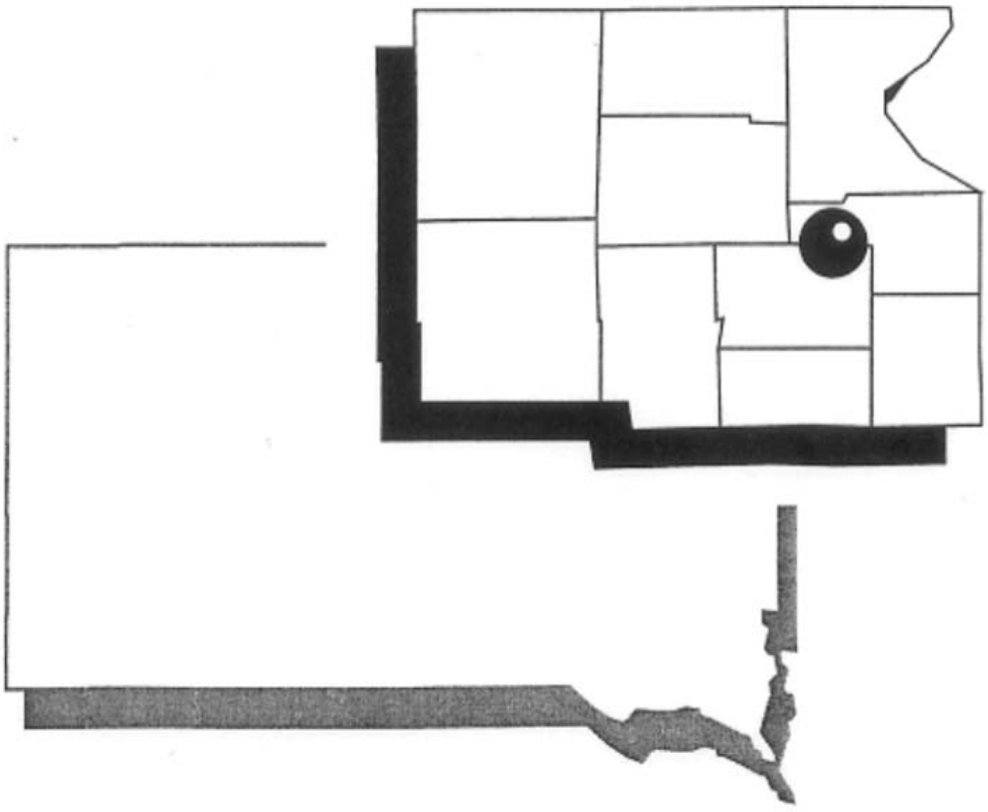
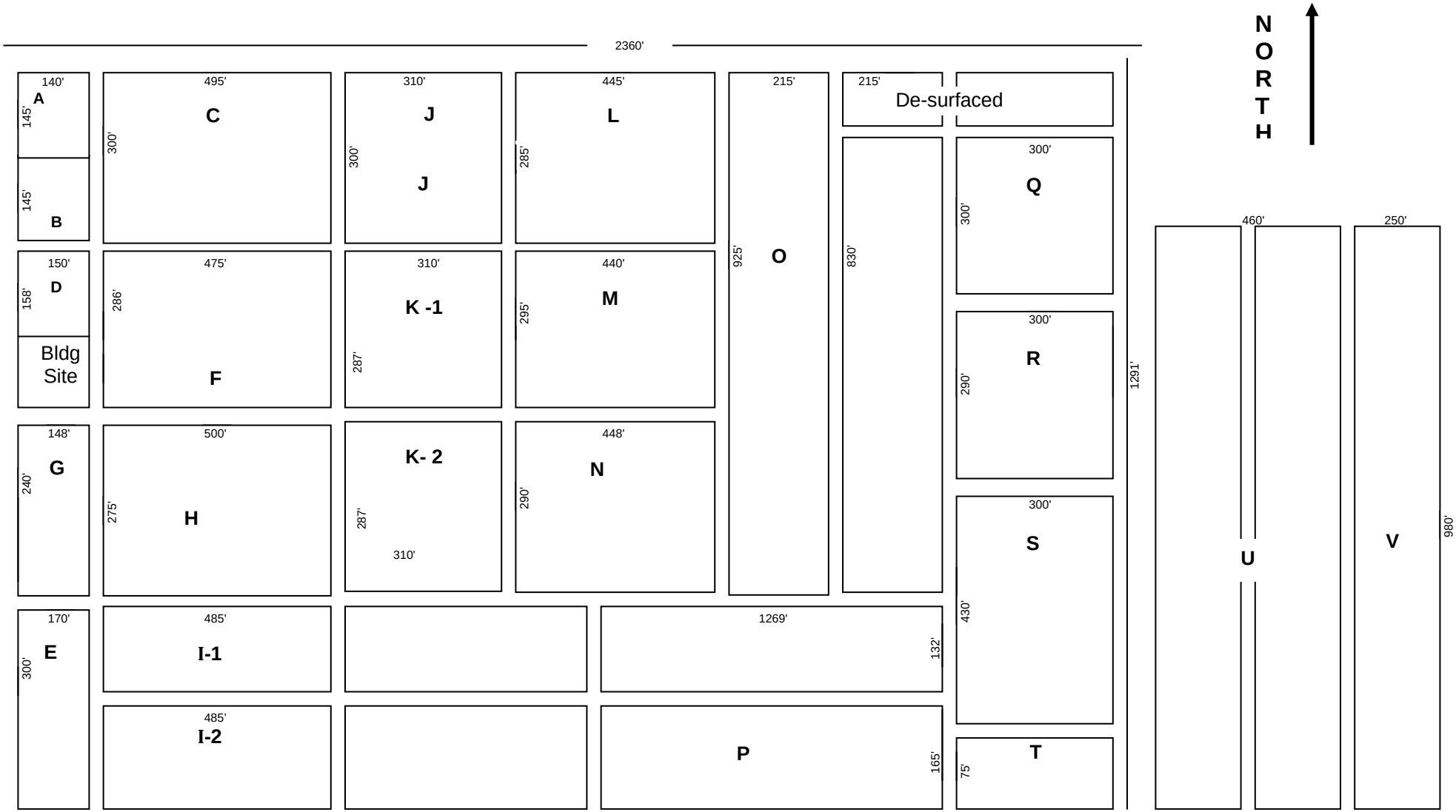


Northeast Research Station

Watertown, South Dakota

Plant Science Department • South Dakota State University • Brookings SD 57007

Northeast Research Station (Watertown)
2009 Land Use Plans



Plot Acreage:

A	0.49	H	3.15	M	3.00	T	0.51
B	0.49	I1	1.2	N	2.98	U	9.72
C	3.40	I2	1.2	O	9.57	V	5.5
D	0.54	J	2.13	P	8.65		
E	1.20	K1	2.00	Q	2.06		
F	3.12	K2	2.00	R	2.00		
G	0.86	L	3.00	S	3.00		

Roadways: 25 feet wide
Acreage in farm: 86
Experimental Acreage: 74

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2009
NORTHEAST RESEARCH STATION ADVISORY BOARD
Paul Leiseth, Chairman Kim McGraw, Secretary

Inel Rychman		Brown	
Gary Erickson*	1019 1st Ave SE Box 13 Aberdeen, SD 57401	Brown	626-7120
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Lon Hall (Farm Supervisor)**	Plant Sci Dept. SDSU, Box 2207A	Brookings	688-4758
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Chris Onstad**	Dist Ext Supervisor, SDSU,AgHall 134	Brookings	688-5132

* County Extension Educator
**SDSU Representatives

SDSU – AES-
NORTHEAST RESEARCH STATION
2009 REPORT

Lon Hall Supervisor
Allen Heuer Farm Manager
Lucinda Olson Secretary

MISSION:

The Northeast Research Station is a regional representative site for conducting cultural research, breeding, and testing crops whose traits are adapted for this areas environment.

INFORMATION DISSEMINATION:

- Summer Agronomy Field Tour
- Industry Field ToursFall Agronomy Field Tour
- Annual Northeast Research Station Research Report (Plant Science Website)

HISTORY:

This year marked the 54th Anniversary of the Northeast Station. The Station has grown considerably from the original 30 acre mobile concept to the current 86 acres. The station has also benefited from a number of improvements over the years. Among the most notable was the construction of an office/storage building in 1991. This was a joint effort by the SD Crop Improvement Association and the Agricultural Experiment Station. A 20 year lease will be up for renewal in 2011.

LOCATION:

The Northeast Research Station is located 15 miles north of Watertown at the intersection of old highway 81 and highway 20. This site was chosen to represent the northeast region of South Dakota. This regions size is approximately 12 counties located within a 70-mile radius with the outside of the circle intersecting research stations located near SDSU. This specific site was chosen for its uniform soil type. The research blocks are made up of 97.5 percent Kranzburg-Brookings and/or 2.5 percent Mckranz-Badger silty clay loam soil types with a 0-2 percent slope. The sites latitude and/or longitude affects several variables including crop and variety selection, photoperiods, growing degree units, precipitation, diseases, and insects. In a continental climate, regional environments are similar from year to year; however, environments always deviate from the mean on a yearly basis, occasionally to the extreme. It is these environmental variations that are useful when assessing genetic by environmental interactions for that region. For example, breeding programs test at several locations in order to evaluate yield stability. The locations may not be optimum environments for a given maturity; however, within maturity, comparisons may be made on a relative basis to assess trait stability.

SCIENTIFIC RESEARCH ADVISORY COMMITTEE:

Research Represented:	**Representatives:**
• Soils Research	Dr. Ron Gelderman
• Forage Research	Dr. Vance Owens
• Extension Educator	Chuck Langner
• Plant Breeding	Lon Hall

FIELD RESEARCH RESOURCES:

- There are 74 tillable acres comprised of 22 research blocks.
- The building is 50' x 100' with 7500 ft^2 of storage and 2500 ft^2 of utility workspace.
- Major Equipment:
  - Tractor- Heston- Model 666
  - Tractor- NH- Model- 7635
  - Loader- 7310- Fits 7635 tractor
  - Tractor- NH TC35 Delux-
  - Tractor- NH T6050 MFWD
  - Planter- JD 7100 4 row 30"
  - Combine- JD 4420- 4 row corn head mod. 443 13ft. bean platform mod. 213
  - 2 Demco 35ft. sprayers
  - Field cult. With harrow 13ft. Wilrich
  - Gravity boxes 250 bu. each
  - Kawaski 610 Mule
  - Cub Cadet lawn mower Z-force 60"
  - Farm King 7ft. finishing mower
  - Ford 15ft. batwing mower

Table 1. Growing Season Precipitation* (inches) 1956 - 2009

Year	April	May	June	July	Aug.	Sept.	Oct.	Total	Frost-Free Days
1956	1.80	2.88	6.56	4.02	6.25	0.70	2.44	24.65	125
1957	4.26	5.98	2.85	0.74	5.26	2.12	3.12	24.33	119
1958	1.41	1.49	2.65	2.68	0.57	0.81	0.18	9.79	116
1959	0.58	3.47	1.91	1.66	4.69	1.10	1.95	15.36	110
1960	1.53	3.84	4.05	0.79	1.03	1.30	1.50	14.04	123
1961	2.16	5.75	4.01	4.62	0.62	1.84	1.00	20.00	138
1962	1.39	5.48	3.98	10.36	1.89	1.39	1.11	25.60	143
1963	1.41	3.54	3.22	5.74	2.51	4.33	0.68	21.43	158
1964	2.39	1.07	3.62	2.01	4.22	0.93	0.04	14.28	92
1965	2.89	6.08	3.66	2.34	2.63	4.33	1.23	23.16	104
1966	1.49	0.77	1.88	2.19	4.59	1.53	1.52	13.97	138
1967	0.92	0.69	4.58	1.05	1.13	1.06	0.35	9.78	129
1968	3.04	2.15	3.18	2.39	1.53	2.56	2.00	16.85	132
1969	1.52	3.44	1.96	4.52	2.48	1.86	2.18	17.96	109
1970	2.00	1.98	1.07	2.29	1.00	1.66	2.01	13.01	148
1971	1.33	1.78	7.61	1.02	2.93	1.46	5.56	21.69	168
1972	1.90	7.73	2.92	6.35	2.57	0.11	1.37	22.95	172
1973	1.14	2.87	1.12	2.05	1.27	3.81	1.39	13.65	183
1974	1.22	3.37	1.45	2.09	3.70	0.22	0.91	12.96	141
1975	4.15	2.18	4.76	1.25	2.89	2.28	1.64	19.15	139
1976	1.10	1.26	1.49	0.51	0.79	1.62	0.57	7.34	144
1977	2.64	2.24	5.78	2.47	2.70	3.67	3.06	22.56	180
1978	3.38	5.15	2.26	2.08	2.43	2.32	0.53	18.15	178
1979	3.14	2.17	5.78	3.10	5.21	0.53	3.50	23.43	162
1980	0.43	3.09	4.97	1.96	3.82	0.72	0.68	15.67	150
1981	0.48	0.99	2.73	2.23	1.20	0.52	1.88	10.03	136
1982	0.35	5.50	1.37	4.05	0.64	2.73	3.11	17.75	175
1983	0.70	1.64	3.43	5.45	3.00	2.86	1.30	18.38	140
1984	2.88	1.66	7.45	1.85	3.09	1.14	4.69	22.76	147
1985	1.93	3.90	2.07	5.21	3.65	3.77	1.59	22.12	167
1986	5.55	4.64	3.62	4.14	3.11	4.19	0.13	25.38	159
1987	0.55	2.03	1.20	4.16	5.64	2.44	0.45	16.47	162
1988	0.59	2.76	0.69	0.86	4.03	2.98	0.22	12.13	144
1989	2.95	1.15	1.74	2.41	4.58	1.56	0.56	14.95	147
1990	1.04	2.26	5.13	3.73	2.58	2.16	1.78	18.68	136
1991	4.01	4.41	10.45	2.69	4.37	1.45	0.63	28.01	146
1992	0.91	1.45	7.95	3.08	0.75	3.17	0.02	17.33	154
1993	1.69	2.53	6.58	6.70	1.40	2.05	0.17	21.12	149
1994	2.48	2.12	6.11	4.65	3.67	2.47	2.11	23.61	162
1995	2.92	3.66	2.89	8.05	6.09	2.45	2.43	28.49	152
1996	0.18	4.20	1.36	3.43	2.92	2.34	2.57	17.00	154
1997	2.20	0.97	0.76	4.77	4.23	1.39	2.25	16.57	152
1998	0.69	4.18	2.96	1.93	3.94	0.02	7.58	21.30	167
1999	1.45	2.57	4.96	1.56	0.49	2.29	0.25	13.57	165
2000	1.20	2.35	3.29	4.29	0.88	1.00	2.45	15.46	157
2001	6.96	2.75	3.94	2.85	0.18	2.35	0.67	19.70	165
2002	1.75	1.67	2.57	2.48	4.44	0.75	1.45	15.11	135
2003	1.78	3.26	1.18	1.94	1.40	1.75	0.67	11.98	160
2004	1.83	5.70	3.34	5.88	1.20	4.77	5.64	28.36	153
2005	1.10	3.43	4.39	1.18	1.67	2.41	1.37	15.55	157
2006	2.53	1.99	0.95	0.92	1.93	5.36	0.24	13.92	168
2007	5.6	3.7	2.07	.85	1.55	3.97	1.91	19.65	192
2008	0.57	2.67	4.48	4.04	1.74	2.25	3.73	19.48	155
2009	1.09	1.73	2.7	3.97	3.6	1.62	6.53	21.24	137
Avg:	1.98	3.00	3.51	3.14	2.72	2.08	1.83	18.29	148

*1960-1962, 1973-1976, 1978 and 1979 data obtained from Watertown FAA station.

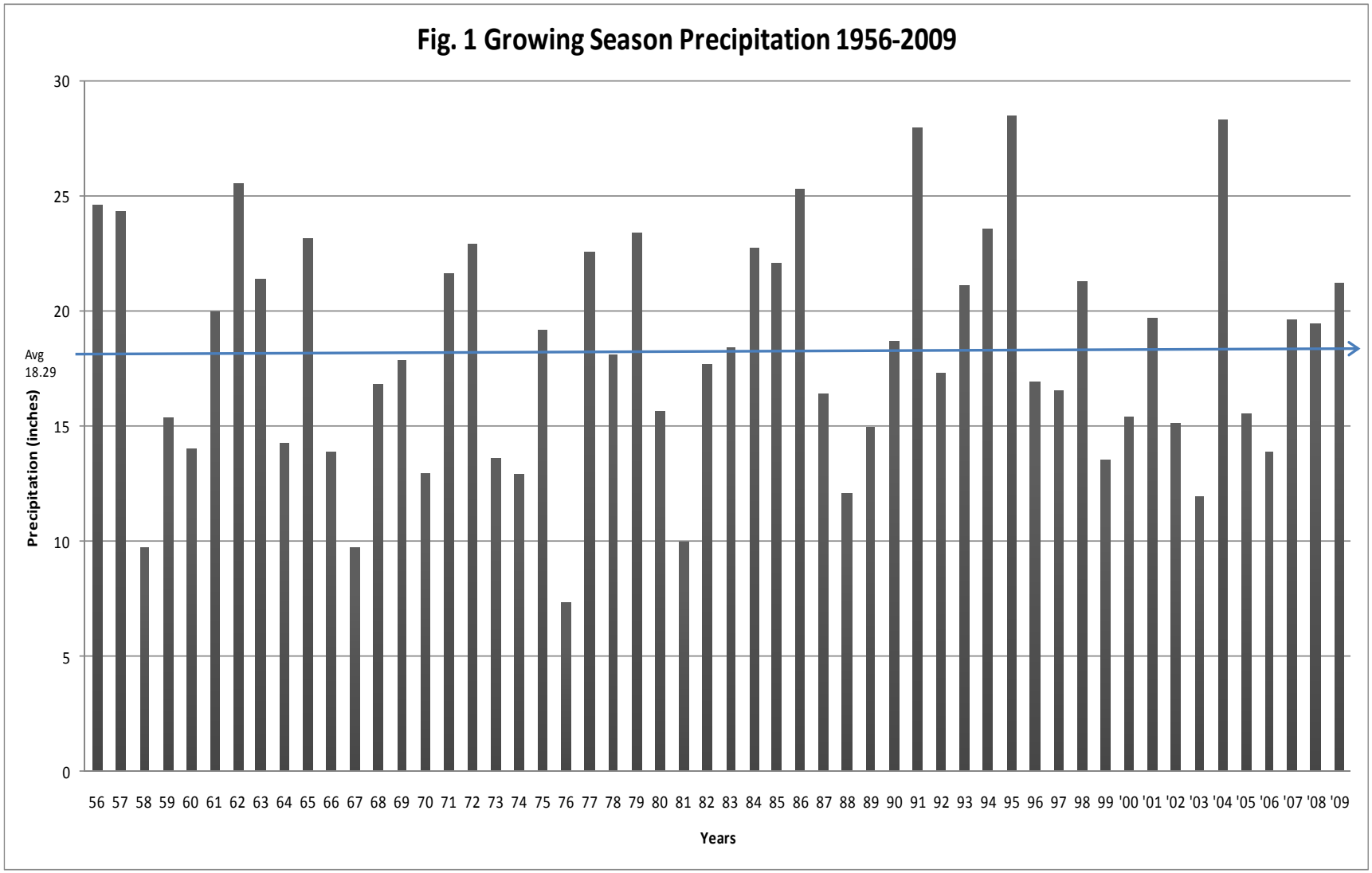
Fig. 1 Growing Season Precipitation 1956-2009
30
25
20
15
10
5
0
Avg
18.29
Precipitation (inches)
56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 '00 '01 '02 '03 '04 '05 '06 '07 '08 '09
Years

2009 SMALL GRAIN VARIETY PERFORMANCE TRIALS

R. G. Hall, K. K. Kirby, J. Hall, and L. Hall

This is a report of the 2009 NE Research Farm performance trials for spring wheat, oat, barley, field pea performance trials conducted by the South Dakota State University Crop Performance Testing (CPT) program. Plots were seeded by the SDSU Oat Breeding Project and harvested by the CPT program.

Plots measuring 5 X 20 feet for each entry were seeded April 21 using a cone-drill with 7-inch row spacing. Seeding rates per acre were: Spring wheat 1.8 million, oats and barley 1.2 million, and field pea at 300,000 in a loam previously cropped to soybean. ***Research funding & support sources:*** The SDAES and testing fees obtained from the SD Crop Performance Testing Program.

Measurements of Performance

Yield (bu./a) and bushel weight (lbs.) values are an average of four replicates and are adjusted to 13.5% grain moisture (dry matter basis) and bushel weights of 60 (wheat), 32 (oats), or 48 lbs. (barley). Grain protein values were obtained using 4 replicates and a FOSS TECATOR Model Infratec 1229 grain analyzer. Yield values are reported for year 2009 and for 3-years (2007-09), while bushel weight, grain protein, and lodging score values are reported for 2009.

Table A. Explanation of performance table footnotes.

No.	Explanation of footnotes
[1]	Heading (small grains) – The number of days an entry takes to grow from the emergence stage to the heading stage (complete head emergence). This value is determined by comparing the entry with a known maturity check variety listed in footnote 1 at the bottom of each performance table. The heading value, if known, is listed after each variety name. In oat, Hls indicates the variety is a hulless type variety.
[2]	State top-yield frequency (spring grains) – the frequency (%) of all test sites that an entry was in the top performance-group for yield on a statewide basis. A value of 50% or higher is considered good.
[3]	Lodging score: 0= all plants erect, 3= 50% of plants lodged at 45°-angle, 5= all plants flat.
[4]	Least Significant Difference (LSD 0.05) (all crops) – the difference two values within a column must equal or exceed to be significantly different from one another at the 0.05 level of probability. If the difference is less than the LSD value the difference between the values is nonsignificant (NS).
[5]	TPG-value (all crops) – the minimum value within a column that yield, bushel weight, tall height, and high protein must equal or exceed; or the maximum value within a column that short height, lodging scores, and low protein must be equal to or less than to qualify for the TPG. TPG- values are indicated in **bold type**.
[6]	Coefficient of variation (C.V.) - the percent of experimental error associated with a test trial. Ideally, the for yield is less than 15%. Values less than 5% tend to be less common while values of 6 to 15% are more common. Occasionally, values exceed 15%; this means the trial contained too much experimental error to be a valid test; thus, there is no data reported for that trial.

Performance Results

HRS Wheat:

Yields (Tables 1a) – The entries **Traverse, Faller, and Howard at 100%; Select and Briggs at 83%; Steele-ND at 67%; and Brick at 50%** (tables 1.) were to top-yield frequency entries for the past 3-years (2007-09). These entries exhibited good yield stability or the ability to adapt to a wide range of growing conditions by being in the top-performance group at more than 50% of the locations tested for the past three years. The entries **Faller at 89%, Traverse at 78%, Albany at 67%, and SD 4023 at 56%** were the top-yield frequency entries for 2009.

Grain protein content (Table 1b) – The entries **Vantage at 15.8%; Chris at 15.3%; SD 4011, Kelby, and Alsen at 15.1%; and Glenn and SD4076 at 15.0% averaged 15% or higher in grain protein across all six locations.** Depending on location, entries had to differ by **0.3 to 0.9%** in grain protein to be significantly different from one another.

Bushel weight (Table 1b) - The top bushel weight entries included the entries **Brick at 59.1 lb, Glenn and Select at 59.0 lb, Barlow at 58.7 and Breaker at 58.6 lb.**. Depending on location, varieties had to differ from 1 to 1.5 lb. to be significantly different from one another

Lodging (Table1c) – The entries **Kelby, Kuntz, SD 4024, SD 4036, Samson, Brogan, Reeder, Breaker Vantage, and Mott** averaged the best in lodging score (1) across all locations compared to the other entries. Entries generally had to in lodging score by **1** to be significantly different from one another.

Height (Table 1c) - The entries **Chris at 38" and SD 3997 at 36" was the tallest** entries while **Kelby and Brennan at 29" were the shortest** entries across all six locations. Depending on location, entries generally had to differ by 2-3" to be significantly different in plant height.

Spring oat:

Yields (Tables 2a) – The entries **Souris, Hi Fi, and Beach at 100%; Stallion at 80%,** and **Colt and Morton at 60%** (tables 2b) were to top-yield frequency entries for the past 3-years (2007-09). The entries **SD 031128-245 at 78%, Souris, Hi Fi, Rockford, and Shelby427 at 56%**; were to top-yield frequency entries for 2009.

Grain protein content (Table 2b) – The entry **SD 051502,** a hulless experimental line, **at 16.9%** and **Hytest at 16.5%** were the entries with the highest grain protein averages across the six locations in table 2c. Depending on location, entries had to differ by **0.7% to 1.9%** in grain protein to be significantly different from one another.

Bushel weight (Table 2b) - The top bushel weight entries across the six location listed in table 2c were the hulless entries **Buff at 43.9, SD 051502 Hls at 43.7, and Streaker Hls at 43.4 lbs**. Among the hulled entries, **Hytest at 39.2 lbs** was the highest in bushel weight. The eastern and western bushel weight averages indicate entries had to differ by

1 lb. to be significantly different. Depending on location, entries had to differ by **1.1 to 1.9 lbs** to be significantly different from one another.

Lodging (Table 2c) – All the locations listed in table 2d had a lodging score average of 2 or higher. When average across all six locations the entries **SD 031128-245, Rockford, Shelby427, Souris, Buff, HiFi, Morton, and Beach** better or lowest lodging scores compared to the other entries.

Height (Table 2c) - The entries **Beach at 45" and Morton at 44"** were the tallest when averaged across the six locations in table 2d, whereas,Don at 33", and Don and Colt at 35" were the shortest entries.. Depending on location, entries had to differ **by 3-4"** in plant height to be significantly different from one another.

Spring Barley:

Yields (Tables 3a) - The entries **Pinnacle at 100%; Eslick, Rawson, Rasmusson, and Conlon at 75%**; and **Lacey at 50%** (table 3b.) were to top-yield frequency entries for the past 3-years (2007-09). The entries **Eslick at 88%**; **and Pinnacle and Rawson at 50%** were to top-yield frequency entries for 2009.

Grain protein content (Table 3b) – The top grain protein entries were **Conlon at 12.9%** and **Robust at 12.8%**. The entries **Pinnacle at 11.1% and Rawson at 12.0%** were the lowest in grain protein when average across all six locations. In addition, Pinnacle and Rawson were generally the lowest in grain protein at every location.

Bushel weight (Table 3b) – The five-location average indicated the top bushel weight entries were **Conlon at 48.0 and Eslick at 47.5 lbs**. The varieties Drummond and Stellar-ND tended to be the lowest in bushel weight at most locations.

Lodging (Table 3c) – the entries **Pinnacle, Stellar-ND, Rawson, and Lacey** had the lowest five-location lodging score averages.

Height (Table 3c) – The five-location average indicated **Drummond and Robust at 35"** were the tallest entries; while **Eslick at 28"** was the shortest entry. Depending on location, entries had to differ by 2-3" in plant height to be significantly different from one another.

Field Pea:

Yield (Table 4) – When averaged over the past two years (2008-2009), the top yield group at both South Shore and Selby included the same entries **Spider, Cooper Arcadia, CDC Meadow, CDC Golden, and CDC Striker**. The top entries by location for yield in 2009 were: South Shore – **Cooper, Arcadia, CDC Meadow, CDC Golden, Thunderbird, and Commander**; Wall – **all entries were in the top yield group** because no significant differences in yield could be detected; and at Selby – **Spider, Cooper, Arcadia, CDC Meadow, CDC Golden, CDC Striker, Thunderbird, Commander, and Summit**.

Table 1a. Spring wheat yield results at six South Dakota locations, 2007-2009.
Table sorted by 3-yr then by 2009 state yield average.

