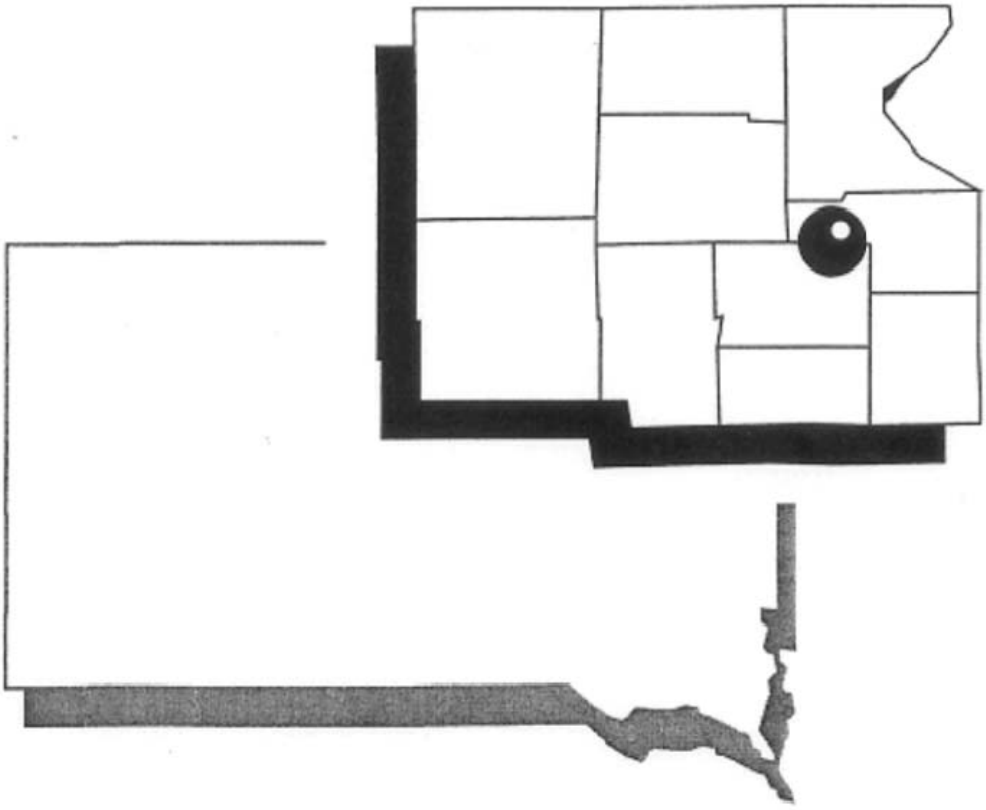
2007 ANNUAL PROGRESS REPORT

Plant Science Pamphlet No. 32

January 2008

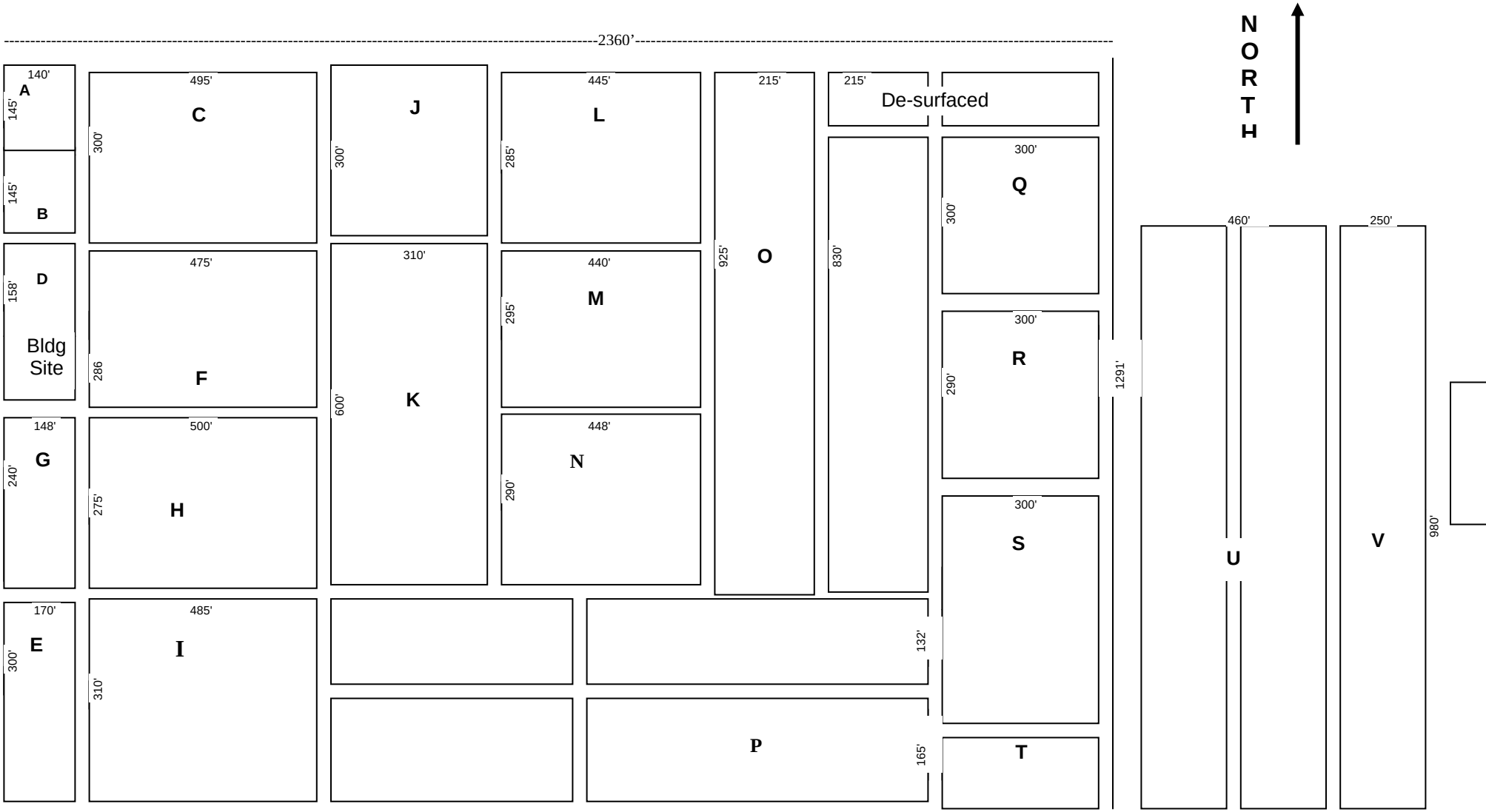


Northeast Research Station

Watertown, South Dakota

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

Northeast Research Station (Watertown)
2006 Land Use Map



Plot Acreage:

A	0.49	H	3.15	O	9.57	V	5.5
B	0.49	I	3.44	P	8.65		
C	3.40	J	2.13	Q	2.06		
D	0.54	K	4.27	R	2.00		
E	1.20	L	3.00	S	3.00		
F	3.12	M	3.00	T	0.51		
G	0.86	N	2.98	U	9.72		

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

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2007
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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Chris Onstad**	Dist Ext Supervisor, SDSU,AgHall 134	Brookings	688-5132

* County Extension Educator
**SDSU Representatives
*** SDSU Representative after Jim Smolik's retirement.

SDSU – AES-
NORTHEAST RESEARCH FARM
2008 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 Tours
- Fall Agronomy Field Tour
- Annual Northeast Research Station Research Report (Plant Science Website)

HISTORY:

This year marked the 53th 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. A 70-mile radius from this location includes 12 counties in the northeast region of South Dakota. 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.

Several factors determined the general area for a research station; photoperiods, growing degree units, precipitation, diseases, and insects are all affected by latitude and/or longitude. In a continental climate, regional environments are similar from year to year; however, environments always deviate from the mean on 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 a maturity, comparisons may be made on a relative basis.

NORTHEAST REGIONAL CROP PRODUCTION 2006:

Planted Acres

	NORTHEAST REGION Acres(12 counties)	SOUTH DAKOTA Total Acres	% of Total Acres
Corn	1,355,500	4,500,000	30.1
Soybean	1,637,000	3,950,000	41.4
Spring Wheat	514,500	1,850,000	27.8
Winter Wheat	69,900	1,450,000	4.8
Oat	34,700	380,000	9.1
Hay (harvested)	525,000	3,100,000	16.9

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:

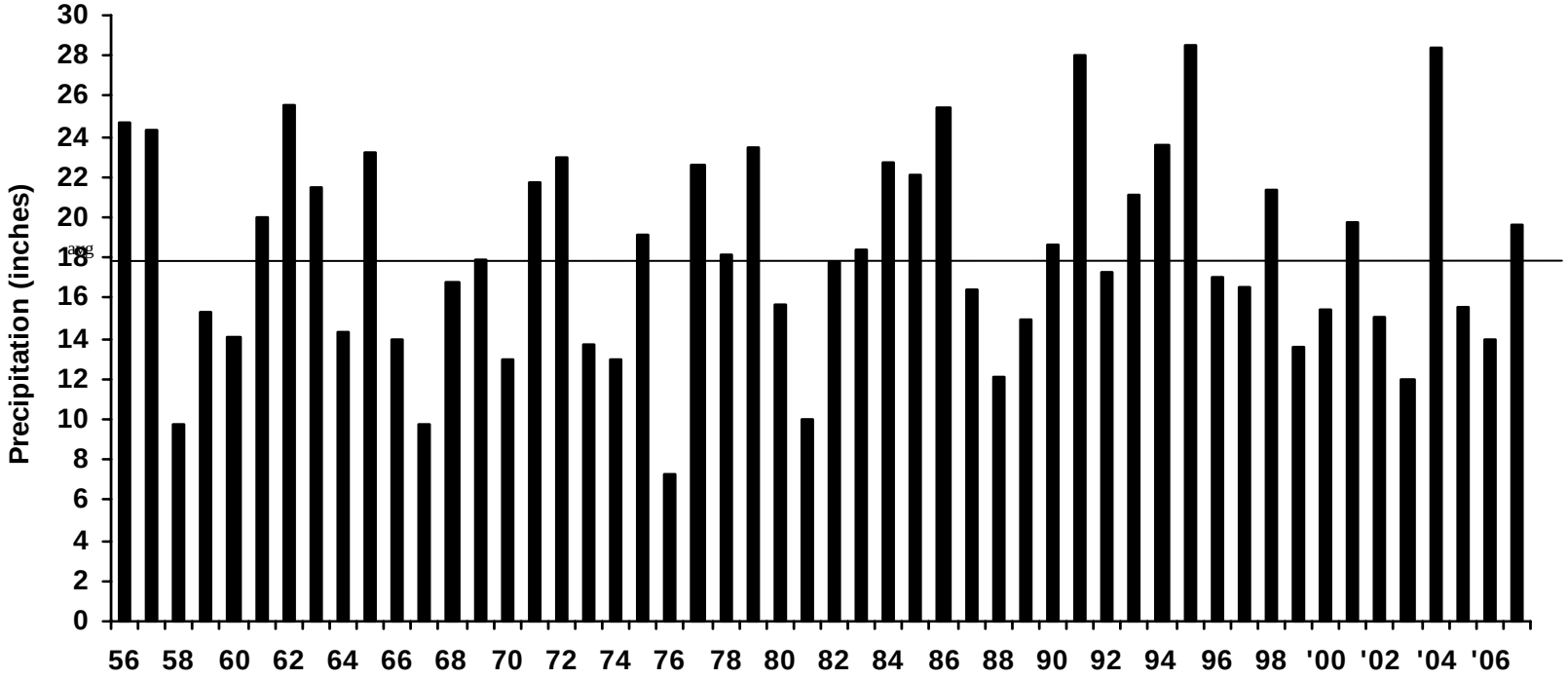
- There are 74 tillable acres comprised of 22 research blocks.
- The building is 50' x 100' with 7500 ft^2 of storage and 2500 ft^2 of utility workspace.
- Major Equipment:
  - Tractor- Heston- Model 666
  - Tractor- NH- Model- 7635
  - Loader- 7310- Fits 7635 tractor
  - Tractor- NH TC35 Delux-
  - 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 - 2006

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
Avg:	2.03	3.04	3.5	3.11	2.72	2.09	1.7	18.21	148

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

Figure 1. Growing Season Precipitation, 1956 - 2007



Eastern South Dakota Spring-Seeded Small Grain Variety Test Results[1]

Robert G. Hall, Extension agronomist – crops
Kevin K. Kirby, Agricultural research manager
Jesse A. Hall, Agricultural research manager
South Dakota State University

Trial Methods

A randomized complete block design with four replicated plots, each measuring 5 feet wide and 14 feet long, were seeded and later harvested with a small plot combine. Plots were fertilized with 60 lb per acre of 18-46-0(10.8 lb of N and 27.6 lb of phosphorus per acre) down the seed tube at planting. A post-emergence application of Bronate (1.0 pint) was used for weed control. The oat and barley plots were seeded at 28 pure-live-seeds (PLS) per square foot or 1,219,680 PLS seeds per acre; a seeding rate that generally results in about 25 seedlings per square foot (1,089,000 seedlings per acre) at emergence. The spring wheat plot seeding rates were seeded at 42 PLS per square foot (1,830,000 PLS per acre). This resulted in a wheat seedling density at emergence of about 37-38 seedlings per square foot (1,633,500 seedlings per acre).

Performance Trail Results

General comments – Small grain performance results for the Northeast Research Farm and other area locations are presented in tables 1a and b (spring wheat), 2a and b (oats), and 3a and b (barley). First, yield averages (four replicates) were analyzed by location. Second, performance averages for the variables bushel weight, height, lodging and grain protein were analyzed across locations using location as a replicate. This allowed entry (treatment) differences for these variables to be determined. The top performance group (TPG) for each variable was determined by location (yield) or statewide (bushel weight, height, lodging, and grain protein). The least significant difference (LSD value) for each variable and the minimum value needed for an entry to qualify for the TPG are listed at the bottom of each column where SAS analysis was done. Look for TPG values identified with a plus sign (+) in each table.

More importantly, when evaluating entries in the yield tables note the values in the State Top-Yield Frequency columns. These values (percentages) indicate how frequently an entry is in the TPG across locations. For example, an entry with a top-yield-frequency value of 50% is in the TPG at half of the locations tested. Generally, a top-yield-frequency of 50% is considered very good, and entries with percentages of 50% or higher exhibit good yield stability. That means they are adapted to a wider range of environments compared to entries with a top-yield-frequency of 0 to 40%. High percentages are better, look for entries with a top-yield-frequencies of 50% or higher.

[1]These results were made possible by funding assistance from the South Dakota Agricultural Experiment Station.

HRS Wheat (Tables 1a-b) - The top entries for yield for the past 3 years as determined by state top yield frequency (3-Yr column in Table 1a) included Traverse at 100%; SD 3868, Steele-ND, Briggs, and Granger at 86%; and SD 3870, SD 3851, and Freyr at 71%. In

2007, among the entries tested for three years, only Traverse and Howard had a top-yield-frequency above 50% (2007 column). Likewise in 2007, among entries tested for less than three years, only SD 3944, SD 3942, SD 3943, Faller, and SD 3948 had top-yield-frequencies above 50%.

The top bushel weight entries (Table 1b) included nine entries that averaged 59 pounds. Eight entries averaged the test trial average of 58 pounds, while one averaged 57 pounds, and six averaged 56 pounds in bushel weight. The tallest entry at 37 inches was the check variety Chris, while other entries had to differ by 1 inch in height to be significantly different from one another. The lodging results on a statewide basis indicated there were no entry differences in the lodging ratings in 2007. The TPG for grain protein included Glen, Kelby, and the check variety Chris.

Oat (Tables 2a-b) - The top entries for yield for the past 3 years as determined by state top yield frequency (3-Yr column in Table 2a) included Stallion, HiFi, Beach, Morton, Loyal at 100%; Don and Jerry at 75%; and Reeves at 50%. In 2007, among the entries tested for three years, only Stallion had a top-yield-frequency above 50% (2007 column). Likewise in 2007, among the entries tested for less than three years, only SD 041405; SD 041451, SD 041445, SD 030888, Souris, and SD 020883-10 exhibited top-yield-frequencies equal to or greater than 50%.

The top bushel weight entry (Table 2b) was the hulless experimental line SD 020301-20 at 45 pounds followed closely by Buff at 44 pounds. Among the standard hulled oat entries, eight averaged the test trial average of 39 pounds, five averaged 38 pounds, three averaged 37 pounds, two averaged 36 pounds, and HiFi averaged a low of 35 pounds in bushel weight. The statewide plant height average was 37 inches and the data indicated entries had to differ by 1 inch to be significantly different in height. The tallest entries were Morton at 41 inches, followed by Stallion, Loyal and Beach at 40 inches. The lodging results indicated Morton and Buff were the most resistant to lodging with a score of 1 while the other entries equaled the statewide average of 2. The TPG for grain protein included Hytest and the hulless experimental SD 020301-20.

Barley (Tables 3a-b) - The top entries for yield for the past 3 years as determined by state top yield frequency (3- Yr column in Table 3a) included Eslick at 67%; and Lacey, Drummond, and Conlon at 50%. In 2007, among the entries tested for three years, only Eslick, Conlon and Lacey had a top-yield-frequency greater or equal to 50% (2007 column). Likewise in 2007, among the entries tested less than three years, only Pinnacle had a top-yield-frequency above 50%.

The top bushel weight entries (Table 3b) included four entries that averaged 46 pounds. Three entries averaged the statewide average of 45 pounds, two averaged 44 pounds, and one (Stellar-ND) averaged a low of 43 pounds per bushel. Plant height averaged 31 inches and entries had to differ by 2 inches to be significantly different in height. The seven tallest entries averaged 31 inches or more in height. The six best lodging resistant entries equaled the statewide average score of 1. The TPG for grain protein included the varieties Conlon, Lacey, Robust, Drummond, Legacy, Eslick, and Tradition.

Table 1a. Hard red spring wheat yield results- four eastern South Dakota locations, 2005-07.

Variety (Hdg.)* - by 3-yr then 2007 state yield	Location Yield Avg. (Bu/A at 13% moist.)								State Yield Avg. (Bu/A)		SD Top-Yield Freq. **	
	Brookings		So. Shore		Spink Co.		Brown Co.					
	2007	3-Yr	2007	3-Yr	2007	3-Yr	2007	3-Yr	2007	3-Yr	2007	3-Yr
Traverse (0)	44+	54+	59	57+	58+	61+	49	58+	47	50	63	100
Howard (4)	39	46	67+	58+	57+	60+	53+	58+	47	49	63	47
SD 3868 (-)	43+	48	60	56+	50	62+	50	58+	44	49	25	86
Steele-ND (3)	41+	46	64	57+	52+	59+	52	55+	45	48	38	86
Briggs (0)	42+	48	65	56+	49	59+	50	56+	45	48	25	86
Granger (0)	43+	48	57	54+	46	57+	47	54+	43	47	13	86
SD 3870 (-)	43+	46	60	55+	46	58+	47	54+	43	47	13	71
SD 3851 (-)	38	47	60	54+	45	55+	43	52+	41	46	13	71
Freyr (1)	33	42	57	51+	47	57+	41	52+	41	45	13	71
Walworth (0)	39	46	57	48	38	52	46	52+	41	44	13	43
Glenn (3)	31	38	58	52+	47	57+	40	50	39	44	0	43
Forge (-1)	38	47	57	50	34	50	40	48	39	44	25	29
Banton (1)	36	44	61	51	47	56+	45	49	41	43	13	43
Ulen (2)	33	40	57	49	42	56+	42	52+	39	43	0	43
Russ (2)	38	45	58	49	41	49	38	50	39	43	0	29
Oxen (2)	34	42	50	47	36	52	44	50	38	43	13	29
Reeder (3)	38	44	55	45	30	45	40	51	37	41	13	29
Alsen (4)	34	39	50	48	37	50	39	48	37	41	13	14
Chris,CK (3)	28	35	37	36	29	40	31	43	28	34	0	0
SD 3944 (-)	45+	.	66+	.	54+	.	58+	.	49	.	88	
SD 3942 (-)	43+	.	65	.	52+	.	56+	.	48	.	88	
Faller (-)	40+	.	64	.	55+	.	48	.	47	.	63	
SD 3943 (-)	43+	.	69+	.	54+	.	56+	.	47	.	88	
SD 3948 (-)	42+	.	71+	.	57+	.	53+	.	47	.	63	
SD 3965 (-)	44+	.	61	.	51	.	50	.	46	.	38	
RB07 (2)	35	.	63	.	50	.	46	.	45	.	38	
SD 3927 (-)	35	.	59	.	52+	.	46	.	43	.	25	
SD 3956 (-)	39	.	65	.	44	.	48	.	43	.	13	
Kelby (2)	36	.	61	.	44	.	46	.	41	.	13	
Kuntz (2)	33	.	58	.	47	.	47	.	40	.	0	
Hat Trick (3)	34	.	53	.	43	.	42	.	39	.	0	
Ada (1)	34	.	51	.	43	.	40	.	39	.	0	
Test avg. :	38	44	59	51	46	54	46	52	42	45		
High avg. :	45	54	71	58	58	62	58	58	49	50		
Low avg. :	28	35	37	36	29	40	31	43	28	34		
# LSD (.05) :	5	5	5	7	6	8	5	6				
## TPG-value :	40	49	66	51	52	54	53	52				
### C.V. :	9	8	6	7	10	7	8	8				

* Heading, the relative days to heading, compared to the variety - Briggs.

LSD - the amount column values must differ to be significantly different.

TPG-value, the minimum value required for the top-performance group (TPG) for yield.

A plus sign (+) indicates values within a column that qualify for the TPG.

Coef. of variation, a measure of trial experimental error, 15% or less is best.

Table 1b. Eastern South Dakota and state spring wheat averages for bushel wt. (BW), height (HT), lodging (LDG), and grain protein (PRT) in 2007.

	Eastern Avg. - BW, HT, LDG, PRT				SD Avg. - BW, HT, LDG, PRT			
Variety (Hdg.)	BW lb	HT in	LDG	PRT %	BW lb	HT in	LDG	PRT %
SD 3956(-)	59	33	1	13.8	59+	33	1	13.8
Banton (1)	59	33	1	14.4	59+	33	1	14.4
SD 3927(-)	59	33	1	13.8	59+	33	1	13.8
SD 3944(-)	58	33	1	13.7	59+	33	1	13.7
SD 3948(-)	59	34	1	14.1	59+	34	1	14.1
RB07 (2)	58	32	1	14.4	59+	32	1	14.4
Hat Trick (3)	59	32	1	13.9	59+	32	1	13.9
Kelby (2)	58	30	1	14.7	59+	30	1	14.7+
SD 3851(-)	59	34	1	13.8	59+	34	1	13.8
Ada (1)	58	32	1	13.9	58	32	1	13.9
Alsen (4)	58	32	1	14.5	58	32	1	14.5
Ulen (2)	58	33	1	14.3	58	33	1	14.3
Briggs (0)	58	33	1	14.2	58	33	1	14.2
Granger (0)	57	35	1	13.7	58	35	1	13.7
SD 3870(-)	58	36	1	13.9	58	36	1	13.9
SD 3965(-)	57	35	1	13.4	58	35	1	13.4
Freyr (1)	57	32	1	14.1	58	32	1	14.1
Glenn (3)	58	33	1	14.9	57	33	1	14.9+
Chris,CK (3)	55	37	2	14.6	56	37+	1	14.6+
Test avg. :	58	33	1	13.9	58	33	1	13.9
High avg. :	59	37	2	15.2	59	37	1	15.2
Low avg. :	55	30	1	12.8	56	30	1	12.8
# LSD (.05) :					1	1	0	0.6
## TPG-value :					59	37	1	14.6
### C.V. :					4	6	18	4

* Heading, the relative days to heading, compared to the variety - Briggs.