Variety, Heading [1]	Location Yield Avg.--Bu/a at 13% moist.												State Yield Avg. bu/a		State [2] Top-Yield Freq. (%)	
	Brookings		South Shore		Miller		Spink Co.		Selby		Brown Co.					
	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr
Faller, 6	**75**	**55**	**82**	**75**	43	.	**76**	**68**	**60**	**52**	**81**	**71**	61	58	89	100
Traverse, 2	66	**52**	**84**	**72**	**49**	.	66	**66**	**57**	**50**	**82**	**70**	60	57	78	100
Howard, 6	64	**50**	78	**76**	42	.	62	**63**	**58**	**47**	72	**69**	55	56	11	100
RB07, 4	58	47	63	**70**	42	.	67	**61**	**60**	**53**	73	**70**	55	56	33	67
Steele-ND, 5	59	**49**	77	**74**	43	.	59	**60**	55	**49**	72	**68**	54	55	11	100
Select, 0	60	**49**	70	**73**	**44**	.	69	**63**	51	43	72	**67**	56	54	44	83
Briggs-Ck, 2	58	**49**	73	**71**	41	.	67	**60**	54	45	69	**65**	54	53	11	83
Granger, 2	62	**50**	69	68	**46**	.	53	55	50	45	73	64	54	52	33	33
Brick, 0	56	48	72	**69**	**44**	.	66	**59**	51	42	64	61	53	52	33	50
Tom, 4	56	46	72	67	42	.	68	**59**	55	44	71	**68**	53	52	0	33
Glenn, 5	60	43	70	67	42	.	65	58	49	42	71	60	52	50	11	17
Kuntz, 4	53	42	66	64	38	.	66	57	**56**	42	74	**68**	50	50	11	17
Kelby, 3	52	44	63	65	40	.	66	56	49	40	63	61	48	49	0	17
Reeder, 5	52	42	67	61	40	.	73	53	51	41	72	64	51	48	0	17
Alsen, 6	57	43	62	61	36	.	63	55	47	39	68	61	49	48	0	17
Chris, 5	50	37	53	46	27	.	45	39	45	33	56	50	41	38	0	0
Albany, 6	**71**	.	77	.	40	.	**83**	.	**61**	.	**83**	.	60	.	67	
SD 4023, -	63	.	**81**	.	42	.	**79**	.	**59**	.	**80**	.	59	.	56	
Barlow, 3	65	.	78	.	**45**	.	67	.	53	.	74	.	56	.	11	
SD 4024, -	60	.	69	.	43	.	**76**	.	55	.	77	.	56	.	33	
SD 4035, -	60	.	77	.	**44**	.	73	.	52	.	76	.	55	.	22	
SD 4073, -	58	.	73	.	37	.	72	.	55	.	78	.	55	.	11	
Breaker, 5	60	.	75	.	41	.	68	.	53	.	74	.	55	.	22	
Sabin, 3	61	.	71	.	**45**	.	63	.	**61**	.	71	.	55	.	44	
Brogan, 5	56	.	64	.	41	.	74	.	53	.	76	.	53	.	0	
Samson, 4	58	.	78	.	38	.	73	.	55	.	70	.	53	.	11	
SD 4011, -	60	.	68	.	43	.	65	.	50	.	70	.	53	.	11	
SD 4036, -	60	.	74	.	**44**	.	73	.	54	.	72	.	53	.	11	
SD 4046, -	54	.	71	.	40	.	63	.	53	.	72	.	53	.	22	
SD 3997, -	62	.	71	.	38	.	67	.	45	.	74	.	51	.	0	
SD 4076, -	58	.	71	.	42	.	66	.	45	.	71	.	51	.	0	
Brennan, 4	56	.	70	.	40	.	65	.	54	.	66	.	51	.	0	
Mott, 6	50	.	70	.	27	.	64	.	51	.	68	.	49	.	11	
Vantage, 9	54	.	61	.	28	.	58	.	**56**	.	65	.	47	.	11	
Test avg. :	59	47	72	67	41	.	67	58	53	44	72	65	54	52		
High avg. :	75	55	86	76	49	.	83	68	61	53	83	71	61	58		
Low avg. :	50	37	53	46	27	.	45	39	45	33	56	50	41	38		
[4] LSD (0.05):	6	6	7	7	5		7	9	5	6	4	6				
[5] TPG-value :	69	49	79	69	44		76	59	56	47	79	65				
[6] C.V. :	7	8	7	7	8		7	7	7	9	4	6				

[1] Heading- days earlier or later (- or +) than Briggs, the check variety (Ck) for maturity.
Column values in **bold type** at each location are top-performance group values.
Note that additional table footnotes are explained in Table C.

Table 1b. HRS wheat grain protein (Prt) and bushel weight (BW) averages at six South Dakota locations.
Table sorted high to low by all location grain protein average.

Variety, Heading [1]	Location Protein (Prt) & Bushel weight (BW) averages												All Locations Average	
	Brookings		South Shore		Miller		Spink Co.		Selby		Brown Co.			
	Prt %	BW lb	Prt %	BW lb	Prt %	BW lb	Prt %	BW lb	Prt %	BW lb	Prt %	BW lb	Prt %	BW lb
Vantage, 9	**14.9**	56.4	**15.9**	**58.7**	**16.6**	53.4	**16.2**	**59.8**	**15.7**	57.5	**15.9**	58.7	15.8	57.4
Chris, 5	**14.6**	54.9	15.1	56.7	15.9	51.6	15.4	58.3	**15.5**	58.1	15.4	56.3	15.3	56.0
SD 4011, -	**14.6**	55.8	14.6	56.8	15.5	54.2	15.4	58.7	**15.5**	57.7	15.3	57.9	15.1	56.9
Kelby, 3	**14.7**	55.9	**15.4**	56.5	15.3	54.9	15.0	58.6	**15.3**	59.2	15.1	58.2	15.1	57.2
Alsen, 6	**14.5**	56.1	**15.5**	57.1	15.8	55.4	15.4	58.9	14.7	58.5	14.9	59.2	15.1	57.5
Glenn, 5	14.1	**57.5**	15.2	**60.1**	15.3	**56.3**	14.8	**60.3**	**15.7**	**60.5**	15.3	59.6	15.0	59.0
SD 4076, -	**14.5**	56.1	14.8	**58.7**	15.4	**56.7**	14.8	59.0	**15.5**	58.9	15.0	59.6	15.0	58.1
RB07, 4	14.2	54.6	15.1	56.6	15.7	52.6	15.0	58.1	**14.8**	**60.0**	15.0	58.7	14.9	56.7
Brick, 0	**14.8**	**58.1**	**15.5**	**59.5**	14.8	57.7	14.8	**59.5**	14.7	**60.2**	15.1	59.7	14.9	59.1
Reeder, 5	**14.4**	54.2	14.7	58.3	15.3	53.0	15.0	**59.2**	**15.0**	58.0	15.1	59.4	14.9	57.0
Brennan, 4	**14.5**	55.6	14.9	57.4	15.4	53.7	14.8	58.1	**14.8**	**59.8**	14.9	58.6	14.9	57.2
Sabin, 3	**14.5**	56.3	14.6	57.8	15.7	52.5	15.1	58.8	14.0	**59.5**	15.1	59.6	14.8	57.4
SD 3997, -	14.1	56.4	15.1	**58.5**	15.2	53.4	14.5	58.9	**14.9**	57.9	15.1	59.1	14.8	57.4
Briggs-Ck, 2	14.3	**58.2**	14.5	**58.6**	15.2	54.7	14.9	59.5	14.2	59.1	15.3	58.3	14.7	58.1
Granger, 2	14.3	55.7	14.6	57.6	14.9	54.2	15.0	57.9	14.5	58.2	14.8	58.4	14.7	57.0
Barlow, 3	14.1	**57.0**	15.1	**59.9**	15.0	**56.6**	14.4	**60.1**	14.4	58.5	14.9	**60.3**	14.6	58.7
Brogan, 5	14.1	55.1	14.8	57.0	15.4	54.7	14.4	**60.2**	14.1	58.7	14.8	**60.2**	14.6	57.6
Select, 0	14.0	**58.0**	14.6	56.9	15.1	**57.5**	14.8	**60.2**	14.2	**60.7**	15.1	60.6	14.6	59.0
Steele-ND, 5	14.3	55.1	14.2	**59.0**	14.7	53.9	14.7	**60.1**	14.7	**60.0**	15.0	59.2	14.6	57.9
Breaker, 5	13.9	56.0	14.7	**59.7**	15.0	**56.5**	14.4	**60.1**	**14.9**	**59.4**	14.5	59.6	14.6	58.6
Howard, 6	13.9	**57.0**	14.5	**59.3**	14.8	53.0	14.6	**59.9**	**14.9**	**59.7**	14.7	59.5	14.5	58.1
SD 4036, -	14.0	53.7	14.3	56.1	15.3	53.7	14.2	57.5	**14.9**	56.6	14.6	59.1	14.5	56.1
Tom, 4	14.1	56.3	14.6	**59.0**	14.9	54.8	14.2	58.4	14.7	59.2	14.7	58.5	14.5	57.7
Samson, 4	14.2	54.5	14.2	57.8	15.4	53.0	14.4	59.0	14.1	57.8	14.5	58.2	14.5	56.7
Kuntz, 4	14.2	55.9	14.5	58.1	15.1	52.5	14.6	57.9	14.2	58.4	14.2	58.6	14.4	56.9
Mott, 6	13.7	53.6	14.2	56.8	14.8	50.4	14.3	58.3	14.5	58.7	15.0	58.2	14.4	56.0
SD 4035, -	14.3	54.1	14.4	**58.5**	15.0	54.9	14.1	57.9	14.0	58.5	14.7	59.4	14.4	57.2
Traverse, 2	13.9	54.0	14.2	57.7	14.7	54.0	14.8	56.7	14.2	57.0	14.6	58.8	14.4	56.4
SD 4046, -	13.8	55.5	14.1	**59.3**	15.1	54.9	14.4	**59.4**	13.6	58.4	14.4	**60.8**	14.2	58.0
SD 4023, -	14.0	56.4	14.1	**59.8**	15.1	53.8	14.2	**60.2**	14.0	**59.9**	14.1	59.6	14.2	58.3
Faller, 6	13.3	56.8	13.5	57.7	15.1	53.0	14.5	58.6	14.3	59.3	14.6	**59.8**	14.2	57.5
SD 4073, -	13.9	52.4	13.8	57.2	15.0	52.9	14.2	58.3	13.9	58.1	14.0	58.4	14.1	56.2
SD 4024, -	13.8	55.2	14.0	58.0	14.9	54.4	14.1	**59.8**	14.0	59.2	14.0	59.7	14.1	57.7
Albany, 6	12.8	56.6	13.6	57.6	14.8	54.8	13.6	**60.1**	13.0	59.2	13.9	**60.0**	13.6	58.0
Test avg. :	14.1	55.7	14.6	58.1	15.2	54.1	14.7	59.0	14.5	58.8	14.8	59.1		
High avg. :	14.9	58.2	15.9	60.1	16.6	57.7	16.2	60.3	15.7	60.7	15.9	60.8		
Low avg. :	12.8	52.4	13.5	56.1	14.4	50.4	13.6	56.7	13.0	56.6	13.9	56.3		
[4] Lsd(.05) :	0.5	1.5	0.6	1.7	0.4	1.4	0.4	1.2	0.9	1.3	0.3	1.0		
[5] TPG-value :	14.4	56.7	15.3	58.4	16.2	56.3	15.8	59.1	14.8	59.4	15.6	59.8		
[6] C.V. :	2	2	3	2	2	2	2	1	5	2	2	1		

[1] Heading- days earlier or later (- or +) than Briggs, the check variety (Ck) for maturity.
Column values in **bold type** at each location are top-performance group values.
Note that additional table footnotes are explained in Table A.

Table 1c. HRS wheat lodging (Ldg) score and plant height (Ht) averages at six South Dakota locations.
Table sorted low (best) to high by all locations average lodging scores.

Variety, Heading [1]	Location Avg.- Lodging score (Ldg) & Plant height (Ht)												All Locations Average	
	Brookings		South Shore		Miller		Spink Co.		Selby		Brown Co.			
	Ldg score	Ht inch	Ldg score	Ht inch	Ldg score	Ht inch	Ldg score	Ht inch	Ldg score	Ht inch	Ldg score	Ht inch	Ldg score	Ht inch
Kelby, 3	**1 [3]**	28	2	28	2	26	.	32	**1**	27	2	31	1	29
Kuntz, 4	**1**	30	2	29	2	28	.	35	**1**	27	2	31	1	30
SD 4024, -	**1**	28	2	30	2	28	.	35	**1**	30	**1**	32	1	30
SD 4036, -	**1**	29	2	30	2	27	.	35	**1**	25	**1**	32	1	30
Samson, 4	**1**	29	**1**	30	2	27	.	36	**1**	26	**1**	30	1	30
Brogan, 5	**1**	30	**1**	32	2	29	.	37	**1**	30	2	31	1	31
Reeder, 5	**1**	30	2	31	2	31	.	37	**1**	31	**1**	33	1	32
Breaker, 5	**1**	30	2	33	2	29	.	37	**1**	30	2	33	1	32
Vantage, 9	**1**	31	**1**	33	**1**	29	.	37	**1**	32	**1**	32	1	32
Mott, 6	**1**	32	**1**	36	**1**	33	.	38	**1**	**37**	**1**	**36**	1	35
Brennan, 4	**1**	29	**2**	29	2	26	.	35	**1**	27	2	30	2	29
SD 4023, -	3	29	3	31	3	29	.	36	**1**	29	3	31	2	31
Albany, 6	2	32	2	30	2	28	.	36	**1**	29	3	32	2	31
SD 4076, -	3	30	2	33	3	29	.	37	**1**	29	2	31	2	31
RB07, 4	2	30	3	31	2	30	.	35	**1**	32	2	31	2	31
Sabin, 3	3	31	3	31	2	31	.	36	**1**	30	3	32	2	32
SD 4011, -	3	31	2	33	3	30	.	35	**1**	31	3	33	2	32
Alsen, 6	**1**	32	2	33	3	28	.	36	**1**	30	2	34	2	32
SD 4035, -	2	30	2	32	2	29	.	36	**1**	32	**1**	32	2	32
Select, 0	3	33	3	34	3	31	.	39	**1**	32	2	33	2	33
Tom, 4	3	32	3	32	2	30	.	37	**1**	32	3	34	2	33
Faller, 6	2	32	2	34	2	32	.	37	**1**	31	2	33	2	33
SD 4073, -	2	32	2	33	2	30	.	38	**1**	32	2	34	2	33
Steele-ND, 5	3	32	3	32	3	31	.	37	**1**	34	2	35	3	33
Brick, 0	3	34	3	35	3	31	.	38	2	32	2	35	2	34
Howard, 6	2	32	3	36	3	29	.	37	**1**	34	3	34	2	34
Barlow, 3	2	33	2	33	2	30	.	38	**1**	33	2	35	2	34
Glenn, 5	2	33	2	34	3	31	.	38	**1**	34	**1**	34	2	34
Granger, 2	2	34	3	36	3	33	.	39	2	35	3	35	2	35
Traverse, 2	2	34	3	34	3	32	.	39	2	34	2	**36**	2	35
SD 3997, -	**1**	**35**	2	**37**	2	33	.	37	**1**	36	2	**38**	2	36
SD 4046, -	3	33	3	35	3	31	.	38	**1**	34	4	35	3	34
Briggs-Ck, 2	3	33	3	34	3	32	.	37	2	34	3	32	3	34
Chris, 5	3	**37**	4	**39**	3	**36**	.	**43**	2	**40**	4	**37**	3	38
Test avg. :	2	31	2	33	2	30	.	37	1	32	2	33		
High avg. :	3	37	4	39	3	36	.	43	2	40	4	38		
Low avg. :	1	28	1	28	1	26	.	32	1	25	1	30		
[4] Lsd(.05) :	1	2	1	2	1	2		3	1	3	1	2		
[5] TPG-value :	1	35	1	37	1	34		40	1	37	1	36		
[6] C.V. :	25	6	22	5	22	5		6	20	6	27	5		

[1] Heading- days earlier or later (- or +) than Briggs, the check variety (Ck) for maturity.
Column values in **bold type** at each location are top-performance group values.
Note that additional table footnotes are explained in Table A.

Table 2a. Spring oat yield results at six South Dakota locations, 2007-2009.
Table sorted by 3-yr then by 2009 state yield average.

Variety, Heading [1]	Location Yield Avg. -- Bu/a at 13% moisture												State Yield Avg. bu/a		State [2] Top-Yield Freq. (%)	
	Brookings		So. Shore		Beresford		Miller		Selby		Brown Co.					
	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr
Souris, 7	167	**141**	**207**	**168**	105	**125**	**148**	.	**146**	.	**165**	**145**	129	131	56	100
HiFi, 8	**171**	**138**	192	**161**	**124**	**124**	**149**	.	**141**	.	**157**	**143**	129	128	56	100
Beach, 7	157	**139**	174	**155**	**126**	**127**	130	.	132	.	130	**130**	121	125	44	100
Stallion, 9	138	**132**	136	141	97	**122**	**138**	.	133	.	141	**135**	113	121	44	80
Morton, 8	112	114	155	**148**	119	**122**	136	.	130	.	128	123	110	116	11	60
Colt, 0	109	**117**	140	135	**124**	**129**	130	.	126	.	127	124	107	116	11	60
Don, 1	119	114	127	127	105	**117**	125	.	126	.	125	124	104	110	0	40
Reeves, 2	108	112	117	125	117	**122**	130	.	**141**	.	124	116	104	108	11	40
Jerry, 5	102	109	134	131	107	**115**	129	.	110	.	123	114	101	108	11	40
Buff Hls, 3	112	90	130	116	98	95	102	.	106	.	110	99	94	93	0	20
Streaker Hls, 3	114	97	110	113	54	78	103	.	94	.	113	105	90	92	0	20
Hytest, 4	103	96	111	107	94	85	94	.	98	.	112	101	87	90	0	20
Stark Hls, 7	113	78	137	101	92	79	105	.	115	.	132	97	100	82	0	0
SD 031128-245, -	174	.	177	.	**139**	.	**143**	.	**152**	.	**151**	.	130	.	78	.
Rockford, 8	**184**	.	195	.	94	.	**143**	.	134	.	**157**	.	129	.	56	.
Shelby427, 2	170	.	179	.	**139**	.	136	.	**141**	.	148	.	128	.	56	.
SD 041445-93, -	138	.	146	.	**133**	.	134	.	131	.	**150**	.	113	.	22	.
SD 1445-119, -	124	.	141	.	**141**	.	142	.	130	.	144	.	112	.	22	.
SD 060966, -	98	.	133	.	**126**	.	136	.	137	.	146	.	112	.	33	.
SD 051502 Hls, -	98	.	123	.	99	.	95	.	102	.	109	.	89	.	0	.
Test avg. :	131	114	148	133	112	111	127	.	126	.	135	120	110	109		
High avg. :	184	141	207	168	141	129	149	.	152	.	165	145	130	131		
Low avg. :	98	78	110	101	54	78	94	.	94	.	109	97	87	82		
[4] LSD (0.05):	13	24	11	25	19	21	11		12		15	19				
[5] TPG-value :	171	117	196	143	122	108	138		140		150	126				
[6] C.V. :	7	7	5	7	12	9	6		7		8	8				

[1] Heading- days earlier or later (- or +) than Don, the check variety (Ck) for maturity. Hls = Hulless variety.
Column values in **bold type** at each location are top-performance group values.
Note that additional table footnotes are explained in Table A.

Table 2b. Spring oat grain protein (Prt) and bushel weight (BW) averages at six South Dakota locations. Sorted high to low by all location grain protein average.

Variety, Heading [1]	Location Protein (Prt) & Bushel weight (BW)												All Locations Average	
	Brookings		South Shore		Beresford		Miller		Selby		Brown Co.			
	Prt %	BW lb	Prt %	BW lb	Prt %	BW lb	Prt %	BW lb	Prt %	BW lb	Prt %	BW lb	Prt %	BW lb
SD 051502 Hls, -	**13.2**	39.8	**18.4**	44.6	**18.6**	**40.8**	**17.2**	**44.4**	**17.7**	**46.5**	**16.5**	46.2	16.9	43.7
Hytest, 4	**14.0**	38.1	**17.8**	40.0	**18.2**	37.5	15.1	36.1	**17.3**	40.1	**16.6**	43.7	16.5	39.2
Streaker Hls, 3	**12.9**	42.9	**17.7**	44.1	16.8	35.9	**15.9**	**44.4**	16.1	44.7	14.6	**48.3**	15.7	43.4
Buff Hls, 3	**13.0**	**44.8**	16.4	**46.2**	16.9	**41.5**	15.3	41.4	14.7	41.1	**15.9**	**48.5**	15.4	43.9
Reeves, 2	**13.4**	37.3	15.9	37.5	15.4	34.3	13.4	36.8	15.1	37.7	15.5	38.4	14.7	37.0
Stark Hls, 7	9.8	40.4	16.4	42.7	15.4	33.8	15.6	42.1	15.1	43.4	15.3	**47.3**	14.6	41.6
Stallion, 9	**12.7**	36.2	15.5	37.5	15.6	31.4	14.2	36.7	13.8	38.6	14.6	42.1	14.4	37.1
Jerry, 5	12.3	33.7	15.0	38.4	15.4	33.9	13.4	35.8	13.9	36.3	14.5	40.8	14.1	36.5
Colt, 0	12.3	36.1	15.2	39.8	14.7	35.2	12.4	35.2	14.8	37.3	14.1	38.4	13.9	37.0
Shelby427, 2	**12.6**	38.6	15.8	39.3	14.4	34.2	11.6	35.9	14.9	37.3	14.0	38.6	13.9	37.3
SD 031128-245, -	**14.3**	38.9	15.4	38.9	14.2	32.9	12.7	36.1	13.7	37.3	12.9	38.2	13.9	37.0
Morton, 8	**13.2**	33.3	14.4	36.0	14.7	30.0	12.3	35.7	13.9	37.3	14.1	39.4	13.7	35.3
Don, 1	12.4	34.6	13.9	36.4	14.1	32.4	13.5	35.9	14.0	34.7	14.3	37.1	13.7	35.2
SD 060966, -	12.4	34.8	14.8	39.0	13.5	34.4	13.6	36.6	13.9	38.1	13.6	38.5	13.6	36.9
SD 041445-93, -	10.8	36.2	14.9	37.7	15.5	35.6	11.9	36.1	14.5	38.7	13.8	41.1	13.6	37.5
Rockford, 8	9.7	38.9	15.2	38.1	14.8	28.3	13.6	35.5	14.1	38.5	14.0	40.7	13.5	36.7
HiFi, 8	10.8	37.6	15.3	37.7	14.8	29.5	12.9	34.6	13.8	37.1	13.6	39.5	13.5	36.0
Souris, 7	10.6	36.9	15.2	37.7	14.8	30.7	12.3	34.7	14.4	37.4	13.6	39.8	13.5	36.2
Beach, 7	10.0	37.3	14.5	38.3	14.9	33.3	13.0	36.8	14.0	38.5	13.5	40.6	13.3	37.5
SD 1445-119, -	11.1	36.2	14.2	38.0	14.6	36.0	11.9	36.3	14.1	38.5	13.8	39.9	13.3	37.5
Test avg. :	12.1	37.6	15.6	39.4	15.4	34.1	13.6	37.3	14.7	39.0	14.4	41.4	14.3	38.1
High avg. :	14.3	44.8	18.4	46.2	18.6	41.5	17.2	44.4	17.7	46.5	16.6	48.5	16.9	43.9
Low avg. :	9.7	33.3	13.9	36.0	13.5	28.3	11.6	34.6	13.7	34.7	12.9	37.1	13.3	35.2
[4] Lsd(.05) :	1.9	1.3	0.7	1.5	1.1	1.9	1.4	1.3	0.8	1.1	0.9	1.7		
[5] TPG-value :	12.5	43.6	17.7	44.8	17.5	39.7	15.9	43.2	17.0	45.5	15.8	46.9		
[6] C.V. :	11	2	3	3	5	4	8	3	4	2	5	3		

[1] Heading- days earlier or later (- or +) than Don, the check variety (Ck) for maturity. Hls = hulless variety.
Column values in **bold type** at each location are top-performance group values.
Note that additional table footnotes are explained in Table A.

Table 2c. Spring oat lodging (Ldg) score and plant height (Ht) averages at six South Dakota locations.
Sorted low (best) to high by all locations average lodging scores.

Variety, Heading [1]	Location Lodging score (Ldg) & Plant height (Ht)												All Locations Average	
	Brookings		South Shore		Beresford		Miller		Selby		Brown Co.			
	Ldg *score*	Ht *inch*	Ldg *score*	Ht *inch*	Ldg *score*	Ht *inch*	Ldg *score*	Ht *inch*	Ldg *score*	Ht *inch*	Ldg *score*	Ht *inch*	Ldg *score*	Ht *inch*
SD 031128-245, -	**2 [3]**	46	**2**	41	**3**	41	**1**	35	**1**	**40**	**2**	41	2	41
Rockford, 8	**1**	**48**	**2**	44	**3**	**43**	**1**	38	**1**	37	**2**	41	2	42
Shelby427, 2	**2**	44	**2**	41	**3**	40	**1**	37	**1**	**39**	**2**	36	2	40
Souris, 7	**2**	42	**2**	39	**3**	39	**1**	35	2	36	**2**	37	2	38
Buff Hls, 3	**2**	38	**2**	37	4	36	2	33	**1**	34	**2**	34	2	35
HiFi, 8	**2**	**47**	**2**	44	**3**	40	2	39	**1**	36	3	**42**	2	41
Morton, 8	3	**50**	**2**	**49**	4	**45**	2	39	2	**40**	**2**	**44**	2	44
Beach, 7	3	**47**	3	**48**	4	**45**	2	**43**	**1**	**40**	3	**45**	2	45
Don, 1	4	37	3	34	**3**	34	**1**	30	2	33	3	31	3	33
Stark Hls, 7	3	46	3	**47**	5	42	2	**40**	2	**40**	3	**44**	3	43
Colt, 0	5	39	3	37	4	37	**1**	31	2	35	**2**	34	3	35
Hytest, 4	3	45	3	44	5	41	2	**40**	2	**41**	3	41	3	42
Jerry, 5	4	44	4	42	4	41	2	36	**1**	**38**	3	39	3	40
SD 041445-93, -	4	44	3	40	5	40	2	36	2	**41**	3	39	3	40
Stallion, 9	4	45	4	44	5	41	2	38	2	**39**	3	41	3	41
SD 060966, -	5	36	4	36	4	35	**1**	32	3	33	**2**	31	3	34
SD 1445-119, -	4	46	4	40	5	41	2	38	2	**38**	3	39	3	40
Reeves, 2	4	43	4	39	5	40	3	36	2	**38**	4	39	4	39
Streaker Hls, 3	4	41	4	38	5	39	2	34	3	36	4	40	4	38
SD 051502 Hls, -	4	42	4	37	5	40	3	33	3	**39**	4	39	4	38
Test avg. :	3	43	3	41	4	40	2	36	2	38	3	39		
High avg. :	5	50	4	49	5	45	3	43	3	41	4	45		
Low avg. :	1	36	2	34	3	34	1	30	1	33	2	31		
[4] Lsd(.05) :	1	3	1	4	1	2	1	4	1	3	1	4		
[5] TPG-value :	1 & 2	47	2	46	3	43	1	40	1	38	2	42		
[6] C.V. :	21	5	17	6	11	3	22	8	29	5	17	6		

[1] Heading- days earlier or later (- or +) than Don, the check variety (Ck) for maturity. Hls = Hulless variety.
Column values in **bold type** at each location are top-performance group values.
Note that additional table footnotes are explained in Table A.