** Lodging score: 0= all plants erect, 3= 50% of plants lodged at 45°-angle, 5= all plants

LSD, the amount column values must differ to be significantly different.

TPG-value, the minimum or maximum value required for the top-performance group

A plus sign (+) indicates values within a column that qualify for the TPG.

Coef. of variation, a measure of trial experimental error.

Table 2a. Oat yield results - three eastern South Dakota locations, 2005-07.

Variety (Hdg.)* - by 3-yr then 2007 state yield avg.	Location Yield Avg. (Bu/A at 13% moist.)						State Yield Avg. (Bu/A)		SD Top-Yield Freq. ** (%)	
	Brookings		So. Shore		Brown Co.					
	2007	3-Yr	2007	3-Yr	2007	3-Yr	2007	3-Yr	2007	3-Yr
Hulled types:										
Stallion (8)	123+	119+	141+	129+	133+	115+	113	122	63	100
HiFi (8)	115	123+	134	131+	127+	121+	104	122	25	100
Beach (6)	124+	117+	139+	125+	123+	116+	107	118	38	100
Morton (7)	114	110+	137	129+	119	108+	105	115	0	100
Loyal (8)	115	117+	130	119+	113	102+	100	113	13	100
Don (1)	112	112+	130	114+	118	100+	107	106	0	75
Jerry (5)	117	113+	119	107	111	95+	100	106	0	75
Reeves (2)	107	105+	133	112	105	93+	103	103	0	50
Hytest (4)	84	89	91	94	79	84	74	84	0	0
SD 041405 (-)	119	.	149+	.	130+	.	119	.	88	
SD 041451 (-)	119	.	148+	.	121	.	115	.	75	
SD 041445 (-)	130+	.	139+	.	128+	.	114	.	75	
Souris (6)	123+	.	141+	.	132+	.	112	.	63	
SD 030888 (-)	127+	.	146+	.	122+	.	112	.	75	
SD 020883-10 (-)	109	.	148+	.	113	.	110	.	50	
SD 020883-29 (-)	115	.	136	.	118	.	109	.	38	
SD 020883-11 (-)	111	.	146+	.	115	.	109	.	38	
SD 020883-17 (-)	117	.	142+	.	114	.	108	.	25	
SD 041117 (-)	113	.	144+	.	113	.	108	.	25	
Hulless types:										
Buff Hls (3)	78	84	97	91	78	74	76	84	0	
SD 020301-20 (-)	86	.	116	.	101	.	84	.	0	
Test avg. :	109	104	131	112	112	98	102	104		
High avg. :	130	123	149	131	133	121	119	122		
Low avg. :	39	60	77	77	55	67	49	67		
# LSD (.05) :	8	18	11	18	11	29				
## TPG-value :	122	105	138	113	122	92				
### C.V. :	5	8	6	8	7	10				

* Heading, the relative days to heading, compared to the variety - Don.

LSD - the amount column values must differ to be significantly different.

TPG-value, the minimum value required for the top-performance group (TPG) for yield. A plus sign (+) indicates values within a column that qualify for the TPG.

Coef. of variation, a measure of trial experimental error, 15% or less is best.

Table 2b. Eastern South Dakota and state oat averages for bushel weight (BW), height lodging (LDG), and grain protein (PRT) in 2007.

	Eastern Avg. - BW, HT, LDG, PRT				State Avg. - BW, HT, LDG, PRT			
Variety (Hdg.)* - by state BW avg.	BW lb	HT in	LDG	PRT %	BW lb	HT in	LDG	PRT %
Hulled types:								
SD 020883-29 (-)	40	36	3	16.9	39	36	2	16.9
SD 020883-11 (-)	40	36	2	16.8	39	35	2	16.8
SD 020883-10 (-)	40	37	2	16.3	39	36	2	16.3
SD 041451 (-)	40	40	3	15.8	39	38	2	15.8
Hytest (4)	39	40	2	19.1	39	39	2	19.1+
SD 020883-17 (-)	39	37	3	16.5	39	36	2	16.5
Reeves (2)	39	40	3	18.0	39	39	2	18.0
SD 041445 (-)	40	40	2	15.6	39	39	2	15.6
SD 041117 (-)	39	36	2	16.4	38	35	2	16.4
Beach (6)	39	42	2	14.7	38	40+	2	14.7
SD 041405 (-)	38	35	3	15.0	38	34	2	15.0
Jerry (5)	38	39	2	16.0	38	38	2	16.0
SD 030888 (-)	38	34	2	15.4	38	33	2	15.4
Stallion (8)	39	42	2	16.6	37	40+	2	16.6
Don (1)	37	34	3	15.3	37	33	2	15.3
Souris (6)	37	36	2	15.6	37	34	2	15.6
Loyal (8)	37	41	2	17.0	36	40+	2	17.0
Morton (7)	37	42	2	15.8	36	41+	1+	15.8
HiFi (8)	37	39	2	15.4	35	38	2	15.4
Hulless types:								
Buff Hls (3)	45	36	2	17.9	44	35	1+	17.9
SD 020301-20 (-)	46	39	2	18.8	45+	38	2	18.8+
Test avg. :	39	38	2	16.5	39	37	2	16.5
High avg. :	46	42	3	19.1	45	41	2	19.1
Low avg. :	37	34	2	14.7	35	33	1	14.7
# LSD (.05) :					1	1	1	0.8
## TPG-value :					44	40	1	18.3
### C.V. :					5	6	27	4

* Heading, the relative days to heading, compared to the variety - Don.

** Lodging score: 0= all plants erect, 3= 50% of plants lodged at 45°-angle, 5= all plants

LSD - the amount column values must differ to be significantly different.

TPG-value, the minimum or maximum value required for the top-performance group

A plus sign (+) indicates values within a column that qualify for the TPG.

Coef. of variation, a measure of trial experimental error.

Table 3a. Barley yield results - three eastern South Dakota locations, 2005-07.

Variety (Hdg.)* - by 3-yr then 2007 state yield avg.	Location Yield Avg. (Bu/A at 13% moist.)						State Yield Avg. (Bu/A)		State Top-Yield Freq. **	
	Brookings		So. Shore		Brown Co.					
	2007	3-Yr	2007	3-Yr	2007	3-Yr	2007	3-Yr	2007	3-Yr
Eslick (3)	59+	79+	76	81+	36	64+	60	71	57	67
Lacey (0)	65+	74+	80	83+	43	64+	59	66	29	50
Tradition (0)	54	66+	85+	84+	46+	64+	60	65	43	33
Drummond (2)	51	65+	86+	84+	44	63+	59	64	29	50
Legacy (3)	66+	71+	73	76	41	60+	55	61	14	17
Conlon (0)	60+	61+	88+	85+	33	59+	58	60	43	50
Stellar-ND (2)	58	68+	74	77	39	59+	57	60	14	17
Robust (3)	57	64+	72	73	39	57+	53	56	0	17
Pinnacle (3)	65+	.	88+	.	53+	.	63	.	57	
Rawson (2)	64+	.	90+	.	49+	.	60	.	43	
Test avg. :	61	69	81	80	44	61	59	63		
High avg. :	66	79	90	85	53	64	63	71		
Low avg. :	51	61	72	73	33	57	53	56		
# LSD (.05) :	7	NS	6	6	8	NS				
## TPG-value :	59	61	84	79	45	57				
### C.V. :	8	8	5	6	12	9				

* Heading, the relative days to heading, compared to the variety - Lacey.

LSD - the amount column values must differ to be significantly different or if the nonsignificant (NS).

TPG-value, the minimum value required for the top-performance group (TPG) for
A plus sign (+) indicates values within a column that qualify for the TPG.

Coef. of variation, a measure of trial experimental error, 15% or less is best.

Table 3B. Eastern South Dakota and state barley averages for bushel weight (BW), height lodging (LDG), and grain protein (PRT) in 2007.

	Eastern Avg. - BW, HT, LDG, PRT				State Avg. - BW, HT, LDG, PRT			
Variety (Hdg.)* - by state BW avg.	BW lb	HT in	LDG	PRT %	BW lb	HT in	LDG	PRT %
Conlon (0)	47	28	2	13.6	46+	29	2	13.6+
Eslick (3)	47	26	1	13.0	46+	27	1+	13.0 +
Tradition (0)	46	31	2	12.7	46+	31+	1+	12.7+
Rawson (2)	46	31	1	12.3	46+	31+	1+	12.3
Lacey (0)	45	31	2	13.3	45	31+	1+	13.3+
Robust (3)	45	32	2	13.3	45	33+	2	13.3+
Pinnacle (3)	45	30	1	11.0	45	30	1+	11.0
Drummond (2)	45	32	2	13.1	44	32+	2	13.1+
Legacy (3)	45	32	2	13.1	44	31+	2	13.1+
Stellar-ND (2)	44	31	2	12.2	43	31+	1+	12.2
Test avg. :	45	30	2	12.7	45	31	1	12.7
High avg. :	47	32	2	13.6	46	33	2	13.6
Low avg. :	44	26	1	11.0	43	27	1	11.0
# LSD(.05) :					1	2	1	0.9
## TPG-value :					46	31	1	12.7
### C.V. :					4	10	23	6

* Heading, the relative days to heading, compared to the variety - Lacey.

** Lodging score: 0= all plants erect, 3= 50% of plants lodged at 45°-angle, 5= all plants flat.

LSD - the amount column values must differ to be significantly different.

TPG-value, the minimum or maximum value required for the top-performance group

A plus sign (+) indicates values within a column that qualify for the TPG.

Coef. of variation, a measure of trial experimental error.

SOYBEAN VARIETY PERFORMANCE TRIALS AT SOUTH SHORE AND WARNER[1]

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This reports the 2007 Northeast Research Farm performance trials for both non-Roundup-Ready™ and Roundup-Ready™ soybean entries and the Allen and Inel Ryckman farm at Warner, SD 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 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 replications (plots) with each replicate randomly located in a block where each plot consisted of four 30-inch rows, 20 feet long. Plots were seeded on May 31 and May 24, 2007 at South Shore and Warner, respectively, with a Monosem precision planter calibrated to deliver 165,000 seeds per acre. Granular Nitragin brand Soybean Soil Implant metered down a tube was used for soil inoculation. The seedbed at South Shore was a Kranzburg silty clay loam with a 3-6% slope previously cropped to spring wheat; and at Warner it was a Harmony-Aberdeen silt clay loam with a 0-2% slope, previously cropped to corn. The procedures apply to both the non-Roundup Ready™ and the Roundup Ready™ trials.

Chemical weed control in the Roundup-Ready™ trials consisted of one post-emergence application of Roundup at both locations and an addition Roundup application at South Shore when weed were 2-5 inches tall. Weed control in the non-Roundup-Ready™ trials at South Shore consisted of a post-emergence split application of Harmony and Poast at label rates. At South Shore, Lorsban™ insecticide was applied at the label rate to control soybean aphids, spider mites, and soybean leaf beetle.

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. Current season protein and oil values for each entry were obtained using each of three samples (replicates) from each trial using a FOSS TECATOR Model Infratec 1229 grain analyzer.

[1]These results were made possible by funding assistance from the South Dakota Agricultural Experiment Station.

Plant Height was measured from the ground to the top-most node on the main stem. Lodging scores at maturity 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.

Measurements of Performance

Check for the "least significant difference" (LSD) value at the bottom of each data column. An LSD value can be used a couple of 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 this years test LSD value equals of 4 bu/a, it can be used to compare the yields of any two entries. If entry A yields 50 and entry B yields 48 their yield difference is 2 bu/a (50 - 48 = 2). This means the two entries do not differ in yield because the difference 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). This means entries A and C differ in yield because their difference of 5 bu/a is more than the LSD value of 4 bu/a, thus, entry A has a 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 two-year), lodging score, and grain protein and oil contents. For example, if this years highest yield is 54 bu/a and the LSD value at the bottom of the column is 4 bu/a one can determine that the minimum yield value needed for TPG this year is 50 bu/a (54 - 4 = 50). Technically, a yield of 51is in the top yield group while a yield of 50 bu/a is not. 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 this year are those that are equal or higher than the minimum TPG value. Also note the minimum TPG value for the 2 yr averages is listed at the bottom of its column. Similarly, the TPG for lodging score (Table 1b) can also be determined because its average and LSD value are also rounded-off to the nearest whole number.

In contrast, the protein and oil averages and LSD values are rounded-off to the nearest tenth of a percent (Table 1b). Thus, the TPG for grain protein and oil are determined similarly to that for yield except that the protein and oil LSD values are rounded to the nearest tenth (0.1) of a number instead of a whole number.

PERFORMANCE TRIAL RESULTS FOR 2006-07

ROUNDUP READY™ ENTRIES:

South Shore, Group-0 (Tables 1a & 1b): The 2007 and 2-yr. yield averages were 52 and 42 bushels per acre, respectively (Table 1a). Entries had to average 55 and 38 bushels or higher to be in the TPG for 2007 and for two years, respectively. Variety yield averages had to differ by 4 bushels in 2007 to be significantly different. Yield

differences did not differ among the entries tested two years. The 2007 protein and oil averages were 35.9% and 19.3%, respectively (Table 1b). Entries had to average 37.1 or higher in protein and 19.9 or higher in oil content to be in the TPG for 2007. Entry protein and oil content averages had to differ by 0.9 and 0.5% to be significantly different. The 2007 lodging score average was 2 (Table 1b) and entries had to average 2 or higher in lodging score to be in the TPG. Entry lodging averages had to differ by 1 to be significantly different.

Warner, Group-0 (Tables 1a & 1b): The 2007 and 2-yr. yield averages were 49 and 42 bushels per acre, respectively (Table 1a). Entries had to average 51 and 37 bushels or higher to be in the TPG for 2007 and for two years, respectively. Variety yield averages had to differ by 4 bushels in 2007 to be significantly different. Yield differences did not differ among the entries tested two years. The 2007 protein and oil averages were 32.5% and 20.5%, respectively (Table 1b). Entries had to average 33.0 or higher in protein and 21.2 or higher in oil content to be in the TPG for 2007. Entry protein and oil content averages had to differ by 1.2 and 0.5% to be significantly different. The 2007 lodging score average was 1 (Table 1b) and because all entries averaged 1 all entry were in the TPG.

South Shore, Group-I (Tables 2a & 2b): The 2007 and 2-yr. yield averages were 50 and 39 bushels per acre, respectively (Table 2a). Entries had to average 54 and 35 bushels or higher to be in the TPG for 2007 and for two years, respectively. Variety yield averages had to differ by 3 bushels in 2007 to be significantly different. Yield differences did not differ among the entries tested two years. The 2007 protein and oil averages were 35.3% and 19.3%, respectively (Table 2b). Entries had to average 36.5 or higher in protein and 20.3 or higher in oil content to be in the TPG for 2007. Entry protein and oil content averages had to differ by 1.0 and 0.5% to be significantly different. The 2007 lodging score average was 1 (Table 2b), entries had to average 1 to be in the TPG, and entries had to differ by 1 to be significantly different.

Warner, Group-I (Tables 2a & 2b): The 2007 and 2-yr. yield averages were 55 and 44 bushels per acre, respectively (Table 2a). Entries had to average 58 and 43 bushels or higher to be in the TPG for 2007 and for two years, respectively. Variety yield averages had to differ by 5 bushels in 2007 and 6 bushel for two years to be significantly different. The 2007 protein and oil averages were 31.9% and 20.3%, respectively (Table 2b). Entries had to average 33.3 or higher in protein and 22.6 or higher in oil content to be in the TPG for 2007. Entry protein and oil content averages had to differ by 1.3 and 0.5% to be significantly different. The 2007 lodging score average was 1 (Table 2b) and because the entries did not differ in lodging score all are in the TPG.

Table 1a. Roundup Ready™ maturity group-0 soybean variety yield averages at South Shore and Warner, SD, 2006-07.

Brand/Variety (By 2-yr then 2007 zone yield)	Average DTM*	Location yield averages - Bu/A			
		South Shore		Warner	
		2007	2-Yr	2007	2-Yr
NUTECH/ NT-0886RR	117	57	43	55	46
KRUGER/ K-072RR	116	58	46	50	43
PRAIRIE/ BR. PB-0936RR	117	55	44	53	45
MUSTANG/ M-096RR	117	54	45	52	44
NUTECH/ NT-0990RR	117	54	42	52	45
HEFTY/ 067R	114	56	43	54	42
DAIRYLAND/ DSR-0903/RR	115	53	43	54	43
SEEDS 2000/ 2090RR	116	54	43	51	43
MUSTANG/ M-095RR	116	51	42	51	44
NUTECH/ NT-0889RR	116	52	42	49	44
KRUGER/ K-098RR	116	52	42	49	43
PRAIRIE/ BR. PB-0923RR	116	54	41	51	42
WENSMAN/ W 2090RR	117	53	41	50	42
THUNDER/ 709RR	118	50	41	48	43
ASGROW/ AG0803	117	52	41	49	41
DAIRYLAND/ DSR-0701/RR	112	52	42	50	40
KRUGER/ K-056RR	115	53	43	47	39
KRUGER/ K-042RR	113	51	42	48	39
MUSTANG/ M-097RR	116	51	42	44	40
MUSTANG/ M-066RR	115	55	40	47	39
PRAIRIE/ BR. PB-0954RR	117	52	40	45	40
MUSTANG/ M-075RR	111	53	41	45	37
SD/ 1092RR	116	46	38	48	40
GOLD/ COUNTRY 2509RR	116	.	.	46	42
NUTECH/ NT-6105	119	52	.	55	.
KRUGER/ K-072+RR	117	54	.	54	.
KRUGER/ K-091RR	117	53	.	55	.
PRAIRIE/ BR. PB-1007RR	119	54	.	54	.
ASGROW/ AG0701	114	54	.	52	.
PRAIRIE/ BR. PB-0636RR	114	52	.	53	.
PUBLIC/ SD03-2768R	120	49	.	51	.
PUBLIC/ SD03-3493R	117	53	.	46	.
THUNDER/ 2608NRR	111	52	.	43	.
PUBLIC/ SD03-1774R	115	52	.	44	.
THUNDER/ 2709RR	116	48	.	45	.
PUBLIC/ SD03-2271R	115	49	.	44	.
PUBLIC/ SD03-3580R	116	47	.	44	.
RG/ 607RR	110	46	.	43	.
PUBLIC/ SD03-3920R	116	45	.	45	.
ZILLER/ BT 7083NR	.	52	.	.	.
Test avg. :	116	52	42	49	42
High avg. :	120	58	46	55	46
Low avg. :	110	45	38	43	37
# LSD(.05):		3	NS	4	NS
## TPG-avg. :		55	38	51	37
@ Coef. Var.:		3	6	5	6
No. Entries:	40	39	23	39	24

* DTM= days to maturity at Warner; South Shore data is missing due to early frost.

LSD (.05)= amount column values must differ to be significant or if they are non-significant (NS).

TPG-avg. = minimum value to qualify for top performance group.

@ Coef. Var.= a measure of trial experimental error, 15% or less is best.

Table 1b. Roundup Ready™ maturity group-0 soybean variety protein, oil, and lodging score averages at South Shore and Warner, SD in 2007.

Brand/Variety (By 2007 zone protein)	Average DTM*	Location averages in 2007					
		South Shore			Warner		
		Protein (%)	Oil (%)	Lodging (1-5)**	Protein (%)	Oil (%)	Lodging (1-5)**
SD/ 1092RR	.	37.9	19.2	3	33.5	20.5	1
SEEDS 2000/ 2090RR	.	37.2	18.3	1	34.1	19.7	1
PRAIRIE/ BR. PB-0954RR	.	36.6	19.5	2	33.8	20.2	1
KRUGER/ K-098RR	.	36.5	19.5	2	33.7	20.3	1
RG/ 607RR	.	36.6	19.6	2	33.6	21.3	1
THUNDER/ 2608NRR	.	36.0	19.2	3	33.9	20.0	1
NUTECH/ NT-0889RR	.	36.1	19.0	2	33.3	20.4	1
NUTECH/ NT-0886RR	.	36.3	18.9	1	33.1	20.3	1
KRUGER/ K-072RR	.	35.7	19.0	1	33.6	20.1	1
THUNDER/ 2709RR	.	35.5	19.2	2	33.7	19.9	1
WENSMAN/ W 2090RR	.	36.3	19.4	2	32.8	20.4	1
MUSTANG/ M-096RR	.	36.3	19.8	1	32.8	20.5	1
KRUGER/ K-072+RR	.	35.8	19.0	1	33.0	20.2	1
PUBLIC/ SD03-2271R	.	36.0	19.2	2	32.8	20.6	1
MUSTANG/ M-095RR	.	35.9	19.2	3	32.8	20.6	1
PUBLIC/ SD03-3580R	.	36.4	19.3	2	32.2	21.2	1
PRAIRIE/ BR. PB-0923RR	.	36.2	19.1	1	32.4	20.4	1
DAIRYLAND/ DSR-0701/RR	.	36.2	19.2	1	32.4	20.4	1
DAIRYLAND/ DSR-0903/RR	.	36.1	19.5	1	32.3	20.8	1
KRUGER/ K-091RR	.	35.9	19.5	1	32.4	20.7	1
MUSTANG/ M-066RR	.	35.3	20.3	2	32.9	20.3	1
KRUGER/ K-056RR	.	36.0	20.2	2	32.3	20.4	1
MUSTANG/ M-075RR	.	35.6	19.0	1	32.6	20.4	1
NUTECH/ NT-0990RR	.	35.8	19.1	1	32.3	20.3	1
KRUGER/ K-042RR	.	36.0	20.3	2	31.7	21.6	1
NUTECH/ NT-6105	.	35.8	19.0	1	31.8	20.2	1
PRAIRIE/ BR. PB-0936RR	.	35.9	19.1	1	31.4	20.8	1
MUSTANG/ M-097RR	.	35.4	19.1	1	31.9	20.5	1
THUNDER/ 709RR	.	35.8	19.0	1	31.4	20.7	1
PRAIRIE/ BR. PB-1007RR	.	35.2	18.7	1	32.0	20.1	1
PUBLIC/ SD03-1774R	.	35.4	20.0	2	31.7	21.3	1
PUBLIC/ SD03-3920R	.	35.6	18.8	2	31.3	20.7	1
PUBLIC/ SD03-3493R	.	35.3	19.7	2	31.5	21.1	1
PRAIRIE/ BR. PB-0636RR	.	34.9	19.5	2	32.0	20.2	1
ASGROW/ AG0803	.	34.5	19.9	3	32.3	20.5	1
ASGROW/ AG0701	.	34.7	19.7	1	31.4	20.2	1
HEFTY/ 067R	.	34.6	19.4	2	31.4	20.3	1
PUBLIC/ SD03-2768R	.	35.2	19.6	2	29.8	21.0	1
GOLD/ COUNTRY 2509RR	.	.	.	.	34.0	20.1	1
ZILLER/ BT 7083NR	.	36.0	19.3	2	.	.	.
Test avg. :	.	35.9	19.3	2	32.5	20.5	1
High avg. :	.	37.9	20.3	3	34.1	21.6	1
Low avg. :	.	34.5	18.3	1	29.8	19.7	1
# LSD(.05) :		0.9	0.5	1	1.2	0.5	NS
## TPG-avg. :		37.1	19.9	1	33.0	21.2	1
@ Coef. Var. :		2	2	41	2	1	0
No. Entries :		39	39	39	39	39	39

* DTM= days, seeding to maturity at Warner. ** Lodging score, all plants erect= 1 to all plants flat= 5.