Table 3a. Spring barley yield results at six South Dakota locations, 2007-2009.
Table sorted by 3-yr then by 2009 state yield average.

Variety, Heading [1]	Location Yield Avg. (Bu/a at 13% moist.)										State Yield Avg. bu/a		State Top-Yield Freq. [2]	
	Brookings		South Shore		Miller		Selby		Brown Co.					
	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr	2009	3-Yr
Pinnacle, 3	**89**	**74**	105	**96**	**95**	.	**80**	**70**	**107**	**94**	82	84	50	100
Eslick, 3	**87**	**72**	**124**	**99**	**95**	.	**89**	**79**	92	81	89	83	88	75
Rawson, 2	**86**	**73**	**121**	**101**	**87**	.	74	66	**102**	**87**	83	82	50	75
Rasmusson, 3	84	**74**	107	89	84	.	**79**	**72**	**108**	**85**	79	80	25	75
Lacey, 0	**85**	**73**	105	86	83	.	**81**	69	**106**	**83**	79	78	38	50
Drummond, 2	82	66	100	87	77	.	74	69	**103**	81	75	76	13	0
Conlon, 0	**93**	**73**	**118**	**96**	82	.	**80**	58	94	78	70	76	38	75
Stellar-ND, 2	**89**	68	93	81	80	.	72	66	**103**	81	75	74	25	0
Robust, 3	74	63	96	79	77	.	67	59	91	71	69	68	0	0
Test avg. :	85	71	107	90	84	.	77	68	100	82	77	78		
High avg. :	93	74	124	101	95	.	89	79	108	94	89	84		
Low avg. :	74	63	93	79	77	.	67	58	91	71	69	68		
[4] LSD (0.05):	8	7	12	11	9		10	9	8	12				
[5] TPG-value :	85	67	112	90	86		79	70	100	82				
[6] C.V. :	7	8	8	7	8		9	9	6	8				

[1] Heading- days earlier or later (- or +) than Lacey, the check variety (Ck) for maturity.
Column values in **bold type** at each location are top-performance group values.
Note that additional table footnotes are explained in Table A.

Table 3b. Spring barley grain protein (Prt) and bushel weight (BW) averages at five South Dakota
Sorted high to low by all location grain protein average.

Variety, Heading [1]	Location Protein (Prt) & Bushel weight (BW)										All Locations average	
	Brookings		South Shore		Miller		Selby		Brown Co.			
	Prt %	BW lb	Prt %	BW lb	Prt %	BW lb	Prt %	BW lb	Prt %	BW lb	Prt %	BW lb
Conlon, 0	**12.0**	**47.8**	**12.5**	**49.7**	**13.4**	**46.0**	**13.0**	**48.7**	**13.6**	**46.5**	12.9	48.0
Robust, 3	11.4	45.3	**12.9**	46.4	12.7	42.1	**13.2**	46.1	**13.8**	42.6	12.8	45.7
Drummond, 2	**11.8**	43.8	**12.1**	44.8	12.6	41.7	**13.2**	45.6	**13.5**	43.8	12.6	45.1
Stellar-ND, 2	**11.8**	44.5	**12.3**	44.3	**13.2**	41.8	12.5	45.0	13.1	43.3	12.5	44.9
Rasmusson, 3	11.5	45.0	12.0	46.4	12.8	43.7	12.5	46.5	**13.2**	44.4	12.4	46.1
Lacey, 0	**11.8**	45.3	**12.3**	47.0	12.6	43.7	12.4	46.1	13.0	44.9	12.4	46.5
Eslick, 3	**11.7**	**47.9**	12.0	48.3	12.6	44.4	11.4	**48.0**	**13.7**	44.6	12.3	47.5
Rawson, 2	11.4	45.3	11.4	47.8	12.2	43.5	12.3	46.2	12.8	45.2	12.0	46.5
Pinnacle, 3	10.0	45.3	10.9	45.0	11.4	43.0	11.3	45.6	11.8	44.7	11.1	45.9
Test avg. :	11.5	45.5	12.0	46.5	12.6	43.2	12.4	46.3	13.2	44.3		
High avg. :	12.0	47.9	12.9	49.7	13.4	46.0	13.2	48.7	13.8	46.5		
Low avg. :	10.0	43.8	10.9	44.3	11.4	41.7	11.3	45.0	11.8	42.6		
[4] Lsd(.05) :	0.4	1.0	0.8	1.0	0.4	1.0	0.6	0.9	0.6	1.0		
[5] TPG-value :	11.6	46.9	12.1	48.7	13.0	45.0	12.6	47.8	13.2	45.5		
[6] C.V. :	2	1	5	2	2	2	4	1	3	2		

[1] Heading- days earlier or later (- or +) than Lacey, the check variety (Ck) for maturity.
Column values in **bold type** at each location are top-performance group values.
Note that additional table footnotes are explained in Table A.

Table 3c. Spring barley lodging (Ldg) score and plant height (Ht) averages at five South Dakota locations. Table sorted low to high by all location lodging score average.

Variety, Heading [1]	Location Lodging score (Ldg) & Plant height (Ht)										All Locations Average	
	Brookings		South Shore		Miller		Selby		Brown Co.			
	Ldg *score*	Ht *inch*	Ldg *score*	Ht *inch*	Ldg *score*	Ht *inch*	Ldg *score*	Ht *inch*	Ldg *score*	Ht *inch*	Ldg *score*	Ht *inch*
Pinnacle, 3	**1 [3]**	32	**1**	31	**1**	30	**1**	**32**	**3**	34	1	32
Stellar-ND, 2	**1**	34	**1**	**33**	**1**	**31**	**1**	**33**	**3**	33	1	33
Rawson, 2	**1**	**36**	**1**	**33**	**1**	**33**	**1**	**32**	**3**	34	1	34
Lacey, 0	**1**	35	**1**	**33**	**1**	**31**	**1**	**35**	**3**	34	1	33
Drummond, 2	**1**	**38**	**1**	**35**	**1**	**32**	2	**33**	**3**	**36**	2	35
Rasmusson, 3	**1**	34	**1**	**33**	2	29	**1**	30	**3**	32	2	31
Robust, 3	**1**	**36**	**1**	**35**	**1**	**33**	2	**35**	**3**	**35**	2	35
Eslick, 3	2	27	**1**	28	2	27	2	30	4	31	2	28
Conlon, 0	**1**	35	**1**	**34**	3	30	3	31	4	**38**	2	33
Test avg. :	1	34	1	33	2	31	2	32	3	34		
High avg. :	2	38	1	35	3	33	3	35	4	38		
Low avg. :	1	27	1	28	1	27	1	30	3	31		
[4] Lsd(.05) :	1	2	NS	2	1	2	1	3	1	3		
[5] TPG-value :	1	36	1	33	1	31	1	32	3	35		
6	22	4	15	4	37	5	33	6	13	5		

[1] Heading- days earlier or later (- or +) than Lacey, the check variety (Ck) for maturity.
Column values in **bold type** at each location are top-performance group values.
Note that additional table footnotes are explained in Table A.

Table 4. Field pea yield results at three South Dakota locations, 2008-2009.
Table sorted by 2-yr then by 2009 state yield average.

Variety, Rel. Mat. [1]	Location Yield Avg. Bu/a at 13% moist.						All Locations Yield Avg. bu/a	
	South Shore		Wall		Selby			
	2009	2-Yr	2009	2-Yr	2009	2-Yr	2009	2-Yr
Spider, M	76	**75**	32	.	**95**	**66**	68	71
Cooper, L	**81**	**75**	33	.	**96**	**62**	70	69
Arcadia, E	**84**	**76**	29	.	**84**	53	66	65
CDC Meadow, E	**80**	**71**	31	.	**92**	**59**	68	65
CDC Golden, M	**79**	**71**	34	.	**85**	**56**	66	64
CDC Striker, M	64	**64**	34	.	**85**	**57**	61	61
SW Midas, E	72	61	31	.	81	53	61	57
DS Admiral, E	59	59	32	.	77	52	56	56
Thunderbird, M	**87**	.	30	.	**86**	.	68	.
Commander, E	**85**	.	33	.	**84**	.	67	.
Summit, E	77	.	30	.	**90**	.	66	.
Agassiz, E	74	.	33	.	81	.	63	.
Korando, M	58	.	26	.	78	.	54	.
Sage, E	70	.	32	.	71	.	58	.
DS 98244, VE	.	.	32	.	.	.	.	.
Test avg. :	75	69	31	.	85	57	64	64
High avg. :	87	76	34	.	96	66	70	71
Low avg. :	58	59	26	.	71	52	54	56
[4] LSD (.05):	9	14	NS		12	10		
[5] TPG-value :	78	62	26		84	56		
[6] C.V. :	8	9	11		10	12		

[1] Maturity- relative to other varieties in the trial.
Note that additional table footnotes are explained in Table A.
Column values in **bold type** at each location are top-performance group values.

SOYBEAN VARIETY PERFORMANCE TRIALS – NORTHEAST RESEARCH FARM[1]

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This reports the 2009 Northeast Research Farm performance trials for both non-Glyphosate-resistant and glyphosate-resistant soybean entries conducted by the South Dakota State University Crop Performance Testing program.

EXPERIMENTAL PROCEDURES

Entries were placed in either a maturity group-0 or group-I test trial according to maturity ratings reported by the seed company. Each company selects the appropriate maturity group trial (0 or I) for their entries at a given location. However, there are no standard regional or national check entries for maturity. Consequently, in some trials, borderline entries with maturity group ratings at or near the assigned break between the late group-0's and early-group-I's may crossover.

Entries were seeded in three plots (replications) with each plot placed in a randomized complete block design and where each plot consisted of four 30-inch rows, 20 feet long. Plots were seeded May 22 and May 21, 2009 at South Shore and Warner, respectively, with a Monosem precision planter calibrated to plant 165,000 seeds per acre. Granular Nitragin brand Soybean Soil Implant metered down a tube was used for soil inoculation. The conventional seedbed at South Shore was a Kranzburg silty clay loam with a 3-6% slope previously cropped to spring wheat; and at Warner the no-till seedbed was a Harmony-Aberdeen silt clay loam with a 0-2% slope, previously cropped to corn. These methods apply to both the non-glyphosate-resistant and the glyphosate-resistant trials.

Chemical weed control in the glyphosate-resistant trials included of one pre-emergence application of Dual II Magnum™ at South Shore and one post-emergence application of Roundup™ at both locations. Weed control in the non-glyphosate-resistant trials at South Shore consisted of a pre-emergence application of Dual II Magnum™ followed by a post-application of Harmony™. All herbicides were applied at label rates. At South Shore, Warrior™ insecticide was aerial applied at the label rate while at Warner Asana™ was ground applied at the label rate.

Yields (bu/a) are an average of three replications, adjusted to 13% moisture (dry-matter basis) and a bushel weight of 60 pounds. Yield least significant difference (LSD) and minimum top-yield values are rounded off to the nearest whole bushel per acre. Plant height was measured from the ground to the top-most node on the main stem. Lodging scores at harvest are a plot average where plants were: All erect = 1, slightly lodged = 2, stem lodged 45$_o$ angle = 3, severely lodged = 4 or all flat = 5.

[1]Results funded with assistance from the South Dakota Agricultural Experiment Station.

MEASUREMENTS OF PERFORMANCE

Check for the "least significant difference" (LSD) value at the bottom of each data column. An LSD value can be used in two ways. First, it can indicate how much a variable like yield must differ between two entries before there is a significant difference. For example, if the test LSD value equals of 4 bu/a, it can be used to compare the yield average of any two entries. If entry A yields 50 and entry B yields 48 bu/a their yield difference is 2 (50 - 48 = 2). These two entries do not differ in yield because their yield of 2 bu/a is not greater than the LSD value of 4 bu/a. In contrast, if variety C yields 45, the yield difference between entry A and C is 5 bu/a (50-45 = 5). Thus entries A and C differ in yield because their difference of 5 bu/a is more than the LSD value of 4 bu/a, therefore, entry A is significantly higher yield than entry C.

A second use for the LSD value is to identify the top performance group (TPG) for yield (this year or 2-yr) and lodging scores for this year. For example, if the highest yield is 54 bu/a and the LSD value at the bottom of the table column is 4 bu/a one can determine that the minimum yield value needed for TPG is 50 bu/a (54-4 = 50). Technically, a yield of 50 is not while a yield of 50 bu/a is in the top yield group. However, because the yield averages and LSD values are rounded to the nearest whole number, one can say 50 bu/a, because of the rounding-off, is the minimum value for TPG entries. Therefore, the top yield entries for the yield column are those that are equal or higher than the minimum TPG value. Remember to look for top-yield group varieties in both the 2-yr and current year yield columns. Similarly, the TPG for lodging score (Table 1b) and its LSD value is also rounded-off to the nearest whole number.

An explanation of performance table footnotes is reported in Table A.

Table A. Explanation of performance table footnotes.

No.	Explanation of footnotes
[1]	Days to maturity (DTM) – the number of days to maturity from seeding to 95% brown pod.
[2]	Lodging scores: 0= all plants erect, 3= 50% of plants lodged at 45°-angle, 5= all plants flat.
[3]	Least Significant Difference (LSD 0.05) – the difference two values within a column must equal or exceed to be significantly different from one another at the 0.05 level of probability. If the difference is less than the LSD value the difference between the values is nonsignificant (NS).
[4]	TPG-avg. – the minimum value within a column that entry yield values must equal or exceed to qualify for the top-performance group (TPG).
[5]	TPG-avg. – the maximum value within a column that lodging score values must equal or be less than to qualify for the TPG.
[6]	Coefficient of variation (C.V.) - the percent of experimental error associated with a test trial. Ideally, the CV value for yield is less than 15%. Values less than 5% tend to be less common while values of 6 to 15% are more common. Occasionally, values exceed 15%; this means the trial contained too much experimental error to be a valid test; thus, the trial is not reported.

SEASONAL PRECIPITATION AND TEMPERATURES

The seasonal precipitation total from April 1 to September 30 was below average (-1.29”). The April through June moisture total was below average at -3.06”, while June and July was 1.81” above average, with September near average. The average monthly daily temperature from April through September was below average at more than -3°F. The monthly average daily temperatures were -3.4 in June, -6.4 in July, and -3.9°F in August.

PERFORMANCE TRIAL RESULTS FOR 2008-09

Glyphosate-resistant soybean variety trial results:

South Shore – Conventional tillage, Northeast Research Farm
Warner – Minimum-tillage, Allen & Inel Ryckman Farm (Farm cooperators)

South Shore, Group-0 (Table 1): The 2-year and 2009 test-yield averages were **49** and **53** bushels per acre, respectively, and the lodging score average was **1.** Varieties had to average **44** and **52** bushels or higher to be in the top-yield group for 2 years and for 2009, respectively. Variety yield differences among the 2-year averages were not significant (NS), while the 2009 variety yield differences had to differ by **7** bushels to be significantly different. Variety lodging score value differences were not significant, so all entries were in the top performance group for lodging score.

Warner, Group-0 (Table 1): The 2-year and 2009 test-yield averages were **52** and **61** bushels per acre, respectively, and the lodging score average was **1.** Varieties had to average **54** and **65** bushels or higher to be in the top yield group for 2 years and for 2009, respectively. Variety yield averages had to differ by **5** bushels for 2 years and **4** bushels for 2009 to be significantly different. Variety lodging score value differences were not significant, so all entries were in the top performance group for lodging score.

Northern test zone, Group-0 (Tables 1): The 2-year and 2009 test-yield averages were **50** and **57** bushels per acre, respectively, and the lodging score average was **1.** In 2009, however, there were significant year-by-location interactions for the 2-year yield and the 2009 yield at both locations; this means variety performance differed by location and year for the 2-year yield and differed by location for the 2009 yield in the Northern zone. Therefore, **producers are encouraged to evaluate variety performance differences by using the yield columns listed under each location** and to not use the yield columns listed for the Northern zone.

South Shore, Group-I (Table 2): The 2-year and 2009 test-yield averages were **51** and **56** bushels per acre, respectively, and the lodging score average was **1.** Varieties had to average **52** bushels and **57** bushels or higher to be in the top yield group for 2 years and for 2009, respectively. Variety yield differences among the 2-year averages were not significant (NS), while the 2009 variety yield differences had to differ by **4** bushels to be significantly different. Variety lodging score value differences were not significant, so all entries were in the top performance group for lodging score.

Warner, Group-I (Table 2): The 2-year and 2009 test-yield averages were **51** and **64** bushels per acre, respectively, and the lodging score average was **1.** Varieties had to average **51** and **66** bushels or higher to be in the top yield group for 2 years and for 2009, respectively. Variety yield averages had to differ by **5** bushels for 2 years and **4** bushels for 2009 to be significantly different. Variety lodging score values had to equal **1** to be in the top performance group for lodging score and had to differ by **1** to be significantly different.

Northern test zone, Group-I (Table 2): The 2-year and 2009 test-yield averages were **51** and **60** bushels per acre, respectively, and the lodging score average was **1.** Because there were significant year-by-location interactions for the 2-year yield and the 2009 yield at both locations, **growers are encouraged to evaluate variety performance differences by using the yield columns listed under each location** and to not use the yield columns listed for the Northern zone

Non-glyphosate-resistant soybean variety trial results:

South Shore – Conventional tillage, Northeast Research Farm

South Shore, Group-0 (Table 3): The 2-year and 2009 test-yield averages were **40** and **46** bushels per acre, respectively, and the lodging score average was **1.** Varieties had to average **37** bushels or higher for 2 years and **49** bushels or higher for 2009 to be in the top yield group. Variety yield averages had to differ by **6** bushels for 2 years and by **4** bushels for 2009 to be significantly different. Variety lodging score values indicated there was no difference in lodging score in the varieties tested in 2009.

South Shore, Group-I (Table 3): The 2-year and 2009 test-yield averages were **41** and **43** bushels per acre, respectively, and the lodging score average was **1.** Varieties had to average **35** bushels or higher for 2 years and **43** bushels or higher for 2009 to be in the top yield group. Variety yield averages had to differ by **10** bushels for 2 years and by **4** bushels for 2009 to be significantly different. Variety lodging score values indicated there was no difference in lodging score in the varieties tested in 2009.

Table 1. Glyphosate-resistant maturity group-0 soybean variety yield and lodging averages at South Shore and Warner, 2008-2009. Sorted by 2-Yr then by 2009 zone yield.

		Northern Averages by Location						Northern Zone Averages		
		South Shore			Warner					
		Yield-bu/a		2009	Yield-bu/a		2009	Yield-bu/a		2009
Brand/Variety	DTM [1]	2-Yr	2009	Lodg. (1-5)	2-Yr	2009	Lodg. (1-5)	2-Yr	2009	Lodg. (1-5)
NUTECH/ NT-0886	126	**51**	50	**1**	**59**	**69**	**1**	55	60	1
NUTECH/ NT-0990	127	**52**	**53**	**1**	51	63	**1**	52	58	1
PRAIRIE BR./ PB-0954RR	124	**47**	**52**	**1**	52	60	**1**	50	56	1
ASGROW/ AG0808	124	**46**	49	**1**	53	61	**1**	50	55	1
HEFTY/ EXP089R	124	**48**	**53**	**1**	49	60	**1**	49	57	1
SODAK GEN./ SD1093RR	124	**44**	49	**1**	48	60	**1**	46	55	1
MUSTANG/ M-09330	129	.	**57**	**1**	.	**65**	**1**	.	61	1
PRAIRIE BR./ EXP 109	126	.	**56**	**1**	.	**65**	**1**	.	61	1
SEEDS 2000/ 2081RR	126	.	**57**	**1**	.	62	**1**	.	60	1
DAIRYLAND/ DSR-0747/R2Y	123	.	**55**	**1**	.	62	**1**	.	59	1
PRAIRIE BR./ PB-0999RR	126	.	**53**	**1**	.	64	**1**	.	59	1
PIONEER/ 90Y80	120	.	**53**	**1**	.	63	**1**	.	58	1
NUTECH/ 0889RR	124	.	**55**	**1**	.	61	**1**	.	58	1
NUTECH/ 6122	130	.	50	**1**	.	**65**	**1**	.	58	1
ASGROW/ RY0809	124	.	**54**	**1**	.	59	**1**	.	57	1
KRUGER/ EXPK2X09A9	129	.	**52**	**1**	.	61	**1**	.	57	1
G-2 GENETICS/ 6098	124	.	**52**	**1**	.	61	**1**	.	57	1
PRAIRIE BR./ PB-0779RR	122	.	**54**	**1**	.	59	**1**	.	57	1
PRAIRIE BR./ EXP 119	124	.	**52**	**1**	.	62	**1**	.	57	1
ASGROW/ RY0819	125	.	50	**1**	.	61	**1**	.	56	1
KRUGER/ EXPK2X05A9	124	.	**52**	**1**	.	59	**1**	.	56	1
PRAIRIE BR./ EXP 129	123	.	51	**1**	.	60	**1**	.	56	1
WENSMAN/ W 2079RR	120	.	**53**	**1**	.	59	**1**	.	56	1
SODAK GEN./ SD2081RR	123	.	49	**1**	.	60	**1**	.	55	1
ASGROW/ AG0803	125	.	50	**1**	.	58	**1**	.	54	1
KRUGER/ EXPK2X06A9	125	.	50	**1**	.	55	**1**	.	53	1
HEFTY/ EXP070R	120	.	45	**1**	.	58	**1**	.	52	1
MUSTANG/ M-09920	133	.	**59**	**1**	.	.	.	.	.	.
PIONEER/ 90Y50	128	.	**52**	**1**	.	.	.	.	.	.
KRUGER/ K-042RR	119	.	.	.	49	59	**1**	.	.	.
KRUGER/ K-072+RR	124	.	.	.	**58**	**67**	**1**	.	.	.
KRUGER/ K-091RR	133	**53**	**59**	**1**	.	.	.	.	.	.
KRUGER/ K-058RR	118	**48**	51	**1**	.	.	.	.	.	.
GOLD COUNTRY/ 2509RR	131	**50**	**58**	**1**	.	.	.	.	.	.
G-2 GENETICS/ 6088	125	.	.	.	.	**66**	**1**	.	.	.
PROSEED/ 80-90	129	**47**	**52**	**1**	.	.	.	.	.	.
Test avg. :	125	49	53	1	52	61	1	50	57	1
High avg. :	133	53	59	1	59	69	1	55	61	1
Low avg. :	118	44	45	1	48	55	1	46	52	1
[3] Test LSD (.05):		NS**	7	NS	5	4	NS	***	***	
[4] Min.TPG-avg. :		44	52	.	54	65	.			
[5] Max.TPG-avg. :		.	.	1	.	.	1			
[6] Test Coef. Var.:		7	8	0	4	4	0			
No. Entries:		10	33	33	8	30	30			

[1] DTM= days to maturity from seeding dates of May 22 at South Shore and May 21 at Warner.
Note that additional table footnotes are explained in Table F.

* Values in **bold type** within a column are included in the top performance group.

** Indicates differences between values within a column were non-significant (NS).

*** There was a significant variety by location interaction for yield. Therefore, evaluate yield by using the yield columns for each location.

Table 2. Glyphosate-resistant maturity group-I soybean variety yield and lodging averages at South Shore and Warner, 2008-2009. Sorted by 2-Yr then by 2009 zone yield.

		Northern Averages by Location						Northern Zone Averages		
		South Shore			Warner					
		Yield-bu/a		2009	Yield-bu/a		2009	Yield-bu/a		2009
Brand/Variety	DTM [1]	2-Yr	2009	Lodg. (1-5)	2-Yr	2009	Lodg. (1-5)	2-Yr	2009	Lodg. (1-5)
WENSMAN/ W 2166RR	128	55	**61**	**1**	**53**	**67**	**1**	54	64	1
HEFTY/ 168R	128	53	**57**	**1**	**54**	**68**	**1**	54	63	1
STINE/ 1108-4	126	53	**61**	**1**	**54**	65	**1**	54	63	1
NUTECH/ 6156	127	52	55	**1**	**56**	**68**	**1**	54	62	1
MUSTANG/ M-168RR	128	53	**59**	**1**	**53**	**67**	**1**	53	63	1
PRAIRIE BR./ PB-1597RR	129	53	**59**	**1**	**53**	**67**	**1**	53	63	1
HEFTY/ 117R	127	51	56	**1**	**55**	**67**	**1**	53	62	1
STINE/ 1008-4	128	50	52	**1**	**56**	**70**	**1**	53	61	1
PRAIRIE BR./ PB-1337RR	128	52	**58**	**1**	**51**	65	**1**	52	62	1
NUTECH/ NT-6205+RR	133	52	56	**1**	**52**	**66**	**1**	52	61	1
ASGROW/ AG1403	130	50	53	**1**	**51**	**66**	**1**	51	60	1
SEEDS 2000/ 2120RR	128	49	52	**1**	**52**	65	**1**	51	59	1
HEFTY/ EXP159RN	131	49	55	**1**	50	**66**	**1**	50	61	1
ASGROW/ AG1102	127	49	56	**1**	**51**	63	**1**	50	60	1
ASGROW/ AG1702	127	51	55	**1**	49	63	**1**	50	59	1
PRAIRIE BR./ PB-1918RR	132	50	54	**1**	49	61	**1**	50	58	1
PROSEED/ 81-30	129	49	50	**1**	**51**	59	**1**	50	55	1
HEFTY/ EXP139R	126	50	53	**1**	48	61	**1**	49	57	1
KRUGER/ K-129RR	126	49	51	**1**	48	62	**1**	49	57	1
SODAK GEN./ SD1161RR/SCN	131	47	52	**1**	48	61	**1**	48	57	1
KRUGER/ K-189RR/SCN	133	45	48	**1**	46	59	**1**	46	54	1
ASGROW/ RY1719	133	.	**61**	**1**	.	**68**	**1**	.	65	1
PRAIRIE BR./ EXP 141	130	.	**60**	**1**	.	**69**	**1**	.	65	1
KRUGER/ EXPK2X11B9	126	.	**60**	**1**	.	65	2	.	63	2
KRUGER/ EXPK2X14A9	129	.	**59**	**1**	.	**67**	**1**	.	63	1
PRAIRIE BR./ EXP 179	133	.	**58**	**1**	.	**67**	**1**	.	63	1
MUSTANG/ M-159NRR	133	.	**60**	**1**	.	63	**1**	.	62	1
NUTECH/ 6145	132	.	**59**	**1**	.	64	**1**	.	62	1
KRUGER/ EXPK2X10A9	126	.	**59**	**1**	.	64	**1**	.	62	1
DAIRYLAND/ DST11-001R2Y	129	.	**57**	**1**	.	**66**	**1**	.	62	1
PRAIRIE BR./ EXP 158	132	.	**59**	**1**	.	65	2	.	62	1
ASGROW/ AG1506	132	.	**58**	**1**	.	64	**1**	.	61	1
ASGROW/ AG1703	134	.	**57**	**1**	.	64	**1**	.	61	1
ASGROW/ RY1709	132	.	56	**1**	.	**66**	**1**	.	61	1
NUTECH/ 6166	131	.	55	**1**	.	**66**	**1**	.	61	1
DAIRYLAND/ DSR-1100/RR	126	.	**57**	**1**	.	65	**1**	.	61	1
PRAIRIE BR./ EXP 199	129	.	**58**	**1**	.	64	**1**	.	61	1
CHANNEL BRAND/ 1651R	133	.	**57**	**1**	.	64	**1**	.	61	1
PROSEED/ 81-50	132	.	56	**1**	.	65	**1**	.	61	1
HEFTY/ 108	127	.	56	**1**	.	64	**1**	.	60	1

Table 2. Glyphosate-resistant maturity group-I soybean variety yield and lodging averages at South Shore and Warner, 2008-2009 (continued).

Brand/Variety	DTM [1]	South Shore Yield-bu/a 2-Yr	South Shore Yield-bu/a 2009	South Shore 2009 Lodg. (1-5)	Warner Yield-bu/a 2-Yr	Warner Yield-bu/a 2009	Warner 2009 Lodg. (1-5)	Northern Zone Yield-bu/a 2-Yr	Northern Zone Yield-bu/a 2009	Northern Zone 2009 Lodg. (1-5)
KRUGER/ EXPK2X15B9	130	.	**58**	**1**	.	61	**1**	.	60	1
KRUGER/ K2-1901	131	.	**57**	**1**	.	62	**1**	.	60	1
KRUGER/ EXPK2X19B9	133	.	**57**	**1**	.	62	**1**	.	60	1
WENSMAN/ W 2112RR	123	.	**57**	**1**	.	62	**1**	.	60	1
SODAK GEN./ SD2121RR	126	.	56	**1**	.	62	**1**	.	59	1
DAIRYLAND/ DSR-1200/R2Y	127	.	54	**1**	.	62	**1**	.	58	1
G-2 GENETICS/ 6159	128	.	54	**1**	.	62	**1**	.	58	1
NUTECH/ 6193	132	.	53	**1**	.	60	**1**	.	57	1
G-2 GENETICS/ 7129	126	.	49	**1**	.	55	**1**	.	52	1
MUSTANG/ M-13320	137	.	**60**	**1**	.	.	.	.	.	.
PIONEER/ 91Y90	130	.	.	.	**51**	**66**	2	.	.	.
KRUGER/ K-167RR/SCN	135	**51**	55	**1**	.	.	.	.	.	.
GOLD COUNTRY/ 2713RR	133	**50**	53	**1**	.	.	.	.	.	.
GOLD COUNTRY/ 2815RR	132	**54**	**59**	**1**	.	.	.	.	.	.
GOLD COUNTRY/ 1915NRR	135	**52**	**61**	**1**	.	.	.	.	.	.
DAIRYLAND/ DSR1423RRSTS	130	.	.	.	.	57	2	.	.	.
DAIRYLAND/ DST14-003R2Y	135	.	.	.	.	**67**	2	.	.	.
REA/ EXP-1054	126	.	.	.	.	**67**	**1**	.	.	.
REA/ EXP-1056	127	.	.	.	.	65	**1**	.	.	.
REA/ EXP-1059	126	.	.	.	.	64	**1**	.	.	.
PROSEED/ 61-00	121	.	.	.	**53**	65	**1**	.	.	.
Test avg. :	129	51	56	1	51	64	1	51	60	1
High avg. :	137	55	61	1	56	70	2	54	65	2
Low avg. :	121	45	48	1	46	55	1	46	52	1
[3] Test LSD (.05):		NS**	4	NS	5	4	1	***	***	
[4] Min.TPG-avg. :		52	57	.	51	66	.			
[5] Max.TPG-avg. :		.	.	1	.	.	1			
[6] Test Coef. Var.:		4	4	0	6	4	10			
No. Entries:		25	54	54	23	56	56			

[1] DTM= days to maturity from seeding dates of May 22 at South Shore and May 21 at Warner.

Note that additional table footnotes are explained in Table A.

* Values in **bold type** within a column are included in the top performance group.

** Indicates differences between values within a column were non-significant (NS).

*** There was a significant variety by location interaction for yield. Therefore, evaluate yield by using the yield columns for each location.

Table 3. Non-glyphosate-resistant maturity group-0 and -I soybean variety yield and lodging averages at South Shore, 2008-09.

BRAND/VARIETY	DTM [1]	Yield average (bu/a) by maturity group					
		MG-0			MG-I		
		Yield-bu/a		2009 Lodg. (1-5)	Yield-bu/a		2009 Lodg. (1-5)
		2-yr	2009		2-yr	2009	
MUSTANG/ ML-0979	128	**.**	**53***	**1**	.	.	.
PUBLIC/MN0908CN	133	.	48	**1**	.	.	.
PUBLIC/HAMLIN	131	**43**	47	**1**	.	.	.
PUBLIC/SURGE	130	**43**	47	**1**	.	.	.
RICHLAND ORG./ MK0508	130	**38**	44	**1**	.	.	.
PUBLIC/MN0806CN	128	.	44	**1**	.	.	.
PUBLIC/SD05-767	133	.	44	**1**	.	.	.
PUBLIC/SD00-1501	129	.	42	**1**	.	.	.
RICHLAND ORG./ MK0649	123	35	41	**1**	.	.	.
MUSTANG/ ML-1520	131	.	.	.		**47**	**1**
PUBLIC/MN1701CN	133	.	.	.	**45**	**46**	**1**
PUBLIC/DEUEL	129	.	.	.	**41**	**44**	**1**
PUBLIC/MN1410	130	.	.	.	**45**	42	**1**
PUBLIC/MN1505SP	131	.	.	.	.	41	**1**
RICHLAND ORG./ MK1016	126	.	.	.	34	37	**1**
Test avg.:	130	40	46	1	41	43	1
High avg.:	133	43	53	1	45	47	1
Low avg. :	123	35	41	1	34	37	1
[3] LSD (.05):		6	4	0	10	4	0
[4] Min. TPG avg.:		37	49	.	35	43	.
[5] Max. TPG avg.:		.	.	1	.	.	1
[6] Coef. Var.:		5	5	0	8	5	0

[1] DTM= days to maturity from seeding dates of May 22 at South Shore.

* Values in **bold type** within a column are included in the top-performance group.

Note that additional table footnotes are explained in Table A.

Precision-Planted Glyphosate-Resistant Corn Hybrid Performance Trials

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This reports the 2009 Northeast Research Farm performance trial for the glyphosate-resistant corn hybrids conducted by the South Dakota State University Crop Performance Testing (CPT) program.

Experimental Procedures

Entries were placed into either an early or late maturity trial according to ratings reported by a given seed company. The break between the early and late test was 95-day for both hybrid trials. Entries were seeded in three replications with each hybrid randomly located within a replication block. Plots consisted of four 30-inch rows, 20 feet long. Plots were seeded on May 7, 2009 into a conventionally tilled Kranzburg silty clay loam with a 3-6% slope and previously cropped to spring wheat. A Monosem precision row crop planter was used to seed plots. During seeding, a starter fertilizer of 100 pounds/acre of 37-18-00 was applied 2” below and 2” to the side (2x2) of the seed furrow and later fertilized for a yield goal of 180 bushels/acre. The precision planter was calibrated to deliver 28,750 seeds per acre, regardless, of seed quality and germination percentage. Thus, the harvest population is an indication of initial seed quality and the ability of the seed to cope with the production environment. Weed control procedures consisted of a pre-Dual II Magnum application plus one post-Roundup application, both at label rates.

Measurements of Performance

Yield values are an average of three replicates (plots), and are expressed as bushels per acre (bu/a), adjusted to 15.5% moisture on a dry-matter basis and a bushel weight of 56 pounds. Moisture content is expressed as the percentage of moisture in the shelled grain at harvest.

Check for the "least significant difference" (LSD) value at the bottom of each data column. The reported LSD values can be used in two ways. First, the LSD value can indicate how much a variable such as yield must differ between two hybrids before there is a real yield difference. For example, if the 2-year LSD value equals 12 bu/a acre it can be used to compare the yields of any two hybrids. If hybrid A averages 190 bu/a and hybrid B averages 189 bu/a the yield difference is 11 bu/a (190 - 189 = 11). In this case the two hybrids do not differ in yield because their yield difference of 11 bu/a is less than the reported LSD value of 12 bu/a. In contrast, if hybrid C yields 185 bu/a the difference between hybrids A and C is 15 bu/a (190-185 = 15). In this case, the yield difference of 15 bu/a is more than the reported LSD value of 12 bu/a; therefore, hybrid A is significantly higher in yield than hybrid C.

The second use for the LSD value is to identify the top performance group (TPG) for current year and two-year yields, bushel weight, grain moisture at harvest, and lodging (below the ear) percentage for each test trial. In order to determine which hybrids are in the TPG for yield use the LSD value indicated at the bottom of each yield column in any yield table. For example, let's say the column LSD value equals 15 (bu/a) and the highest yield for that column equals 155 bu/a. If you subtract the column LSD value from the highest yield you obtain an intermediate value of 140 bu/a (155–15 = 140). The minimum top yield value has to be greater than this intermediate value of 140 bu. and since the yield values are rounded to the nearest bushel it must be at least 141 bu. Thus, varieties with an average of 141 bu. or higher are included in the top-yield group. Top yield hybrids are those hybrids that are equal or more than the minimum TPG for yield. Likewise, a minimum TPG value is listed for the 2 yr. (2007-08) average. The minimum yield value needed for a hybrid to qualify for **the TPG for yield for 2008 or for 2008-09 is listed at the bottom of each yield column**. If hybrid yield differences are not significant (NS), then by definition - **all hybrids in the test are in the TPG for yield** for the stated one- or two-year yield average.

Similarly, the TPG for bushel weight, grain moisture at harvest, and stalk lodging below the ear percentage can be determined. Note that yield and bushel weight TPG values must exceed a minimum value; while grain moisture and lodging below ear percentage values must be equal to or less than maximum value to qualify for the TPG depending on a given variable.

Table A. Explanation of performance table footnotes.

No	Explanation of footnotes
[1]	Entries listed by Brand/Hybrid- Sorted by 2-yr then 2009 yield average.
[2]	Brand Relative Maturity (Rel. Mat.)– The relative maturity rating as reported by the seed company.
[3]	Lodging Percentage– percentage of stalks broken below the ear at harvest.
[4]	Final Stand Percentage – number of standing stalks at harvest as a percent of seeded population.
[5]	Least Significant Difference ($LSD_{0.05}$) – the difference two values within a column exceed to be significantly different (0.05 level of probability). If their difference is less than the LSD value the difference is nonsignificant (NS).
[6]	Min. TPG-avg.– the minimum column value for yield, bushel weight, and final stand percentage that a given hybrid must equal or exceed to be in the TPG.
[7]	Max. TPG-avg.– the maximum column value for grain moisture at harvest, lodging percentage that a given hybrid must equal or be less than to be in the TPG.
[8]	Coefficient of variation (C.V.) - the percent of experimental error associated with a trial. Ideally, the CV value for yield is less than 15%. Values less than 5% are less common, values of 6-15% are more common, and if values exceed 15%; the trial contained too much experimental error to be valid; so the trial is not reported.

Seasonal Precipitation and Temperatures

The seasonal precipitation total from April 1 to September 30 was below average (-1.29”). The April through June moisture total was below average at -3.06”, while June and July was 1.81” above average, with September near average. The average monthly daily temperature from April through September was below average at slightly more than -3°F. The monthly average daily temperatures were -3.4 in June, -6.4 in July, and -3.9°F in August. Consequently, this lead to growing degree day (GDD) deficits of -65 GDDs in June, -192 in July, and -109 in August; with a total GDD 307 GDDs below average for the April through September period.

Performance Trial Results – 2009

Early maturity trial, Table 1. The test trial yield averages were **187** bu/a for 2 years and **200** bu/a for 2009. The yield differences among those hybrids tested for 2 years were not significant (NS). Hybrids that yielded **205** bu/a or more for 2009 qualified for the TPG for yield. Hybrids had to differ in yield by **11** bu/a in 2009 to be significantly different. In 2009, bushel weights averaged **50** lbs, grain moisture averaged **20**%, lodging averaged **zero percent**, and final stand percentage averaged **96**%**.** In order for hybrids to be in the TPG for these factors, the hybrid had to average **52** lbs. or more in bushel weight, **18**% or less in grain moisture**, 1**% or less in lodging, and **95**% or more in final stand percentage.

Late maturity trial, Table 2. The test trial yield averages were **185** bu/a for 2 years and **192** bu/a for 2009. Hybrids that yielded **171** bu/a or more for 2 years and **204** bu/a or more for 2009 qualified for the TPG for yield. Hybrids had to differ in yield by **28** bu/a for two years and **13** bu/a in 2009 to be significantly different. In 2009, bushel weights averaged **47** lbs, grain moisture averaged **26**%, lodging averaged **zero percent**, and final stand percentage averaged **93%.** In order for hybrids to be in the TPG for these factors, the hybrid had to average **49** lbs. or more in bushel weight, **22**% or less in grain moisture**,** and **1**% or less in lodging, and **93**% or higher in final stand percentage.

Table 1. South Shore early matury glyphosate-resistant corn hybrid test results, 2008-09, Seeded May 7, 2009 at 28,750 seeds per acre.

Brand/Hybrid & Seed Treatment [1]	Rel. Mat. [2]	Yield Averages 2-Yr bu/a	Yield Averages 2009 bu/a	Other 2009 Averages Bu.Wt. lb	Grain Moisture Pctg	Lodging Pctg [3]	Final Stand Pctg [4]
DEKALB/ DKC43-27(VT3) + Poncho 250	93	**202**	**212**	**52**	20	**0**	**95**
AGSOURCE/ 3T-995 VT3 + Cruiser 250	95	**199**	**206**	49	20	**0**	**96**
KRUGER/ 6093VT3 + Cruiser 250	93	**185**	201	50	22	**0**	**98**
PIONEER/ 38H08 + Poncho 250	92	**184**	195	47	**18**	**0**	94
SEEDS/ 2000 9501VT3 + Poncho 1250	95	**178**	204	48	19	**0**	**99**
DAIRYLAND/ ST-9594 + Poncho 250	94	**176**	**213**	51	**16**	**0**	**95**
DAIRYLAND/ ST-6992 + Poncho 250	92	.	**216**	51	20	**1**	**95**
KRUGER/ 6295VT3 + Cruiser 250	95	.	**215**	49	19	**0**	**99**
DEKALB/ DKC42-72(VT3) + Poncho 250	92	.	**212**	51	20	**0**	**96**
DAIRYLAND/ ST-9395 + Poncho 250	95	.	**212**	49	19	**0**	**95**
DAIRYLAND/ ST-9789 + Poncho 250	89	.	**210**	51	**18**	**1**	**99**
NUTECH/ 3T-493 VT3 + Poncho 250	93	.	**207**	49	**17**	**0**	92
NUTECH/ 3T-295 VT3 + Poncho 250	95	.	**207**	50	23	**0**	94
AGSOURCE/ 3T-294 VT3 + Poncho 250	94	.	**207**	51	19	**0**	93
WENSMAN/ W 8180 + Poncho 250	95	.	**206**	51	22	**0**	94
PROSEED/ 894 + Poncho 250	94	.	**205**	49	21	**1**	**95**
NUTECH/ 3T-894 VT3 + Poncho 250	94	.	**205**	49	20	**0**	**96**
DEKALB/ DKC40-20(VT3) + Poncho 250	90	.	204	51	21	**0**	94
KRUGER/ 6490VT3 + Cruiser 250	90	.	203	**53**	19	**0**	**99**
SEEDS/ 2000 9502VT3 + Poncho 1250	95	.	203	50	20	**0**	93
DAIRYLAND/ ST-7790 + Cruiser 250	90	.	202	51	21	**0**	93
WENSMAN/ W 7195VT3 + Poncho 250	95	.	198	49	23	**0**	**95**
AGSOURCE/ 3P-494+RR/YGPL +	94	.	193	49	22	**0**	**97**
AGSOURCE/ 3T-096 VT3 + Cruiser 250	95	.	191	50	23	**0**	92
G2/ GEN. 3P-595 RR/YGPL + Cruiser	95	.	189	49	23	**0**	**99**
PROSEED/ 794 + Poncho 250	94	.	187	47	20	**0**	**99**
G2/ GEN. 5X-594 RR/HXT + Cruiser 250	94	.	182	45	21	**0**	**95**
G2/ GEN. 5X-398 RR/HXT + Cruiser 250	95	.	173	47	24	**0**	**95**
PIONEER/ 38P43 + Poncho 250	95	.	171	51	22	**0**	**95**
EPLEY/ E1115GT + Not reported	93	.	159	50	22	**0**	**95**
Trial avg.:	94	187	200	50	20	0	96
High avg.:	95	202	216	53	24	1	99
Low avg.:	89	176	159	45	16	0	92
[5] LSD(.05):		NS	11	1	2	NS	4
[6] Min.TPG value:		176	205	52	.	.	95
[7] Max.TPG value:		.	.	.	18	1	.
[8] Coef. of var.:		6	3	2	5	557	3
No. entries:	30	6	30	30	30	30	30

[1] Entries are listed by Brand/Hybrid and sorted by 2-yr then by 2009 yield average.

* Values in **bold type** within a column are included in the top-performance group.

Note that additional table footnotes are explained in table A.

Table 2. South Shore late maturity glyphosate-resistant corn hybrid test results, 2008-09,
Seeded May 7, 2009 at 28,750 seeds per acre.

Brand/Hybrid & Seed Treatment [1]	Rel. Mat. [2]	Yield Averages		Other 2009 Averages			
		2-Yr bu/a	2009 bu/a	Bu.Wt. lb	Grain Moisture Pctg	Lodging Pctg [3]	Final Stand Pctg [4]
KRUGER/ 6102VT3 + Cruiser 250	102	**199**	**209**	48	25	**0**	**93**
DEKALB/ DKC48-37(VT3) + Poncho 250	98	**196**	**209**	**50**	**20**	**0**	**93**
DEKALB/ DKC46-60(VT3) + Poncho 250	96	**196**	200	48	**21**	**0**	**97**
DEKALB/ DKC50-44(VT3) + Poncho 250	100	**194**	**208**	47	25	**1**	92
KRUGER/ 6298VT3 + Cruiser 250	98	**190**	197	48	24	**0**	**96**
SEEDS/ 2000 9901VT3 + Poncho 250	99	**187**	195	**49**	24	**0**	92
KRUGER/ 6097VT3 + Cruiser 250	97	**182**	**215**	46	27	**0**	**97**
WENSMAN/ W 7273VT3 + Poncho 250	98	**182**	181	47	31	**0**	**94**
KRUGER/ 6401VT3 + Cruiser 250	101	**181**	195	**50**	27	**0**	**96**
G2/ GEN. 5H-797 RR/HX + Cruiser 250	96	**179**	196	45	24	**0**	**94**
NUTECH/ 3T-098 VT3 + Cruiser 250	98	169	188	46	29	**0**	**96**
KRUGER/ 6499VT3 + Cruiser 250	99	164	186	47	29	**0**	**95**
G2/ GEN. 5H-999 RR/HX + Cruiser 250	99	.	**217**	48	23	**1**	**94**
DEKALB/ DKC50-66(VT3) + Poncho 250	100	.	**214**	**49**	**22**	**0**	**94**
KRUGER/ 6200VT3 + Cruiser 250	100	.	**213**	**49**	**21**	**0**	**94**
EPLEY/ E1184VT3 + Cruiser 250	96	.	**208**	48	**21**	**0**	**94**
G2/ GEN. 5H-501 RR/HX + Cruiser 250	100	.	203	47	24	**0**	92
G2/ GEN. 5X-199RR/HXT + Cruiser 250	99	.	199	47	25	**0**	91
PROSEED/ 896 + Poncho 250	96	.	198	**49**	25	**0**	91
NUTECH/ 3T-601 VT3 + Poncho 250	100	.	198	48	24	**0**	96
PROSEED/ 897 + Poncho 250	97	.	197	47	26	**1**	91
G2/ GEN. 5H-199 RR/HX + Cruiser 250	99	.	197	47	23	**0**	90
WENSMAN/ W 7270VT3 + Poncho 250	97	.	196	47	25	**0**	**95**
NUTECH/ 3T-401 VT3 + Cruiser 250	100	.	193	46	29	**0**	**93**
DAIRYLAND/ ST-9597Q + Cruiser 250	97	.	192	**49**	24	**0**	92
DEKALB/ DKC51-13(VT3) + Poncho 250	101	.	189	47	26	**0**	**94**
NUTECH/ 3T-300 VT3 + Cruiser 250	100	.	184	46	31	**0**	**94**
AGSOURCE/ 5B-198 GTCBLL + Poncho	100	.	182	47	29	**0**	84
G2/ GEN. 5X-802 RR/HXT + Cruiser 250	100	.	180	46	26	**0**	**97**
NUTECH/ 3T-600 VT3 + Poncho 250	100	.	179	47	25	**1**	87
AGSOURCE/ 3T-799 VT3 + Cruiser 250	99	.	173	48	29	**0**	88
NUTECH/ 3T-603 VT3 + Cruiser 250	103	.	168	48	25	**0**	87
AGSOURCE/ 5X-100A RR/HXT + Poncho	100	.	165	48	31	**0**	**94**
AGSOURCE/ 3T-302 VT3 + Cruiser 250	102	.	165	48	35	**0**	**95**
EPLEY/ EXP1307HXLLRR + Cruiser 250	100	.	162	46	30	**0**	91
NUTECH/ 3T-801 VT3 + Poncho 250	100	.	154	45	34	**0**	91
Trial avg.:	99	185	192	47	26	0	93
High avg.:	103	199	217	50	35	1	97
Low avg.:	96	164	154	45	20	0	92
[5] LSD(.05):		28	13	1	2	NS	4
[6] Min.TPG value:		171	204	49	.	.	93
[7] Max.TPG value:		.	.	.	22	1	.
[8] Coef. of var.:		5	4	2	5	420	3
No. entries:	36	12	36	36	36	36	36

[1] Entries are listed by Brand/Hybrid and sorted by 2-yr then by 2009 yield average.

* Values in **bold type** within a column are included in the top-performance group.
Note that additional table footnotes are explained in table A.

OAT PROJECT

Lon Hall

(web site: http://plantsci.sdstate.edu/oats/index.htm)

The oat program's objective is to develop oat varieties for producers in South Dakota and surrounding states. Multipurpose varieties are being developed to satisfy more than one market. These varieties may be used in double cropping, as a companion crop, forage, and/or harvested for grain. The desired agronomic traits are high grain and/or forage yield potential, high-test weight, disease resistance, straw strength, white hulled or hulless, and maturity adaptation for South Dakota's diverse regional environments.

'Shelby427', a white-hulled spring oat, was developed by the South Dakota Agricultural Experiment Station (SDAES) and approved for release in 2010. Shelby427 was tested as experimental line SD031128-330. SD031128-330 is a F10 derived line developed from the two-parent population SD99674/ND960851. Shelby427, when compared to 'Jerry' and 'Reeves', has superior grain yield, test weight, crown rust, and lodging resistance. Shelby427 has a medium plant height and an early-medium maturity (table 1). It also has a high groat percentage, very good stem rust, and barley yellow dwarf virus resistance.

TABLE 1. STANDARD VARIETY OAT PEFORMANCE TRIAL SUMMARY:

	8loc 2008 Yield Bu/a	8loc 2009 Yield Bu/a	16loc Avg. Yield Bu/a	16loc Avg. Test Wt. Lbs/bu	5loc Avg Straw Strength 1-5	4loc Avg Heading >June	16loc Avg Height inches	Brookings Crown Rust %	16loc Avg Protein %
Souris	129	129	129	36.6	1.6	28.5	37.0	4	14.3
HiFi, 8	125	129	127	36.0	2.4	30.1	41.0	4	14.3
Shelby427	120	128	124	38.2	2.3	24.9	40.0	0	14.5
Beach, 6	122	121	121.5	37.8	2.4	28.4	43.5	49	13.9
Stallion, 8	119	113	116	37.6	4.0	28.7	41.0	16	14.8
SD060966	115	112	113.5	38.5	3.3	21.0	34.5	94	14.6
Morton, 7	115	110	112.5	36.2	1.8	29.8	43.0	65	14.4
Colt	112	107	109.5	38.0	2.9	22.6	36.0	89	15.0
Jerry, 5	113	101	107	37.3	2.6	26.4	40.0	79	15.0
Don, 2	107	104	105.5	36.1	2.6	23.8	33.5	80	14.3
Reeves, 2	104	104	104	37.5	4.0	23.9	40.0	76	15.3
Hytest, 4	93	87	90	37.6	3.5	27.1	41.5	51	15.8
Buff Hls, 3	89	94	91.5	44.0	2.0	24.1	35.5	50	16.1
Streaker	90	90	90	43.7	3.8	25.8	38.5	33	16.6
Stark Hls, 6	77	100	88.5	40.3	2.7	32.7	41.5	21	15.6
Mean	108.7	108.6	108.6	38.3	2.8	26.5	39.1	47	14.9

1 RATING IS BEST

Program Synopsis:

Parents in the crossing block were selected for specific traits. The desired combination of traits cannot always be acquired in two-way crosses; therefore, some combinations were made specifically for three-way crosses. The 2009 spring crossing block yielded 401 successful unique genetic combinations. Two hundred and thirty five of these were selected for F1 increase in the fall greenhouse cycle. Thirty-six high avenathramide/beta-glucan populations were selected for rapid generation advancement. The goal is to develop hulless and hulled varieties for human consumption from these populations. There were a total of 4,692 yield plots grown in the field. Plot locations include Brookings, South Shore, Beresford, Miller, and Brookings Buckthorn. The numbers of unique bulk populations grown were 256 bulk F2s and 120 bulk F3s. There were 1,704 lines derived from F5, F7, F8, and/or F9 generations grown in unreplicated Preliminary Yield Trials (PYT) at the Northeast Farm or the Brookings location. The number of unique lines grown in replicated Advanced Yield Trials (AYT) and regional nurseries were 264 and 143 respectively. Thirty-six lines of SD030888BC1 backcrosses and twelve SD060966 derivatives were yield tested and underwent a simultaneous preliminary increase. SD031128-330 was released as variety and named Shelby427. Fifteen thousand plants consisting of 36 populations were screened for kernel type and crown rust in the fall greenhouse cycle. Approximately 3000 selected single seed descent seeds will be planted in the spring greenhouse cycle of which 1,500 will be harvested for yield trials.

Production Research: For information on fertility and fungicide trials see web site for summarized data.

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Spring Wheat Breeding

Karl D. Glover

Our primary objective is to improve the agronomic, milling, and baking characteristics of spring wheat cultivars that are well adapted to South Dakota. Prior to the release of a new cultivar to growers, its advantageous features must be well documented. Characterization of material begins during the second growing season after a cross has been made. Thousands of breeding lines, each representing a potential cultivar, are created yearly and are subject to removal from consideration based on their susceptibility to disease and lack of agronomic promise. Lines chosen for additional testing are more heavily scrutinized with each successive testing year. Therefore, the number of lines included in preliminary and advanced yield tests is relatively few compared to early generation tests. Spring wheat production environments in our state can be dramatically different from year-to-year and even from location-to-location within a year. Unfortunately, this prevents cultivars from being optimally adapted to all production environments. This necessitates that preliminary and advanced yield tests also be conducted in several environments throughout the state. The Northeast Research Station is one of two locations used for testing material in both early- and advanced-selection stages.

Thirty-three experimental lines appearing to hold the most potential for release as a cultivar were included in the 2009 Advanced Yield Trials (AYT) along with twelve released cultivars included for comparative purposes. Not all thirty-three entries will be selected for continued testing in 2010. Table 1 presents statewide agronomic and Fusarium head blight resistance observations collected from twenty-seven entries that were grown in both the 2008 and 2009 AYT, as well as grain yield observations from the Northeast Research Station. Statewide data for each entry are presented as an average over seven AYT locations (Aurora, Brookings, Groton, Miller, Redfield, Selby, and South Shore) from both 2008 and 2009 (14 location-year combinations).

Among the experimental lines presently being considered for release, SD4011 appears most promising as a new cultivar due to its yield potential, test weight, short plant stature, and excellent end-use qualities (data not shown). Breeder seed of SD4011 will be increased in South Dakota during 2010 and may be released to Registered seed producers in 2011.

Efforts carried out, and cultivars released, by this program are made possible primarily with financial support provided by the South Dakota Agricultural Experiment Station, South Dakota Wheat Commission, and South Dakota Crop Improvement Association.