LSD (.05)= amount column values must differ to be significant or if they are non-significant (NS).

TPG-avg. = minimum value to qualify for top performance group.

@ Coef. Var.= a measure of trial experimental error, 15% or less is best.

Table 2a. Roundup Ready™ maturity group-I soybean variety yield averages at South Shore and Warner, SD, in 2006-07.

Brand/Variety (By 2-yr then 2007 zone yield)	Average DTM*	Location yield averages - Bu/A			
		South Shore		Warner	
		2007	2-Yr	2007	2-Yr
NUTECH/ NT-7205+RR	123	53	40	60	49
WENSMAN/ W 2108RR	117	55	40	58	49
ASGROW/ AG1702	121	53	40	56	47
PRAIRIE/ BR. PB-1954RR	123	50	41	53	46
ASGROW/ AG1102	118	54	40	59	46
HEFTY/ 117R	118	54	39	60	46
NUTECH/ NT-1991RR	124	47	38	61	47
KRUGER/ K-194RR	123	48	39	56	47
NUTECH/ NT-1766RR	121	46	39	56	47
KRUGER/ K-140RR	118	54	40	55	43
GOLD/ COUNTRY 2713RR	119	52	40	53	43
PRAIRIE/ BR. PB-1754RR	122	50	40	55	44
PUBLIC/ SDX00R-017-52	120	47	39	53	44
HEFTY/ 137R	118	51	38	54	43
DAIRYLAND/ DSR-1301/RR	119	50	38	53	44
MUSTANG/ M-115RR	117	49	37	52	44
PUBLIC/ SD02R-8	123	45	36	54	45
KRUGER/ K-100RR	116	52	40	52	40
DAIRYLAND/ DSR1500RRSTS	119	47	37	55	43
SD/ 1161RR/SCN	123	49	38	53	41
SD/ 1111RR	118	51	38	50	39
PUBLIC/ SD00-1018R	118	46	36	51	41
PUBLIC/ SD01-1120R	123	45	36	48	41
KRUGER/ K-120RR	115	50	37	48	38
PUBLIC/ SDX00R-053-46	121	42	35	49	41
WENSMAN/ W 2166RR	120	57	.	62	.
MUSTANG/ M-168RR	121	56	.	62	.
HEFTY/ EXP168R	120	55	.	63	.
STINE/ 1468-4	121	56	.	62	.
NUTECH/ NT-6133	118	53	.	60	.
GOLD/ COUNTRY 2815RR	120	52	.	61	.
STINE/ 1008-4	116	56	.	58	.
WENSMAN/ W 2124RR	119	53	.	61	.
PRAIRIE/ BR. PB-1337RR	119	52	.	60	.
PRAIRIE/ BR. PB-1597RR	119	55	.	56	.
NUTECH/ NT-6166	122	52	.	58	.
KRUGER/ EXP19A07	123	47	.	62	.
STINE/ 1432-4	121	52	.	57	.
PRAIRIE/ BR. PB-1607RR	121	52	.	57	.
NORTHSTAR/ NS 1012RR	119	54	.	56	.
ASGROW/ AG1403	119	48	.	59	.
MUSTANG/ T-138RR	118	53	.	55	.
KRUGER/ K-195+RR/SCN	122	53	.	54	.
WENSMAN/ W 2147NRR	121	52	.	55	.
NORTHSTAR/ NS 1311RR	117	54	.	54	.
PRAIRIE/ BR. PB-1557NRR	122	50	.	55	.
WENSMAN/ W 2172NRR	121	51	.	54	.
PUBLIC/ SD(LD)05-16121	123	49	.	57	.
NUTECH/ NT-6145	118	53	.	50	.
KRUGER/ K-142RR	119	50	.	54	.

Table 2a. Roundup Ready™ maturity group-I soybean yield averages (continued).

Brand/Variety (By 2-yr then 2007 zone yield)	Average DTM*	Location yield averages- Bu/A			
		South Shore		Warner	
		2007	2-Yr	2007	2-Yr
PRAIRIE/ BR. PB-1956RR	124	43	.	61	.
SEEDS 2000/ 2120RR	116	50	.	53	.
PUBLIC/ SDX01R-00403109	114	49	.	53	.
PUBLIC/ SD02R-48	121	47	.	54	.
PRAIRIE/ BR. PB-1737NRR	121	49	.	51	.
ASGROW/ AG2002	123	46	.	52	.
KRUGER/ K-170RR/SCN	122	48	.	50	.
PUBLIC/ SD02R-51	123	46	.	52	.
NUTECH/ NT-1212RR	121	49	.	47	.
PUBLIC/ SDX04R-68-1-9	121	36	.	42	.
COYOTE/ 4719RR	.	50	.	.	.
GOLD/ COUNTRY 8716RR	.	52	40	.	.
GOLD/ COUNTRY 3817RR	.	51	.	.	.
STINE/ 1918-4	.	51	39	.	.
STINE/ 1108-4	116	.	.	54	41
STINE/ 1916-4	.	49	.	.	.
ZILLER/ BT 7156NR	.	49	.	.	.
NORTHSTAR/ NS 1312RR	.	45	.	.	.
NORTHSTAR/ NS 1123RR	.	52	.	.	.
Test avg. :	120	50	39	55	44
High avg. :	124	57	41	63	49
Low avg. :	114	36	35	42	38
# LSD(.05) :		3	NS	5	6
## TPG-avg. :		54	35	58	43
@ Coef. Var. :		4	6	6	7
No. Entries :	61	68	27	61	26

* DTM= days, seeding to maturity at Warner; South Shore data is missing due to frost.

LSD (.05)= amount column values must differ to be significant or if they are non-significant (NS).

TPG-avg. = minimum value to qualify for top performance group.

@ Coef. Var.= a measure of trial experimental error, 15% or less is best.

Table 2b. Roundup Ready™ maturity group-I soybean variety protein, oil, and lodging score averages at South Shore and Warner, SD in 2007.

Brand/Variety (By zone protein)	Average DTM*	Location averages in 2007					
		South Shore			Warner		
		Protein (%)	Oil (%)	Lodging (1-5)**	Protein (%)	Oil (%)	Lodging (1-5)**
PUBLIC/ SDX04R-68-1-9	.	37.3	18.2	3	33.6	18.9	2
KRUGER/ K-170RR/SCN	.	36.1	18.7	2	34.5	19.1	1
PRAIRIE/ BR. PB-1737NRR	.	36.5	18.9	2	34.1	19.2	1
PUBLIC/ SDX01R-00403109	.	37.3	19.3	1	33.3	20.3	1
PRAIRIE/ BR. PB-1754RR	.	37.4	18.3	1	32.4	19.8	1
DAIRYLAND/ DSR-1301/RR	.	37.0	18.5	1	32.7	20.4	1
DAIRYLAND/ DSR1500RRSTS	.	37.1	18.5	1	32.2	20.0	1
NUTECH/ NT-7205+RR	.	35.7	19.0	1	33.4	19.9	1
STINE/ 1008-4	.	35.6	19.3	1	33.2	20.2	1
KRUGER/ K-100RR	.	36.2	19.3	1	32.5	20.8	1
NUTECH/ NT-1766RR	.	35.9	18.1	1	32.8	19.5	1
ASGROW/ AG1702	.	35.4	19.5	1	33.1	19.8	1
PRAIRIE/ BR. PB-1956RR	.	37.1	20.7	2	31.4	20.4	1
SD/ 1161RR/SCN	.	35.4	19.2	1	32.8	19.9	1
NUTECH/ NT-6133	.	35.5	19.2	1	32.5	19.8	1
PRAIRIE/ BR. PB-1954RR	.	36.1	19.1	2	31.9	19.9	1
WENSMAN/ W 2108RR	.	35.3	19.4	1	32.7	20.3	1
ASGROW/ AG2002	.	36.6	19.0	2	31.3	20.2	1
KRUGER/ K-194RR	.	35.0	18.8	1	32.9	19.2	1
SEEDS 2000/ 2120RR	.	35.8	19.0	1	32.0	19.9	1
KRUGER/ K-140RR	.	34.9	19.6	1	32.7	20.6	1
PRAIRIE/ BR. PB-1337RR	.	35.8	18.9	1	31.7	20.0	1
PUBLIC/ SD01-1120R	.	35.9	19.4	2	31.7	20.5	1
HEFTY/ 117R	.	35.3	19.5	1	32.2	20.3	1
NUTECH/ NT-6166	.	34.8	19.3	1	32.7	19.7	1
KRUGER/ K-120RR	.	35.5	18.8	1	32.0	19.6	1
NORTHSTAR/ NS 1012RR	.	35.4	19.4	1	32.0	20.4	1
ASGROW/ AG1403	.	35.2	19.3	1	32.2	19.7	1
KRUGER/ EXP19A07	.	35.2	19.0	1	32.0	20.7	1
NORTHSTAR/ NS 1311RR	.	35.3	19.7	1	31.9	20.6	1
NUTECH/ NT-1991RR	.	34.8	19.2	1	32.3	19.4	1
WENSMAN/ W 2124RR	.	35.8	19.1	2	31.2	20.2	1
KRUGER/ K-142RR	.	35.0	19.9	1	32.0	20.7	1
NUTECH/ NT-6145	.	34.8	19.8	1	32.0	20.4	1
HEFTY/ 137R	.	34.8	19.4	1	32.0	23.5	1
PRAIRIE/ BR. PB-1607RR	.	35.1	19.1	1	31.6	20.0	1
MUSTANG/ T-138RR	.	35.1	19.2	1	31.6	20.1	1
PUBLIC/ SD00-1018R	.	35.4	19.6	2	31.2	21.0	1
GOLD/ COUNTRY 2713RR	.	34.9	19.8	1	31.5	20.9	1
PUBLIC/ SD02R-48	.	34.6	19.5	1	31.7	20.1	1
SD/ 1111RR	.	34.2	20.2	2	31.9	20.9	1
KRUGER/ K-195+RR/SCN	.	34.6	20.1	1	31.4	20.7	1
STINE/ 1432-4	.	34.5	19.7	1	31.6	20.8	1
PUBLIC/ SD02R-51	.	34.4	19.4	1	31.4	19.8	1
ASGROW/ AG1102	.	33.9	19.1	1	31.9	20.1	1
PUBLIC/ SD02R-8	.	34.3	19.4	1	31.3	20.3	1
PUBLIC/ SDX00R-017-52	.	35.1	19.9	2	30.5	21.1	1
PRAIRIE/ BR. PB-1557NRR	.	34.4	19.8	1	31.1	20.8	1

WENSMAN/ W 2172NRR	.	34.0	19.9	1	31.5	20.5	1
PUBLIC/ SDX00R-053-46	.	34.7	19.4	3	30.7	20.4	1

Table 2b. Roundup Ready™ maturity group-I soybean variety protein, oil, and lodging score averages in 2007 (continued).

		Location averages in 2007					
		South Shore			Warner		
Brand/Variety (By zone protein)	Average DTM*	Protein (%)	Oil (%)	Lodging (1-5)**	Protein (%)	Oil (%)	Lodging (1-5)**
STINE/ 1468-4	.	34.5	19.8	1	30.8	20.9	1
PRAIRIE/ BR. PB-1597RR	.	34.8	19.7	1	30.4	21.0	1
WENSMAN/ W 2166RR	.	34.5	19.7	1	30.7	20.8	1
GOLD/ COUNTRY 2815RR	.	34.4	19.7	1	30.7	20.8	1
WENSMAN/ W 2147NRR	.	34.2	19.8	1	30.7	20.8	1
NUTECH/ NT-1212RR	.	34.4	19.7	1	30.1	20.4	1
PUBLIC/ SD(LD)05-16121	.	33.4	19.6	1	31.1	19.9	1
MUSTANG/ M-115RR	.	34.1	19.6	1	30.2	20.7	1
MUSTANG/ M-168RR	.	34.4	19.9	1	29.9	21.1	1
HEFTY/ EXP168R	.	34.1	19.4	1	29.9	21.1	1
COYOTE/ 4719RR	.	35.2	19.3	1	.	.	.
GOLD/ COUNTRY 8716RR	.	35.1	19.2	1	.	.	.
GOLD/ COUNTRY 3817RR	.	33.3	20.0	2	.	.	.
STINE/ 1918-4	.	35.0	19.3	1	.	.	.
STINE/ 1108-4	.	.	.	.	32.4	20.3	1
STINE/ 1916-4	.	36.2	19.0	1	.	.	.
ZILLER/ BT 7156NR	.	36.2	19.3	1	.	.	.
NORTHSTAR/ NS 1312RR	.	35.9	18.9	1	.	.	.
NORTHSTAR/ NS 1123RR	.	35.5	19.0	1	.	.	.
Test avg. :	.	35.3	19.3	1	31.9	20.3	1
High avg. :	.	37.4	20.7	3	34.5	23.5	2
Low avg. :	.	33.3	18.1	1	29.9	18.9	1
# Lsd(.05) :		1.0	0.5	1	1.3	1.0	NS
## TPG-avg. :		36.5	20.3	1	33.3	22.6	1
@ Coef.Var. :		2	2	34	3	3	0
No. Entries :		68	68	68	61	61	61

* DTM= days, seeding to maturity at Warner: South Shore data is missing due to frost.
** Lodging score, all plants erect= 1 to all plants flat= 5.
# LSD (.05)= amount column values must differ to be significant or if they are non-significant (NS).
TPG-avg. = minimum value to qualify for top performance group.
@ Coef. Var.= a measure of trial experimental error, 15% or less is best.

NON-ROUNDUP-READY™ ENTRIES:

South Shore, Group-0 (Tables 3a & 3b): The 2007 and 2-yr. yield averages were 47 and 35 bushels per acre, respectively (Table 3a). There was no difference in yield among the maturity group-0 entries tested in 2007 or for two years; therefore, all entries were in the TPG. The 2007 protein and oil averages were 35.1% and 19.1%, respectively (Table 3b). Entries had to average 35.5 or higher in protein and 19.5 or higher in oil content to be in the TPG for 2007. Entry protein and oil content averages had to differ by 1.0 and 0.4% to be significantly different. The 2007 lodging score

average was 1 (Table 2b) and because the entries did not differ in lodging score all were in the TPG.

South Shore, Group-I (Tables 3a & 3b): The 2007 and 2-yr. yield averages were 47 and 34 bushels per acre, respectively (Table 3a). Entries had to average 47 bushels or higher to be in the TPG for 2007. There was no difference in yield among the maturity group-I entries tested for two years; therefore, all entries were in the TPG. The 2007 protein and oil averages were 36.3% and 18.1%, respectively (Table 3b). Entries had to average 37.0 or higher in protein and 18.1 or higher in oil content to be in the TPG. Entry protein and oil content averages had to differ by 0.9 and 0.7% to be significantly different. The 2007 lodging score average was 2, entries had to average 1 to be in the TPG, and entries had to differ by 1 to be significantly different (Table 3b).

Table 3a. Non-Roundup Ready™ maturity group-0 and -I soybean variety yield averages at at South Shore, SD, 2006-07.

Brand/Variety (By maturity group & 2007 yield)	Average DTM*	Yield averages (Bu/A) by maturity group			
		MG-0		MG-I	
		2007	2-Yr	2007	2-Yr
PUBLIC/ SHEYENNE	.	52	.	.	.
PUBLIC/ SD04CV-534	.	49	.	.	.
PUBLIC/ SD02-1138	.	48	.	.	.
PUBLIC/ SD03-2154	.	48	34	.	.
PUBLIC/ SURGE	.	48	35	.	.
PUBLIC/ HAMLIN	.	47	35	.	.
PUBLIC/ SD03-2327	.	47	37	.	.
PUBLIC/ SD04CV-405	.	45	.	.	.
PUBLIC/ SD04CV-519	.	42	.	.	.
PUBLIC/ SD04CV-620	.	.	.	50	.
PUBLIC/ SD03-1537	.	.	.	50	.
PUBLIC/ SD04CV-277	.	.	.	48	.
PUBLIC/ SD02-906	.	.	.	48	34
PUBLIC/ SD03-1607	.	.	.	47	35
PUBLIC/ SD04CV-254	.	.	.	46	.
PUBLIC/ SD02-911	.	.	.	45	33
PUBLIC/ SD02-833	.	.	.	44	.
RICHLAND/ ORGANICS EX16	.	.	.	43	.
Test avg.:	.	47	35	47	34
High avg.:	.	52	37	50	35
Low avg. :	.	42	34	43	33
# LSD(.05):		NS	NS	3	NS
## TPG-value:		42	34	47	33
@ Coef. Var.:		6	5	3	5
No. Entries:	18	9	4	9	3

* DTM= days, seeding to maturity; missing data resulted from an early frost.

LSD (.05)= amount column values must differ to be significant or if they are non-significant (NS).

TPG-avg. = minimum value to qualify for top performance group.

@ Coef. Var.= a measure of trial experimental error, 15% or less is best.

Table 3b. Non-Roundup Ready™ maturity group-0 and -I soybean variety protein, oil, and lodging score averages at South Shore, SD in 2007.

Brand/Variety (By maturity group & protein)	Average DTM*	2007 Averages by maturity group					
		MG-0			MG-I		
		Protein %	Oil %	Lodging* (1-5)	Protein %	Oil %	Lodging* (1-5)
PUBLIC/ SD04CV-405	.	36.4	18.2	2	.	.	.
PUBLIC/ HAMLIN	.	36.3	19.2	1	.	.	.
PUBLIC/ SURGE	.	36.3	19.0	1	.	.	.
PUBLIC/ SD03-2327	.	36.2	18.8	1	.	.	.
PUBLIC/ SD04CV-519	.	35.9	18.6	1	.	.	.
PUBLIC/ SD04CV-534	.	35.6	19.8	1	.	.	.
PUBLIC/ SD03-2154	.	34.9	19.4	2	.	.	.
PUBLIC/ SD02-1138	.	34.4	19.5	2	.	.	.
PUBLIC/ SHEYENNE	.	33.7	19.8	1	.	.	.
RICHLAND/ ORGANICS EX16	.	.	.	.	37.8	16.4	3
PUBLIC/ SD04CV-620	.	.	.	.	37.6	18.2	1
PUBLIC/ SD02-911	.	.	.	.	36.4	18.5	2
PUBLIC/ SD03-1537	.	.	.	.	36.1	18.0	3
PUBLIC/ SD03-1607	.	.	.	.	36.1	18.0	1
PUBLIC/ SD02-906	.	.	.	.	35.9	18.7	2
PUBLIC/ SD04CV-254	.	.	.	.	35.8	18.1	1
PUBLIC/ SD04CV-277	.	.	.	.	35.8	18.5	1
PUBLIC/ SD02-833	.	.	.	.	35.6	18.3	2
Test avg. :	.	35.5	19.1	1	36.3	18.1	2
High avg. :	.	36.4	19.8	2	37.8	18.7	3
Low avg. :	.	33.7	18.2	1	35.6	16.4	1
# LSD(.05) :		1.0	0.4	NS	0.9	0.7	1
## TPG-avg. :		35.5	19.5	2	37.0	18.1	1
@ Coef. Var. :		2	2	35	2	2	32
No. Entries :		9	9	9	9	9	9

* DTM= days, seeding to maturity; missing data resulted from an early frost.

** Lodging score, all plants erect= 1 to all plants flat= 5.

LSD (.05)= amount column values must differ to be significant or if they are non-significant (NS).

TPG-avg. = minimum value to qualify for top performance group.

@ Coef. Var.= a measure of trial experimental error, 15% or less is best.

Precision-Planted Corn Hybrid Performance Trials

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This reports the 2007 Northeast Research Farm performance trials for both non-Roundup-Ready™ and Roundup-Ready™ 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 the non-Roundup Ready™ and Roundup Ready™ 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 4, 2007 into a conventionally tilled Kranzburg silty clay loam with a 3-6% slope previously cropped to oats. 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. Therefore, the harvest population is an indication of initial seed quality and the ability of the seed to cope with the production environment. Force insecticide was applied in-furrow at label rates for corn rootworm control at planting.

Pre-emergence weed control procedures for both the non-Roundup Ready™ and the Roundup Ready™ hybrid trials consisted of Dual II Magnum at label rates. Post-emergence weed control, at label rates, consisted of single applications of Roundup in the Roundup-Ready and a tank mix of Accent/Buctril in the Non-Roundup Read trials.

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 groups (TPG) for for yield for the current year and for two years, bushel weight, grain moisture at harvest, and stalk lodging below the ear percentage. For example, if the highest 2007 yield average is 190 bu/a and the LSD value listed at the bottom of the 2007 yield column equals 12 bu/a, the minimum TPG value equals 178 bu/a or higher (190-12 = 178). Technically, a yield of 179 bu/a falls in the TPG while a yield of 178 bu/a does not. However, since all yields and LSD values are rounded to the nearest whole number. We can say 178 bu/a, because of the rounding-off, is an appropriate minimum value for top yield hybrids. 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. (2006-07) average. The minimum yield value needed for a hybrid to qualify for **the TPG for yield for 2007 or for 2006-07 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 values needed to qualify for the TPG are reported as a minimum values; while grain moisture and lodging below the ear percentages are reported as a maximum values. In other words, 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.

Performance Trial Results - 2007

Note that data for 2006 are excluded do to the high levels of experimental error resulting from high temperatures during pollination that severely reduced pollination and grain yield.

Early - Non-Roundup Ready™, Tables 1. The test trial yield average (Table 1) was 177 bu/a for year 2007. Hybrids that yielded 178 bu/a or more qualified for the top yield group. Hybrids had to differ in yield by 12 bu/a in 2007 to be significantly different. Bushel weights averaged 55 lbs, grain moisture 19%, lodging 1%, and final percent stand 98%. In order for hybrids to be in the top group for these variables they had to equal 55 lbs. or more in bushel weight, 18% or less in grain moisture, 2% or less in stalk lodging below the ear, and 97% or more for final percent stand.