Table 1. Agronomic and disease resistance performance data of sixteen hard red spring wheat experimental lines evaluated in 2008 and 2009 Advanced Yield Trials.

Entry	Northeast Research Station Yield (bu/ac)			2008 - 2009 Statewide Averages *					
	2008	2009	2yr.	TW (lb/bu)	Heading (Day)***	Height (in)	Pro (%)	DIS (%)***	Yield (bu/ac)
FALLER	73.6	60.8	67.2	57.6	28.6	34.9	14.2	32.7	62.0
TRAVERSE	71.1	66.6	68.8	55.6	24.9	36.3	13.7	32.3	60.4
SD4073	80.0	46.4	63.2	55.4	27.3	35.4	14.0	35.7	59.3
SD4076	74.1	59.0	66.5	58.9	23.6	33.5	14.3	36.0	58.3
SD4023	66.2	56.2	61.2	57.9	27.8	33.1	13.8	36.3	58.3
KNUDSON	71.8	58.7	65.3	57.7	26.2	33.8	14.4	35.7	57.8
STEELE-ND	77.3	48.7	63.0	58.1	26.4	35.3	14.8	41.5	57.2
SD4035	68.0	52.6	60.3	56.1	25.4	33.0	14.0	40.3	56.5
SD4112	74.4	54.6	64.5	57.7	23.9	34.5	14.1	36.4	56.1
SELECT	67.5	50.1	58.8	58.6	23.5	35.0	14.2	29.5	56.0
BRICK	65.8	58.9	62.4	58.7	22.8	35.3	14.3	30.4	55.5
SD4024	72.0	40.0	56.0	57.1	28.2	31.6	14.1	41.6	55.5
SD4036	65.3	56.7	61.0	56.2	24.9	30.6	13.8	39.3	55.4
SD3997	66.7	51.5	59.1	58.2	25.4	37.9	14.8	32.9	55.1
BRIGGS	68.8	51.6	60.2	57.1	24.0	34.8	14.4	32.9	54.6
SD4011	69.4	52.4	60.9	56.4	25.3	33.2	14.8	36.3	54.1
SD4046	62.0	52.1	57.1	58.0	25.4	36.8	13.8	33.4	54.1
SD4105	71.0	54.7	62.9	58.4	24.9	35.0	13.8	34.4	53.5
SD4136	62.1	40.7	51.4	55.4	23.3	34.2	13.8	37.6	53.5
RUSS	60.6	46.9	53.7	55.4	26.5	36.6	14.3	41.8	53.1
GRANGER	65.5	45.0	55.3	57.5	25.7	36.9	14.3	41.9	52.6
SD4119	68.1	48.8	58.4	58.7	26.8	35.0	14.1	36.8	52.4
SD4109	71.9	40.2	56.1	56.1	25.9	34.2	13.9	41.3	52.0
OXEN	57.9	48.7	53.3	54.5	25.5	33.2	14.2	38.5	51.6
ALSEN	66.3	48.5	57.4	57.6	26.6	33.8	15.1	30.9	51.1
KELBY	68.4	48.9	58.7	57.2	24.9	30.0	15.0	37.1	50.3
REEDER	54.7	41.1	47.9	55.4	27.1	34.1	14.4	47.0	49.3
MEAN	68.2	51.1	59.6	57.1	25.6	34.4	14.2	36.7	55.0
LSD (0.05)	8.7	9.1	6.2	0.4	1.6	1.6	0.2	8.0	2.7
CV (%)	8.3	13.1	8.3	2.2	5.9	5.3	2.8	11.5	5.6

* Performance based on 14 AYT locations grown in 2008 and 2009.

** Heading date expressed as days after 1 June.

*** DIS (%) calculated as product of average incidence and average severity of entries tested for Fusarium head blight resistance at Brookings nursery in 2008 and 2009.

Northeast Research Farm Annual Report

2009 Alfalfa Production

Vance Owens and Chris Lee

Alfalfa cultivars are tested at several South Dakota research stations. Our objective is to provide producers with yield data from currently available alfalfa cultivars to aid them in cultivar selection. Even though our yield trial does not contain all available cultivars, it should be a helpful tool in identifying cultivars suitable for your specific needs.

Materials and Methods

Six replications of each cultivar were planted 1 May 2006 at a rate of 18 lbs pure live seed/acre. Fifty pounds super phosphate (P_2O_5) was applied and incorporated before planting. Later fertilizer application was made when necessary as recommended by the South Dakota State Soil Testing Laboratory. Forage was harvested with a sickle-type harvester equipped with a weigh bin for obtaining fresh plot weights. Random subsamples from the fresh herbage were taken to determine percent dry matter. Alfalfa cultivars were evaluated for maturity prior to harvest. Yield differences among cultivars were tested using the LSD at the 0.10 level of probability when significant F-tests were detected by analysis of variance.

Results

Table 1 provides forage production data for 12 alfalfa cultivars planted in 2006 and Table 2 is for 10 cultivars planted in 2008. Two cuttings were obtained from the 2006 trial while three cuttings were taken from the 2008 trial. Cultivars are ranked from highest to lowest based on cumulative production. The least significant difference (LSD) listed at the bottom of each table is used to identify significant differences between the cultivars. If the difference in yield between two cultivars exceeds the given LSD, then they are significantly different.

Acknowledgements

Financial support for this research was provided by marketers of the various alfalfa seed entries and by the South Dakota Agricultural Experiment Station.

Table 1. Forage yield of 12 alfalfa cultivars entered in the South Dakota State University alfalfa testing program. Trial was planted 1 May 2006 at the Northeast Research Farm.

	2009			2008	2007	3-year
Entry	12-Jun	15-Jul	Total	Total	Total	Total
	Tons Dry Matter/Acre					
WL 343	0.96	1.28	2.24	4.38	6.07	12.68
6443 RR	1.16	1.35	2.51	4.38	5.44	12.32
Melton	0.90	1.24	2.14	4.24	5.46	11.83
Genoa	1.07	1.19	2.26	4.09	5.44	11.78
DKA 41-18RR	1.03	1.14	2.18	4.48	5.11	11.76
DKA 34-17RR	1.00	1.19	2.18	4.10	5.25	11.52
53Q30	0.99	1.16	2.15	3.98	5.27	11.41
54V46	0.90	0.95	1.86	4.07	5.31	11.23
Shaw	0.85	1.05	1.89	3.99	5.33	11.22
Mustang 420	0.83	1.11	1.94	4.11	5.14	11.19
Vernal	0.58	0.93	1.51	3.74	5.54	10.79
6400 HT	0.72	1.00	1.72	3.51	5.42	10.66
Average	0.92	1.13	2.05	4.09	5.40	11.53
Maturity (Kalu & Fick)	5.1	4.4				
LSD (P=0.10)	0.24	0.21	0.41	NS	NS	NS
CV (%)	26.6	19.5	20.5	14.5	13.0	12.7
P-value	0.012	0.035	0.013	0.263	0.686	0.485

NS = not significant at 0.10 level of probability
50 lbs P2O5/Acre - preplant
Treflan applied preplant

Table 2. Forage yield of 10 alfalfa cultivars entered in the South Dakota State University alfalfa testing program. Trial was planted 6 May 2008 at the Northeast Research Farm.

	2009			
Entry	12-Jun	15-Jul	10-Aug	Total
	---------- Tons Dry Matter/Acre ----------			
Producers A4330	1.76	1.68	1.39	4.84
Rebound 5.0	1.67	1.67	1.25	4.59
LegendDairy 5.0	1.55	1.67	1.30	4.51
54V09	1.64	1.62	1.06	4.31
Ameristand 407TQ	1.54	1.48	1.21	4.23
DKA 43-13	1.28	1.55	1.20	4.03
Garst 6417	1.34	1.42	1.06	3.82
WL 343HQ	1.23	1.41	1.08	3.71
55V48	1.29	1.36	1.03	3.68
Vernal	1.33	1.44	0.72	3.49
Average	1.46	1.53	1.13	4.12
Maturity (Kalu & Fick)	4.6	4.8	4.4	
LSD (P=0.10)	0.31	NS	0.20	0.67
CV (%)	22.2	16.7	18.1	16.8
P-value	0.050	0.224	< 0.001	0.021

NS = not significant at 0.10 level of probability
50 lbs P2O5/Acre - preplant

Weed Control - W.E.E.D. Project

M. Moechnig, D. Deneke, D. Vos, and J. Alms

Introduction

The Northeast Station provides a strategic location to collect weed control data for northeastern South Dakota. Field plots provide side-by-side comparisons and comparative performance data. Plots are evaluated for weed control and crop tolerance. Yields were harvested from selected studies.

2009 Research and Demonstration Projects

1. Corn Herbicide Demonstration
2. Weed Control Programs with Sharpen and Integrity
3. Weed Control in Liberty Link Corn
4. Deposition Aids with Laudis and Ignite
5. Laudis with Deposition Aids
6. Mesotrione Mixes in Corn
7. Helm Products in Corn
8. Soybean Herbicide Demonstration
9. Weed Control w/Ignite in Liberty Link Soybeans
10. Authority Products in Liberty Link Soybean
11. Valor Weed Programs in Soybean
12. Grass Control in Spring Wheat
13. Puma & Rimfire Max in Spring Wheat
14. Broadleaf Weed Control with Pulsar and Orion
15. Wolverine - Broadleaf Control in Spring Wheat
16. Huskie - Broadleaf Control in Spring Wheat
17. Broadleaf Control with Vida in Spring Wheat
18. Pre-Pare in Spring Wheat
19. Sharpen Burndown - No-Till Wheat
20. Valor Wheat Desiccation
21. Glyphoate Tank-Mix Contamination in Conventional Spring Wheat
22. Sharpen in Proso Millet

The most commmon broadleaf weed species included common lambquarters, pigweed species, kochia, wild buckwheat, and wild mustard. Green foxtail was the most common grass weed species.

Additional experiments were also conducted at the Northeast Research Station to evaluate experimental herbicides. Results from these studies may be released at a later time when those products are registered for use in South Dakota. Results from other research stations are printed in the 2009 Weed Control Field Test Data (EMC 678) or on the internet at http://plantsci.sdstate.edu/weeds/. This internet site also contains research results from previous years at the Northeast Experiment Station and other locations across South Dakota.

ACKNOWLEDGEMENT

Local Extension educators assist with identifying research needs, conducting tours, and incorporating research results into crop production recommendations for growers. Funding for this research is provided by:

1. South Dakota Soybean and Research and Promotion Council
2. South Dakota Wheat Commission
3. Consortium for Alternative Crops
4. Crop protection industries

NOTE: Data reported in this publication are results from field tests that include labeled product uses, experimental products or experimental rates, combinations, or other unlabeled uses for herbicide products. Refer to the appropriate weed control fact sheets available from county extension offices for herbicide recommendations.

Table 1. Corn Herbicide Demonstration

RCB; 4 reps
Variety: Pio 37Y14
Planting Date: 5/6/09
PRE: 5/6/09
POST: 6/5/09; Corn 3 lf, 2 collar, 4-5 in; Grft 4 lf tillered, 1-4 in; Colq 1-3 in; Wibw 3-4 lf, 2-3 in; Rrpw 1-2 in.
Soil: Clay loam; 4.1% OM; 5.8 pH

Precipitation:

PRE:	1st week	0.20 inches
	2nd week	0.21 inches
POST:	1st week	1.24 inches
	2nd week	0.91 inches

Grft=Green foxtail
Colq=Common lambsquarter
Wibw=Wild buckwheat
Rrpw=Redroot pigweed

Comments: The objective of this study was to evaluate weed control in conventional, Roundup Ready, or Liberty Link programs. Only one RR/LL corn variety was used for all herbicide treatments in this study. Weed control in the BreakFree followed by Laudis+atrazine treatment was less than expected because a proper adjuvant was not added. In the RR and LL programs, Roundup alone or one application of Ignite (glufosinate) + atrazine resulted in slightly less weed control than the other tank mix or two pass programs. Despite differences in weed control, corn yield was simiar among most of the herbicide treatments. In summary, results from this study indicated that weed control was generally more consistent in the RR and LL programs than the conventional programs and one application of Roundup or Ignite + atrazine was not adequate to achieve complete weed control.

Treatment	*Rate/A*	*% Grft 6/5/09*	*% Colq 6/5/09*	*% Wibw 6/5/09*	*% Grft 7/21/09*	*% Wibw 7/21/09*	*% Rrpw 7/21/09*	*% Colq 7/21/09*	*Corn Yield bu/A*
Check	----	0 c	0 c	0 c	0 d	0 c	0 e	0 e	40 c
PREEMERGENCE									
Integrity	17 oz	85 ab	97 a	98 a	78 abc	83 a	89 c	81 d	108 b
Corvus+atrazine	3 oz+1 qt	84 ab	98 a	96 ab	79 abc	58 b	96 a	90 c	136 ab
PREEMERGENCE & POSTEMERGENCE									
BreakFree&Laudis+atrazine	1.5 pt&3 oz+1 pt	91 a	93 ab	75 ab	89 ab	55 b	98 a	76 d	124 ab
POSTEMERGENCE									
Status+Option+ MSO+28% N	5 oz+1.5 oz+ 1.5 pt+2 qt	—	—	—	75 abc	95 a	90 bc	93 abc	131 ab
Stout+atrazine+ COC+AMS	0.75 oz+1.5 pt+ 1.5 pt+2 lb	—	—	—	76 abc	93 a	98 a	98 ab	146 ab
Check	----	—	—	—	0 d	0 c	0 e	0 e	44 c
PREEMERGENCE & POSTEMERGENCE									
Harness Xtra 6L& Roundup WeatherMax+AMS	1 qt& 22 oz+2.5 lb	90 a	95 ab	92 ab	90 ab	92 a	98 a	97 ab	151 a
SureStart&Durango+AMS	1.75 pt&22 oz+2.5 lb	85 ab	95 ab	96 ab	81 abc	92 a	94 ab	89 c	146 ab
POSTEMERGENCE									
Roundup WeatherMax+AMS	22 oz+2.5 lb	—	—	—	69 bc	88 a	71 d	76 d	132 ab
Halex GT+atrazine+AMS	3.6 pt+1 pt+2.5 lb	—	—	—	92 a	93 a	98 a	98 ab	148 ab
Roundup WeatherMax+ atrazine+AMS	1.5 qt+ 1 qt+2.5 lb	—	—	—	76 abc	95 a	98 a	99 a	145 ab
Check	----	—	—	—	0 d	0 c	0 e	0 e	56 c

Table 1. Corn Herbicide Demonstraton (Continued . . .)

Treatment	Rate/A	% Grft 6/5/09	% Colq 6/5/09	% Wibw 6/5/09	% Grft 7/21/09	% Wibw 7/21/09	% Rrpw 7/21/09	% Colq 7/21/09	Corn Yield bu/A
PREEMERGENCE & POSTEMERGENCE									
Corvus+atrazine& Ignite 280+AMS	2.5 oz+1 pt& 22 oz+2.5 lb	85 ab	89 b	89 ab	88 ab	80 a	96 a	94 abc	147 ab
Balance Flexx+atrazine& Ignite 280+AMS	3 oz+1 pt& 22 oz+2.5 lb	78 b	97 a	71 b	82 abc	81 a	96 a	97 ab	153 a
BreakFree&Ignite 280+AMS	1.5 pt&22 oz+2.5 lb	91 a	94 ab	84 ab	90 ab	82 a	97 a	92 bc	147 ab
POSTEMERGENCE									
Ignite 280+atrazine+AMS	22 oz+1 pt+2.5 lb	—	—	—	73 abc	87 a	88 c	95 abc	141 ab
Ignite 280+Laudis+atrazine+ COC+AMS	22 oz+2 oz+1 pt+ 1 pt+1%+1.5 lb	—	—	—	61 c	94 a	98 a	98 ab	140 ab
LSD (.05)		7	5	17	13	16	4	4	24

Table 2. Weed Control Programs with Sharpen and Integrity

RCB; 4 reps
Variety: DKC 43-27
Planting date: 5/6/09
PRE: 5/6/09
POST: 6/11/09; Corn 3-4 lf; Rrpw 2-5 in; Wibw 1-4 in; Yeft 1-5 in.
Soil: Clay loam; 4.1% OM; 5.8 pH

Precipitation:

PRE:	1st week	0.20 inches
	2nd week	0.21 inches
POST:	1st week	0.46 inches
	2nd week	0.78 inches

Rrpw=Redroot pigweed
Wibw=Wild buckwheat
Yeft=Yellow foxtail

Comments: The objective of this study was to evaluate herbicide programs that include Sharpen (saflufenacil) or Integrity (saflufenacil + dimethenamid) in corn. Ratings on June 11 indicated weed control associated with the pre-emergence applications. Several of the pre-emergence treatments resulted in very good weed control. Both Integrity and SureStart (acetochlor + flumetsulam +clopyralid) are non-atrazine products, but Integrity at 17 oz/A resulted in greater wild buckwheat control. Adding Sharpen at 1 oz/A to Corvus (thiencarbazone + isoxaflutole) resulted in less than 90% wild buckwheat control suggesting that either a higher rate was needed or atrazine could be a better tank mix partner. On June 27, weed escapes became apparent in the one pass pre-emergence treatments but all treatments with post-emergence applications of Roundup resulted in excellent weed control. Weed escapes in the Harness Xtra (acetochlor + atrazine) treatments reduced corn yield, but yield was statistically similar among the other treatments. In summary, results from this study indicated that the saflufenacil herbicides may be effective components of weed management in RR corn.

Treatment	Rate/A	% Rrpw 6/11/09	% Wibw 6/11/09	% Yeft 6/11/09	% Yeft 6/27/09	% Rrpw 6/27/09	% Wibw 6/27/09	% Yeft 9/29/09	% Rrpw 9/29/09	Corn Yield bu/A
Check	----	0 d	0 e	0 c	0 c	0 d	0 d	0 d	0 e	66 c
PREEMERGENCE										
Lumax	96 oz	99 ab	92 abc	96 a	81 b	94 b	85 b	82 bc	90 b	191 ab
Harness Xtra 6L	32 oz	97 ab	83 cd	94 a	81 b	78 c	73 c	81 bc	45 d	159 b
Integrity	25 oz	98 ab	93 abc	91 a	79 b	92 b	94 a	75 c	85 c	181 ab
Corvus+atrazine	5.6 oz+32 oz	99 a	93 abc	93 a	92 a	93 b	84 b	90 ab	94 ab	197 a
PREEMERGENCE & POSTEMERGENCE										
Integrity&	17 oz&									
Roundup PowerMax+	22 oz+									
NIS+AMS	0.25%+3.4 lb	96 bc	96 a	91 a	99 a	99 a	99 a	96 a	98 a	199 a
Harness Xtra&	32 oz&									
Roundup PowerMax+	22 oz+									
NIS+AMS	0.25%+3.4 lb	94 c	78 d	90 a	99 a	99 a	97 a	96 a	99 a	205 a
Sharpen+Harness Xtra&	3 oz+32 oz&									
Roundup PowerMax+	22 oz+									
NIS+AMS	0.25%+3.4 lb	99 a	95 ab	88 a	99 a	99 a	99 a	96 a	99 a	199 a
SureStart&	32 oz&									
Roundup PowerMax+	22 oz+									
NIS+AMS	0.25%+3.4 lb	97 ab	78 d	90 a	99 a	99 a	98 a	95 a	97 a	209 a
Integrity&	17 oz&									
Roundup PowerMax+	22 oz+									
Status+	2.5 oz+									
NIS+AMS	0.25%+3.4 lb	98 ab	92 abc	86 a	99 a	99 a	99 a	96 a	99 a	204 a
PREEMERGENCE										
Corvus+Sharpen	3.3 oz+1 oz	98 ab	84 bcd	77 b	75 b	95 ab	75 c	85 abc	84 c	172 ab
LSD (.05)		2	7	7	8	3	7	8	4	25

Table 3. Weed Control in Liberty Link Corn

RCB: 4 reps
Variety: Pio 37Y14
Planting Date: 5/6/09
PRE: 5/6/09
EPOST: 6/4/09; Corn 2-3 lf; Grft 4 lf, 1-4 in; Rrpw 1-2 in; Wibw 1-2 in; Colq 1-3 in.
MIDPOST: 6/11/09; Corn 4-5 lf; Grft 1-6 in; Rrpw 2-5 in; Wibw 1-4 in; Colq 2-6 in.
Soil: Clay loam; 4.1% OM; 5.8 pH

Precipitation:

PRE:	1st week	0.20 inches
	2nd week	0.21 inches
EPOST:	1st week	1.24 inches
	2nd week	0.46 inches
MIDPOST:	1st week	0.46 inches
	2nd week	0.78 inches

Grft=Green foxtail
Rrpw=Redroot pigweed
Wibw=Wild buckwheat
Colq=Common lambsquarters

Comments: The objective of this study was to evaluate weed control associated with conventional or Liberty Link weed control programs that include Laudis (tembotrione), Corvus (isoxaflutole + thiencarbazone), and Capreno (tembotrione + thiencarbazone). Several of the single pass EPOST and PRE followed by POST treatments resulted in nearly complete weed control.

Treatment	Rate/A	% Grft 6/4/09	% Rrpw 6/4/09	% Grft 7/2/09	% Wibw 7/2/09	% Rrpw 7/2/09	% Grft 9/16/09	% Rrpw 9/16/09	% Colq 9/16/09
PREEMERGENCE									
Corvus+atrazine	5.6 oz+2 pt	93 a	98 a	82 ab	86 ab	92 a	84 b	92 b	92 b
Balance Flexx+atrazine	6 oz+2 pt	95 a	98 a	78 b	78 b	85 b	87 ab	88 c	93 b
EARLY POSTEMERGENCE									
Corvus+atrazine+NIS	5.6 oz+2 pt+0.25%	—	—	96 a	99 a	99 a	93 ab	99 a	99 a
Balance Flexx+atrazine+NIS	6 oz+2 pt+0.25%	—	—	93 a	99 a	99 a	95 ab	99 a	99 a
Capreno+atrazine+COC+AMS	3 oz+2 pt+1%+1.5 lb	—	—	96 a	99 a	99 a	91 ab	99 a	99 a
Impact+atrazine+Outlook+ MSO+28% N	0.5 oz+1 pt+10 oz+ 1%+1.5 qt	—	—	95 a	99 a	99 a	91 ab	99 a	99 a
PREEMERGENCE & MID-POSTEMERGENCE									
Corvus&Laudis+atrazine+ MSO+AMS	3 oz&3 oz+2 pt+ 1%+1.5 lb	81 b	95 a	96 a	99 a	99 a	92 ab	99 a	99 a
Balance Flexx&Laudis+ Atrazine+MSO+AMS	3 oz&3 oz+ 2 pt+1 %+1.5 lb	85 ab	96 a	97 a	99 a	99 a	95 ab	99 a	99 a
Corvus&Ignite 280+Laudis+ MSO+AMS	3 oz&22 oz+2 oz+ 1%+1.5 lb	86 ab	98 a	95 a	98 a	99 a	93 ab	99 a	99 a
Balance Flexx&Ignite 280+ Laudis+MSO+AMS	3 oz&22 oz+ 2 oz+1%+1.5 lb	87 ab	97 a	96 a	95 a	99 a	93 ab	99 a	99 a
Corvus&Capreno+atrazine+ COC+AMS	3 oz&3 oz+2 pt+ 1%+1.5 lb	87 ab	97 a	97 a	99 a	99 a	97 a	99 a	99 a
Balance Flexx&Capreno+ Atrazine+COC+AMS	3 oz&3 oz+ 2 pt+1%+1.5 lb	81 b	96 a	95 a	99 a	99 a	91 ab	99 a	99 a
Check	----	—	—	0 c	0 c	0 c	0 c	0 d	0 c
LSD (.05)		7	3	10	10	6	7	3	2

Table 4. Deposition Aids with Laudis and Ignite

RCB; 4 reps
Variety: Pio 37Y14
Planting Date: 5/6/09
POST: 6/4/09;Corn 2-3 lf, 1-2 collar; Rrpw 1-2 in; Wibw 1-2 in; Wimu 1-3 in; Yeft 1-4 in; Bygr 1-4 in.
Soil: Clay loam; 4.1% OM; 5.8 pH

Precipitation:
POST: 1st week 1.24 inches
2nd week 0.46 inches

Rrpw=Redroot pigweed
Wibw=Wild buckwheat
Wimu=Wild mustard
Yeft=Yellow foxtail
Bygr=Barnyardgrass

Comments: The objective of this study was to evaluate the effect of drift reduction agents on weed control associated with Laudis (tembotrione) + Ignite (glufosinate) mixes. Laudis resulted in slightly greater weed control than Ignite. The drift reduction agents did not significantly reduce weed control indicating that the Laudis + Ignite mix was compatible with many different drift reducing products.

Treatment	*Rate/A*	*% Yeft 7/2/09*	*% Rrpw 7/2/09*	*% Wibw 7/2/09*	*% Wimu 7/2/09*	*% Yeft 9/29/09*	*% Bygr 9/29/09*	*% Rrpw 9/29/09*
Check	----	0 c	0 c	0 c	0 c	0 c	0 c	0 e
POSTEMERGENCE								
Ignite 280+AMS	22 oz+1.5 lb	58 b	53 b	92 a	92 b	61 b	63 b	71 d
Laudis+MSO+AMS	2 oz+1 pt+1.5 lb	80 a	89 a	68 b	99 a	79 a	85 a	92 ab
Ignite 280+Laudis+AMS	22 oz+2 oz+1.5 lb	81 a	90 a	91 a	99 a	80 a	81 a	91 ab
Ignite 280+Laudis+ Weathergard Complete	22 oz+2 oz+ 2 qt/100 gal	84 a	91 a	88 a	99 a	84 a	86 a	91 ab
Ignite 280+Laudis+Array	22 oz+2 oz+9 lb/100 gal	85 a	86 a	88 a	97 a	82 a	83 a	86 bc
Ignite 280+Laudis+ Class Act NG+Interlock	22 oz+2 oz+ 5 qt/100 gal+4 oz	87 a	91 a	92 a	99 a	83 a	83 a	93 a
Ignite 280+Laudis+ Gardian Plus	22 oz+2 oz+ 2.5 gal/100 gal	76 a	87 a	85 a	99 a	78 a	80 a	92 ab
Ignite 280+Laudis+ Hel-fire+Grounded	22 oz+2 oz+ 2 pt/100 gal+1 gal/100 gal	82 a	89 a	86 a	99 a	78 a	83 a	92 ab
Ignite 280+Laudis+ Doubledown	22 oz+2 oz+ 2.5 gal/100 gal	84 a	85 a	87 a	99 a	86 a	88 a	90 ab
Ignite 280+Laudis+ Border Xtra 8L	22 oz+2 oz+ 2.5 gal/100 gal	82 a	86 a	89 a	99 a	81 a	83 a	91 ab
Ignite 280+Laudis+ Bronc Max E.D.T.	22 oz+2 oz+ 2 qt/100 gal	84 a	88 a	86 a	98 a	78 a	80 a	83 c
Ignite 280+Laudis+ Request+Grounded	22 oz+2 oz+ 2 qt/100 gal+1 gal/100 gal	86 a	90 a	88 a	99 a	86 a	89 a	92 ab
LSD (.05)		7	4	6	2	8	6	4

Table 5. Laudis with Deposition Aids

RCB; 4 reps
Variety: DKC 43-27
Planting Date: 5/6/09
EPOST: 6/4/09; Corn 2-3 lf, 1-2 collar; Grft 4 lf, 1-4 in; Rrpw 1-2 in; Wibw 1-2 in; Wimu 1-5 in.
Soil: Clay loam; 4.1% OM; 5.8 pH

Precipitation:
EPOST: 1st week 1.24 inches
2nd week 0.46 inches

Grft=Green foxtail
Rrpw=Redroot pigweed
Wibw=Wild buckwheat
Wimu=Wild mustard

Comments: The objective of this study was to evaluate the effect of deposition aids on Laudis (tembotrione) activity. Deposition aids or drift reduction agents can change droplet sizes which can affect herbicide activity. Laudis and Capreno (tembotrione + thiencarbazone) resulted in very good broadleaf weed control, but Capreno resulted in better foxtail control. None of the deposition aids significantly reduced weed control from Laudis in this study.