Table 1. Early maturity Non-Roundup Ready corn hybrid test trial results- Northeast Research Farm, South Shore, SD, 2007.

Brand/Hybrid (By '07 yield)	Brand Rel. Mat.	Hybrid performance variable at harvest				
		07 Yield bu/a	07 Bu. Wt. lb	07 Grain Moist. %	'07 Lodging %	07 Pct.* Stand %
WENSMAN/ W5105BT	91	190	56	18	0	100
RENK/ RK442LLYGCB	95	186	54	19	1	100
SEEDS 2000/ 2953BT	95	175	56	20	0	95
GOLD COUNTRY/ 95-03CB	95	171	56	21	0	99
WENSMAN/ W4141	93	169	56	18	2	96
FARM ADVANTAGE/ 9690L	90	168	55	16	1	100
Trial avg.:	93	177	55	19	1	98
Highest (H)-avg.:	95	190	56	21	2	100
Lowest (L)-avg.:	90	168	54	16	0	95
H-L avg. difference:	5	22	3	5	2	5
** LSD (.05):		12	1	2	NS	3
# Min. TPG-value:		178	55	-	-	97
## Max. TPG-value:		-	-	18	2	-
+ Coef. of var.:		4	1	5	151	1
No. of entries:	6	6	6	6	6	6

* Seeded May 14, 2007 at 28,750 seeds per acre.

** LSD(.05)= amount column values must differ to be significant or if they are non-significant (NS).

Min. TPG-value= minimum value required for the top performance group.

Max. TPG-value= maximum value required for the top performance group.

Late - Non-Roundup Ready™, Tables 2. The test trial yield average (Table 2) was 174 bu/a for year 2007. Hybrids that yielded 168 bu/a or more qualified for the top yield group. Hybrids had to differ in yield by 16 bu/a in 2007 to be significantly different. Bushel weights averaged 53 lbs, grain moisture 26%, lodging below the ear slightly more than 0%, and the final percent stand 100%. There was no difference among hybrids in lodging below the ear and final percent stand. In order for hybrids to be in the top performance group for these variables they had to equal 52 lbs. or more in bushel weight, 25% or less in grain moisture, 1% or less in lodging below the ear, and 99% or more for percent stand.

Table 2. Late maturity Non-Roundup Ready corn hybrid test trial results- Northeast Research Farm, South Shore, SD, 2007.

Brand/Hybrid (By '07 yields)	Brand Rel. Mat.	Hybrid performance variable at harvest					
		2-year Yield bu/a	07 Yield bu/a	07 Bu. Wt. lb	07 Grain Moist. %	'07 Lodging %	07 Pct.* Stand %
KRUGER/ 0401	101	.	184	53	25	0	100
FARM ADVANTAGE/ 9699L	99	.	181	54	23	0	100
KRUGER/ EXP8199HX	99	.	179	54	22	1	100
KRUGER/ EXP8502HX	102	.	174	52	25	1	99
KRUGER/ 8602HX	102	.	167	50	26	0	99
KRUGER/ EXP9502HXT	102	.	161	51	33	1	100
Trial avg.:	101	.	174	53	26	>0	100
Highest (H)-avg.:	102	.	184	54	33	1	100
Lowest (L)-avg.:	99	.	161	50	22	0	99
H-L avg. difference:	3	.	23	4	10	1	2
** LSD (.05):			16	2	1	NS	NS
# Min. TPG-value:			168	52	-	-	99
## Max. TPG-value:			-	-	25	1	-
+ Coef. of var.:			5	2	2	245	1
No. of entries:	6	0	6	6	6	6	6

* Seeded May 14, 2007 at 28,750 seeds per acre.

** LSD(.05)= amount column values must differ to be significant or if they were non-significant (NS).

non-significant (NS).

Min. TPG-value= minimum value required for the top performance group.

Max. TPG-value= maximum value required for the top performance group.

+ Coef. of Variation = a measure of trial experimental error, 20% or less is best for yield.

Early - Roundup Ready™, Tables 3. The test trial yield average (Table 3) was 179 bu/a for year 2007. Hybrids that yielded 182 bu/a or more in 2007 qualified for the top yield group. Hybrids had to differ in yield by 12 bu/a to be significantly different. Bushel weights averaged 55 lbs, grain moisture 20%, lodging below the ear 1%, and the final percent stand averaged 99%. In order for hybrids to be in the top performance group for these variables they had to equal 57 lbs. or more in bushel weight, 18% or less in grain moisture, 3% or less in lodging below the ear, and 97% or more for final percent stand.

Table 3. Early maturity Roundup Ready corn hybrid test trial results- Northeast Research Farm, South Shore, SD, 2007.

Brand/Hybrid (By '07 yield)	Brand Rel. Mat.	Test trial variable at harvest				
		07 Yield bu/a	07 Bu.Wt. lb	07 Grain Moist. %	'07 Lodging %	07 Pct.* Stand %
NUTECH/ 3P-098A RR/YGPL	95	194	56	23	1	99
KRUGER/ 9496TS	93	194	55	22	1	100
NUTECH/ 3P-494 RR/YGPL	94	193	53	18	1	100
PANNAR/ 5A-155VT3	95	189	53	21	4	100
AGSOURCE/ 3T-096 VT3	95	189	56	23	3	100
WENSMAN/ W7118VT3	92	187	54	21	1	100
NUTECH/ 3T-595 VT3	95	186	56	20	1	98
NUTECH/ 3T-393 VT3	93	184	56	21	0	100
KRUGER/ 2090RR/YGCB	90	183	56	19	1	100
KRUGER/ 2094RR/YGCB	94	183	55	21	3	100
SEEDS/ 2000 9501VT3	96	182	54	20	1	100
AGSOURCE/ 3P-191RR/YGPL	91	182	55	21	1	97
NUTECH/ 3T-098A VT3	95	181	57	21	1	100
PANNAR/ 4E-705VT3	94	181	53	22	0	100
WENSMAN/ W7195VT3	95	181	55	21	0	100
DEKALB/ DKC43-31RR2YGCB	93	180	54	21	0	99
AGVENTURE/ AV4883YPRR	95	180	56	22	1	95
DAIRYLAND/ STEALTH-9194	94	179	55	20	1	99
SEEDS/ 2000 2953RRYGPL	95	179	56	22	1	96
KRUGER/ 9392TS	92	176	55	20	1	100
FONTANELLE/ 2R144	92	176	58	18	0	100
WENSMAN/ W6117BTRR	92	176	56	19	1	100
WENSMAN/ W6194BTRR	95	173	58	21	2	100
AGSOURCE/ 3T-995 VT3	95	173	55	21	2	99
DEKALB/ DKC42-95RR2YGCB	92	171	56	19	1	100

Table 3. Early maturity Roundup Ready corn hybrid test trial results (continued).

Brand/Hybrid (By '07 yield)	Brand Rel. Mat.	Test trial variable at harvest				
		07 Yield bu/a	07 Bu.Wt. lb	07 Grain Moist. %	'07 Lodging %	07 Pct.* Stand %
KRUGER/ 1490RR	90	171	58	18	2	99
RENK/ RK570VT3	95	170	54	21	0	96
KALTENBERG/ K4012RRBT	94	168	54	22	2	100
PANNAR/ 4D-255VT3	93	167	55	20	4	100
FIELDERS/ CHOICE NG6402	92	163	54	17	3	99
GCS/ 89-02R	89	163	56	20	2	93
PANNAR/ 5A-125RR2	95	159	55	18	2	100
Trial avg.:	93	179	55	20	1	99
Highest (H)-avg.:	96	194	58	23	4	100
Lowest (L)-avg:	89	159	53	17	0	93
H-L avg. difference:	7	35	5	6	4	7
** LSD (.05):		12	1	1	3	3
# Min. TPG-value:		182	57	-	-	97
## Max. TPG-value:		-	-	18	3	-
+ Coef. of var.:		4	2	4	122	2
No. of entries:	32	32	32	32	32	32

* Seeded May 14, 2007 at 28,750 seeds per acre.

** LSD (.05) = amount column values must differ to be significantly different.

Min. TPG-value= minimum value required for the top performance group.

Max. TPG-value= maximum value required for the top performance group.

+ Coef. of Variation = a measure of trial experimental error, 20% or less is best for yield.

Late - Roundup Ready™, Tables 4. The test trial yield average (Table 4) was 177 bu/a for year 2007. Hybrids that yielded 172 bu/a or more in 2007 qualified for the top performance yield group. Hybrids had to differ in yield by 22 bu/a to be significantly different. Bushel weights averaged 54 lbs, grain moisture 22%, lodging below the ear 1%, and final percent stand 98%. In order for hybrids to be in the top performance group for these variables they had to equal 56 lbs. or more in bushel weight, 20% or less in grain moisture, 2% or less in lodging below the ear, and 96% or more for final percent stand.

Table 4. Late maturity Roundup Ready corn hybrid test trial results- Northeast Research Farm, South Shore, SD, 2007.

Brand/Hybrid (By '07 yield)	Brand Rel. Mat.	Test trial variable at harvest				
		07 Yield bu/a	07 Bu.Wt. lb	07 Grain Moist. %	'07 Lodging %	07 Pct.* Stand %
NUTECH/ 3P-302 RR/YGPL	102	192	54	25	1	100
RENK/ RK488RRYGPL	97	192	54	22	1	98
KRUGER/ 6401TS	101	192	55	25	1	97
WENSMAN/ W7289VT3	99	191	55	23	2	100
AGSOURCE/ 3C-799RR/YGCB	100	191	52	24	1	100
FONTANELLE/ 5N503	101	190	53	22	0	100
WENSMAN/ W6271RR	97	190	54	20	3	98
DEKALB/ DKC46-22RR2YGPL	96	188	56	20	0	100
FIELDERS/ CHOICE NG6490	97	187	55	20	1	97
GOLD COUNTRY/ 98-10CBR	98	185	54	21	0	99
DEKALB/ DKC46-60(VT3)	96	184	54	21	0	99
KRUGER/ 6697TS	97	184	55	21	1	97
CROWS/ 2121S	101	184	56	24	1	92
WENSMAN/ W7309VT3	101	184	53	23	2	100
NUTECH/ 3T-098 VT3	98	183	55	22	0	99
FIELDERS/ CHOICE NG6510	98	182	54	20	1	99
DAIRYLAND/ STEALTH-9196	96	181	56	20	0	96
DAIRYLAND/ STEALTH-9497	98	181	54	22	2	100
DAIRYLAND/ STEALTH-9201	101	181	55	23	1	95
NUTECH/ 3P-098 RR/YGPL	98	181	55	20	1	100
WENSMAN/ W6266BTRR	97	181	54	23	1	94
AGSOURCE/ 3P-902RR/YGPL	100	180	56	20	0	100
DEKALB/ DKC51-39RR2YGPL	101	179	53	23	1	100
KALTENBERG/ K4663RRPLUS	96	179	54	22	1	99
AGSOURCE/ 3C-504ARRYGCB	100	179	53	25	5	100
NUTECH/ 3W-099 RR/YGRW	99	177	57	21	2	98
GCS/ 100-07CBR	100	177	56	22	0	100
DEKALB/ DKC52-63RR2YGCB	102	176	55	22	1	97
DAIRYLAND/ STEALTH-9799	99	176	54	20	0	100
WENSMAN/ W7267VT3	97	176	55	22	1	100
DAIRYLAND/ STEALTH-7196	96	175	55	22	1	98
GCS/ 99-02CBR	99	175	53	22	0	100
CROWS/ 4S502	97	174	56	22	2	98
AGSOURCE/ 3T-799 VT3	99	174	53	23	1	99
RENK/ RK618VT3	100	173	55	22	1	100
KRUGER/ 6499VT3	99	172	55	21	1	99
PANNAR/ 5E-900RR/YG+	99	171	54	21	2	99
GCS/ 102-04CBR	102	171	55	24	0	97
NUTECH/ 3P-300 RR/YGPL	99	170	54	24	1	96
SEEDS/ 2000 EXP9901VT3	99	170	55	22	0	99

Table 4. Late maturity Roundup Ready corn hybrid test trial results (continued).

Brand/Hybrid (By '07 yield)	Brand Rel. Mat.	Test trial variable at harvest				
		07 Yield bu/a	07 Bu.Wt. lb	07 Grain Moist. %	'07 Lodging %	07 Pct.* Stand %
AGVENTURE/ AV5480R2CB	98	169	56	21	1	100
KRUGER/ 1500RR	100	169	54	21	3	95
FONTANELLE/ 4N627	98	169	55	22	1	99
WENSMAN/ W6307RR	100	168	52	23	3	100
AGSOURCE/ 3T-099 VT3	99	168	55	21	1	98
PANNAR/ 5D-303RR/YG+	98	165	56	22	0	100
KRUGER/ 2298RR/YGCB	98	159	55	21	0	100
PANNAR/ 6C-260RR/BT	102	157	51	24	3	99
SEEDS/ 2000 3122RR/BT	102	157	52	20	2	100
DEKALB/ DKC49-35(RR2)	99	154	54	18	1	95
Trial avg.:	99	177	54	22	1	98
Highest (H)-avg.:	102	192	57	25	5	100
Lowest (L)-avg.:	96	154	51	18	0	92
H-L avg. difference:	6	38	6	7	5	8
** LSD (.05):		20	1	2	2	4
# Min. TPG-value:		172	56	-	-	96
## Max. TPG-value:		-	-	20	2	-
+ Coef. of var.:		7	1	6	150	2
No. of entries:	50	50	50	50	50	50

* Seeded May 14, 2007 at 28,750 seeds per acre.

** LSD (.05) = amount column values must differ to be significantly different.

Min. TPG-value= minimum value required for the top performance group.

Max. TPG-value= maximum value required for the top performance group.

+ Coef. of Variation = a measure of trial experimental error, 20% or less is best for yield.

Eastern South Dakota Field Pea Variety Test Results[1]

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Trial Methods

A randomized complete block design with four replicated plots, each measuring 5 feet wide and 20 feet long, were seeded and later harvested with a small plot combine. Plots were seeded at 7 pure-live-seeds ft^{-2} (320, 320 seeds/acre) on April 20 (South Shore) and April 24 (Selby) with inoculated seed using a small plot planter. Chemical weed control included 4.5oz/acre of pre-emergence Spartan at South Shore and 0.75 pint/acre of post-emergence Poast at Selby. South Shore plots were sprayed with 3.0 oz/acre of Baythroid to control a pea aphid infestation in mid-June.

Performance Trail Results

General comments – Field pea performance was evaluated at the Northeast Research Farm - South Shore and the Mark Stiegelmeier Farm - Selby (Tables 1 and 2). Two types of means were generated for statistical analysis (Statistical Analysis System, SAS). First, yield averages (four replicates) were analyzed by location. Second, averages for the variables bushel weight, height, lodging and grain protein were analyzed across locations with location as a replicate. This enabled SAS to determine variety (treatment) differences for these variables. The top performance group (TPG) for yield was determined for each location and for the variables bushel weight, height, lodging, and grain protein by statewide performance. The least significant difference (LSD value) for a variable and the minimum value needed for an entry to qualify for the TPG are listed at the bottom of each column where SAS analysis was done. Look for table values with a plus sign (+) indicating they are in the top-performance-group.

The 2007 yield averages (Table 1) indicate the top-yielding varieties at South Shore were CDC Golden, Eclipse, SW Marquee, Fusion, CEB 4152, and Cooper. At Selby the top yielding varieties in 2007 were CEB 1093, Cooper, and CDC Golden.

People are encouraged to evaluate variety differences in bushel weight and protein by looking at the statewide averages for these two variables. Statewide, the top bushel weight entries were CDC Striker and CDC Meadow at 61 pounds. Eight entries equaled the test trial average of 60, six averaged 59, and one averaged 58 pounds per bushel. Likewise statewide, Cruiser had the top or highest protein content; and entries had to differ by 0.6% to be significant.

[1]These results were made possible by funding assistance from the South Dakota Agricultural Experiment Station.

Table 1. Field pea yield results at two eastern South Dakota locations for 2007.

Variety (Mat.)* - by 2007 state yield avg.	Location Yield Avg. (Bu/A) 13% moist.				Eastern Yield Avg. (Bu/A)	
	South Shore		Selby			
	2007	2-Yr	2007	2-Yr	2007	2-Yr
CEB 4152 (E)	63+	.	59	.	61	.
CDC Golden (M)	70+	.	61+	.	66	.
Eclipse (M)	65+	.	59	.	62	.
SW Midas (E)	61	.	59	.	60	.
SW Salute (E)	62	.	57	.	60	.
SW Marguee (E)	65+	.	57	.	61	.
Cooper (L)	63+	.	62+	.	63	.
Fusion (M)	64+	.	52	.	58	.
CDC Meadow (E)	55	.	57	.	56	.
DS Admiral (E)	59	.	51	.	55	.
CEB 1093 (L)	56	.	64+	.	60	.
SW Capri (E)	41	.	58	.	50	.
SW Circus (E)	41	.	55	.	48	.
CDC Sage (M)	53	.	53	.	53	.
K2 (E)	35	.	52	.	44	.
CDC Striker (M)	38	.	52	.	45	.
Cruiser (M)	31	.	52	.	42	.
Test avg. :	54	.	56	.	56	.
High avg. :	70	.	64	.	66	.
Low avg. :	31	.	51	.	42	.
# LSD (.05) :	7		4			
## TPG-value :	63		60			
### C.V. :	9		5			

* Early- E, medium- M, or late- L maturity.

LSD - the amount colmn values must differ to be significantly different.

TPG-value, the minimum value required for the top-performance group (TPG) for yield. A plus sign (+) indicates values within a column that qualify for the TPG.

Coef. of variation, a measure of trial experimental error, 15% or less is best.

Table 2. Field pea eastern and statewide averages for bushel weight (BW) and grain protein (PRT) in 2007

Variety (Mat.)* - by state bushel weight avg.	Eastern Avg.		State Avg.**	
	BW lb	PRT %	BW lb	PRT %
CDC Striker (M)	63	29.1	61+	29.1
CDC Meadow (E)	64	24.5	61+	24.5
CDC Golden (M)	63	28.1	60	28.1
SW Circus (E)	63	28.3	60	28.3
K2 (E)	62	27.1	60	27.1
SW Marguee (E)	62	28.6	60	28.6
SW Capri (E)	63	29.3	60	29.3
Cruiser (M)	62	30.5	60	30.5+
CEB 4152 (E)	62	26.3	60	26.3
CEB 1093 (L)	62	23.1	60	23.1
SW Salute (E)	62	26.8	59	26.8
DS Admiral (E)	61	26.3	59	26.3
Fusion (M)	62	26.9	59	26.9
Eclipse (M)	63	29.1	59	29.1
CDC Sage (M)	62	26.1	59	26.1
SW Midas (E)	62	25.9	59	25.9
Cooper (L)	61	25.4	58	25.4
Test avg. :	62	27.1	60	27.1
High avg. :	64	30.5	61	30.5
Low avg. :	61	23.1	58	23.1
# LSD (.05) :			1	0.6
## TPG-value :			60	29.9
### C.V. :			2	1

* Early- E, medium- M, or late- L maturity.

** Eastern averages were obtained from South Shore and Selby.

*** State averages were obtained from South Shore, Selby, Wall, and Bison.

LSD - the amount column values must differ to be significantly different.

TPG-value, the minimum or maximum value required for the top-
A plus sign (+) indicates values within a column that qualify for the TPG.

Coef. of variation, a measure of trial experimental error.

Eastern South Dakota Winter Wheat Variety Test Results[1]

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Trial Methods

A randomized complete block design with four replicated plots, measuring 5 feet wide and 20 feet long, were seeded and later harvested with a small plot combine. Plots were seeded at 28 pure-live-seeds ft^{-2} (1,219,680 seeds/acre) on October 2, 2006. Bronate (2.0 pint/acre) was applied prior to jointing for weed control. A starter fertilizer of 10 gallons of 10-34-0 (N-P-K) was used at planting with an additional application of 100 pounds of actual N and 20 pounds of actual phosphorus shortly after planting.

Performance Trail Results

General comments – Winter wheat performance results for the Northeast Research Farm and other area locations are presented in tables 1 and 2. Two types of means were generated for statistical analysis (Statistical Analysis System, SAS). First, yield averages (four replicates) were analyzed by location. Second, performance averages for the variables bushel weight, height, lodging and grain protein were analyzed across locations using location as a replicate. This enabled SAS to determine entry (treatment) differences for these variables. The top performance group (TPG) for each variable was determined by location (yield) or statewide (bushel weight, height, lodging, and grain protein). The least significant difference (LSD value) for each variable and the minimum value needed for an entry to qualify for the TPG are listed at the bottom of each column where SAS analysis was done. Look for table values with a plus sign (+).

The 2007 yield averages in table 1 indicate Overland and SD 00111-9 were in the top-performance-group (+ signs) at all four locations; Millennium at three locations; SD 01273 at two locations; and Arapahoe, Harding, Wahoo, Wesley, NuDakota and Hawken at one location. Analysis of three years data indicated there was either too much experimental error with the data or it was missing. Therefore, no analysis was done on the three-year data.

The top bushel weight entries (+ signs in table 2) included five that averaged 61 pounds. Twelve entries equaled the test trial average of 59, seven averaged 58, and the other five averaged 57 pounds or less per bushel. Plant height averaged 31 inches and entry heights had to differ by 3 inches to be significantly different. The tallest entries were Jerry, Harding, Darrell, Tandem, Arapahoe, and Millennium. The top grain protein entries included SD98W175-1-1, SD00111-9, Harding, Hawken, Arapahoe, SD03171, SD001058, and Ripper.

[1]These results were made possible by funding assistance from the South Dakota Agricultural Experiment Station.

Table 1. Winter wheat yield results - four eastern South Dakota locations, 2005-2007.

Variety (Hdg.)*- by 3-yr then 2007 state yield avg.	Location Yield Avg. (Bu/A at 13% moist.)								East Yield Avg. (Bu/A)		State Yield Avg. (Bu/A)	
	Brookings		So. Shore		Selby		Onida					
	2007	3-Yr	2007	3-Yr	2007	3-Yr	2007	3-Yr	2007	3-Yr	2007	3-Yr
Overland (4)	60+	64	74+	.	76+	.	62+	.	68	64	57	48
Millennium (4)	57+	62	72+	.	69	.	61+	.	64	62	55	47
Arapahoe (3)	57+	61	66	.	65	.	60+	.	62	61	54	46
Wahoo (3)	49	55	55	.	63	.	60+	.	58	55	51	46
Wesley (2)	45	51	42	.	52	.	59+	.	51	51	50	45
Wendy~W (-)	46	52	43	.	57	.	57	.	53	52	49	45
SD96240-3-1 (-)	41	52	49	.	51	.	59+	.	51	52	47	45
Hatcher (2)	40	46	47	.	32	.	54	.	44	46	45	45
Trego~W (3)	43	43	54	.	61	.	55	.	54	43	50	44
Expedition (0)	46	53	45	.	66	.	52	.	54	53	49	44
Harding (5)	50	53	62	.	68	.	61+	.	60	53	52	43
Jerry (5)	50	59	57	.	64	.	55	.	55	59	46	43
Alice~W (-)	38	44	41	.	50	.	55	.	48	44	45	43
Darrell (5)	37	47	43	.	46	.	56	.	46	47	43	43
SD01W064 (-)	33	41	43	.	50	.	51	.	46	41	42	43
Tandem (4)	43	48	54	.	53	.	56	.	52	48	48	42
Overley (0)	47	51	40	.	42	.	50	.	48	51	46	42
Jagalene (3)	31	38	26	.	31	.	42	.	34	38	36	40
SD00111-9 (-)	63+	.	75+	.	79+	.	58+	.	67	.	57	.
SD01273 (-)	57+	.	54	.	61	.	61+	.	58	.	52	.
NuDakota~W (3)	44	.	57	.	55	.	61+	.	54	.	51	.
Hawken (3)	51	.	61	.	48	.	62+	.	56	.	51	.
SD01058 (-)	50	.	54	.	55	.	57	.	54	.	49	.
NI04420 (-)	41	.	43	.	49	.	52	.	48	.	46	.
SD98W175-1-1 (-)	44	.	55	.	46	.	55	.	51	.	46	.
SD98W175-1 (-)	44	.	45	.	53	.	55	.	51	.	46	.
SD03171 (-)	42	.	45	.	58	.	53	.	50	.	45	.
Ripper (2)	35	.	44	.	43	.	49	.	45	.	43	.
Danby~W (3)	40	.	47	.	41	.	50	.	45	.	43	.
Test avg. :	46	51	51	.	55	.	56	.	53	51	48	44
High avg. :	63	64	75	.	79	.	62	.	68	64	57	48
Low avg. :	31	38	26	.	31	.	42	.	34	38	36	40
# LSD (.05) :	6		5		6		4					
## TPG-value :	57		70		73		58					
### C.V. :	10		7		8		5					

* Heading, the relative days to heading, compared to the variety - Expedition.

LSD, the amount two values in a column must differ to be significantly different.

TPG-value, the minimum value required for the top-performance group (TPG) for yield.

A plus sign (+) indicates values within a column that qualify for the TPG.

Coef. of variation, a measure of trial experimental error, 15% or less is best.

Table 2. Eastern and state winter wheat averages for bushel wt. (BW), height (HT), lodging (LDG), and grain protein (PRT) in 2007.

	Eastern Avg. - BW, HT, PRT			State Avg. - BW, HT, PRT		
Variety (Hdg.)* - by state BW avg.	BW lb	HT in	PRT %	BW lb	HT in	PRT %
SD00111-9 (-)	62	33	13.4	61+	31	13.1+
Millennium (4)	61	35	12.0	61+	33+	11.9
Overland (4)	61	32	11.7	61+	31	11.7
Tandem (4)	61	34	12.3	61+	34+	12.3
SD01273 (-)	60	32	11.6	60+	31	11.5
Overley (0)	58	29	12.4	59	30	12.3
Harding (5)	59	36	12.9	59	35+	12.8+
Arapahoe (3)	59	34	12.8	59	33+	12.5+
SD03171 (-)	59	30	12.4	59	30	12.5+
Trego~W (3)	59	29	11.3	59	28	11.4
Wendy~W (-)	58	28	12.3	59	27	12.2
NI04420 (-)	58	31	12.0	59	30	12.0
SD01W064 (-)	58	33	11.7	59	32	11.7
Expedition (0)	59	28	11.9	59	29	11.8
SD98W175-1-1 (-)	57	31	13.5	59	31	13.2+
Hawken (3)	58	30	13.1	59	28	12.7+
SD98W175-1 (-)	58	33	12.6	59	32	12.4
SD01058 (-)	57	33	12.7	58	32	12.5+
Danby~W (3)	57	31	11.7	58	30	11.6
Jerry (5)	59	36	12.7	58	36+	12.8
Wesley (2)	57	28	12.2	58	29	12.2
Alice~W (-)	56	28	12.1	58	27	12.2
Darrell (5)	57	34	12.6	58	34+	12.3
Hatcher (2)	56	30	11.0	58	30	10.9
Jagalene (3)	55	30	11.8	57	29	11.7
SD96240-3-1 (-)	57	31	12.1	57	30	12.1
Wahoo (3)	57	31	12.1	57	31	11.9
NuDakota~W (3)	55	29	12.4	56	28	12.4
Ripper (2)	54	31	12.6	55	31	12.5+
Test avg. :	58	31	12.3	59	31	12.2
High avg. :	62	36	13.5	61	36	13.2
Low avg. :	54	28	11.0	55	27	10.9
# LSD (.05) :				1	3	0.7
## TPG-value :				60	33	12.5
### C.V. :				3	7	4

* Heading, the relative days to heading, compared to the variety - Expedition.
# LSD, the amount two values in a column must differ to be significantly different.
TPG-value, the minimum or maximum value required for the top-performance group
A plus sign (+) indicates values within a column that qualify for the TPG.
Coef. of variation, a measure of trial experimental error.

OAT PROJECT

Lon Hall

My 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 a high grain and/or forage yield potential, high-test weight, disease resistance, straw strength, and maturity adaptation for different regional environments. Desired seed traits for hulled oats include a white hull, high groat percentage, and large seeds; the hulless seed traits include a light color seed, few trichomes (hairless), and large seed. The quality traits desired by the millers are low oil, high protein, and beta-glucan grain. The horse feed community want a white hull and high protein grain, and the livestock feeders want high Relative Feed Value forage, high oil, and high protein grain.

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 2007 spring crossing block yielded 359 successful unique genetic combinations. Two hundred and thirty six of these were selected for F1 increase in the fall greenhouse cycle. Twenty three crosses were selected, based on pedigree, for single seed descent generation advancement. These crosses theoretically possess exceptional gene combinations, hence, the effort to advance three generations a year. There were a total of 5260 yield plots grown in the field. The numbers of unique bulk populations grown were 218 bulk F2s and 96 bulk F3s. There were 2448 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 304 and 120 respectively. Thirty five preliminary seed increases were grown at the Brookings location. Five minor increases were grown at the Southeast and Northeast Research farms. Thirty seven thousand eight hundred plants consisting of 108 populations and thirty six backcross single seed descent subpopulations were screened for kernel type and crown rust in the fall greenhouse cycle. Approximately 6,000 selected single seed descent seeds will be planted in the spring greenhouse cycle of which 3000 will harvested. Two thousand and four hundred single seed descent plants will be selected for yield testing in 2008 PYT.

Three lines are being increased with the intent to release. The pedigree for experimental line SD020301-20NO is D950864/3/SD89504//Newdak/PennComp31. This is a multi-purpose hulless oat that may be harvested for forage, straw, and/or grain. SD020301-20NO has excellent forage quality and agronomic traits (tables 1 and 2). The pedigree for experimental lines SD020883-29 andSD020883-109 is SD97575/Morten. These siblings are white-hulled lines that have a very early maturity making them suitable for double cropping, companion crop, or harvesting for grain. Their agronomic traits may be compared to other experimental lines and standard varieties in tables 1. One of these siblings will be considered for release after further evaluation in 2008.

The oat project is funded through the Agricultural Experiment Station, Crop Improvement Association, and Consortium for Alternate Crops.

Table 1. 2007 South Dakota Standard Variety Oat Trials.

Highlights and bolding used for comparison	8loc top yield frequency	8loc *adjyld bu/a	8loc yield bu/a	8loc Test wt lbs/bu	8loc height inch	2loc head June	8loc Lodg I-10	2loc snapback I-5	innoc-ulated(cr) crownrust	Buck-thorn cr%	8loc protein %
SD020301-20(NO)*	**0**	***120**	**84**	**45**	**38**	**15.6**	**2**	**3.4**	**15MS**	**22**	**18.8**
SD041405	88	119	119	38	34	14.6	2	2.9	20MS	1	15.0
SD041451	75	115	115	39	38	18.3	2	3.3	1VR	1	15.8
SD041445	75	114	114	39	39	19.6	2	3.1	0R	1	15.6
Stallion	63	113	113	37	40	20.9	2	3.7	12MS	2	16.6
SD030888	75	112	112	38	33	16.4	2	1.6	10MS	2	15.4
Souris	63	112	112	37	34	19.0	2	2.4	NA	NA	15.6
SD020883-109	**50**	**110**	**110**	**39**	**36**	**13.1**	**2**	**2.8**	**2MR**	**31**	**16.3**
SD020883-29	**38**	**109**	**109**	**39**	**36**	**13.1**	**2**	**2.8**	**1R**	**23**	**16.9**
BUFF(NO)*	0	*109	76	44	35	14.9	1	2.1	NA	60	17.9
SD020883-114	38	109	109	39	35	12.8	2	2.8	NA	32	16.8
SD020883-171	25	108	108	39	36	13.0	2	3.2	1R	14	16.5
SD041117	25	108	108	38	35	15.4	2	2.8	5R	11	16.4
Beach	38	107	107	38	40	19.6	2	3.5	NA	NA	14.7
Don	0	107	107	37	33	13.8	2	3.2	NA	98	15.3
Morten	0	105	105	36	41	20.3	1	2.4	NA	30	15.8
HiFi	25	104	104	35	38	20.8	2	2.8	NA	NA	15.4
Reeves	0	103	103	39	39	14.5	2	4.1	26S	NA	18.0
Jerry	0	100	100	38	38	17.3	2	2.5	NA	NA	16.0
Loyal	13	100	100	36	40	20.1	2	3.3	NA	NA	17.0
Hytest	0	74	74	39	39	17.1	2	3.5	NA	NA	19.1
STARK(NO)*	0	***70**	49	39	39	23.0	1	1.9	NA	NA	17.5
		106.8	102	38.5	37.1	17	1.9	2.9			16.5

*hulless yield/.7 to estimate hulled yield

Table 2. **South Dakota Extension Forage Yield Trials.

**SD exper-imental lines excluded	Avg tons/acre dry matter	Brookings tons/acre dry matter	Timber Lake tons/acre dry matter	2006 crude protein %	2006 Relative feed value%
Stallion	6.60	8.1	5.1	NA	NA
CORA126	6.35	7.3	5.4	NA	NA
Jerry	6.35	7.3	5.4	NA	NA
Morten	6.20	6.5	5.9	NA	NA
SD020301-20	**6.00**	**6.8**	**5.2**	**12**	**114**
Hayes	5.65	5.2	6.1	NA	NA
Valier	5.55	5.1	6	NA	NA
CORA114	5.50	6.2	4.8	NA	NA
Buff	5.35	6.3	4.4	13	106
Haybet	5.30	5.5	5.1	NA	NA
Loyal	5.30	6.3	4.3	NA	NA
Stark	5.10	5.7	4.5	NA	NA
Haxby	4.65	5.3	4	NA	NA
Sundro	3.90	4.7	3.1	NA	NA
Mean	5.64	6.26	5.02		

Spring Wheat Breeding

Karl D. Glover

Our primary objective is to improve the agronomic, milling, and baking characteristics of spring wheat varieties that are well adapted to South Dakota. Prior to the release of a new variety 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 variety, 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 varieties 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-one experimental lines appearing to hold the most potential for release as varieties were included in the 2007 Advanced Yield Trials (AYT) along with eleven released varieties included for comparative purposes. Not all thirty-one entries will be selected for continued testing in 2008. Table 1 presents statewide agronomic and Fusarium head blight resistance observations collected from twenty-four entries that were grown in both the 2006 and 2007 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 2006 and 2007 (14 location-year combinations).

Among the experimental lines, SD3851 appears most promising as a new variety due to its above average yield potential, high test weight, good level of leaf rust resistance (data not shown), and excellent Fusarium head blight resistance. Breeder seed of SD3851 is being increased in California and will be further increased in 2008. Foundation seed should be made available to certified seed producers in 2009.

Efforts carried out, and varieties released, by this program are made possible 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 eighteen hard red spring wheat experimental lines evaluated in 2006 and 2007 Advanced Yield Trials.

Entry	Northeast Research Station Yield (bu/ac)			2005 - 2006 Statewide Averages *					
	2006	2007	2yr.	TW (lb/bu)	Heading (Day)***	Height (in)	Pro (%)	DIS (%)***	Yield (bu/ac)
SD3943	52.2	67.9	62.1	59.3	18.6	35.7	13.8	20.7	50.0
SD3944	52.3	61.8	58.0	59.0	18.7	37.1	14.2	19.7	49.6
SD3942	52.2	61.7	58.6	58.8	18.4	34.4	13.8	16.2	48.9
TRAVERSE	56.3	63.6	57.9	55.9	19.9	38.7	13.9	30.5	47.3
SD3868	51.2	55.7	56.1	57.0	18.9	37.8	14.0	26.0	47.2
STEELE-ND	55.5	66.9	59.6	58.6	21.0	37.7	15.1	35.8	47.0
GRANGER	46.8	58.0	55.1	58.6	20.7	39.9	14.6	32.2	46.2
SD3983	54.2	59.7	54.9	58.5	20.0	37.2	14.1	36.6	46.1
BRIGGS	46.3	61.0	57.0	58.5	18.9	36.3	15.2	27.5	45.8
SD3948	52.7	58.7	55.7	59.7	17.9	36.8	14.7	25.0	45.7
SD3927	52.2	57.4	54.3	58.8	23.1	36.3	14.2	37.8	45.5
SD3965	53.4	55.7	52.6	57.8	19.3	38.3	14.0	27.8	45.2
SD3997	55.1	62.4	54.6	59.0	19.6	40.2	14.9	27.5	44.7
SD3870	51.3	57.3	54.2	58.6	19.5	39.6	15.0	30.2	44.4
KNUDSON	47.9	58.2	56.9	58.1	18.9	36.1	15.2	27.2	44.0
SD3851	50.9	57.6	54.9	59.9	17.1	36.6	14.7	5.5	43.3
SD3976	53.5	53.4	53.5	60.0	18.9	36.8	15.4	19.7	43.2
SD3956	53.0	57.5	54.0	59.4	18.1	36.6	14.5	25.3	42.2
RUSS	50.6	52.0	49.7	56.7	20.6	38.3	14.3	34.8	41.6
WALWORTH	56.4	54.2	51.0	57.1	19.8	36.3	14.7	30.7	41.1
KELBY	47.5	52.0	52.7	58.2	20.4	30.4	15.6	42.0	40.4
OXEN	49.4	49.4	50.1	56.0	20.1	34.1	14.3	42.7	40.1
ALSEN	45.8	51.8	48.8	57.3	21.9	35.2	15.4	28.6	36.3
REEDER	50.1	48.9	47.6	55.8	22.7	35.3	14.5	38.8	36.0
MEAN	51.5	57.6	54.5	58.1	19.7	36.7	14.5	28.7	44.2
LSD (0.05)	4.9	9.5	5.4	0.5	0.3	1.8	0.2	10.5	2.2
CV %	5.9	8.7	6.4	2.1	7.4	5.6	3.7	29.8	8.3

* Performance based on 14 AYT locations grown in 2006 and 2007.

** 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 2006 and 2007.

NE Farm Soybean Breeding Summary for 2007 Growing Season

Project Leader: Roy Scott
Research Associate Marci Green
Research Assistant: Matt Caron
Research Manager: Richard Geppert

As in the past, soybean plots were grown in replicated 30-inch rows with 4 rows per plot and 14-foot plot lengths. Experiments grown at NE farm included preliminary and advanced yield trials with conventional and Roundup Ready (RR) entries from SDSU's soybean breeding project. In addition, regional soybean trials (UNF), and quality traits trials (QT) containing high protein and modified fatty acid entries were grown. Entries grown were in maturity group 0 and I. Advanced trials contained only SD entries, while regional and quality traits trials contained entries from several universities across the North-central region as well as conventional and Roundup Ready entries. Plots were planted on May 14 for QT, May 25 for all other trails. Group 0 plants generally matured before the first frost. Most group I plants may not have fully matured before the first frost.

There were 21 entries in the group 0 quality traits test and 38 entries in the group I. Yields for the quality trait tests were lower at NE Farm than those obtained at Aurora and Brookings. The yields for group 0 ranged from 26.1-46.7 bu/acre with mean 36.0 at NE farm compared to 26.2-53.6 bu/acre (mean 44.2) at Aurora and 38.9-58.3bu/acre (mean 48.5) at Brookings. Group I yields were also lower with a range of 28.4-47.5 bu/acre at NE and 35.9-61.6 bu/acre at Aurora. Means were 38.2 and 49.9 bu/acre respectively.

Advanced trails included conventional and RR entries in maturity groups 0 and I. Group 0 RR advanced line yields ranged from 37.2-48.1 bu/acre with a mean of 44.0 at NE Farm versus 38.8-55.4 bu/acre with a mean 48.1 at Aurora. Group I RR yields ranged from 31.2-46.9 bu/acre (mean 39.3) at NE farm compared with 45.7-63.3 bu/acre (mean 51.6) at Aurora. For conventional entries, yields in group 0 ranged from 30.0-44.5 bu/acre at NE Farm and 32.8-51.7 bu/acre at Aurora. Means were 36.8 bu/acre at NE Farm and 43.7 bu/acre at Aurora. Group I conventional yields ranged from 27.8-47.5 bu/acre (mean 39.5) at NE Farm compared to 34.4-48.6 bu/acre (mean 40.4) at Aurora.

Protein data on a 13% moisture basis at NE Farm and Aurora were similar in all of the advanced trails with conventional varieties ranging slightly higher than RR. For conventional entries, group 0 at NE Farm ranged from 32.3-36.7% and 32.8-36.8% at Aurora. Group I proteins were 33.0-42.9% at NE Farm and 32.2-41.5% at Aurora.

Group 0 RR advanced lines ranged from 33.3-38.3% protein at NE Farm and 33.7-38.0% at Aurora. Group I RR ranged from 32.1-38.2% at NE Farm and 31.8-38.6 at Aurora.

Oil data for group 0 and group I advanced lines were similar for conventional and Roundup Ready entries. Oil concentrations ranged from 16.4-19.5% for RR group 0 and 17.1-19.6% for conventional group 0. Group I RR ranged from 16.0-19.2% and conventional group I ranged from 13.1-20.0%. Similar oil concentrations were seen at Aurora for group 0 and I Roundup Ready and conventional entries.

The Northeast Farm remains a key site in our testing program. Yields usually are more unpredictable at this site than other sites, providing a good contrast of performance of individual lines. This site appears to be a good measure of soybean performance on the SD Choteau. Lines that do well at NE Farm should do well elsewhere on the Choteau.

Northeast Research Farm Annual Report

2007 Alfalfa Production

Vance Owens, Chris Lee, and Peter Jeranyama

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 28 April 2004 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 2004. Yields (tons dry matter/acre) are shown for four cuttings in 2007. Average cumulative yield in 2007 was 4.98 tons dry matter/acre.

Cultivars are ranked from highest to lowest based on cumulative production (3-year total). 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 28 April 2004 at the Northeast Research Farm.

	2007					2006	2005	3-year
Entry	5-Jun	5-Jul	7-Aug	14-Sep	Total	Total	Total	Total
	Tons Dry Matter/Acre							
6200 HT	2.12	1.26	1.31	0.52	5.20	4.32	5.37	14.89
54H91	2.36	1.28	1.29	0.53	5.46	4.21	5.19	14.86
54Q25	1.98	1.23	1.31	0.58	5.11	4.24	5.24	14.59
54V46	1.87	1.24	1.37	0.61	5.09	4.34	5.00	14.43
WL 319HQ	1.81	1.22	1.29	0.55	4.87	4.12	5.35	14.34
eXtreme	1.93	1.17	1.32	0.57	4.98	3.93	5.31	14.21
6415	1.95	1.29	1.42	0.64	5.29	3.93	4.97	14.20
WL 348AP	2.02	1.19	1.26	0.57	5.03	3.99	5.10	14.12
HybriForce 420/wet	1.86	1.16	1.29	0.54	4.84	3.98	5.19	14.01
ProSeed-381 Hyb	1.71	1.10	1.25	0.54	4.59	4.03	5.24	13.86
Vernal	1.98	1.15	1.14	0.49	4.77	3.81	4.96	13.54
GH 711	1.75	1.10	1.20	0.51	4.57	3.67	4.99	13.23
Average	1.94	1.20	1.29	0.55	4.98	4.05	5.16	14.19
Maturity (Kalu & Fick)	4.3	5.2	5.2	4.9				
LSD (P=0.10)	NS	NS	NS	NS	NS	NS	NS	NS
CV (%)	17.4	12.7	11.8	20.6	12.6	16.6	11.1	11.8
P-value	0.122	0.405	0.233	0.637	0.381	0.850	0.942	0.882

NS = not significant at 0.10 level of probability

50 lbs P_2O_5/Acre - preplant

Treflan applied 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.

2007 Research

Early spring moisture was adequate for good crop establishment and incorporating pre-emergence herbicides. There was moderate to heavy weed pressure in several trials, but excellent small grain establishment and growth greatly suppressed weed growth.

2007 Research and Demonstration Projects

1. Herbicide Resistant Corn Demonstration
2. Conventional Corn Herbicide Demonstration
3. Weed Control with Laudis in Corn
4. Weed Control and Corn Yield with Halex GT
5. Burndown with Valor in Corn
6. Adjuvants with Laudis in Corn
7. Herbicide Resistant Soybean Demonstration
8. Conventional Soybean Herbicide Demonstration
9. Weed Control with Orion in Spring Wheat
10. Huskie Broadleaf Control
11. Affinity Broadspec Tank-Mixes with Starane NXT
12. Pre-Harvest Applications in Spring Wheat
13. Crop Tolerance and Weed Control with Callisto in Oats
14. Flax Tolerance to Callisto
15. Crop Tolerance and Weed Control of Callisto in Millet
16. ET Herbicide Tank-Mixtures for Preplant Burndown Applications

The most common broadleaf weeds species included common lambsquarters, 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 2007 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 Research and Promotion Council
2. Consortium for Alternative Crops
3. 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 sheet available from county Extension offices for herbicide recommendations.

Table 1. Herbicide Resistant Corn Demonstration

Demonstration
Variety: Roundup Ready --DKC 46-60 VT3;
Liberty Link – Pioneer 38H72 HXX RR2 LL
PRE: 5/11/07
EPOST: 6/4/07; Corn V2, 3 lf, 3-4 in; Yeft 1-3 lf, 1-3 in; Colq 1-3 in.
POST: 6/12/07; Corn V3, 5 lf, 5-7 in; Yeft 2-5 lf, 1-5 in; Colq 2-4 in.
Soil: Clay loam; 3.0% OM; 6.1 pH

Precipitation:

PRE:	1st week	0.04 inches
	2nd week	1.32 inches
EPOST:	1st week	0.17 inches
	2nd week	0.72 inches
POST:	1st week	0.73 inches
	2nd week	0.00 inches

Yeft=Yellow foxtail
Colq=Common lambsquarter

Comments: This demonstration was intended to evaluate several herbicide programs in Liberty Link and Roundup Ready corn, including pre- followed by postemergence, and postemergence programs.