Treatment	***Rate/A***	***% Grft 6/27/09***	***% Rrpw 6/27/09***	***% Wibw 6/27/09***	***% Wimu 6/27/09***	***% Grft 9/30/09***	***% Rrpw 9/30/09***
Check	—	0 d	0 c	0 b	0 b	0 d	0 b
EARLY POSTEMERGENCE							
Laudis+atrazine+MSO+AMS	3 oz+1 pt+1%+1.7 lb	89 ab	98 a	98 a	99 a	88 abc	97 a
Impact+atrazine+MSO+AMS	0.75 oz+1 pt+1%+1.7 lb	81 c	89 b	99 a	99 a	80 c	96 a
Capreno+atrazine+MSO+AMS	3 oz+1 pt+0.5%+1.7 lb	97 a	99 a	99 a	99 a	96 a	99 a
Laudis+atrazine+ MSO+AMS+Compadre	3 oz+1 pt+ 1%+1.7 lb+1 pt/100 gal	92 ab	98 a	99 a	99 a	90 ab	97 a
Laudis+atrazine+ MSO+AMS+Interlock	3 oz+1 pt+ 1%+1.7 lb+4 oz	90 ab	99 a	99 a	99 a	88 abc	98 a
Laudis+atrazine+ MSO+AMS+Grounded	3 oz+1 pt+ 1%+1.7 lb+1 gal/100 gal	88 b	98 a	99 a	99 a	85 bc	95 a
Laudis+atrazine+ MSO+Array	3 oz+1 pt+ 1%+9 lb/100 gal	91 ab	98 a	98 a	99 a	90 ab	97 a
Laudis+atrazine+ MSO+AMS+Gardian	3 oz+1pt+ 1%+1.7 lb+2 qt/100 gal	90 ab	99 a	99 a	99 a	90 ab	98 a
Laudis+atrazine+ MSO+AMS+Affect GC	3 oz+1 pt+ 1%+1.7 lb+4 oz/100 gal	85 bc	95 a	99 a	99 a	83 bc	95 a
Laudis+atrazine+ MSO+AMS+Border EG	3 oz+1 pt+ 1%+1.7 lb+10 oz/100 gal	88 b	99 a	99 a	99 a	85 bc	96 a
Laudis+atrazine+ In-Place+MSO+AMS	3 oz+1 pt+ 1.1875 oz+1%+1.7 lb	91 ab	99 a	99 a	99 a	87 bc	98 a
LSD (.05)		5	3	1	0	6	4

Table 6. Mesotrione Mixes in Corn

RCB; 4 reps
Variety: DKC 43-27
Planting Date: 5/6/09
POST: 6/4/09; Corn 2-3 lf, 1-2 collar; Rrpw 1-2 in; Wibw 3-4 lf, 2-3 in; Wimu 1-5 in; Yeft 1-4 in.
Soil: Clay loam; 4.1% OM; 5.8 pH

Precipitation:
POST: 1st week 1.24 inches
2nd week 0.46 inches

Rrpw=Redroot pigweed
Wibw=Wild buckwheat
Wimu=Wild mustard
Yeft=Yellow foxtail

Comments: The objective of this study was to evaluate herbicide mixes with mesotrione (e.g. Callisto) in corn. To get adequate wild buckwheat control, it was necessary to tank mix Roundup, Ignite, or atrazine. Tank mixing mesotrione + Resolve with Ignite resulted in incomplete pigweed control. The greatest overall weed control occurred in the treatments that contained atrazine. In summary, results from this study indicated several tank mixes with mesotrione may be effective, but continuing to add atrazine in the mix may still be important to optimize control.

Treatment	***Rate/A***	***% Yeft 6/27/09***	***% Rrpw 6/27/09***	***% Wibw 6/27/09***	***% Wimu 6/27/09***	***% Yeft 9/29/09***	***% Rrpw 9/29/09***	***Corn Yield bu/A***
POSTEMERGENCE								
Resolve+Mesotrione+ COC+AMS	1.2 oz+2.5 oz+ 1%+2 lb	91 abc	92 bc	85 c	99 a	88 bc	93 abc	190 a
Cinch ATZ+Resolve+ Mesotrione+COC+AMS	1 qt+1.2 oz+ 2.5 oz+1%+2 lb	97 ab	99 a	99 a	99 a	97 a	99 a	194 a
Resolve+Mesotrione+ Roundup PowerMax+AMS	1.2 oz+2.5 oz+ 22 oz+2 lb	97 a	95 ab	99 a	99 a	89 bc	91 bc	189 a
Resolve+Mesotrione+ Ignite 280+AMS	1.2 oz+2.5 oz+ 22 oz+2 lb	87 c	89 c	94 ab	99 a	71 e	82 e	---
Resolve+Mesotrione+ Atrazine+COC+AMS	1.2 oz+2.5 oz+ 1 pt+1%+2 lb	91 abc	97 a	99 a	99 a	93 ab	97 a	191 a
Resolve+Harmony 50SG+ Mesotrione+COC+AMS	1 oz+0.1 oz+ 2.5 oz+1%+2 lb	93 abc	97 a	91 b	99 a	86 c	96 ab	187 a
Accent+Mesotrione+ COC+AMS	0.67 oz+2.5 oz+ 1%+2 lb	91 bc	89 c	83 c	99 a	80 d	85 de	182 a
Steadfast+Mesotrione+ COC+AMS	0.75 oz+2.5 oz+ 1%+2 lb	97 a	95 ab	81 c	99 a	86 c	90 cd	192 a
Check	----	0 d	0 d	0 d	0 b	0 f	0 f	38 c
LSD (.05)		4	4	4	0	5	5	11

Table 7. Helm Products in Corn

RCB; 4 reps
Variety: DKC 43-27
Planting Date: 5/6/09
POST: 6/11/09; Corn 2-3 lf, 3-5 in; Colq 1-4 in; Wibw 1-4 in; Rrpw 2-3 in.
Soil: Clay loam; 3.2% OM; 6.3 pH

Precipitation:
POST: 1st week 0.46 inches
2nd week 0.78 inches

Colq=Common lambsquarters
Wibw=Wild buckwheat
Rrpw=Redroot pigweed

Comments: The objective of this study was to evaluate some Helm herbicides in corn. The Helm glyphosate products, Helosate Plus and Helm 70, resulted in similar weed control as Roundup PowerMax. Fluroxypyr was most effective at higher rate, but adding fluroxypyr to glyphosate did not seem to increase weed control relative to glyphosate alone. Atrazine alone or Callisto (mesotione) + Atrazine resulted in nearly complete weed control. In summary, results from this study indicated that weed control was similar between the Helm products and similar chemistries.

Treatment	***Rate/A***	***% Colq 7/8/09***	***% Wibw 7/8/09***	***% Rrpw 7/8/09***
Check	----	0 e	0 c	0 f
POSTEMERGENCE				
Helm fluroxypyr	8 oz	0 e	93 a	94 abc
Helm fluroxypyr	11 oz	43 c	91 a	92 bcd
Starane Ultra	5.9 oz	0 e	91 a	92 bcd
Helm BW Glyphosate	20 oz	94 a	85 a	88 cde
Helosate Plus	32 oz	92 a	86 a	83 e
Helm 70	20 oz	93 a	87 a	86 de
Roundup PowerMax	22 oz	94 a	88 a	86 de
Helosate Plus+Helm Fluroxypyr	32 oz+8 oz	93 a	88 a	84 e
Helosate Plus+Helm Fluroxypyr	32 oz+11 oz	92 a	90 a	86 de
WideMatch	16 oz	65 b	95 a	95 ab
Atrazine+COC	1 qt+1%	99 a	99 a	99 a
Steadfast	0.75 oz	21 d	30 b	97 ab
Callisto+atrazine+COC	3 oz+1 qt+1%	99 a	98 a	99 a
LSD (.05)		12	10	4

Table 8. Soybean Herbicide Demonstration

RCB; 4 reps
Variety: Conventional - Deuel
RR - Asgrow 1403
LL - 80137
Planting Date: 5/21/09
PRE: 5/21/09
POST: 6/25/09; Soybean 2 tri; Yeft 4-6 in; Rrpw 3-5 in; Colq 4-6 in; KOCZ 2-5 in.
Soil: Clay loam; 4.1% OM; 5.8 pH

Precipitation:

PRE:	1st week	1.17 inches
	2nd week	0.36 inches
POST:	1st week	0.22 inches
	2nd week	2.45 inches

VCRR=Visual Crop Response Rating (0=no injury; 100=complete kill)
Yeft=Yellow foxtail
Rrpw=Redroot pigweed
Colq=Common lambsquarter
KOCZ=Kochia

Comments: The objective of the study was to demonstrate weed control efficacy and soybean yield associated with herbicide programs in conventional, Roundup Ready (RR), and Liberty Link (LL) soybeans. Ratings on June 26 reflect the efficacy of the pre-emergence herbicides at the time of post- emergence applications. Valor at 3 oz/A resulted in greater broadleaf weed control than at 2 oz/A. Weed control was also very good after applications of Authority Assist (sulfentrazone + imazethapyr), or Authority First (sulfentrazone + cloransulam). The OpTill (saflufenacil + imazethapyr) treatment resulted in the least kochia control. Several of the conventional herbicide programs resulted in good to very good weed control, but some soybean stunting was noticed in some treatments containing Harmony (thifensulfuron) which may have been partially due to the addition of COC or MSO adjuvants. Several of the RR programs resulted in slightly greater pigweed control than the LL programs. Preemergence applications of Valor or Authority Assist improved pigweed control in the Ignite programs. Yield was similar among the RR and LL treatments, but these treatments generally resulted in greater yield than the conventional treatments which was likely due to the soybean variety (Deuel) rather than a lack of weed control. In summary, results from this research indicated that there are several effective herbicide programs for conventional, RR, or LL soybeans, but each has strengths or weaknesses that can be partially fixed with effective pre-emergence herbicide applications.

Treatment	*Rate/A*	*% Yeft 6/26/09*	*% Rrpw 6/26/09*	*% Colq 6/26/09*	*% Yeft 7/21/09*	*% Colq 7/21/09*	*% Rrpw 7/21/09*	*% VCRR Stunting 7/21/09*	*% KOCZ 7/21/09*	*Soybean Yield bu/A*
Check ***(Conventional)***	----	0 e	0 e	0 e	0 e	0 d	0 d	0 d	0 c	9 fg
PREEMERGENCE & POSTEMERGENCE										
Prowl H_2O&Raptor+ Resource+ MSO+28% N	2.25 pt&4 oz+ 4 oz+ 1 qt+1 qt	93 a	80 b	69 d	95 ab	86 c	96 a	6 c	97 a	34 cde
Boundary&Resource+ Harmony 50SG+ Assure II+ COC+28% N	2 pt&4 oz+ 0.125 oz+ 7 oz+ 1%+2 qt/100 gal	97 a	92 a	93 a	97 ab	96 ab	98 a	14 b	99 a	33 de
Valor+FirstRate& Harmony 50SG+ Select Max+COC	3 oz+0.3 oz& 0.125 oz+ 12 oz+1 qt	88 a	96 a	97 a	97 ab	97 ab	99 a	25 a	96 a	32 e
Authority Assist& FirstRate+Fusion+ NIS+AMS	10 oz& 0.3 oz+6 oz+ 0.5%+2 lb	94 a	98 a	98 a	95 ab	97 ab	97 a	0 d	99 a	37 b-e
OpTill& Harmony 50SG+ Poast Plus	2 oz& 0.125 oz+ 0.75 oz	93 a	94 a	98 a	96 ab	98 a	96 a	8 c	84 b	33 de

Table 8. Soybean Herbicide Demonstration (Continued . . .)

Treatment	Rate/A	% Yeft 6/26/09	% Rrpw 6/26/09	% Colq 6/26/09	% Yeft 7/21/09	% Colq 7/21/09	% Rrpw 7/21/09	% VCRR Stunting 7/21/09	% KOCZ 7/21/09	Soybean Yield bu/A
Check ***(Roundup Ready)***		0 e	0 e	0 e	0 e	0 d	0d	—	---	12 f
PREEMERGENCE & POSTEMERGENCE										
Valor&	2 oz&									
Rdup WeatherMax+	22 oz+									
AMS	2.5 lb	55 cd	79 b	80 c	95 ab	98 a	99 a	—	—	42 ab
Authority First&	3 oz&									
Rdup WeatherMax+	22 oz+									
AMS	2.5 lb	58 cd	95 a	94 a	94 ab	99 a	99 a	—	—	43 ab
Prowl H_2O&	2.25 pt&									
Rdup WeatherMax+	22 oz+									
AMS	2.5 lb	78 ab	73 c	77 c	98 a	97 ab	99 a	—	—	43 ab
POSTEMERGENCE										
Rdup WeatherMax+	22 oz+									
AMS	2.5 lb	—	—	—	96 ab	97 ab	98 a	—	—	41 abc
Extreme+	1.5 qt+									
NIS+AMS	0.25%+2.5 lb	—	—	—	98 a	97 ab	99 a	—	—	41 abc
Check ***(Liberty Link)***	—-	0 e	0 e	0 e	0 e	0 d	0 d	—	—	6 g
PREEMERGENCE & POSTEMERGENCE										
Valor&Ignite 280+AMS	2 oz&22 oz+2.5 lb	50 d	84 b	86 b	81 c	96 ab	89 b	—	—	41 abc
Authority Assist&	5 oz&									
Ignite 280+AMS	22 oz+2.5 lb	70 bc	98 a	98 a	84 c	97 ab	97 a	—	—	45 a
Prowl H_2O&	2.25 pt&									
Ignite 280+AMS	22 oz+2.5 lb	72 bc	68 d	75 c	91 ab	93 b	78 c	—	—	42 ab
POSTEMERGENCE										
Ignite 280+AMS	22 oz+2.5 lb	—	—	—	74 d	96 ab	79 c	—	—	36 b-e
Ignite 280+	1.5 qt+									
Pursuit 2L+	3 oz+									
NIS+AMS	1 qt+3.4 lb	—	—	—	90 b	95 ab	88 b	—	—	39 a-d
LSD (.05)		13	4	5	5	3	4	5	4	4

Table 9. Weed Control w/Ignite in Liberty Link Soybeans

RCB; 4 reps
Variety: SO80137 LL
Planting Date: 5/21/09
PRE: 5/21/09
EPOST: 6/25/09; Soybean 2 tri; Yeft 4-6 in; Rrpw 3-5 in; Grft 3-6 in; Colq 4-6 in.
POST: 7/1/09; Soybean 3-4 tri; Yeft 5-7 in; Rrpw 4-6 in; Grft 4-7 in; Colq 5-7 in.
LPOST: 7/20/09; Soybean 12-15 in.
Soil: Clay loam; 4.1% OM; 5.8 pH

Precipitation:

PRE:	1st week	1.17 inches
	2nd week	0.36 inches
EPOST:	1st week	0.22 inches
	2nd week	2.45 inches
POST:	1st week	2.44 inches
	2nd week	1.05 inches
LPOST:	1st week	0.17 inches
	2nd week	0.31 inches

Yeft=Yellow foxtail
Rrpw=Redroot pigweed
Grft=Green foxtail
Colq=Common lambsquarters

Comments: The objective of this study was to evaluate weed control programs that include Ignite (glufosinate) in Liberty Link soybeans. The low yield in the untreated check indicates high weed competition. Ratings on June 26 indicate weed control associated with the preemergence herbicide applications. Among the preemergence treatments, Authority Assist (sulfentrazone + imazethapyr), Enlite (flumioxazin + chlorimuron + thifensulfuron), Prefix (s-metolachlor + fomesafen), and Optill (saflufenacil + imazethapyr) resulted in the greatest weed control. Sharpen (saflufenacil) did not provide noticeable weed control. By the end of the season, one application of Ignite or Sharpen followed by Ignite were the only two treatments that did not result in nearlyl complete weed control and consequently soybean yield was slightly reduced in these treatments. In summary, results from this study indicated that two applications of Ignite or a preemergence herbicide followed by Ignite is necessary to obtain satisfactory weed control in Liberty Link soybeans.

Treatment	*Rate/A*	*% Yeft 6/26/09*	*% Rrpw 6/26/09*	*% Yeft 7/16/09*	*% Rrpw 7/16/09*	*% Grft 10/27/09*	*% Rrpw 10/27/09*	*% Colq 10/27/09*	*Soybean Yield bu/A*
Check	----	0 d	0 d	0 g	0 e	0 c	0 c	0 e	11 c
PREEMERGENCE & POSTEMERGENCE & LATE POSTEMERGENCE									
Valor&Ignite 280+AMS& Ignite 280+AMS	2 oz&22 oz+1.7 lb& 11 oz+1.7 lb	55 c	61 c	74 e	72 d	98 a	99 a	99 a	38 a
Authority First& Ignite 280+AMS& Ignite 280+AMS	4 oz& 22 oz+1.7 lb& 22 oz+1.7 lb	60 c	81 b	78 de	89 abc	99 a	99 a	99 a	38 a
PREEMERGENCE & POSTEMERGENCE									
Valor&Ignite 280+AMS	2 oz&36 oz+1.7 lb	63 c	60 c	85 bcd	84 c	96 a	97 a	96 ab	37 a
Authority First& Ignite 280+AMS	4 oz& 36 oz+1.7 lb	78 b	89 ab	88 abc	97 ab	99 a	99 a	99 a	38 a
Authority Assist& Ignite 280+AMS	5 oz& 22 oz+1.7 lb	87 ab	97 a	93 ab	98 a	99 a	99 a	99 a	37 a
Enlite&Ignite 280+AMS	2.8 oz&22 oz+1.7 lb	81 ab	94 a	89 abc	97 ab	98 a	99 a	98 a	38 a
Prefix&Ignite 280+AMS	2 pt&22 oz+1.7 lb	93 a	86 ab	93 ab	89 bc	99 a	98 a	99 a	37 a
Intrro&Ignite 280+AMS	1.5 qt&22 oz+1.7 lb	92 a	78 b	93 ab	82 c	99 a	95 a	94 b	36 a
Sharpen&Ignite 280+AMS	1 oz&22 oz+1.7 lb	0 d	0 d	67 f	68 d	80 b	86 b	88 c	30 b
Optill&Ignite 280+AMS	2 oz&22 oz+1.7 lb	95 a	96 a	96 a	97 ab	99 a	99 a	99 a	38 a

Table 9. Weed Control w/Ignite in LL Soybeans (Continued . . .)

Treatment	Rate/A	% Yeft 6/26/09	% Rrpw 6/26/09	% Yeft 7/16/09	% Rrpw 7/16/09	% Grft 10/27/09	% Rrpw 10/27/09	% Colq 10/27/09	Soybean Yield bu/A
POSTEMERGENCE									
Ignite 280+AMS	36 oz+1.7 lb	—	—	83 cd	75 d	83 b	86 b	84 d	31 b
EARLY POSTEMERGENCE & POSTEMERGENCE									
Ignite 280+AMS&	22 oz+1.7 lb&								
Ignite 280+AMS	22 oz+1.7 lb	—	—	97 a	96 ab	99 a	99 a	99 a	37 a
LSD (.05)		11	8	6	6	5	3	3	3

Table 10. Authority Products in Liberty Link Soybean

RCB; 4 reps
Variety: SO80137 LL
Planting Date: 5/21/09
PRE: 5/21/09
EPOST: 6/25/09; Soybean 2 tri; Yeft 4-6 in; Rrpw 3-5 in; Colq 4-6 in.
LPOST: 7/1/09; Soybean 3-4 tri.
Soil: Clay loam; 4.1% OM; 5.8 pH
Yeft=Yellow foxtail

Precipitation:

PRE:	1st week	1.17 inches
	2nd week	0.36 inches
EPOST:	1st week	0.22 inches
	2nd week	2.45 inches
LPOST:	1st week	2.44 inches
	2nd week	1.05 inches

Rrpw=Redroot pigweed
Colq=Common lambsquarter

Comments: The objective of this study was to evaluate Authority First (sulfentrazone + cloransulam) and Authority Assist (sulfentrazone + imazethapyr) in Liberty Link soybeans. Authority Assist resulted in greater yellow foxtail control than Authority First. Weed control with Authority Assist followed by Ignite (glufosinate) was similar to Ignite followed by Ignite + Cadet (fluthiacet). In summary, results from this study indicated that Authority Assist was a good option for pre-emergence applications in LL soybeans where assistance with grass control is needed. Ignite does not translocate to growing points as well as glyphosate, so occasionally grasses can escape Ignite applications, particularly when conditions are dry.

Treatment	Rate/A	% Yeft 6/26/09	% Rrpw 6/26/09	% Yeft 7/16/09	% Rrpw 7/16/09	% Yeft 10/27/09	% Rrpw 10/27/09	% Colq 10/27/09	Soybean Yield bu/A
PREEMERGENCE & EARLY POSTEMERGENCE									
Authority First&Ignite 280	3.2 oz&22 oz	83 b	95 a	87 c	93 b	99 a	98a	98 a	39 a
Authority Assist&Ignite 280	5 oz&22 oz	90 a	98 a	94 b	98 a	99 a	99 a	99 a	39 a
Authority Assist&Ignite 280	6 oz&22 oz	92 a	98 a	95 b	97 a	99 a	99 a	99 a	39 a
EARLY POSTEMERGENCE & LATE POSTEMERGENCE									
Ignite 280& Ignite 280+Cadet	22 oz& 22 oz+0.5 oz			98 a	97 a	99 a	98 a	99 a	38 a
Check	----	0 c	0 b	0 d	0 c	0 b	0 b	0 b	10 b
LSD (.05)		3	3	2	2	0	2	2	4

Table 11. Valor Weed Programs in Soybean

RCB; 4 reps
Variety: Asgrow 1403
Planting Date: 5/21/09
PRE: 5/21/09
EPOST: 6/25/09; Soybean 2 tri; Yeft 4-6 in; Rrpw 3-5 in.
LPOST: 7/1/09; Soybean 3-4 tri; Yeft 5-7 in; Rrpw 4-6 in.
Soil: Clay loam; 4.1% OM; 5.8 pH

Precipitation:

PRE:	1st week	1.17 inches
	2nd week	0.36 inches
EPOST:	1st week	0.22 inches
	2nd week	2.45 inches
LPOST:	1st week	2.44 inches
	2nd week	1.05 inches

Yeft=Yellow foxtail
Rrpw=Redroot pigweed

Comments: The objective of this study was to evaluate V-10233, an experimental premix of flumioxazin (Valor) + pyroxasulfone (KIH-485) for weed control in soybeans. Ratings on June 26 indicate weed control associated with the preemergence herbicides. Valor + Intrro (alachlor), Authoirty Assist (sulfentrazone + imazethapyr), and V-10233 resulted in the greatest weed control among the preemergence treatments. All treatments resulted in nearly complete weed control by August and soybean yield was similar among all treatments. In summary, results from this indicated that V-10233 was an effective premix for residual grass and broadleaf control in soybeans.

Treatment	*Rate/A*	*% Yeft 6/26/09*	*% Rrpw 6/26/09*	*% Yeft 7/16/09*	*% Rrpw 7/16/09*	*% Yeft 9/29/09*	*% Rrpw 9/29/09*	*Soybean Yield bu/A*
Check	----	0 d	0 c	0 c	0 b	0 b	0 b	19 b
EARLY POSTEMERGENCE & LATE POSTEMERGENCE								
Roundup Original Max&	22 oz&							
Roundup Original Max	22 oz	—	—	99 a	99 a	99 a	99 a	45 a
PREEMERGENCE & EARLY POSTEMERGENCE								
Valor&	2 oz&							
Roundup Original Max+AMS	22 oz+2.5 lb	58 c	79 b	97 b	99 a	99 a	99 a	48 a
Gangster FR+Gangster V&	0.4 oz+2 oz&							
Roundup Original Max+AMS	22 oz+2.5 lb	63 bc	95 a	95 b	99 a	99 a	99 a	45 a
V-10233&	3 oz&							
Roundup Original Max+AMS	22 oz_2.5 lb	82 a	93 a	97 b	99 a	99 a	99 a	47 a
Valor+Intrro&	2 oz+16 oz&							
Roundup Original Max+AMS	22 oz+2.5 lb	74 ab	92 a	96 b	99 a	99 a	99 a	45 a
Valor+Intrro&	2 oz+32 oz&							
Roundup Original Max+AMS	22 oz+2.5 lb	86 a	95 a	96 b	99 a	99 a	99 a	47 a
Sonic&	3.2 oz&							
Roundup Original Max+AMS	22 oz+2.5 lb	65 bc	93 a	96 b	99 a	99 a	99 a	48 a
Authority Assist&	5 oz&							
Roundup Original Max+AMS	22 oz+2.5 lb	86 a	96 a	97 b	99 a	99 a	99 a	45 a
LSD (.05)		10	4	2	0	1	0	4

Table 12. Grass Control in Spring Wheat

RCB; 4 reps
Variety: Traverse
Planting Date: 4/24/09
POST: 5/29/09; SpWht 4 lf, 4 in, tillered; Grft 2-3 lf, 0.5-2 in; Wibw 2-3 lf, 1-2 in; Yeft
Soil: Clay loam; 3.2% OM; 6.3 pH

Precipitation:

POST:	1st week	0.00 inches
	2nd week	1.24 inches

Grft=Green foxtail
Wibw=Wild buckwheat
Colq=Common lambsquarters
Yeft=Yellow foxtail

Comments: The objective of this study was to evaluate weed control with Axial (pinoxaden) and Axial TBC (pinoxaden + florasulam). Relative to Axial alone, green foxtail control was slightly less with Huskie (pyrasulfotole + bromoxynil) or WideMatch (fluroxypyr + clopyralid) and yellow foxtail control was slightly less with each tank mix partner. Although we have seen slight grass control antagonism with Axial + bromoxynil products in past research, we would not expect to typically see antagonism with WideMatch. Wild buckwheat and common lambsquarters control was very good among all treatments. Results from this study suggest there is a risk of slightly grass control antagonism when mixing some broadleaf herbicides with Axial.

Treatment	*Rate/A*	*% Grft 6/17/09*	*% Wibw 6/17/09*	*% Colq 6/17/09*	*% Yeft 7/30/09*	*% Wibw 7/30/09*	*% Colq 7/30/09*	*SpWht Yield bu/A*
POSTEMERGENCE								
Axial XL+Bronate Adv	16.4 oz+0.8 pt	94 a	96 b	97 a	89 b	99 a	99 a	70 ab
Axial	16.4 oz	95 a	0 c	0 c	96 a	0 b	0 b	68 b
Axial XL+WideMatch+ MCPA ester	16.4 oz+1 pt+ 8 oz	96 a	97 ab	98 a	90 b	99 a	99 a	72 a
Axial XL+Huskie	16.4 oz+11 oz	83 b	98 a	98 a	87 b	99 a	99 a	70 ab
Axial TBC+Adigor+ WideMatch	8.85 oz+9.6 oz+ 10 oz	82 b	98 a	93 b	90 b	99 a	99 a	70 ab
Check	----	0 c	0 c	0 c	0 c	0 b	0 b	64 c
LSD (.05)		7	1	2	3	0	0	2

Table 13. Puma & Rimfire Max in Spring Wheat

RCB; 4 reps
Variety: Traverse
Planting Date: 4/24/09
POST: 5/29/09; SpWht 4 lf, 4 in, tiller;
Grft 2-3 lf, 0.5-2 in; Wibw 2-3 lf, 1-2 in;
Colq 4 lf, 1.5 in
Soil: Clay loam; 3.6% OM; 6.3 pH

Precipitation:
POST: 1st week 0.00 inches
2nd week 1.24 inches

VCRR=Visual Crop Response Rating
(0=no injury; 100=complete kill)
Grft=Green foxtail
Wibw=Wild buckwheat
Colq=Common lambsquarters

Comments: The objective of this study was to evaluate weed control with Rimfire Max (propoxy-carbazone + metsulfuron), a new formuation of Rimfire that contains a lower ratio of propoxycarbazone, the same active ingredient in Olympus. Puma (fenoxaprop) resulted in greater green foxtail control than Rimfire Max. Huskie (pyrasulfotole + bromoxynil) appeared to slightly antagonize green foxtail control from Puma in the Puma+Huskie tank mix of the Wolverine (fenoxaprop + Huskie) premix. Foxtail control was slightly greater when Rimfire Max + Huskie was mixed with Quad 7 (alcohol ethoxylate + ammonium nitrate) than with MSO suggesting that adjuvants can influence potential interactions between Rimfire, a grass herbicide, and Huskie, a broadleaf herbicide. Among the Rimfire treatments, moderate wheat chlorosis (yellowing) was noticed.

Treatment	***Rate/A***	***% VCRR Chlorosis 6/5/09***	***% Grft 7/30/09***	***% Wibw 7/30/09***	***% Colq 7/30/09***	***SpWht Yield bu/A***
Check	----	0 c	0 e	0 c	0 b	63 b
POSTEMERGENCE						
Puma	0.66 pt	0 c	96 a	0 c	0 b	66 b
Puma+Huskie	0.66 pt+11 oz	0 c	86 c	99 a	99 a	70 a
Wolverine	27.4 oz	0 c	91 b	99 a	99 a	73 a
Rimfire+MSO	3 oz+1.5 pt	13 b	83 c	50 b	99 a	65 b
Rimfire Max+Huskie+MSO	3 oz+11 oz+1.5 pt	20 a	72 d	99 a	99 a	65 b
Rimfire Max+Huskie+Quad 7	3 oz+11 oz+0.8 pt	20 a	82 c	97 a	99 a	64 b
LSD (.05)		2	4	7	0	4

Table 14. Broadleaf Weed Control with Pulsar and Orion

RCB; 4 reps
Variety: Traverse
Planting Date: 4/24/09
POST: 5/29/09; SpWht 4 lf, 4 in, tiller; Colq 4 lf, 1.5 in; Wibw 2-3 lf, 1-2 in
Soil: Clay loam; 3.6% OM; 6.3 pH

Precipitation:
POST: 1st week 0.00 inches
2nd week 1.24 inches

Wibw=Wild buckwheat
Colq=Common lambsquarters

Comments: The objective of this study was to evaluate weed control with Pulsar, a new premix of dicamba and fluroxypyr, and Axial TBC (pinoxaden + florasulam). Most of the treatments resulted in very good control of wild buckwheat and common lambsquarters.

Treatment	***Rate/A***	***% Wibw 6/18/09***	***% Colq 6/18/09***	***% Wibw 7/27/09***	***% Colq 7/27/09***	***SpWht Yield bu/A***
Check	----	0 d	0 c	0 b	0 c	62 b
POSTEMERGENCE						
Pulsar+NIS	8.3 oz+0.25%	92 c	93 b	99 a	99 a	71 a
Pulsar+NIS	12.5 oz+0.25%	95 b	96 a	99 a	99 a	68 ab
Pulsar+MCPA ester+NIS	8.3 oz+0.54 pt+0.25%	93 c	99 a	99 a	99 a	70 a
Pulsar+MCPA ester+NIS	12.5 oz+0.54 pt+0.25%	97 a	97 a	99 a	99 a	68 ab
Amber+Pulsar+NIS	0.28 oz+8.3 oz+0.25%	98 a	98 a	99 a	99 a	69 a
Amber+Pulsar+NIS	0.28 oz+12.5 oz+0.25%	99 a	98 a	99 a	99 a	72 a
Peak+Pulsar+NIS	0.25 oz+8.3 oz+0.25%	97 ab	97 a	99 a	99 a	70 a
Peak+Pulsar+NIS	0.25 oz+12.5 oz+0.25%	98 a	98 a	99 a	99 a	70 a
Harmony 50SG+Express 50SG+ Pulsar+NIS	0.48 oz+0.12 oz+ 8.3 oz+0.25%	99 a	99 a	99 a	99 a	70 a
Harmony 50SG+Express 50SG+ Pulsar+NIS	0.48 oz+0.12 oz+ 12.5 oz+0.25%	99 a	99 a	99 a	99 a	68 ab
Harmony 50SG+Express 50SG+ Pulsar+NIS+WideMatch	0.48 oz+0.12 oz+ 12.5 oz+0.25%+1 pt	99 a	99 a	99 a	99 a	70 a
Orion	17 oz	97 a	96 a	99 a	99 a	68 ab
WideMatch+Orion	1 pt+17 oz	98 a	98 a	99 a	99 a	68 ab
Orion+Starane	17 oz+0.33 pt	98 a	98 a	99 a	99 a	66 ab
Orion+Buctril	17 oz+1 pt	98 a	98 a	99 a	99 a	66 ab
Bronate Adv	0.8 pt	96 ab	98 a	99 a	99 a	68 ab
Huskie+NIS+AMS	11 oz+0.25%_1 lb	98 a	98 a	99 a	99 a	68 ab
Axial TBC+Adigor+(Starane+Sword)	8.85 oz+0.6 pt+12 oz	98 a	98 a	99 a	99 a	67 ab
Axial TBC+Adigor+WideMatch	8.85 oz+0.6 pt+16 oz	98 a	97 a	99 a	98 b	69 ab
Axial TBC+Adigor+Bronate Adv	8.85 oz+0.6 pt+0.8 pt	99 a	98 a	99 a	99 a	69 ab
LSD (.05)		2	2	0	1	4

Table 15. Wolverine - Broadleaf Control in Spring Wheat

RCB; 4 reps
Variety: Traverse
Planting Date: 4/24/09
POST: 5/29/09; SpWht 4 lf, 4 in, tillered;
Wibw 2-3 lf, 1-2 in; Grft 2-3 lf, 0.5-2 in; Corw 1-2 in; Colq 4 lf, 1.5 in.
Soil: Clay loam; 3.2% OM; 6.3 pH

Precipitation:
POST: 1st week 0.00 inches
2nd week 1.24 inches

VCRR=Visual Crop Response Rating (0=no injury; 100=complete kill)
Wibw=Wild buckwheat
Grft=Green foxtail
Corw=Common ragweed
Colq=Common lambsquarters

Comments: The objective of this research was to evaluate grass and broadleaf weed control with premix products such as Wolverine (fenoxapropr + pyrasulfotole + bromoxynil), GoldSky (florasulam + fluroxypyr + pyroxsulam), and Axial TBC (pinoxaden + florasulam). Green foxtail control was slightly greater with Axial TBC and GoldSky than Wolverine. All the grass/broadleaf premix products resulted in very good wild buckwheat control, but common ragweed control was greatest with Wolverine and only Axial TBC resulted in less than 98% common lambquarters control. These results indicated that the grass/broadleaf premix products provided good control of grass and broadleaf weeds, but there were some different strengths and weaknesses among these products.

Treatment	Rate/A	% VCRR Stunting 6/5/09	% Wibw 6/15/09	% Grft 6/15/09	% Corw 6/15/09	% Colq 6/15/09	SpWht Yield bu/A
Check	----	0 b	0 c	0 c	0 d	0 c	58 b
POSTEMERGENCE							
Wolverine	27.4 oz	0 b	95 a	94 b	97 a	98 a	71 a
WideMatch+MCPA ester	0.75 pt+0.5 pt	0 b	86 b	0 c	93 a	98 a	67 a
Orion	17 oz	0 b	96 a	0 c	76 c	98 a	67 a
Goldsky+NIS	16 oz+0.25%	6 a	95 a	97 a	82 b	98 a	66 a
Axial TBC+Adigor	8.85 oz+0.6 pt	0 b	97 a	98 a	85 b	53 b	71 a
LSD (.05)		2	4	2	6	3	6

Table 16. Huskie - Broadleaf Control in Spring Wheat

RCB; 4 reps
Variety: Traverse
Planting Date:
POST: 5/29/09; SpWht 3-4 lf, 3-5 in; Wibw 1-3 in; Colq 1-3 in
Soil: Clay loam; 3.0% OM; 6.1 pH

Precipitation:
POST: 1st week 0.00 inches
2nd week 1.24 inches

Wibw=Wild buckwheat
Colq=Common lambsquarter

Comments: The objective of this research was to evaluate weed control with Huskie (pyrasulfotole + bromoxynil) at different rates and with different adjuvants. Huskie rates greater than 11 oz/A slightly increased wild buckwheat control at the latter evaluation date. Otherwise, weed control was similar among the Huskie rates or by adding AMS or AMS + NIS. Wheat yield was not statistically different among the treatments. This indicates that there was no detectable crop response from the high Huskie rates or by adding NIS.

Treatment	***Rate/A***	***% Wibw 6/17/09***	***% Colq 6/17/09***	***% Wibw 8/18/09***	***% Colq 8/18/09***	***SpWht Yield bu/A***
Check	----	0 b	0 b	0 c	0 b	44 b
POSTEMERGENCE						
Huskie+AMS	11 oz+0.5 lb	95 a	98 a	90 b	98 a	63 a
Huskie+AMS	13.5 oz+0.5 lb	97 a	98 a	98 a	98 a	63 a
Huskie+AMS	15 oz+0.5 lb	98 a	98 a	98 a	98 a	54 a
Huskie+AMS+NIS	13.5 oz+0.5 lb+0.25%	98 a	98 a	95 a	98 a	58 a
WideMatch+MCPA ester	1 pt+0.5 pt	97 a	98 a	98 a	98 a	63 a
Affinity TM+Starane+NIS	0.6 oz+0.33 pt+0.25%	98 a	98 a	98 a	98 a	62 a
LSD (.05)		2	1	4	0	7

Table 17. Broadleaf Control with Vida in Spring Wheat

RCB: 4 reps
Variety: Traverse
Planting Date: 4/27/09
EPOST: 5/29/09; SpWht 3-4 lf, 3-5 in.
Wibu 1-3 in; Pesw 2-3 lf
Soil: Clay loam; 3.0% OM; 6.1 pH

Precipitation:
EPOST: 1st week 0.00 inches
2nd week 1.24 inches

Wibu=Wild buckwheat
Pesw=Pennsylvania smartweed

Comments: The objective of this study was to evaluate broadleaf weed control with Vida (pyraflufen) in spring wheat. Pyraflufen, a PPO inhibiting herbicide with a similar mode of action as Aim (carfentrazone), was previously sold at ET. Rage-D-Tech (carfentrazone + 2,4-D) was used as a comparison treatment. Vida resulted in poor (25-28%) control of wild buckwheat and Pennsylvania smartweed in June, but control of these weeds seemed fair (77-81%) in August. The other treatments resulted in very good control of these weed species. Despite the reduced weed control associated with the Vida treatment, wheat yield was similar among the herbicide treatments. Results from this study indicate that Vida may be a good tank mix product but may not provide adequate control by itself in fields with high weed densities.

Treatment	***% Wibw Rate/A***	***% Pesw 6/17/09***	***% Wibw 6/17/09***	***% Pesw 8/18/09***	***Yield 8/18/09***	***SpWht bu/A***
EARLY POSTEMERGENCE						
Check	----	0 c	0 c	0 d	0 c	46 b
Vida+NIS+28% N	0.75 oz+0.25%+1%	25 b	28 b	81 c	77 b	63 a
Rage-D-Tech+NIS	0.75 pt+0.25%	98 a	96 a	98 a	93 a	65 a
Huskie+AMS	11 oz+0.5 lb	96 a	97 a	90 b	98 a	73 a
WideMatch	1 pt	96 a	97 a	98 a	95 a	67 a
LSD (.05)		3	6	3	8	10

Table 18. Pre-Pare in Spring Wheat

RCB; 4 reps
Variety: Traverse
Planting Date: 4/24/09
PRE: 4/28/09
POST: 5/29/09; SpWht 4 lf, 4 in - tillered;
Grft 2-3 lf, 0.5-2 in; Wibw 2-3 lf, 1-2 in; Corw 1-2 in.
Soil: Clay loam; 3.2% OM; 6.3 pH

Precipitation:

PRE:	1st week	0.62 inches
	2nd week	0.09 inches
POST:	1st week	0.00 inches
	2nd week	1.24 inches

Grft=Green foxtail
Wibw=Wild buckwheat
Corw=Common ragweed

Comments: The objective of this study was to evaluate weed control associated with pre-emergence herbicide applications in spring wheat. PrePare (flucarbazone) provides residual control of grasses and mustard species whereas Sharpen (saflufenacil) and Valor (flumioxazin) provide residual broadleaf control. The PrePare treatments resulted in good (80-90%) grass control. The Sharpen and Valor treatments resulted in similar wild buckwheat and common ragweed control which appeared to be good at the end of May but were poor (less than 62%) later in the season. Wheat yields were variable and did not differ among many treatments. Results from this study suggested that pre-emergence applications of PrePare were adequate for season-long grass control by Sharpen and Valor did not provide satisfactory broadleaf control.

Treatment	*Rate/A*	*% Grft 6/17/09*	*% Wibw 6/17/09*	*% Corw 6/17/09*	*% Grft 7/30/09*	*% Wibw 7/30/09*	*% Corw 7/30/09*	*SpWht Yield bu/A*
Check	----	0 c	0 d	0 e	0 d	0 c	0 d	57 abc
PREEMERGENCE								
Pre-Pare	0.306 oz	82 ab	13 cd	20 de	86 ab	0 c	0 d	50 c
Pre-Pare+Sharpen+ MSO+AMS	0.3 oz+1 oz+ 1%+17 lb/100 gal	83 ab	54 b	62 b	70 c	40 b	43 bc	57 abc
Pre-Pare+Valor+ MSO+AMS	0.3 oz+1.5 oz+ 1%+17 lb/100 gal	78 b	30 bc	50 bc	90 ab	28 b	35 bc	60 ab
PREEMERGENCE & POSTEMERGENCE								
Pre-Pare&Everest+Quad 7	0.306 oz&0.306 oz+1%	95 a	95 a	18 de	93 a	98 a	0 d	51 c
POSTEMERGENCE								
Everest+Quad 7	0.61+1%	94 a	95 a	50 bc	93 a	98 a	28 c	57 abc
Rimfire+Quad 7	1.75 oz+1%	91 a	33 bc	54 bc	91 ab	35 b	53 b	63 a
LSD (.05)		9	18	19	10	21	13	6

Table 19. Sharpen Burndown - No-Till Wheat

RCB; 4 reps
Variety: Traverse
Planting Date: 4/24/09
PRE: 4/28/09
Soil: Clay loam; 3.2% OM; 6.3 pH

Precipitation:
PRE: 1st week 0.62 inches
2nd week 0.09 inches

Colq=Common lambsquarters
Corw=Common ragweed
Wibu=Wild buckwheat

Comments: The objective of this study was to evaluate weed control associated with Sharpen (saflufenacil) applied prior to wheat emergence. Relative to Sharpen at 1 oz/A, Sharpen at 1.5 oz/A resulted in greater common ragweed and common lambsquarters control. Adding dicamba to Sharpen at 1 oz/A increased common ragweed control to a level similar to Sharpen at 1.5 oz/A. None of the pre-emergence herbicide applications reduced wheat yield. Results from this study suggest that Sharpen applied pre-emergence could provide fair - good weed control without injuring wheat.

Treatment	*Rate/A*	*% Colq 6/5/09*	*% Corw 6/5/09*	*% Wibw 6/5/09*	*% Wibw 7/30/09*	*% Corw 7/30/09*	*SpWht Yield bu/A*
Check	----	0 d	0 c	0 c	0 b	0 c	62 a
PREEMERGENCE							
Sharpen	1 oz	55 c	40 b	45 b	86 a	80 b	64 a
Sharpen	1.5 oz	83 ab	73 a	50 b	86 a	88 a	67 a
Sharpen+Clarity	1 oz+2 oz	68 bc	60 a	38 b	87 a	88a	63 a
LSD (.05)		18	17	21	4	3	8

Table 20. Valor Wheat Desiccation

RCB; 3 reps
Variety: Traverse
Planting Date: 4/27/09
POST: 8/4/09; Colq 24-30 in; Cath 24-36 in; Grft 10-18 in; KOCZ 20-30 in; Rrpw 2-4 in; Bygr 12-20 in.
Soil: Clay loam; 3.0% OM; 6.1 pH

Precipitation:
POST: 1st week 0.66 inches
2nd week 1.87 inches

Colq=Common lambsquarter
Cath=Canada thistle
Grft=Green foxtail
KOCZ=Kochia
Rrpw=Redroot pigweed
Bygr=Barnyard grass

Comments: The objective of this study was to evaluate the efficacy of Valor (flumioxazin) and Sharpen (saflufenacil) as pre-harvest weed desiccants in spring wheat. Valor and Sharpen are contact herbicides that have similar modes of action (PPO inhibitors). Treatment differences were difficult to distinguish at the time of harvest on August 4, which was 14 days after herbicide application. However, on September 14 it became apparent that the treatments with Roundup resulted in greater broadleaf and grass weed control than Valor or Sharpen alone. Weed control evaluations will continue to next spring to determine if the residual activity of Valor or Sharpen reduce weed densities the spring after application.

Treatment	*Rate/A*	*% Colq 8/18/09*	*% Cath 8/18/09*	*% Grft 8/18/09*	*% Colq 9/14/09*	*% KOCZ 9/14/09*	*% Rrpw 9/14/09*	*% Bygr 9/14/09*	*SpWht Yield bu/A*
Check	----	0 c	0 c	0 d	0 c	0 c	0 c	0 b	37 a
POSTEMERGENCE									
Roundup PowerMax+AMS	21.3 oz+2.5 lb	87 ab	78 ab	99 a	92 a	96 a	95 a	99 a	33 a
Roundup PowerMax+ Valor+AMS	21.3 oz+ 0.99 oz+2.5 lb	90 ab	78 ab	99 a	91 a	98 a	98 a	95 a	34 a
Roundup PowerMax+ Valor+AMS	21.3 oz+ 1.5 oz+2.5 lb	88 ab	79 ab	99 a	91 a	95 a	95 a	95 a	33 a
Roundup PowerMax+ Valor+AMS	21.3 oz+ 2.02 oz+2.5 lb	92 ab	79 ab	99 a	98 a	99 a	99 a	99 a	35 a
Roundup PowerMax+ Valor+AMS+MSO	21.3 oz+ 2.02 oz+2.5 lb+1 qt	94 a	81 ab	99 a	96 a	99 a	99 a	99 a	33 a
Valor+AMS+MSO	2.02 oz+2.5 lb+1 qt	84 b	62 b	89 b	43 b	43 b	43 b	0 b	36 a
Valor+2,4-D amine+NIS	2 oz+1 pt+0.25%	83 b	83 ab	75 c	45 b	45 b	45 b	0 b	33 a
Sharpen+MSO	1 oz+1%	85 ab	88 a	0 d	40 b	37 b	40 b	0 b	38 a
Sharpen	2 oz	83 b	89 a	0 d	55 b	48 b	52 b	0 b	35 a
LSD (.05)		6	12	3	14	11	14	4	8

Table 21. Glyphosate Tank-Mix Contamination in Conventional Spring Wheat

RCB; 4 reps
Variety: Traverse
Planting Date: 4/24/09
POST: 5/29/09; SpWht 4 lf, 4 in, tillered
Soil: Clay loam; 3.6% OM; 6.3 pH

Precipitation:
POST: 1st week 0.00 inches
2nd week 1.24 inches

VCRR=Visual Crop Response Rating
(0=no injury; 100=complete kill)

Comments: The objective of this study was to determine if a glyphosate tank contamination would cause greater injury to wheat if it was contaminating ALS inhibiting herbicides like Harmony (thifensulfuron), Express (tribenuron), or Silverado (mesosulfuron) than if glyphosate was not mixed with these products. No wheat stunting or chlorosis (yellowing) was observed when Roundup was applied at 0.25 or 0.75 oz/A alone, but injury was observed in the treatments where glyphosate was mixed with other herbicides. Chlorosis and stunting was similar among most treatments on June 5 and only differed slightly among some treatments on June 17. Wheat yield was similar among the treatments. Results from this study suggested that glyphosate contaminating ALS herbicides may cause slightly greater injury than if glyphosate was applied alone. This study was also conducted in 2008, but those results indicated that glyphosate tank contaminations cause much greater wheat injury.

Treatment	***Rate/A***	***% VCRR Chlorosis 6/5/09***	***% VCRR Stunting 6/5/09***	***% VCRR Stunting 6/17/09***	***SpWht Yield bu/A***
POSTEMERGENCE					
WideMatch+MCPA ester+ Silverado+MSO	1 pt+12 oz+ 1.78 oz+1.5 pt	10 ab	10 ab	0 b	58 a
Roundup WeatherMax+ Silverado+MSO	0.25 oz+ 1.78 oz+1.5 pt	8 a	1 c	0 b	54 a
Roundup WeatherMax+ Express XP+NIS	0.25 oz+ 0.33 oz+0.25%	8 a	4 bc	0 b	58 a
Roundup WeatherMax+ Harmony 50SG+NIS	0.25 oz+ 0.9 oz+0.25%	6 a	4 bc	0 b	57 a
Roundup WeatherMax+ Silverado+MSO	0.75 oz+ 1.78 oz+1.5 pt	8 a	5 abc	0 b	53 a
Roundup WeatherMax+ Express XP+NIS	0.75 oz+ 0.33 oz+0.25%	10 a	5 abc	6 a	56 a
Roundup WeatherMax+ Harmony 50SG+NIS	0.75 oz+ 0.9 oz+0.25%	11 a	11 a	6 a	51 a
Roundup WeatherMax	0.25 oz	0 b	0 c	0 b	48 a
Roundup WeatherMax	0.75 oz	0 b	0 c	0 b	51 a
LSD (.05)		4	5	3	7

Table 22. Sharpen in Proso Millet

RCB; 4 reps
Variety: Sun-Up
Planting Date: 6/4/09
PRE: 6/4/09
Soil: Silty clay loam; 3.2% OM; 6.3 pH

Precipitation:
PRE: 1st week 1.24 inches
2nd week 0.46 inches

VCRR=Visual Crop Response Rating
(0=no injury; 100=complete kill)
Rrpw=Redroot pigweed
Wimu=Wild mustard

Comments: The objective of this study was to evaluate millet tolerance to Sharpen (saflufenacil). At higher rates, Sharpen caused some visible stand reduction and stunting but did not cause forage yield loss. KIH-485 (pyroxasulfone), an experimental herbicide similar to Dual (s-metolachlor), caused significant millet injury. Impact (topramezone) did not cause millet injury or forage reduction, but did not greatly improve weed control relative to Sharpen alone at 1.44 oz/A. In summary, results from this study demonstrated that millet may tolerate low rates of Sharpen. In addition, these results suggest that millet may tolerate Sharpen residue in the soil which would allow re-planting to millet in case of a crop failure where Sharpen had been applied.

Treatment	Rate/A	Millet % VCRR Stand Reduction 6/26/09	Millet % VCRR Stunting 7/16/09	% Rrpw 7/16/09	% Wimu 7/16/09	Weed Weight lbs/A	Millet Yield (Whole Plant) lbs/A	Maturity Delay (days) 9/16/09
Check	----	0 c	0 c	0 c	0 c	6692 a	2282 a	0 d
PREEMERGENCE								
Sharpen	1.44 oz	1 c	1 c	85 b	93 b	0 b	3023 a	0 d
Sharpen	2 oz	5 c	5 c	89 b	96 a	0 b	2905 a	0 d
Sharpen	4 oz	13 c	13 b	98 a	99 a	0 b	2420 a	0 d
Sharpen+KIH-485	1 oz+3 oz	94 a	96 a	99 a	99 a	—	—	13 b
Sharpen+Impact	1 oz+0.75 oz	5 c	1 c	85 b	94 b	0 b	2820 a	0 d
LSD (.05)		10	6	4	2	920	717	2

Fertilizer Application Influence on Nutrient Soil Tests and Corn Grain Yield and Moisture at the NE Research Farm in 2009. (25509)

A. Bly, R. Gelderman and Allen Heuer

Introduction

Soil testing research has shown that knowledge of soil test levels can improve the profitability of fertilizer use. Profits increase if more fertilizer is used when soil test levels are low and less or no fertilizer is used when test levels are high. It is still a common practice, however, to apply fertilizer without a current soil test. Frequently all the major nutrients (N P K) and sometimes zinc are used. This experiment was initiated to demonstrate the effects of applying P, K and Zn regardless of soil test. The objective is to demonstrate soil testing's ability to predict crop response to fertilizer and fertilizer influence on soil tests.

Materials and Methods

Treatments listed in Table 1 are applied as below. These treatments have been applied since 1996.

Item:		Description:
Rotation		Soybean, Wheat, Corn (since 1996)
Hybrid		Dekalb (DKC 43-27 VT3)
Fertilizer*	N	Rate = 120 lbs/a (urea) applied according to EC-750 and a high yield goal for corn.
	P	40 lbs P_2O_5/a/yr broadcast (Triple Super Phosphate, 0-46-0)
	K	40 lbs K_2O/a/yr broadcast (potash, 0-0-60)
	Zn	5 lbs/a/yr (zinc sulfate)
		* no fertilizer applied for 2007 soybean crop
Tillage		conventional, incorporate fertilizer treatments
Plot size		15 x 60 ft
reps		4 (randomize complete block)

Results and Discussion

Soil testing clearly shows the influence of annual fertilizer nutrient application as measured from treatment plots with and without each nutrient (Table 1). The P check (No-P) had 1 ppm Olsen P compared to a range of 11 to 19 ppm P when fertilizer P was applied. The K check (No-K) had 116 extractable K compared to 136 to 170 ppm K when fertilizer K was applied. The Zn check (No-Zn) had 1.1 ppm Zn compared to 7.5 to 9.5 when Zn was applied. The large soil test differences between treatment 1 and the nutrient check treatments can be used to determine if these lower tests are limiting grain yields.

During 2009, the N and P check plots limited corn yield (Table 1). Corn grain yield was approximately 39 and 92 bu/a less with low soil test P levels and no applied N, respectively. The corn did not respond to higher K or Zn soil test levels. Grain moisture was significantly lower from the N check plots (trt 2) probably because this treatment already N stressed did not reach physiologic maturity due to much below growing degree days.

Table 1. Corn grain yield and moisture response to long term N, P, K and Zn application at NE farm in 2009.

Fertilizer Nutrients Applied	Oct. 2009 Soil Test			2009 Corn Grain	
	P	K	Zn	Moisture	Yield
	-------- ppm 0-6" -------			%	bu/a
1- all - NPKZN	11	136	9.2	19.2 b	153.0 a
2 - No N - PKZn	19	139	7.5	27.7 a	61.5 c
3 - No P - NKZn	1	159	9.5	18.6 b	114.3 b
4 - No K - PKZn	11	116	9.1	18.4 b	169.3 a
5 - No Zn - NPK	13	170	1.1	18.9 b	157.7 a
Pr>F				0.001	0.001
CV				9.4	10.5
$LSD_{(.05)}$				3.0	21.3

Site in corn/soybean/spring wheat rotation since 1996.
Nutrients applied = N for high yield goal = 120 lbs/a, P_2O_5 = 40 lbs/a/yr, K_2O = 50 lbs/a/yr, Zn = 5 lbs/a/yr

Influence of phosphorus placement and rate on no-till corn, NE Farm 2009. (43709)

R. Gelderman, A. Bly and A. Heuer

Introduction

Recent data is indicating for no-till cropping systems that broadcast P applications are as effective as band or seed placement. Therefore, a research project was initiated at the NE farm to measure the influence of P placement on no-till corn yield.