Liberty Link corn: All treatments resulted in adequate control of common lambsquarters, but yellow foxtail control was slightly greater in two pass programs or programs that included a residual herbicide.

Roundup Ready corn:
Postemergence programs: For early postemergence applications, tank mixing residual herbicides with Roundup improved yellow foxtail control. For the mid postemergence applications, weeds were adequately controlled with one Roundup application.

Pre- followed by postemergence applications: All treatments resulted in nearly complete weed control.

Treatment	***Rate/A***	***% Yeft 9/21/07***	***% Colq 9/21/07***
Liberty Link Check	----	0	0
EARLY POSTEMERGENCE			
Liberty+Atrazine+AMS	32 oz+1 pt+3 lb	91	99
POSTEMERGENCE			
Liberty+Atrazine+AMS	32 oz+1 pt+3 lb	94	99
Liberty+Resolve+AMS	32 oz+1 oz+3 lb	92	95
Liberty+Callisto+AMS	32 oz+1.5 oz+3 lb	90	97
EARLY POSTEMERGENCE & POSTEMERGENCE			
Liberty+Atrazine+AMS&LIberty+AMS	24 oz+1 pt+3 lb&24 oz+3 lb	95	99
PREEMERGENCE & POSTEMERGENCE			
Define SC&Liberty+Atrazine+AMS	12 oz&32 oz+1 pt+3 lb	97	99
Balance Pro&Liberty+Atrazine+AMS	1.5 oz&32 oz+1 pt+3 lb	96	99
Roundup Ready Check	----	0	0
EARLY POSTEMERGENCE			
Roundup WeatherMax+AMS	22 oz+2.5 lb	82	94
Touchdown Total+AMS	32 oz+2.5 lb	82	94
Touchdown Total+Lumax+AMS	24 oz+1 qt+2.5 lb	96	98

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Treatment	***Rate/A***	***% Yeft 9/21/07***	***% Colq 9/21/07***
EARLY POSTEMERGENCE (Continued . . .)			
Roundup WeatherMax+Resolve+AMS	22 oz+1 oz+2.5 lb	94	98
Roundup WeatherMax+Resolve+ Atrazine+AMS	22 oz+1 oz+ 1 pt+2.5 lb	95	99
Roundup WeatherMax+Atrazine+AMS	22 oz+1 pt+2.5 lb	96	99
Roundup WeatherMax+Harness+AMS	22 oz+1 pt+2.5 lb	98	98
Roundup WeatherMax+Stalwart C+AMS	22 oz+1 pt+2.5 lb	98	96
Roundup WeatherMax+Outlook+AMS	22 oz+12 oz+2.5 lb	98	97
Roundup WeatherMax+Prowl H_2O+AMS	22 oz+2.5 pt+2.5 lb	98	97
POSTEMERGENCE			
Roundup WeatherMax+AMS	22 oz+2.5 lb	97	98
Roundup WeatherMax+Resource+AMS	22 oz+4 oz+2.5 lb	98	98
Roundup WeatherMax+Aim+AMS	22 oz+.5 oz+2.5 lb	97	98
Roundup WeatherMax+Callisto+ Atrazine+AMS	22 oz+1.5 oz+ 1 pt+2.5 lb	99	99
Roundup WeatherMax+Laudis+AMS	22 oz+1 oz+2.5 lb	98	99
Roundup WeatherMax+Impact+AMS	22 oz+.5 oz+2.5 lb	98	98
Roundup WeatherMax+Status+AMS	22 oz+2.5 oz+2.5 lb	98	98
Roundup WeatherMax+2,4-D amine+AMS	22 oz+8 oz+2.5 lb	97	98
Roundup WeatherMax+Clarity+AMS	22 oz+8 oz+2.5 lb	97	99
EARLY POSTEMERGENCE & POSTEMERGENCE			
Roundup WeatherMax+AMS& Roundup WeatherMax+AMS	22 oz+2.5 lb& 22 oz+2.5 lb	94	99
PREEMERGENCE & POSTEMERGENCE			
Atrazine&Roundup WeatherMax+AMS	1 qt&22 oz+2.5 lb	95	99
Atrazine+Resolve& Roundup WeatherMax+AMS	1 pt+1.5 oz& 22 oz+2.5 lb	96	99
Harness&Roundup WeatherMax+AMS	1.5 pt&22 oz+2.5 lb	99	98
Harness Xtra 6L&Roundup WeatherMax+AMS	1 qt&22 oz+2.5 lb	98	98
Micro-Tech&Roundup WeatherMax+AMS	2 qt&22 oz+2.5 lb	98	98
Dual II Magnum&Roundup WeatherMax+AMS	1.67 pt&22 oz+2.5 lb	99	98
Keystone LA&Roundup WeatherMax+AMS	1.1 qt&22 oz+2.5 lb	98	99
Outlook&Roundup WeatherMax+AMS	12 oz&22 oz+2.5 lb	98	98
Lumax&Touchdown Total+AMS	1.5 qt&24 oz+2.5 lb	99	99
Harness+Atrazine&Roundup WeatherMax+AMS	1 pt+1 pt&22 oz+2.5 lb	99	99
Balance Pro+Atrazine& Roundup WeatherMax+AMS	1.5 oz+1 pt& 22 oz+2.5 lb	94	98
Define SC+Atrazine& Roundup WeatherMax+AMS	7 oz+1.5 pt& 22 oz+2.5 lb	95	98
Balance Pro+Define SC& Roundup WeatherMax+AMS	1.7 oz+4 oz& 22 oz+2.5 lb	96	99
Balance Pro+Define SC& Roundup WeatherMax+AMS	1 oz+3.5 oz& 22 oz+2.5 lb	96	98

Table 2. Conventional Corn Herbicide Demonstration

Demonstration
Variety: DKC 46-60 VT3
Planting Date: 5/11/07
PRE: 5/11/07
EPOST: 6/4/07; Corn 3 lf, V2, 3-4 in; Yeft 1-3 lf, 1-3 in; Colq 1-3 in.
POST: 6/12/07; Corn 5 lf, V3, 5-7 in; Yeft 2-5 lf, 1-5 in; Colq 2-4 in.
Soil: Clay loam; 3.0% OM; 6.1 pH

Precipitation:

PRE:	1st week	0.04 inches
	2nd week	1.32 inches
EPOST:	1st week	0.17 inches
	2nd week	0.72 inches
POST:	1st week	0.73 inches
	2nd week	0.00 inches

Yeft=Yellow foxtail
Colq=Common lambsquarter

Comments: This demonstration was intended to evaluate several herbicide programs in conventional corn, including preemergence, pre- followed by postemergnece, and postemergence programs.

Preemergence programs: All treatments resulted in nearly complete control of yellow foxtail and common lambsquarters.

Pre- followed by postemergence programs: All treatments resulted in good control of yellow foxtail and common lambsquarters. However, the treatment with MicroTech & WideMatch resulted in only 85% control of common lambsquarters.

Early postemergence programs: All treatments resulted in very good control of common lambsquarters. Several treatments resulted in less than 90% yellow foxtail control. Only Lumax+Steadfast or Steadfast+Atrazine+Callisto resulted in greater than 95% yellow foxtail control.

Treatment	***Rate/A***	***% Yeft 9/21/07***	***% Colq 9/21/07***
PREEMERGENCE			
Epic	14.5 oz	99	99
Radius	18 oz	99	98
Lumax	3 qt	99	98
Bicep Lite II Magnum	2 qt	97	97
Stalwart Xtra	2.1 qt	97	96
G-Max Lite	3.5 pt	97	97
Harness Xtra 6L	2.1 qt	99	98
Keystone LA	2.2 qt	98	98
Balance Pro+Atrazine	3 oz+35 oz	97	98
Balance Pro+Define SC+Atrazine	2.1 oz+7 oz+1 qt	99	99
Balance Pro+Resolve+Atrazine	1.5 oz+1.5 oz+1 qt	96	98
Atrazine+Harness	33 oz+29 oz	99	99
PREEMERGENCE & POSTEMERGENCE			
Harness&Aim+Atrazine+COC+28% N	1.5 pt&.5 oz+1 qt+1%+2 qt	99	98
Balance Pro&Callisto+Atrazine+COC+28% N	1.5 oz&3 oz+1 pt+1%+2 qt	97	98
Balance Pro&Laudis+Atrazine+MSO+28% N	1.5 oz&3 oz+1 pt+1%+1.5 qt	98	99
Balance Pro&Impact+Atrazine+MSO+28% N	1.5 oz&.5 oz+1 pt+1%+1.5 qt	97	99
Balance Pro&Option+MSO+28% N	1.5 oz&1.5 oz+1.5 pt+2 qt	95	98
Balance Pro&Stout+COC+AMS	1.5 oz&.75 oz+1%+2 lb	93	97
Balance Pro+Atrazine&Stout+COC+AMS	1.5 oz+1.5 pt&.75 oz+1%+2 lb	94	98
Resolve+Atrazine&Stout+COC+AMS	1.5 oz+1 qt&.75 oz+1%+2 lb	95	95
Outlook&Status+COC+28% N	21 oz&7.5 oz+1%+2 qt	99	99
Outlook&Marksman+NIS+28% N	21 oz&2 pt+.125%+2 qt	98	99

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Treatment	***Rate/A***	***% Yeft 9/21/07***	***% Colq 9/21/07***
PREEMERGENCE & POSTEMERGENCE (Continued . . .)			
Micro-Tech&Hornet WDG+MSO+28% N	2.5 qt&3 oz+1%+2 qt	97	99
Micro-Tech&WideMatch	2.5 qt&1.33 pt	96	85
Surpass&2,4-D amine	2.5 pt&1 pt	98	98
Breakfree+Atrazine&Accent+COC+28% N	1.5 pt+1.5 pt&.67 oz+1%+2 qt	98	95
Breakfree+Atrazine&Stout+COC+28% N	1.5 pt+1.5 pt&.5 oz+1%+2 qt	97	96
Dual II Magnum&Northstar+NIS+28% N	1.67 pt&5 oz+.25%+2 qt	96	98
Dual II Magnum&Callisto+28% N	1.67 pt&3 oz+2 qt	94	98
Dual II Magnum&Callisto+Atrazine+ COC+AMS	1.5 pt&3 oz+1 pt+ 1%+2 lb	98	99
Dual II Magnum&Impact+Atrazine+ MSO+28% N	1.5 pt&.5 oz+1 pt+ 1%+1.5 qt	98	99
Dual II Magnum&Laudis+Atrazine+ MSO+28% N	1.5 pt&3 oz+1 pt+ 1%+1.5 qt	99	99
Cinch&Steadfast+Callisto+Atrazine+ COC+AMS	.67 pt&.75 oz+2 oz+1 pt+ 1%+2.5 lb	98	98
Cinch&Steadfast+Marksman+COC+AMS	1 pt&.75 oz+1 pt+1%+2 qt	98	98
Keystone LA&Hornet WDG+Clarity+ NIS+AMS	2 qt&3 oz+4 oz+ .25%+2.5 lb	99	99
EARLY POSTEMERGENCE			
Stout+Atrazine+COC+AMS	.75 oz+1.5 pt+1.5 pt+2 lb	91	96
Option+Callisto+COC+28% N	1.5 oz+2 oz+1%+1.5 qt	85	96
Laudis+Atrazine+Resolve+MSO+28% N	3 oz+1 pt+1 oz+1%+1.5 qt	89	97
Laudis+Atrazine+Stout+MSO+28% N	2 oz+1 pt+.5 oz+1%+1.5 qt	92	98
Impact+Atrazine+Stout+MSO+28% N	.5 oz+1 pt+.5 oz+1%+1.5 qt	92	98
Impact+Outlook+Atrazine+NIS+28% N	.5 oz+12 oz+1 qt+1%+2 qt	94	98
Option+Distinct+NIS+28% N	1.5 oz+4 oz+1%+2 qt	82	98
Option+Status+MSO+28% N	1.5 oz+5 oz+1.5 pt+2 qt	82	98
Steadfast+Atrazine+COC+28% N	.75 oz+1.5 pt+1%+2 qt	86	94
Steadfast+Starane+Atrazine+COC+28% N	.75 oz+.5 pt+1 qt+1%+2 qt	89	97
Steadfast+Callisto+Atrazine+COC+28% N	.75 oz+2 oz+1 pt+1%+2 qt	92	98
Lumax+Steadfast+COC+AMS	1.5 qt+.75 oz+1%+2.5 lb	96	99
Steadfast+Atrazine+Callisto+COC+AMS	.75 oz+3 pt+2 oz+1%+2.5 lb	96	99

Table 3. Weed Control with Laudis in Corn

RCB; 3 reps
Variety: DKC 46-60 VT3
Planting Date: 5/11/07
POST: 6/12/07; Corn V3, 5 lf, 5-7 in; Grft 2-5 lf, 1-5 in; Wibw 2-5 in; Bdlf 2-4 in.
Soil: Clay loam; 3.0% OM; 6.1 pH

Precipitation:
POST: 1st week 0.73 inches
2nd week 0.00 inches

VCRR=Visual Crop Response Rating (O=no injury; 100=complete kill)
Grft=Green foxtail
Wibw=Wild buckwheat
Bdlf=Common lambsquarter, redroot pigweed

Comments: The objective of this study was to evaluate Laudis (tembotrione) programs in conventional or Roundup Ready corn. Laudis is a new HPPD-inhibitor or "bleacher" with a similar mode of action as Callisto (mesotrione). Yield loss in the untreated check was approxi- mately 50%, indicating moderate weed competition. On July 30, Laudis+atrazine resulted in approximately 91% green foxtail control whereas Callisto+atrazine resulted in only 69% green foxtail control. Foxtail control with Laudis+atrazine was similar to Laudis+Accent. Wild buckwheat control with Laudis alone was only 53%, but greater than 90% when mixed with atrazine or Roundup. Adding a low rate of Laudis (1 oz/A) to Roundup only slightly increased general broadleaf weed control relative to Roundup alone. Laudis alone resulted in the lowest crop yield, which was likely due to incomplete wild buckwheat and grass control.

		Corn							
		% VCRR	% Grft	% Wibw	% Bdlf	% Grft	% Wibw	% Bdlf	Yield
Treatment	**Rate/A**	**6/20/07**	**7/5/07**	**7/5/07**	**7/5/07**	**7/30/07**	**7/30/07**	**7/30/07**	**bu/A**
Untreated Check	----	0	0	0	0	0	0	0	62
POSTEMERGENCE									
Laudis+atrazine+ COC+28% N	3 oz+1 pt+ 1%+1.5 qt	0	94	92	99	91	91	98	153
Callisto+atrazine+ COC+28% N	3 oz+1 pt+ 1%+2.5%	0	84	96	99	69	94	99	130
Laudis+Accent+ MSO+28% N	3 oz+.33 oz+ 1%+1.5 qt	0	92	67	99	89	53	99	130
Laudis+ Roundup Original Max+ AMS	1 oz+ 22 oz+ 17 lb/100 gal	0	93	94	97	89	92	98	145
Laudis+COC+28% N	3 oz+1%+1.5 qt	0	90	62	99	82	53	98	124
Roundup WeatherMax+ AMS	22 oz+ 2.5 lb	0	92	94	97	87	90	96	146
LSD (.05)		0	4	6	1	8	11	1	17

Table 4. Weed Control with Halex GT

RCB; 3 reps
Variety: DKC 46-60 VT3
Planting Date: 5/11/07
PRE: 5/11/07
EPOST: 5/27/07; Corn 2 lf, 3 in; Grft 1-2 lf; Wibw 1-3 lf; Colq 1 in; Rrpw 1 in; Wimu 1-3 in; Corw 1 in.
POST: 6/12/07; Corn V3, 5 lf, 5-7 in; Grft 2-5 lf, 1-5 in; Wibw 2-5 in; Colq 2-4 in; Rrpw 1-4 in; Wimu 2-5 in; Corw 2-5 in.
LPOST: 6/20/07; Corn V5, 12-14 in; Grft 2-5 in; Wilbw 4-8 in; Colq 2-4 in; Rrpw 2-5 in; Wimu 3-7 in; Corw 3-6 in.
Soil: Clay loam; 3.0% OM; 6.1 pH

Precipitation:

PRE:	1st week	0.04 inches
	2nd week	1.32 inches
EPOST:	1st week	1.32 inches
	2nd week	0.02 inches
POST:	1st week	0.73 inches
	2nd week	0.00 inches
LPOST:	1st week	0.13 inches
	2nd week	0.00 inches

Grft=Green foxtail
Wibw=Wild buckwheat
Bdlf=Redroot pigweed, common lambsquarter, wild mustard, common ragweed
Colq=Common lambsquarter
Rrpw=Redroot pigweed

Comments: The objective of this study was to evaluate several herbicide programs including new herbicides such as Halex GT (S-metolachlor+mesotrione+glyphosate), Laudis (tembotrione), and SureStart (acetochlor+flumetsulam+clopyralid). The untreated check resulted in approximately 65% corn yield loss, indicating relatively high weed competition. Prior to applying the postemergence herbicide, many of the preemergence herbicides provided good green foxtail control but wild buckwheat control was greatest in the treatments that contained atrazine (Lumax or Harness Xtra) and SureStart. By September 11, most treatments resulted in very good grass and broadleaf weed control except green foxtail control was 83% with Roundup alone or 62% with Roundup+ Laudis applied early postemergence. One early postemergence application of Halex GT alone resulted in nearly complete weed control. Corn yield was similar among all herbicide treatments in this study.

Treatment	Rate/A	% Grft 6/20/07	% Wibw 6/20/07	% Grft 7/5/07	% Wibw 7/5/07	% Bdlf 7/5/07	% Grft 9/11/07	% Colq/ Rrpw 9/11/07	Yield bu/A
Untreated Check	----	0	0	0	0	0	0	0	49
EARLY POSTEMERGENCE									
Halex GT+NIS+AMS	4 pt+.25%+1%	—	—	97	95	99	96	98	155
Halex GT+atrazine+ NIS+AMS	4 pt+1 pt+ .25%+1%	—	—	98	98	99	98	99	146
Laudis+ Roundup Original Max+AMS	3 oz+ 22 oz+1%	—	—	76	90	99	62	98	134
PREEMERGENCE & LATE POSTEMERGENCE									
Lumax& Touchdown Total+AMS	1.5 qt& 24 oz+1%	95	91	99	97	99	99	99	151
Harness Xtra 6L& Roundup Original Max+AMS	1.2 qt& 22 oz+1%	98	94	99	97	99	99	99	147
Dual II Magnum& Touchdown Total+AMS	1.34 pt& 24 oz+1%	95	23	99	85	99	99	99	133
Dual II Magnum& Callisto+ Touchdown Total+AMS	1.34 pt& 3 oz+ 24 oz+1%	95	33	99	91	99	99	99	135

Table 4. Weed control with Halex GT (Continued . . .)

Treatment	Rate/A	% Grft 6/20/07	% Wibw 6/20/07	% Grft 7/5/07	% Wibw 7/5/07	% Bdlf 7/5/07	% Colq/ % Grft 9/11/07	Rrpw 9/11/07	Yield bu/A
PREEMERGENCE & LATE POSTEMERGENCE (Continued . . .)									
Surestart&	1.75 pt&								
Roundup Original Max+AMS	22 oz+1%	97	83	99	90	99	98	99	147
Outlook&Experimental+	12 oz&2.5 oz+								
Roundup Original Max+AMS	22 oz+1%	90	20	99	92	99	98	99	138
Dual II Magnum&	1.34 pt&								
Callisto+Atrazine+	3 oz+1 pt+								
COC+AMS	1%+1%	94	27	97	96	99	97	98	145
Define SC&	10 oz&								
Laudis+atrazine+	3 oz+1 pt+								
MSO+AMS	1%+1%	87	27	98	95	99	97	99	143
Outlook&	14 oz&								
Impact+atrazine+	.5 oz+1 pt+								
COC+AMS	1%+1%	94	60	99	94	99	98	97	149
POSTEMERGENCE									
Roundup Original Max+AMS	22 oz+1%	—	—	87	92	99	83	95	141
POSTEMERGENCE & LATE POSTEMERGENCE									
Roundup Original Max+AMS&	22 oz+1%&								
Roundup Original Max+AMS	22 oz+1%	—	—	99	97	99	97	98	145
LSD (.05)		2	13	3	4	0	2	1	12

Table 5. Burndown with Valor in Corn

RCB; 4 reps
Variety: DK-4660
Planting Date: 6/6/07
EPP: 5/22/07; Wibw 1-5 in; Dali 5 in; Rrpw 1-3 in; KOCZ .5-2 in.
Soil: Clay loam; 4.1% OM; 5.8 pH

Precipitation:
EPP: 1st week 1.22 inches
2nd week 0.02 inches

VCRR=Visual Crop Response Rating (0=no injury; 100=complete kill)
Wibw=Wild buckwheat
Dali=Dandelion
Rrpw=Redroot pigweed
KOCZ=Kochia

Comments: The objective of this study was to evaluate Valor (flumioxazin) for residual weed control in corn. Valor is currently not registered for preemergence application in corn. However, none of the Valor treatments (1 to 2 oz/A) caused injury to corn when applied preemergence. The residual control provided by Valor or Atrazine improved control of kochia or redroot pigweed on September 11 resulting in greater corn yield.

					Corn				
Treatment	***Rate/A***	***% Wibw 6/7/07***	***% Dali 6/7/07***	***% Rrpw 6/7/07***	***% Rrpw 7/5/07***	***% VCRR 7/30/07***	***% KOCZ 9/11/07***	***% Rrpw 9/11/07***	***Yield bu/A***
Untreated Check	----	0	0	0	0	0	0	0	12
EARLY PREPLANT									
Roundup WeatherMax+AMS	22 oz+2.5 lb	94	95	99	86	0	83	85	117
Roundup WeatherMax+ Valor SX+AMS	22 oz+ 2 oz+2.5 lb	99	99	99	99	0	99	98	143
Roundup WeatherMax+ Valor SX+Atrazine+AMS	22 oz+ 1 oz+1 qt+2.5 lb	99	99	99	99	0	99	99	144
Roundup WeatherMax+ Atrazine+AMS	22 oz+ 1 qt+2.5 lb	95	91	99	97	0	99	98	148
Roundup WeatherMax+ Valor SX+AMS	22 oz+ 2 oz+2.5 lb	99	99	99	99	0	99	99	144
Roundup WeatherMax+ Valor SX+AMS	22 oz+ 2 oz+2.5 lb	99	99	99	99	0	97	99	145
LSD (.05)		2	2	0	4	0	4	3	11

Table 6. Adjuvants with Laudis in Corn

RCB; 3 reps
Variety: DKC 46-60 VT3
Planting Date: 5/11/07
POST: 6/12/07; Corn V3, 5 lf, 5-7 in; Grft 1-5 in, 2-5 lf; Wibw 2-5 in.
Soil: Clay loam; 3.0% OM; 6.1 pH

Precipitation:
POST: 1st week 0.73 inches
2nd week 0.00 inches

Grft=Green foxtail
Wibw=Wild buckwheat

Comments: The objective of this study was to evaluate several adjuvants with Laudis in corn. It is recommended that Laudis is tank mixed with either MSO or COC and a nitrogen fertilizer such as UAN or AMS. Destiny is a modified vegetable oil and nonionic surfactant blend that may be used for herbicides that require a COC or MSO. Prime Oil is a crop oil concentrate. Superb HC is a concentrated crop oil concentrate that may be used at lower rates than other crop oil concentrate. Newtone is a surfactant and nitrogen basic blend. The dominant grass weed species was green foxtail in this study. Although Laudis may provide control of some grass species, it may provide greater control of yellow or giant foxtail than green foxtail. Laudis provided very little weed control without the addition of adjuvants. The Destiny treatment resulted in the greatest green foxtail control. Green foxtail and wild buckwheat control was least with Newtone on July 5.

Treatment	***Rate/A***	***% Grft 7/5/07***	***% Wibw 7/5/07***	***% Grft 9/11/07***
Untreated Check	----	0	0	0
POSTEMERGENCE				
Laudis	3 oz	0	23	0
Laudis+Destiny+N–Pak AMS Liquid	3 oz+1%+2.5%	94	88	89
Laudis+Prime Oil+N–Pak AMS Liquid	3 oz+1%+2.5%	84	85	78
Laudis+Superb HC+N–Pak AMS Liquid	3 oz+.5%+2.5%	84	84	79
Laudis+Newtone	3 oz+1%	79	70	78
LSD (.05)		3	6	3

Table 7. Herbicide Resistant Soybean Demonstration

Demonstration
Variety: Ag 1401
Planting Date: 5/29/07
PRE: 5/29/07
EPOST: 6/20/07; Soybean 1 tri, 4 in.; Bygr 4-8 in; Rrpw 1-4 in.; Colq 2-4 in.
POST: 6/29/07; Soybean 8-10 in.; Bygr 10-14 in.; Rrpw 6-10 in.; Colq 6-10 in.
POST2: 7/5/07; Soybean 4 tri, 10-12 in.; Bygr 10-20 in.; Rrpw 8-10 in; KOCZ 10-15 in.; Colq 12-18 in.
Soil: Silty clay loam; 3.2% OM; 6.3 pH

Precipitation:

PRE:	1st week	1.23 inches
	2nd week	0.16 inches
EPOST:	1st week	0.13 inches
	2nd week	0.00 inches
POST:	1st week	0.00 inches
	2nd week	0.00 inches
POST2:	1st week	0.00 inches
	2nd week	0.00 inches

Bygr=Common barnyardgrass
Rrpw=Redroot pigweed
KOCZ=Kochia
Colq=Common lambsquarter

Comments: This demonstration was intended to evaluate several herbicide programs in Roundup Ready soybeans, including pre- followed by postemergence, and early, mid, and late postemergence programs.

Pre- followed by postemergence prgorams: Roundup applied postemergence resulted in nearly complete weed control, so preemergence application did not increase control.

Early postemergence programs: Roundup alone resulted in nearly complete weed control, so the addition of residual herbicides did not increase weed control.

Mid- and late postemergence programs: Roundup alone resulted in nearly complete weed control, so the addition of other herbicides with foliar activity did not increase weed control.

Treatment	***Rate/A***	***% Bygr 9/21/07***	***% Rrpw 9/21/07***	***% KOCZ 9/21/07***	***% Colq 9/21/07***
Untreated Check	----	0	0	0	0
PREEMERGENCE & POSTEMERGENCE					
Prowl H_2O&Extreme+NIS+AMS	2.25 pt&1.5 qt+.25%+2.5 lb	98	99	99	99
Python&Roundup WeatherMax+AMS	.8 oz&22 oz+2.5 lb	99	99	99	99
Valor&Roundup WeatherMax+AMS	1.5 oz&22 oz+2.5 lb	99	99	99	99
Valor+Python&	1.5 oz+1 oz&				
Roundup WeatherMax+AMS	22 oz+2.5 lb	99	99	99	99
Valor+FirstRate&	1.5 oz+.3 oz&				
Roundup WeatherMax+AMS	22 oz+2.5 lb	99	99	99	99
Spartan 4F&	3 oz&				
Roundup WeatherMax+AMS	22 oz+2.5 lb	99	99	99	99
Sencor DF&	8 oz&				
Roundup WeatherMax+AMS	22 oz+2.5 lb	99	99	99	99
Boundary&	1.5 pt&				
Roundup WeatherMax+AMS	22 oz+2.5 lb	99	99	99	99
Dual II Magnum+Reflex&	1 pt+1 pt&				
Touchdown Total+AMS	24 oz+2.5 lb	99	99	99	99
Authority First&	3 oz&				
Roundup WeatherMax+AMS	22 oz+2.5 lb	99	99	99	99
Domain&	10 oz&				
Roundup WeatherMax+AMS	22 oz+2.5 lb	99	99	99	99
Intrro&	1.5 qt&				
Roundup WeatherMax+AMS	22 oz+2.5 lb	99	99	99	99

Table 7. Herbicide Resistant Soybean Demonstration (Continued . . .)

Treatment	*Rate/A*	*% Bygr 9/21/07*	*% Rrpw 9/21/07*	*% KOCZ 9/21/07*	*% Colq 9/21/07*
EARLY POSTEMERGENCE					
Roundup WeatherMax+AMS	22 oz+2.5 lb	98	98	99	99
Extreme+NIS+AMS	1.5 qt+.25%+2.5 lb	99	98	99	99
Roundup WeatherMax+ Dual II Magnum+AMS	22 oz+ 1 pt+2.5 lb	98	97	99	99
Roundup WeatherMax+ FirstRate+AMS	22 oz+ .3 oz+2.5 lb	99	97	99	98
POSTEMERGENCE					
Roundup WeatherMax+AMS	22 oz+2.5 lb	98	99	99	99
Roundup WeatherMax+ Harmony GT 75WDG+AMS	11 oz+ .083 oz+2.5 lb	98	99	99	99
Roundup WeatherMax+Aim+AMS	11 oz+.25 oz+2.5 lb	98	98	99	99
Roundup WeatherMax+Resource+AMS	11 oz+2 oz+2.5 lb	99	97	99	99
Roundup WeatherMax+Flexstar+AMS	11 oz+8 oz+2.5 lb	98	98	99	99
POSTEMERGENCE 2					
Roundup WeatherMax+AMS	22 oz+2.5 lb	99	98	99	99
Roundup WeatherMax+AMS	44 oz+2.5 lb	99	99	99	99
Roundup WeatherMax+ Harmony GT 75WDG+AMS	22 oz+ .083 oz+2.5 lb	99	99	99	99
Roundup WeatherMax+Aim+AMS	22 oz+.25 oz+2.5 lb	99	98	99	99
Roundup WeatherMax+Resource+AMS	22 oz+2 oz+2.5 lb	99	99	99	99
Roundup WeatherMax+Flexstar+AMS	22 oz+8 oz+2.5 lb	99	98	98	99
Roundup WeatherMax+FirstRate+AMS	22 oz+.3 oz+2.5 lb	99	99	99	99

Table 8. Conventional Soybean Herbicide Demonstration

Demonstration
Variety: AG 1401
Planting Date: 5/29/07
PRE: 5/29/07
EPOST: 6/20/07; Soybean 1 tri, 4 in.; Bygr 1-4 in; Rrpw 1-4 in; KOCZ 3-6 in; Colq 2-4 in.
POST: 6/29/07; Soybean 8-10 in; Bygr 10-24 in; Rrpw 6-10 in; KOCZ 6-12 in; Colq 6-10 in.
Soil: Silty clay loam; 3.2% OM; 6.3 pH

Precipitation:

PRE:	1st week	1.23 inches
	2nd week	0.16 inches
EPOST:	1st week	0.13 inches
	2nd week	0.00 inches
POST:	1st week	0.00 inches
	2nd week	0.00 inches

Bygr=Barnyardgrass
Rrpw=Redroot pigweed
KOCZ=Kochia
Colq=Common lambsquarters

Comments: This demonstration was intended to evaluate several herbicide programs in conventional soybeans, including preemergence, pre- followed by postemergence, and postemergence programs.

Preemergence programs: Treatments with Pursuit Plus(imazethapyr+pendimethalin) or Outlook+ Valor+Python resulted in the greatest overall weed control. Intrro (alachlor) and Prowl (pendimethalin) resulted in the least control of pigweed, kochia, and common lambsquarters.

Pre- and postemergence programs: Several programs resulted in good weed control. Treatments resulting in at least 95% control of weed species included Boundary & Flexstar+Fusion or Valor & Poast Plus. Treatments resulting in 90-95% control of each weed species included Boundary & Poast Plus, Valor+Python & Select Max, Valor & FirstRate+Select Max, or Intrro & Raptor.

Postemergence programs: Weed control with the postemergence programs was generally less than some of the pre- followed by postemergence programs. Raptor+Flexstar resulted in the greatest overall weed control, but kochia control was only 87% and lambsquarters control was 83%. Tank mixing Poast Plus with either Phoenix (lactofen) or Harmony (thifensulfuron) did not antagonize grass control relative to sequential applications, but antagonism can occasionally occur if these herbicides are mixed.

Treatment	***Rate/A***	***% Bygr 9/21/07***	***% Rrpw 9/21/07***	***% KOCZ 9/21/07***	***% Colq 9/21/07***
Untreated Check	----	0	0	0	0
PREEMERGENCE					
Prowl H_2O	2.75 pt	71	45	45	58
Intrro	2 qt	68	52	42	50
Pursuit Plus	2.5 pt	97	96	91	94
Dual II Magnum+Reflex	1 pt+1 pt	96	97	87	92
Boundary	2.5 pt	95	96	87	93
Outlook+Valor+Python	16 oz+2 oz+1 oz	97	97	96	96
FirstRate+Valor	.3 oz+1.5 oz	80	94	89	94
Authority First	6.45 oz	80	90	88	93
Sonic	6.45 oz	80	90	88	93
Sencor 4F+Intrro	16 oz+99 oz	97	98	88	92
PREEMERGENCE & POSTEMERGENCE					
Prowl H_2O&Pursuit DG+Flexstar+ MSO+28% N	2.25 pt&.72 oz+10 oz+ 1 qt+1 qt	85	96	90	90
Prowl H_2O&Raptor+ Ultra Blazer+COC	32 oz&4 oz+ 10 oz+1%	38	95	92	90
Boundary&Poast Plus+COC	2.5 pt&1.5 pt+1 qt	99	98	90	98
Boundary&FLexstar+Fusion+NIS	33.5 oz&20 oz+9.6 oz+.5%	99	96	97	96

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

Treatment	*Rate/A*	*% Bygr 9/21/07*	*% Rrpw 9/21/07*	*% KOCZ 9/21/07*	*% Colq 9/21/07*
PREEMERGENCE & POSTEMERGENCE (Continued . . .)					
Valor&Poast Plus+COC	3 oz&1.5 pt+1 qt	99	98	95	95
Valor+Python&Select Max+COC	2 oz+1 oz&14 oz+1 qt	99	94	90	96
Valor+FirstRate&Select Max+COC	1.5 oz+.3 oz&14 oz+1 qt	99	88	93	91
Valor&FirstRate+Select Max+COC	2 oz&.3 oz+14 oz+1 qt	98	95	92	90
Dual II Magnum+Reflex& Raptor+MSO+28% N	1 pt+1 pt& 4 oz+1%+2.5%	88	98	95	89
Intrro&Flexstar+Fusion+NIS	2 qt&20 oz+9.6 oz+.5%	90	93	92	87
Intrro&Raptor+MSO+28% N	2 qt&4 oz+1 qt+1 qt	92	98	93	95
Intrro&Harmony GT 75WG+NIS	2 qt&.083 oz+.25%	40	95	91	88
Python&FirstRate+Select Max+COC	1.33 oz&.3 oz+14 oz+1 qt	99	80	50	79
Authority First&Select Max+COC	6.45 oz&14 oz+1 qt	99	79	90	92
EARLY POSTEMERGENCE & POSTEMERGENCE					
Poast Plus+COC&Phoenix+COC	1.5 pt+1 qt&.8 pt+1 qt	99	73	40	85
Poast Plus+COC& Harmony GT 75WG+NIS	1.5 pt+1 qt& .083 oz+1 qt	99	88	10	78
EARLY POSTEMERGENCE					
Poast Plus+Phoenix+COC	1.5 pt+.8 pt+1 qt	99	72	30	84
Poast Plus+Harmony GT 75WG+NIS	1.5 pt+.083 oz+.25%	99	80	10	84
FirstRate+Flexstar+Select Max+ MSO+28% N	.3 oz+10 oz+12 oz+ 1 qt+1 qt	99	87	89	85
Flexstar+Select Max+MSO+28% N	15 oz+12 oz+1 qt+1 qt	99	78	88	79
Raptor+MSO+28% N	5 oz+1%+2.5%	97	97	10	88
Raptor+Flexstar+MSO+28% N	4 oz+10 oz+1%+2.5%	93	96	87	83

Table 9. Weed Control with Orion in Spring Wheat

RCB; 4 reps
Variety: Briggs
Planting Date: 4/30/07
POST: 6/4/07; SpWht 5-7 in; 4-5 lf tiller; Rrpw 2-4 in; Wibw 2-5 in; Pesw 1-3 in; Grft 2-4 in.
Soil: Clay loam; 3.6% OM; 6.3 pH

Precipitation:
POST: 1st week 0.17 inches
2nd week 0.72 inches

VCRR=Visual Crop Response Rating (0=no injury; 100=complete kill)
Rrpw=Redroot pigweed
Wibw=Wild buckwheat
Pesw=Pennsylvania smartweed
Grft=Green foxtail

Comments: The objective of this study was to evaluate weed control with Orion (florasulam+MCPA) in spring wheat. Orion may require a tank mix partner for controlling weeds such as kochia. In this study, Orion alone resulted in very good control of pigweed and Pennsylvania smartweed and fair control of wild buckwheat. Tank mix partners slightly increased wild buckwheat control. Green foxtail control was not reduced when tank mixing Axial with Orion or a fungicide such as Tilt. The highest yielding treatment was Orion + Tilt whereas yields were similar among all the other treatments including the untreated check. The high yield in the untreated check indicates low weed competition at this site.

Treatment	Rate/A	SpWht % VCRR 6/20/07	% Rrpw 7/12/07	% Wibw 7/12/07	% Pesw 7/12/07	% Grft 7/12/07	Yield bu/A
POSTEMERGENCE							
Orion	17 oz	0	98	92	99	—	33
Orion+MCPA ester	17 oz+2.2 oz	0	99	96	99	—	34
Orion+Starane	17 oz+.33 pt	0	99	99	99	—	34
Orion+Starane	17 oz+.66 pt	0	99	99	99	—	32
Orion+Buctril	17 oz+1 pt	0	99	99	99	—	31
Orion+Stinger	17 oz+.33 pt	0	99	99	99	—	32
Axial	16.4 oz	0	0	0	0	99	32
Axial+Orion	16.4 oz+17 oz	0	95	87	94	99	31
Axial+Orion+Tilt	16.4 oz+17 oz+2 oz	0	91	86	93	98	36
Orion+Tilt	17 oz+2 oz	0	99	98	99	—	39
Bronate Advanced	.8 pt	0	99	99	99	—	34
WideMatch+MCPA ester	1 pt+8 oz	0	98	99	99	—	34
Affinity TM+MCPA ester	.6 oz+8 oz	0	99	93	99	—	31
Huskie+NIS+AMS	11 oz+.5%+.5 lb	0	99	99	99	—	33
Curtail M	1.75 pt	0	98	99	99	—	33
Untreated Check	----	0	0	0	0	0	34
LSD (.05)		0	2	3	1	1	3

Table 10. Huskie broadleaf control

RCB; 4 reps
Variety: Briggs
Planting Date: 4/30/07
POST: 6/4/07; SpWht 5-7 in, 4-5 lf tiller; Colq 1-3 in; Wibw 2-5 in; Pesw 1-3 in; Grft 2-4 in.
Soil: Clay loam; 3.6% OM; 6.3 pH

Precipitation:
POST: 1st week 0.17 inches
2nd week 0.72 inches

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

Comments: The objective of this study was to evaluate weed control with Huskie (pyrasulfotole+ bromoxynil) in spring wheat. Huskie is a new broadleaf herbicide that contains an HPPD-inhibitor or "bleacher" that is a similar mode of action as Callisto (mesotrione) or Balance (isoxaflutole). Wheat yield was not reduced in the untreated check indicating very low weed competitive ability. All treatments resulted in nearly complete weed control and no crop injury was observed. Wheat yield was similar among the herbicide treatments.

Treatment	***Rate/A***	***Sp Wht % VCRR 6/20/07***	***% Colq 7/12/07***	***% Wibw 7/12/07***	***% Pesw 7/12/07***	***% Grft 7/12/07***	***Yield bu/A***
Untreated Check	----	0	0	0	0	0	34
POSTEMERGENCE							
Huskie+AMS	11 oz+.5 lb	0	99	99	99	—	33
Huskie+AMS	13.5 oz+.5 lb	0	99	99	99	—	34
Huskie+AMS+NIS	13.5 oz+.5 lb+.25%	0	99	99	99	—	34
Experimental+AMS	27.4 oz+.5 lb	0	99	99	99	98	32
WideMatch+MCPA ester	1 pt+.5 pt	0	99	99	99	—	34
Affinity TM+Starane+NIS	.6 oz+.33 pt+.25%	0	99	99	99	—	33
Starane NXT	14 oz	0	99	99	99	—	32
Ally+2,4-D ester+ Clarity+NIS	.1 oz+8.4 oz+ 2 oz+.25%	0	99	99	99	—	30
Cleanwave	14 oz	0	99	99	99	—	34
Bronate Advanced	12.8 oz	0	99	99	99	—	34
Starane+2,4-D ester	10.6 oz+8.4 oz	0	99	99	99	—	35
Clarity+MCPA ester	4 oz+.5 pt	0	99	99	99	—	32
Orion	17 oz	0	99	99	99	—	34
LSD (.05)		0	0	0	0	2	3

Table 11. Affinity Broadspec tank-mixes with Starane NXT

RCB; 4 reps
Variety: Briggs
Planting Date: 4/30/07
EPOST: 6/4/07; SpWht 5-7 in; 4-5 lf tiller; Rrpw 2-4 in; Wibw 2-5 in; Colq 1-3 in.
POST: 6/12/07; SpWht 7-8 in; 5 lf tiller; Rrpw 3-6 in; Wibw 4-7 in; Colq 2-4 in.
Soil: Clay loam; 3.6% OM; 6.3 pH

Precipitation:

EPOST:	1st week	0.17 inches
	2nd week	0.72 inches
POST:	1st week	0.73 inches
	2nd week	0.00 inches

VCRR=Visual Crop Response Rating (0=no injury; 100=complete kill)
Rrpw=Redroot pigweed
Wibw=Wild buckwheat
Colq=Common lambsquarter

Comments: The objective of this study was to evaluate weed control efficacy with tank-mixes of Affinity Broadspec (thifensulfuron+tribenuron; 1:1 ratio) and Starane NXT (fluroxypyr+bromoxynil). All treatments resulted in nearly complete control of redroot pigweed, wild buckwheat, and common lambsquarters. The yield in the untreated check suggests weed competitive ability was relatively low.

Treatment	***Rate/A***	***SpWht % VCRR 6/20/07***	***% Rrpw 7/12/07***	***% Wibw 7/12/07***	***% Colq 7/12/07***	***Yield bu/A***
EARLY POSTEMERGENCE						
Affinity Broadspec+ Starane NXT+NIS	.5 oz+ .5 pt+.25%	0	99	99	99	35
Affinity Broadspec+ Starane NXT+NIS	.5 oz+ .75 pt+.25%	0	99	99	99	34
Affinity Broadspec+ Starane NXT+NIS	.5 oz+ 1 pt+.25%	0	99	99	99	33
Starane NXT+NIS	.5 pt+.25%	0	91	99	99	36
Starane NXT+NIS	.75 pt+.25%	0	94	99	99	37
Starane NXT+NIS	1 pt+.25%	0	95	99	99	36
POSTEMERGENCE						
Affinity Broadspec+ Starane NXT+NIS	.5 oz+ .5 pt+.25%	0	95	99	99	29
Affinity Broadspec+ Starane NXT+NIS	.5 oz+ .75 pt+.25%	0	97	99	99	30
Affinity Broadspec+ Starane NXT+NIS	.5 oz+ 1 pt+.25%	0	97	99	99	31
Starane NXT+NIS	.5 pt+.25%	0	93	99	93	31
Starane NXT+NIS	.75 pt+.25%	0	96	99	98	32
Starane NXT+NIS	1 pt+.25%	0	98	99	97	34
Untreated Check	----	0	0	0	0	36
LSD (.05)		0	10	0	3	23

Table 12. Pre-harvest applications in spring wheat

RCB; 3 reps
Variety: Briggs
Planting Date: 4/30/07
POST1: 7/17/07; SpWht - milk dough; Grft - early heading
POST2: 7/24/07; SpWht - hard dough; Grft - heading
Soil: Clay loam; 3.6% OM; 6.3 pH

Precipitation:

POST1:	1st week	0.00 inches
	2nd week	0.00 inches
POST2:	1st week	0.00 inches
	2nd week	0.00 inches

Grft=Green foxtail

Comments: The objective of this study was to evaluate crop tolerance to pre-harvest applications. The first application timing was on July 17 when the plants were approximately 60% green and approximately 50% moisture and seeds were in the milk to dough stage. The second application was one week later on July 24 when the plants were approximately 20% green and 10% moisture and seeds were in the hard dough stage. It is generally recommended to make pre-harvest applications after the hard dough stage to avoid loss of seed viability or stem breakage. The primary weed near harvest was green foxtail, so Roundup was the only pre-harvest herbicide that adequately controls grasses. Aim (carfentrazone) and Ally (metsulfuron) resulted in some grass suppression. Wheat yield was similar among all the treatments. Tests will continue to evaluate wheat seed viability.