Materials and Methods

Item:	Description:
Rotation	corn/soybeans
Hybrid	Dekalb (DKC 43-27 VT3)
Planting Date	May 7, 2009
N rate (lbs N/a) applied to all plots	163 as broadcast urea and AMS
P2O5 rates applied as 11-52-0 (MAP)	0, 20, 40
K2O rate (lbs/a) applied to all plots as potash	60
S rate (lbs/a) applied to all plots as AMS	15
Zn rate (lbs/a) applied to all plot as zinc sulfate	5
P2O5 applications methods	Seed furrow and broadcast
Tillage	No-till
Plot Size	10’ x 30’
Replications	4

Results and Discussion

Soil test Olsen P at this site was 10 ppm (Medium). Therefore a 40-60% probability of a response to added P was expected. Corn grain yield was not significantly influenced by P rate (Table 1). However a trend for increased yield existed for the means of P application methods across P rates. P placement was significant (Pr>F 0.08), with the seed placed mean 5 bu/a greater than broadcast P. The rate and placement interaction was not significant. This study will be conducted in 2010.

Table 1. Influence of phosphorus placement and rate on no-till corn, NE Farm 2009. (43709)

	P Placement Method		
P_2O_5 Rate	Seed Furrow	Broadcast	Mean
lbs/a	---------- bu/a ----------		
0	153		153
20	162	150	156
40	158	157	158
Mean	158	153	

Statistics	Pr>F
P Rate (rate)	0.62
P Placement (place)	0.08
Rate x place	0.20

Soil Test P = 10 ppm (Medium)

2009 Spring Wheat Foliar Fungicide Trials

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Introduction:

Spring wheat in northeast South Dakota is subject to several fungal diseases that can limit grain yield, quality and test weight. These diseases include leaf rust (*Puccinia triticina*) and stripe rust (*Puccinia striiformis* f. sp. *tritici*) as well as the residue-borne diseases tan spot (*Pyrenophora tritici-repentis*) and Septoria complex (*Septoria tritici*, *S. avenae*, and *Stagonospora nodorum*). Management of these diseases requires integrating varietal resistance, cultural practices, risk assessment and foliar fungicides. Early applications of some fungicides (applied at Feekes 2-3), often with post-emergence herbicides, have been shown to be effective at slowing disease development and increasing grain yield in wheat, especially in high residue and continuous cropping systems. Typically, however fungicides in wheat are applied at a stage to protect the flag leaf soon after it is fully emerged (Feekes 9), targeting leaf rust, tan spot, and the Septoria complex.

Fusarium head blight (scab or FHB) has also been a recurring problem in winter and spring wheat, durum, and barley grown in South Dakota. Scab outbreaks have been periodic and localized since the early 1990's. A small and localized outbreak occurred in the NE South Dakota in 2004 and a more widespread epidemic developed in 2005 causing extensive damage to winter wheat in the southeastern and south central counties of SD. Damage from FHB is two-fold: yield and test-weight losses are common, but quality losses due to mycotoxin contamination may be even more economically damaging. The fungus which causes FHB, *Fusarium graminearum*, produces potent mycotoxins such as deoxynivalenol (DON, vomitoxin) which contaminate the grain. Scab management also requires an integrated approach including the use of resistant varieties, good rotation and residue management, disease forecasting and foliar fungicides when necessary. Fungicides alone have provided only moderate suppression of FHB, however when combined with other management components, the disease can be effectively minimized. Proper timing of fungicides for FHB management is essential to achieving the greatest efficacy. Fungicides should be applied at or very near the flowering stage (Feekes 10.51) to be most effective on FHB as the host is at the peak of susceptibility to the pathogen. This timing also has some effect on flag-leaf diseases mentioned above.

Materials and Methods:

Hard red spring wheat study areas were established at three South Dakota locations in 2009; the Northeast Research Station, (NE Farm) near South Shore, the Plant Science Research Farm, at Brookings, SD. and in a cooperator's field near Groton, SD. Three types of studies were carried out: 1) a Feekes 2 (2-3 leaf stage) foliar fungicide efficacy trial for management of early season leaf diseases (NE Farm and Brookings); 2) a Feekes 8-9 (flag leaf) foliar fungicide efficacy trial for management of leaf rust and foliar blights; and 3) a fungicide efficacy trial for management of FHB and DON (all three locations). All studies were conducted using two red hard spring wheat cultivars: 'Briggs' a variety resistant to leaf rust and other foliar blights, and moderately resistant to FHB; and 'Reeder', a variety with susceptibility to most major fungal diseases including leaf rust and FHB. Trials were planted in a factorial, randomized complete block design incorporating wheat variety*fungicide treatment as the principle experimental unit (plot). Foliar disease studies utilized four replications, while FHB studies used six replications in a study area. Fungicide treatments were applied at various

growth stages from Feekes 2 (three to five leaf stage, early tillering) to five days after Feekes 10.51 (initiation of flowering). Brookings FHB plots were misted at regular intervals from 6:00pm to 8:00am for ten days following anthesis to enhance the environment for FHB development. The Brookings FHB site was also inoculated with *Fusarium graminearum*-colonized corn grain to enhance inoculum levels in the study area.

At the soft dough stage of crop development, plots were evaluated for leaf diseases, FHB incidence, FHB head severity, and FHB field severity. After harvest, Fusarium damaged kernels (FDK), deoxynivalenol (DON), grain yield, test weight, and protein data were collected. Leaf area assessments were used to estimate the percentage of the flag leaf that was necrotic due to either foliar blights or leaf rust. Specific information on dates of planting, treatment, assessment and harvest are outlined in Table 1.

Table 1: Dates of planting, fungicide applications, plot rating, and harvest for wheat fungicide and FHB trials in northeastern South Dakota in 2009.

Activity	Crop Stage		Date/Location (2009)		
	Descriptive	Feekes	Brookings (Foliar/FHB)	Groton (Foliar/FHB)	NE Farm (Foliar/FHB)
Planting	-	-	5/4	5/2	5/4
Fungicide Appl.	Early/Tillering	2-3	6/4	6/3	6/3
"	Flag leaf	8-9	6/23	6/22	6/23
"	Boots just swollen	10	6/26	6/25	6/25
"	Fully Headed	10.5	6/30	6/30	6/30
"	Flowering	10.51	7/1	7/2	7/1
"	5 days after flowering	-	7/6	7/8	7/6
Disease Ratings	Soft Dough	11.2	7/23	7/28	7/29
Grain Harvest	Mature	11.4	8/31	8/24	8/25

Results and Discussion:

In general, foliar disease pressure was low in 2009, due in large part to the dry weather late in the season. Early season leaf disease development was limited due to cool temperatures and limited inoculum development. Leaf rust did not develop until very late in the season and was generally found at very low severity. Based on data reported in Table 2, early application of foliar fungicides at both locations (Brookings and NE Farm) had no significant effects on either disease ratings or yields for either variety. Furthermore, none of the Feekes 8-9 (flag-leaf) fungicide applications (Table 3) had effects on disease ratings or yields, however two treatments containing insecticides were slightly better than the untreated in either yield or test weight. This is reflective of the low disease pressure, and we would not expect to see differences in the absence of leaf diseases.

There was disease pressure in 2009 in the form of Fusarium head blight (FHB). FHB developed to a greater level in 2009 than in recent years, in large part due to the longer dew periods and more optimal temperatures at heading and flowering (60-80^{o}F). Tables 4-6 summarize the results of FHB integrated management studies at three locations (Brookings, NE Farm and Groton). The FHB trials this year examined various timings of application including

'early' treatment at Feekes 10.5 (fully headed, pre-flowering), 'ideal' timing at Feekes 10.51 (full flowering), and 'late' timing at 5 days after flowering. The timing study was intended to quantify any differences in control as well as to measure the influence of fungicide timing on DON development.

Severity of FHB at Brookings was the greatest at around 25-30% in untreated checks. Brookings location is irrigated to enhance disease development. At Brookings, as in the other locations, Caramba and Prosaro provided the best disease suppression, as expected as these products have been shown in numerous studies to be slightly better at FHB management than most other available products. Timing of application did prove to be important. Early applications of either Prosaro or Caramba resulted in slightly lower rates of control than did a properly timed spray at flowering, or even the late application. DON data at the Brookings location indicated that timing was not as critical for management of toxin accumulation, however other studies around the region have shown conflicting data and care should be taken when interpreting a single location. As expected, the strobilurin-containing product Headline resulted in elevated DON levels nearly 33% greater than untreated checks at Brookings when applied to booted or headed wheat. This is not a recommended practice and should be avoided for this reason.

A principle conclusion reached based on the results of these and many related studies conducted over years and locations are that resistant varieties are a critical component to a sound plant disease management system. By selecting varieties with susceptibility to some of our common diseases, managing those diseases becomes more challenging. Fungicides can be used in many situations; however, some of the current need for these inputs can be mediated through the use of good rotations and selection of resistant varieties.

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Table 2: Feekes 2 foliar fungicide efficacy on two HRSW varieties at two locations in SD.

			BRIGGS- Resistant[1] NE Farm			REEDER- Susceptible NE Farm			BRIGGS- Resistant Brookings			REEDER- Susceptible Brookings		
Treatment	Rate fl oz/A	Crop Stage Feekes	Leaf Rust %[2]	Yield bu/A	Test Weight lb/bu	Leaf Rust %[2]	Yield bu/A	Test Weight lb/bu	Leaf Rus %[2]	Yield bu/A	Test Weight lb/bu	Leaf Rust %[2]	Yield bu/A	Test Weight lb/bu
Untreated			0.00	51.34	57.17	0.10	43.36	55.21	0.50	58.41	52.44	5.75	50.35	52.71
Stratego	5	2	0.00	54.24	56.70	0.15	44.40	55.90	0.00	60.93	54.55	5.25	55.72	51.95
Experimental A	1.5	2	0.00	51.67	57.07	0.20	44.77	55.56	0.25	60.20	53.93	6.75	51.44	53.51
Experimental B + Induce NIS	2	2	0.00	53.50	57.04	0.00	45.05	55.66	0.50	60.73	54.06	3.75	50.53	53.65
Tilt + Warrior (1.28 fl oz/A)	2	2	0.00	57.49	57.28	0.10	51.89	56.10	0.00	61.58	53.55	4.00	57.64	54.00
Experimental C	7	2	0.00	50.61	57.04	0.15	41.15	54.07	0.00	61.07	54.64	5.25	52.46	53.87
Quilt	7	2	0.00	54.49	57.25	0.05	42.28	55.76	0.25	64.29	54.59	6.50	52.13	54.85
Quilt + Warrior (1.28 fl oz/A)	7	2	0.00	56.49	57.04	0.00	49.47	56.84	1.50	64.73	54.14	4.75	60.41	53.32
Warrior II	1.28	2	0.00	55.92	57.87	0.10	49.11	55.85	0.00	62.19	55.05	4.75	57.37	54.16
Tilt	2	2	0.00	52.23	56.87	0.00	45.84	55.51	0.25	60.35	53.62	6.75	53.63	53.00
Headline + Induce NIS	3	2	0.00	54.40	56.85	0.15	47.60	55.89	0.50	64.72	55.37	9.25	56.00	53.81
TwinLine + Induce NIS	7	2	0.00	52.34	57.37	0.05	44.23	54.67	0.50	60.47	53.83	14.25	52.95	52.12
Prosaro + Induce NIS	6.5	2	0.00	50.60	56.79	0.05	45.06	56.51	0.50	63.01	54.22	7.50	53.61	53.44
Experimental D + Induce NIS	3	2	0.00	52.74	57.34	0.05	46.45	55.23	1.00	62.55	53.56	3.75	53.57	53.15
	F-LSD (P=0.05)		NS[3]	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

[1] 'Briggs is generally more resistant to leaf diseases than 'Reeder'.

[2] Percentage of the flag leaf affected by leaf rust.

[3] NS indicates no significant differences among values within columns.

Table 3: Feekes 8-9 foliar fungicide efficacy on two HRSW varieties at three locations in SD.

			BRIGGS- Resistant[1] NE Farm			REEDER- Susceptible NE Farm			BRIGGS- Resistant Brookings			REEDER- Susceptible Brookings		
Treatment	Rate fl oz/A	Crop Stage Feekes	Leaf Rust %[2]	Yield bu/A	Test Weight lb/bu	Leaf Rust %[2]	Yield bu/A	Test Weight lb/bu	Leaf Rust %[2]	Yield bu/A	Test Weigh t lb/bu	Leaf Rust %[2]	Yield bu/A	Test Weight lb/bu
Untreated			0.00	58.64	54.55	0.00	49.65	50.87	0.05	61.30	53.19	0.90	49.61	53.77
Stratego	10	8-9	0.00	55.16	53.16	0.00	48.31	52.07	0.00	60.13	54.13	0.70	51.61	52.57
Experimental A + Induce NIS	4	8-9	0.00	58.26	53.86	0.00	48.77	51.68	0.15	61.72	53.89	0.65	54.52	51.55
Prosaro + Induce NIS	6.5	8-9	0.00	65.42	52.82	0.00	53.73	48.37	0.05	64.22	53.02	0.40	55.96	52.85
Experimental B + Crop Oil	14	8-9	0.00	60.17	53.38	0.05	54.51	49.24	0.20	58.91	53.50	1.10	52.41	52.73
Experimental C + Crop Oil	10.5	8-9	0.00	56.05	52.23	0.00	45.96	49.72	0.05	66.70	50.81	0.25	54.20	52.10
Experimental C + Crop Oil	14	8-9	0.00	58.03	52.95	0.00	45.57	50.07	0.05	62.34	54.64	0.30	52.72	52.45
Alto + Crop Oil	4	8-9	0.00	60.17	52.44	0.00	49.07	48.95	0.05	63.45	53.61	0.45	53.85	52.48
Experimental D + Crop Oil	5	8-9	0.00	55.66	53.43	0.00	45.67	49.18	0.25	56.93	54.67	0.25	49.72	51.00
TwinLine + Induce NIS	7	8-9	0.00	63.36	52.90	0.00	51.40	49.30	0.00	58.32	54.45	0.45	56.72	53.78
Experimental B + Crop Oil	14	8-9	0.00	59.18	53.64	0.10	48.06	50.51	0.10	56.54	54.05	1.05	53.93	52.30
TwinLine + Induce NIS	9	8-9	0.00	57.09	54.17	0.00	47.53	51.88	0.05	64.35	53.32	0.10	57.77	53.96
Quilt	14	8-9	0.00	60.41	53.17	0.00	44.69	50.61	0.05	60.25	53.61	0.85	52.46	52.98
Experimental E	10	8-9	0.00	60.16	51.39	0.00	49.50	51.91	0.05	62.16	54.10	0.55	56.19	52.81
Headline + Induce NIS	6	8-9	0.00	60.43	53.62	0.00	52.54	50.64	0.05	59.22	54.40	0.80	60.07	53.97
Experimental F + Induce NIS	6	8-9	0.00	59.37	52.86	0.00	52.42	50.05	0.10	66.80	53.78	0.95	55.83	52.98
Experimental G + Induce NIS	6	8-9	0.00	56.83	53.73	0.00	45.76	50.71	0.07	64.35	51.09	0.66	51.71	53.80
Experimental G + Induce NIS	9	8-9	0.00	63.72	51.99	0.00	49.97	51.22	0.05	64.22	53.54	1.10	55.83	51.62
Experimental H	12	8-9	0.05	57.39	52.36	0.00	54.33	51.13	0.15	58.13	52.87	0.70	54.01	53.08
Experimental H	24	8-9	0.00	58.86	54.17	0.00	54.19	50.97	0.05	59.79	52.19	0.55	47.65	53.12
Tilt + Quilt	2	8-9	0.00	61.67	53.42	0.00	50.22	48.49	0.35	56.29	52.30	0.45	54.47	54.20
Quilt + Warrior II (1.28 fl oz/A)	14	8-9	0.00	62.03	52.11	0.00	55.08	50.31	0.05	63.68	**55.69**	0.80	60.07	53.97
Warrior II	1.28	8-9	0.00	62.85	54.65	0.05	**57.30**	50.38	0.25	61.96	**55.44**	0.95	57.44	53.88
	F-LSD (P=0.05)		NS[3]	NS	NS	NS	6.99	2.03	NS	NS	2.31	NS	NS	NS

[1] 'Briggs is generally more resistant to leaf diseases than 'Reeder'.

[2] Percentage of the flag leaf affected by leaf rust.

[3] NS indicates no significant differences among values within columns.

Table 4: Foliar fungicide efficacy on two HRSW Varieties for management of Fusarium Head Blight at **NE Farm**.

			BRIGGS- Resistant						REEDER- Susceptible					
Treatment	Rate fl oz/A	Crop Stage Feekes[1]	Leaf Blights %[2]	Leaf Rust %[3]	FHB Dis-ease[4] Index %	Yield bu/A	Test Weight lb/bu	DON[5] ppm	Leaf Blights %[2]	Leaf Rust %[3]	FHB Disease[4] Index %	Yield bu/A	Test Weight lb/bu	DON[5] ppm
Untreated			25.17	0.00	6.35	60.11	52.60		20.83	0.50	6.43	53.70	48.86	
Proline +Caramba	3 + 7	10.51	20.67	0.00	**1.98**	**66.19**	**55.89**		17.67	**0.00**	**3.99**	**59.53**	**50.62**	
Prosaro	6.5	10.5	20.33	0.00	**2.87**	64.58	**54.80**		17.83	**0.00**	4.23	56.38	50.52	
Prosaro	6.5	10.51	19.17	0.00	**1.38**	**68.09**	**54.88**		18.33	**0.00**	4.30	58.08	**51.96**	
Prosaro	6.5	5 days after 10.51	13.87	0.03	**2.89**	**65.64**	**55.89**		19.83	**0.13**	**3.77**	**59.47**	**52.51**	
Caramba	13.5	10.5	14.93	0.00	**2.67**	**67.41**	**54.64**		19.40	**0.00**	6.21	56.08	50.17	
Caramba	13.5	10.51	28.33	0.00	**2.62**	**66.23**	**55.51**		16.83	**0.03**	**3.93**	54.57	**51.50**	
Caramba	13.5	5 days after 10.51	17.33	0.00	**2.49**	**67.51**	**55.13**		18.33	**0.13**	**3.05**	**61.38**	**52.23**	
Headline	6	10	18.00	0.00	6.33	61.28	51.73		21.33	**0.07**	7.26	51.01	49.90	
Headline	6	10.5	19.83	0.00	**3.65**	**66.63**	52.43		13.83	**0.17**	6.52	**59.53**	48.41	
Headline	6	9	19.83	0.00	**4.40**	62.25	52.64		18.17	**0.17**	8.73	55.70	48.27	
Folicur	4	10.51	21.60	0.00	**2.34**	64.26	**54.81**		21.33	**0.00**	**3.49**	57.22	49.15	
Prosaro	8.2	10.51	16.83	0.00	**1.59**	64.52	**55.10**		17.00	**0.00**	**3.23**	**59.76**	**52.26**	
Stratego	5	2	23.43	0.00	**1.36**	63.03	**55.21**		20.67	**0.00**	4.56	**63.49**	**50.72**	
Prosaro	6.5	10.51												
Experimental A	1.5	2	15.00	0.00	**1.33**	**70.36**	**56.15**		12.83	**0.00**	4.39	**61.81**	**51.76**	
Prosaro	6.5	10.51												
Experimental B	2	2	16.50	0.00	**2.08**	**67.10**	**56.89**		25.67	**0.00**	**3.22**	**59.59**	**51.69**	
Prosaro	6.5	10.51												
		F-LSD (P=0.10)	NS	NS	1.59	4.56	1.53		NS	0.16	2.38	5.72	1.72	

Briggs is generally more resistant to FHB than Reeder.

[1] The recommended timing is Feekes 10.51; alternative times were tested for efficacy and influence on DON levels.

[2] Percentage of the flag leaf affected by leaf blights (tan spot, Septoria complex, leaf rust).

[3] Percentage of the flag leaf affected by leaf rust.

[4] Index represents overall amounts of disease (Incidence x Severity of Diseased Heads).

[5] Data not available at time of publication.

Table 5: Foliar fungicide efficacy on two HRSW Varieties for management of Fusarium Head Blight at **Brookings**.

			BRIGGS- Resistant						REEDER- Susceptible					
Treatment	Rate fl oz/A	Crop Stage Feekes[1]	Leaf Blights %[2]	Leaf Rust %[3]	FHB Disease[4] Index %	Yield bu/A	Test Weight lb/bu	DON ppm	Leaf Blights %[2]	Leaf Rust %[3]	FHB Disease[4] Index %	Yield bu/A	Test Weight lb/bu	DON ppm
Untreated			49.80	0.20	31.25	44.31	54.32	9.60	46.20	1.50	25.19	29.17	55.10	19.58
Proline +Caramba	3 +7	10.51	38.53	0.17	**24.39**	**57.73**	**56.13**	**6.10**	41.37	**0.43**	20.85	**44.39**	55.51	**13.08**
Prosaro	6.5	10.5	55.73	0.07	**22.34**	**56.61**	**56.38**	**5.70**	30.00	**0.17**	**16.64**	**40.46**	55.33	**14.52**
Prosaro	6.5	10.51	44.70	0.07	**20.17**	**54.81**	**55.87**	**6.42**	36.93	**0.77**	**18.97**	**41.73**	54.62	**15.05**
Prosaro	6.5	5 days after 10.51	40.87	0.17	**20.73**	**54.42**	**56.08**	**6.90**	37.77	**0.33**	**18.84**	**41.96**	55.21	**15.33**
Caramba	13.5	10.5	43.60	**0.03**	27.39	**58.56**	**55.98**	**6.52**	27.00	**0.37**	28.47	**36.28**	54.48	**16.77**
Caramba	13.5	10.51	47.70	0.17	27.07	**57.65**	**56.61**	**5.47**	30.67	**0.37**	**14.19**	**38.93**	54.37	**14.82**
Caramba	13.5	5 days after 10.51	37.23	0.07	**24.68**	**52.53**	**55.91**	**7.53**	41.67	**0.60**	**19.19**	**41.22**	54.12	**13.95**
Headline	6	10	34.17	0.17	30.23	46.23	54.45	12.78	43.23	**0.63**	25.46	27.09	53.71	18.95
Headline	6	10.5	49.90	0.13	30.98	**52.64**	54.96	11.47	28.00	**0.70**	25.52	30.95	52.51	21.98
Headline	6	9	44.10	0.43	29.70	44.45	54.56	8.60	37.67	1.93	25.91	27.86	54.15	17.48
Folicur	4	10.51	47.23	**0.03**	25.74	**51.16**	55.37	8.75	31.33	**0.47**	23.62	**36.52**	54.20	18.33
Prosaro	8.2	10.51	45.13	**0.00**	27.20	**58.86**	**56.86**	**6.87**	42.70	**0.20**	22.58	**48.32**	55.42	**14.28**
Stratego	5	2	50.71	0.13	27.73	**58.62**	**56.63**	**6.60**	31.56	**0.38**	22.44	**39.08**	55.06	**16.20**
Prosaro	6.5	10.51												
Experimental A	1.5	2	50.23	**0.03**	**19.43**	**57.53**	**56.15**	**6.33**	29.67	**0.37**	**19.53**	**39.44**	55.21	**13.13**
Prosaro	6.5	10.51												
Experimental B	2	2	50.77	**0.00**	**21.68**	**60.11**	**56.37**	**6.13**	38.63	**0.43**	**18.75**	**41.41**	55.00	**13.60**
Prosaro	6.5	10.51												
		F-LSD (P=0.10)	NS	0.17	5.97	5.88	1.06	1.83	NS	0.54	5.58	4.39	NS	2.47

Briggs is generally more resistant to FHB than Reeder.

[1] The recommended timing is Feekes 10.51; alternative times were tested for efficacy and influence on DON levels.

[2] Percentage of the flag leaf affected by leaf blights (tan spot, Septoria complex, leaf rust).

[3] Percentage of the flag leaf affected by leaf rust.

[4] Index represents overall amounts of disease (Incidence x Severity of Diseased Heads).

Table 6: Foliar fungicide efficacy on two HRSW Varieties for management of Fusarium Head Blight at **Groton**.

			BRIGGS- Resistant						REEDER- Susceptible					
Treatment	Rate fl oz/A	Crop Stage Feekes[1]	Leaf Blights %[2]	Leaf Rust %[3]	FHB Dis-ease[4] Index %	Yield bu/A	Test Weight lb/bu	DON[5] ppm	Leaf Blights %[2]	Leaf Rust %[3]	FHB Disease[4] Index %	Yield bu/A	Test Weight lb/bu	DON[5] ppm
Untreated			41.77	0.27	3.86	56.98	56.73		52.73	2.40	2.73	46.55	55.78	
Proline +Caramba	3 +7	10.51	48.57	**0.03**	2.61	54.29	57.76		48.10	**0.30**	3.21	48.50	56.69	
Prosaro	6.5	10.5	42.60	**0.00**	3.14	55.39	57.66		41.07	**0.13**	3.68	50.93	54.53	
Prosaro	6.5	10.51	38.60	**0.00**	**1.29**	56.13	57.52		42.67	**0.07**	3.34	49.49	56.73	
Prosaro	6.5	5 days after 10.51	44.90	**0.00**	**1.85**	56.90	57.65		30.51	**0.03**	2.53	52.73	**57.21**	
Caramba	13.5	10.5	59.07	**0.03**	3.13	53.97	56.81		50.47	**0.33**	4.02	47.51	56.38	
Caramba	13.5	10.51	53.60	**0.00**	2.64	56.94	57.00		51.03	**0.00**	3.40	46.60	56.04	
Caramba	13.5	5 days after 10.51	40.93	**0.03**	**1.60**	57.84	57.28		38.77	**0.00**	1.88	48.54	55.79	
Headline	6	10	36.13	0.40	6.02	58.46	57.35		35.00	**1.13**	5.25	53.28	54.59	
Headline	6	10.5	42.47	**0.07**	3.91	53.62	56.54		54.63	**0.80**	3.93	47.79	55.15	
Headline	6	9	34.60	0.27	5.20	53.22	57.89		47.40	**0.87**	3.78	48.59	55.04	
Folicur	4	10.51	38.77	**0.00**	3.45	54.95	57.89		47.50	**0.33**	2.67	49.53	55.15	
Prosaro	8.2	10.51	43.77	**0.00**	**1.15**	58.73	57.80		33.17	**0.00**	3.70	50.56	56.70	
Stratego	5	2	44.33	**0.03**	**2.15**	57.59	57.73		50.53	**0.03**	2.80	48.94	55.14	
Prosaro	6.5	10.51												
Experimental A	1.5	2	51.23	**0.00**	**1.81**	53.83	57.82		45.57	**0.03**	2.44	47.79	55.42	
Prosaro	6.5	10.51												
Experimental B	2	2	47.03	**0.03**	2.24	53.08	57.08		33.93	**0.00**	2.35	46.93	55.89	
Prosaro	6.5	10.51												
		F-LSD (P=0.10)	NS	0.13	1.67	NS	NS		NS	0.43	1.35	NS	1.42	

Briggs is generally more resistant to FHB than Reeder.

[1] The recommended timing is Feekes 10.51; alternative times were tested for efficacy and influence on DON levels.

[2] Percentage of the flag leaf affected by leaf blights (tan spot, Septoria complex, leaf rust).

[3] Percentage of the flag leaf affected by leaf rust.

[4] Index represents overall amounts of disease (Incidence x Severity of Diseased Heads).

[5] Data not available at time of publication.