Treatment	***Rate/A***	***% Grft 8/13/07***	***Sp Wheat Yield bu/A***
Untreated Check	----	0	39
POSTEMERGENCE 1			
2,4-D ester	1 qt	0	32
Clarity	.5 pt	0	30
Ally+NIS	.1 oz+.25%	37	37
Roundup WeatherMax+AMS	22 oz+2.5 lb	99	32
Aim+MSO	2 oz+.25%	67	34
POSTEMERGENCE 2			
2,4-D ester	1 qt	3	38
Clarity	.5 pt	0	32
Ally+NIS	.1 oz+.25%	30	35
Roundup WeatherMax+AMS	22 oz+2.5 lb	99	32
Aim+MSO	2 oz+.25%	40	32
LSD (.05)		9	5

Table 13. Crop tolerance and weed control with Callisto in oats

RCB; 4 reps
Variety: Reeves
Planting Date: 4/27/07
PRE: 4/27/07
POST: 5/27/07; Oat 4 lf tiller; 6 in; Wimu 3-6 in; Wibw 2-5 in; Colq 1-3 in; Rrpw 2-4 in.
Soil: Clay loam; 4.1% OM; 5.8 pH

Precipitation:
PRE: 1st week 0.00 inches
2nd week 1.37 inches
POST: 1st week 1.22 inches
2nd week 0.02 inches

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

Comments: The objective of this study was to evaluate oat tolerance to Callisto (mesotrione) for possible future registration. Some oat stunting and leaf chlorosis was noticed on June 6. Adding 28% N with COC or Buctril+MCPA to Callisto caused some oat stunting and leaf chlorosis, but no injury was noticeable on July 12. The early-season injury did not significantly reduce oat yield. All the postemergence applications of Callisto resulted in very good control of wild mustard, wild buckwheat, common lambsquarters, and pigweed.

Treatment	Rate/A	Oat % VCRR Stunting 6/6/07	Oat % VCRR Chlorosis 6/6/07	% Wimu 6/20/07	% Wibw 6/20/07	% Colq/ Rrpw 6/20/07	% VCRR 7/12/07	Yield bu/A
Untreated Check	----	0	0	0	0	0	0	142
PREEMERGENCE								
Callisto	6 oz	0	0	77	96	99	0	147
Callisto	12 oz	0	0	99	99	99	0	151
POSTEMERGENCE								
Callisto+COC	3 oz+1%	1	0	99	99	98	0	149
Callisto+COC+28% N	3 oz+1%+2.5%	9	14	99	98	99	0	138
Callisto+NIS	3 oz+.25%	3	1	99	99	98	0	139
Callisto+NIS+28% N	3 oz+.25%+2.5%	6	11	99	98	98	0	142
Buctril+MCPA ester	1 pt+8.65 oz	1	0	99	99	99	0	145
Callisto+Buctril+ MCPA ester	3 oz+1 pt+ 8.65 oz	10	9	99	99	99	0	135
MCPA ester	8.65 oz	0	0	99	97	98	0	154
Callisto+MCPA ester	3 oz+8.65 oz	0	0	99	99	99	0	153
PREEMERGENCE & POSTEMERGENCE								
Callisto& Buctril+MCPA ester	6 oz& 1 pt+8.65 oz	1	0	99	99	99	0	151
POSTEMERGENCE								
Callisto+Buctril	3 oz+1 pt	6	4	99	99	99	0	142
Experimental+Callisto	17 oz+3 oz	4	0	99	99	98	0	152
LSD (.05)		4	3	17	2	2	0	13

Table 14. Flax tolerance to Callisto

RCB; 4 reps
Variety: Selby
Planting Date: 5/3/07
EPP: 4/27/07
PRE: 5/3/07
POST: 5/27/07; Flax 2-3 in; Colq 1-3 in; Rrpw 1-3 in; Grft 2-3 in.
Soil: Clay loam; 4.1% OM; 5.8 pH

Precipitation:

EPP:	1st week	0.00 inches
	2nd week	1.37 inches
PRE:	1st week	1.37 inches
	2nd week	0.04 inches
POST:	1st week	1.22 inches
	2nd week	0.02 inches

VCRR=Visual Crop Response Rating (0=no injury; 100=complete kill)
Colq=Common lambsquarter
Rrpw=Redroot pigweed
Grft=Green foxtail

Comments: The objective of this study was to evaluate oat tolerance to Callisto (mesotrione) for possible future registration. Callisto was only applied preplant or preemergence. Callisto alone did not cause visual injury to flax. However, some stunting was observed in treatments with MCPA or bromoxynil (Bronate Advanced and Buctril). All treatments resulted in very good broadleaf weed control, but only Spartan (preplant or preemergence application) resulted in some control of green foxtail.

Treatment	***Rate/A***	***Flax % VCRR Stunting 6/6/07***	***% Colq 6/20/07***	***% Rrpw 6/20/07***	***% Grft 7/5/07***	***Flax % VCRR 7/12/07***	***Yield bu/A***
Untreated Check	----	0	0	0	0	0	21
EARLY PREPLANT							
Callisto	3 oz	0	97	97	0	0	25
Callisto	6 oz	0	98	99	0	0	27
Callisto	12 oz	0	99	99	3	0	26
PREEMERGENCE							
Callisto	3 oz	0	99	99	0	0	28
Callisto	6 oz	0	99	99	4	0	27
Callisto	12 oz	0	99	99	0	0	24
PREEMERGENCE & POSTEMERGENCE							
Callisto&Bronate Advanced	6 oz&12.8 oz	6	99	99	0	0	22
Callisto&Buctril+NIS	6 oz&16 oz+.25%	3	99	99	0	0	25
Callisto&MCPA ester	6 oz&8.6 oz	6	99	99	5	0	26
POSTEMERGENCE							
Buctril+NIS	16 oz+.25%	0	99	99	0	0	25
MCPA ester	8.6 oz	5	99	96	0	0	28
Bronate Advanced	12.8 oz	8	99	99	0	0	23
EARLY PREPLANT							
Spartan 4F	6 oz	0	98	97	83	0	31
PREEMERGENCE							
Spartan 4F	6 oz	0	97	98	84	0	33
LSD (.05)		2	1	1	4	0	5

Table 15. Crop tolerance and weed control of Callisto in millet

RCB; 4 reps
Variety: Proso - SunUp; Pearl - Diamond Gem X
Planting Date: 6/20/07
EPP: 6/12/07
PRE: 6/20/07
POST: 7/5/07; Proso millet 4 lf 3 in; Pearl millet 6-8 in.
Soil: Clay loam; 4.1% OM; 5.8 pH

Precipitation:

EPP:	1st week	0.73 inches
	2nd week	0.00 inches
PRE:	1st week	0.13 inches
	2nd week	0.00 inches
POST:	1st week	0.00 inches
	2nd week	0.00 inches

VCRR=Visual Crop Response Rating (0=no injury; 100=complete kill)
Bdlf=Redroot pigweed and common lambsquarters

Comments: The objective of this study was to evaluate millet tolerance to Callisto (mesotrione) for possible future registration. No millet injury was observed among the Callisto treatments. Millet was very competitive with the weeds, so all treatments resulted in nearly complete weed control.

Treatment	***Rate/A***	***Proso Millet % VCRR 7/5/07***	***Pearl Millet % VCRR 7/5/07***	***Proso Millet % VCRR 7/30/07***	***Pearl Millet % VCRR 7/30/07***	***% Bdlf 7/30/07***
Untreated Check	----	0	0	0	0	0
EARLY PREPLANT						
Callisto	3 oz	0	0	0	0	99
Callisto	6 oz	0	0	0	0	99
Callisto	12 oz	0	0	0	0	99
PREEMERGENCE						
Callisto	3 oz	0	0	0	0	99
Callisto	6 oz	0	0	0	0	99
Callisto	12 oz	0	0	0	0	99
PREEMERGENCE & POSTEMERGENCE						
Callisto&2,4-D amine	6 oz&8.4 oz	0	0	0	0	99
EARLY PREPLANT & POSTEMERGENCE						
Callisto&2,4-D amine	6 oz&8.4 oz	0	0	0	0	99
POSTEMERGENCE						
2,4-D amine	8.4 oz	0	0	0	0	99

Table 16. ET herbicide tank-mixtures for preplant burndown applications

RCB; 4 reps
PRE: 6/4/07; Yeft 2-5 in; Rrpw 2-4 in; Colq 2-4 in; Wibw 2-5 in; Corw 1-3 in; Pesw 1-3 in
Soil: Clay loam; 3.2% OM; 6.3 pH

Precipitation:

PRE:	1st week	0.17 inches
	2nd week	0.72 inches

Comments: The objective of this study was to evaluate ET (pyraflufen) as a tank mix option for preplant burndown applications. All treatments resulted in very good control of yellow foxtail and Pennsylvania smartweed, but treatments differed in wild buckwheat or common ragweed control. On June 12, the treatments with ET appeared to result in greater wild buckwheat control than the treatments with Roundup alone or Roundup + 2,4-D. On July 5, wild buckwheat control was increased when either ET or 2,4-D was added to Roundup. Common ragweed control was generally greatest with treatments containing ET+2,4-D with and without Roundup or 2,4-D+Roundup. These results indicated that tank mixing ET with Roundup may increase weed control after burndown applications.

Treatment	***Rate/A***	***% Yeft 6/12/07***	***% Rrpw/Colq 6/12/07***	***% Wibw 6/12/07***	***% Corw 6/12/07***	***% Pesw 6/12/07***	***% Corw 7/5/07***	***% Wibw 7/5/07***
Roundup Original+ NIS+AMS	1 qt+ .25%+2%	99	99	28	53	93	73	64
ET+Roundup Original+ NIS+AMS	1 oz+1 qt+ .25%+2%	99	99	91	90	95	49	79
Roundup Original+ 2,4-D ester+ NIS+AMS	1 qt+ 16.8 oz+ .25%+2%	99	99	53	88	95	96	89
ET+Roundup Original+ 2,4-D ester+ NIS+AMS	1 oz+1 qt+ 16.8 oz+ .25%+2%	99	99	89	98	94	95	86
ET+2,4-D ester+ NIS+AMS	1 oz+16.8 oz+ .25%+2%	10	99	79	97	93	99	91
Untreated Check	----	0	0	0	0	0	0	0
LSD (.05)		0	0	6	10	5	11	10

Fertilizer Application Influence on Soil Tests and Soybean Yield at the NE Research Farm in 2007.

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

Item:		Description:
Rotation		Soybean, Wheat, Corn (since 1996)
Variety		Asgrow 1401 RR
Fertilizer*	N	Rate(urea) applied according to EC-750 and yield goal for corn and wheat.
	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 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 N check (No-N) had significantly lower two foot Nitrate-Nitrogen when compared to the other treatment plots with N. The P check (No-P) had 5 ppm Olsen P compared to a range of 16 to 22 ppm P when fertilizer P was applied. The K check (No-K) had 142 extractable K compared to 154 to 210 ppm K when fertilizer K was applied. The Zn check (No-Zn) had 0.86 ppm Zn compared to 5.6 to 11.9 when Zn was applied. Therefore, the nutrient check plots can be used in comparison to the other treatment with all nutrients applied to measure if each nutrient soil test level is limiting grain productivity. During 2007, only the P check plot limited soybean yield (Table 1). Soybean grain yield was approximately 6 bu/a less with low soil test P level. The soybeans did not respond to higher N, K or Zn soil test.

Table 1. Soybean grain yield response to long term N, P, K and Zn application at NE farm in 2007.

Fertilizer Nutrients Applied	Fall 2006 Soil Test				2007 Soybean Grain Yield
	N	P	K	Zn	
	lbs/a 2’	-------- ppm 0-6” -------			bu/a
all - NPKZN	128	16	154	5.65	38.6 a
No N - PKZn	44	17	207	11.9	38.2 a
No P - NKZn	148	5	210	7.3	32.2 b
No K - PKZn	162	22	142	9.9	37.6 a
No Zn - NPK	140	20	189	0.86	39.1 a
Pr>F					0.01
CV					6.3
$LSD_{(.05)}$					3.6

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

PERFORMANCES OF TRANSGENIC CORN (BT-CORN BORER, BT-ROOTWORM, AND STACKED BT), SEED TREATMENTS, AND INSECTICIDES AGAINST THE UNIVOLTINE CORN BORER

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INTRODUCTION

The Northeast Research Station has been the site for testing new transgenic Bt corn hybrids, seed treatments, and insecticides against the univoltine ecotype European corn borer in SD since 1996 (Catangui 2003). The univoltine corn borer only has one peak moth flight each growing season which usually occurs in July. Injuries to corn by larvae of univoltine corn borers are cumulative and can be more severe because the larvae stay active throughout the growing season. That is, unlike the bivoltine ecotype of southern SD corn growing areas, univoltine corn borers do not stop feeding to transform into inactive pupae in the summer of the current year. Univoltine larvae overwinter in the corn stubbles, then turn into moths only in the spring of the following year.

MATERIALS AND METHODS

The research site was tilled conventionally; on second-year corn following corn. Corn seeds were planted using a precision planter on May 14, 2007. Each treatment was replicated 4 times and assigned in a randomized complete block fashion on each experimental unit. Each experimental unit was composed of four rows (20 ft. long) spaced 30 inches apart. The insecticides were applied on August 13. One row per plot was destroyed and dissected for corn borer injuries on September 11-25. Two inner rows were kept intact then harvested at the end of season (October 10). Ten consecutive plants on one row were dissected before harvest using a curved knife and examined for corn borer larval tunnels, tunnel length, and live corn borer larvae in the stalk, ear shank, and ear.

RESULTS AND DISCUSSION

Yield. No statistically significant differences in yield were observed among the different treatments. However, the conventional corn hybrid P38H67 sprayed with Hero insecticide in August has an 11.4 bushel per acre increase in yield over the untreated P38H67 (Fig. 1A). The other foliar insecticidal treatments did not improve yield. Bt genes incorporated into the corn genome did not appear to greatly improve yield. However, it must be noted that the Bt

hybrids used in this study most likely did not have exactly the same conventional isoline base. The hybrid choices and seeds were provided by the seed company (Pioneer) and an attempt was made to plant only corn hybrids with the same (or very similar) base genetics suited for northeastern SD corn growing conditions. P38H72 with the stacked Herculex XTRA gene and Poncho 250 seed treatment improved the yield by only 1.4 bushels per acre. P38H64 with Herculex I, and P38H65 with Herculex and Poncho 250 improved yield by 0.6 and 5.9 bushels per acre, respectively (Fig. 1A).

Stalk injury. All of the Bt genes that were expected to protect cornstalks against injuries by European corn borer larvae performed very well (Fig. 1B). No injuries were recorded in corn hybrids containing the Herculex I and Herculex XTRA genes. In contrast, about 65% of the cornstalks in the untreated conventional corn hybrid were infested with corn borer larvae. P38H62 with the Herculex RW gene, as expected, was susceptible to corn borers because the Herculex RW gene is effective only against the larvae of corn rootworms. Similarly, the seed treatments (Poncho 250 and 1250) were ineffective against corn borers as their target pests are soil insects such as corn rootworms, cutworms, seed corn maggots, white grubs, and wireworms. The different foliar insecticidal treatments performed well in protecting the stalks against corn borers. Conventional corn treated with Pounce granules were completely free of corn borer infestations (Fig. 1B); corn sprayed with Baythroid and Hero had about 18% and 5% of their stalks infested with corn borers.

Root injury. Despite being on second-year corn, we did not observe significant injuries caused by corn rootworm larvae in the corn hybrids unprotected by Bt-rootworm genes or seed treatments. The site itself where the research was conducted appeared to be relatively free of corn rootworm infestations. Future research seeking to test rootworm control capabilities by Bt-corn, seed treatments, or insecticides will need to be conducted on a location infested with rootworm larvae. This can be accomplished by setting aside a permanent site at the NE Research Station wherein corn can be grown continuously for many years.

Grain mycotoxins. Mycotoxin analyses of the corn grains at harvest did not reveal significant amounts of aflatoxin or fumonisin.

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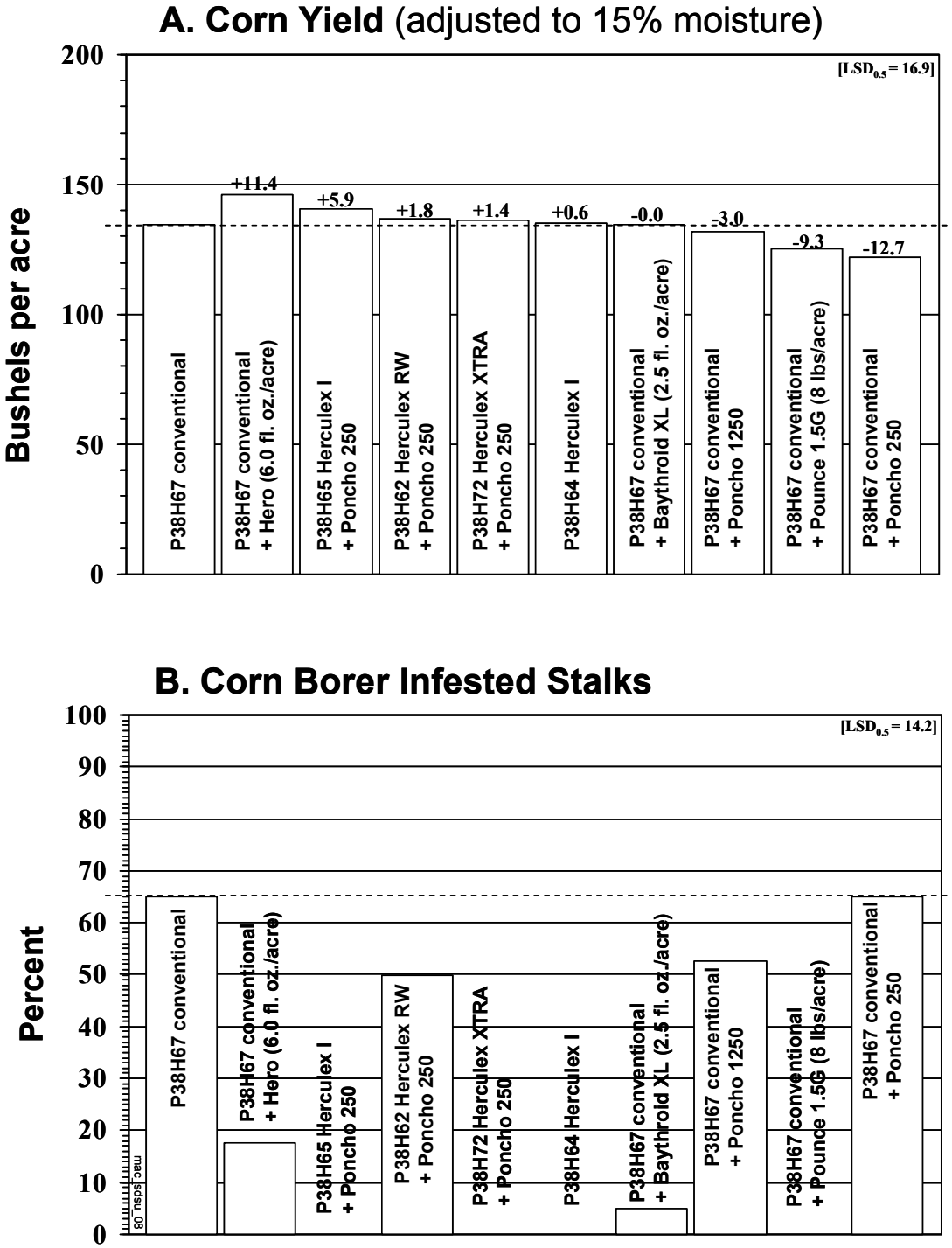
Fig. 1. Performances of Bt-corn, seed treatments, and insecticides against the univoltine ecotype European corn borer at the NE Research Station during the 2007 season



2007 Spring Wheat Fungicide Trials

K. Ruden, B. Ruden, K. Glover and J. Kleinjan

Introduction:

Fusarium head blight (scab or FHB) has been a recurring problem in winter and spring wheat, durum, and barley grown in South Dakota since the severe epidemic of 1993. Scab outbreaks have been periodic and localized since that time. 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. Scab management requires a multi-faceted approach including cultural methods and variety selection. Fungicides alone have only provided suppression of FHB. It appears at this time that even after the release of highly resistant crop varieties, fungicides will be a component in managing this disease and minimizing crop losses. Fungicide applications late in crop development, approaching flowering, have been shown to provide the best control of scab. At the same time, they often provide the optimal control of leaf disease over application at flag leaf emergence.

Additionally, several fungi cause foliar diseases on wheat every year and fungicides are more efficacious at their control than against FHB. These diseases include leaf rust (*Puccinia triticina*) and stripe rust (*Puccinia striiformis* f. sp. *tritici*) and the residue-borne diseases tan spot (*Pyrenophora tritici-repentis*) and the Septoria complex (*S. tritici*, *S. avenae*, and *S. nodorum*). Timing of fungicide applications varies, as does the period at which the diseases attack, and as such all fungicide applications should not be expected to provide maximum suppression of all diseases.

Materials and Methods:

Hard red spring wheat was planted in several South Dakota locations in the northeastern quarter of the state; the Northeast Research Station, (NE Farm), on-station in Brookings, SD (Brookings), and in a cooperator's field near Groton, SD (Groton).

The trial was conducted on two red hard spring wheat cultivars, Briggs and Forge. Trials were planted in a factorial randomized complete block design where factor A was the wheat variety and factor B was fungicide treatment variety. Trials were replicated four times for Study 1 (Table 2) and replicated six times for Study 2 (Tables 3-5) at Brookings, NE Farm and Groton. Fungicide treatments (Tables 2-5) were applied at various growth stages from three to five leaf stage to initiation of flowering. Most fungicides were applied with Induce, a non-ionic surfactant (NIS). Brookings plots were misted from 6:00pm to 8:00am for ten days following anthesis to enhance the environment for FHB development. The Brookings site was also inoculated with *Fusarium graminearum* isolate Fg4 colonized corn grain to enhance infection. With the addition of the colonized corn and the mist irrigation, disease pressure was optimized.

At the soft dough stage of crop development, plots were evaluated for leaf diseases, FHB incidence, FHB head severity, and FHB field severity, Fusarium damaged kernels (FDK), deoxynivalenol (DON), grain yield, test weight, and protein data were collected after harvest. Various ratings were used for leaf disease. Whole plot ratings evaluated the relative amount of green tissue remaining on a 0-9 scale where completely green tissue was rated as a zero and fully necrotic plants were rated a nine. Ideally, leaf area assessments are used to estimate the percentage of the flag leaf that is necrotic due to total leaf diseases and leaf rust alone. Specific information on dates of planting and treatment dates is listed in Table 1. Fungicide treatments are

listed in Tables 2-5. Due to the volume of data generated, only leaf rust infection on the flag leaf, yield, and test weight are reported in Tables 2 and 3.

Table 1: Dates of planting, fungicide applications, plot rating, and harvest for wheat fungicide trials in northeastern South Dakota in 2007.

Activity	Crop stage		Date/Location (2007)		
	Descriptive	Feekes growth stage	Brookings	Groton	NE Farm
Planting	-	-	5/10	4/30	4/27
Fungicide Applications	Jointing	2-3	6/8	6/15	6/7
	Flag leaf emergence	8-9	6/19	6/20	-----
	Completely Headed	10.5	6/22	----	6/20
	Anthesis	10.51	6/28	6/27	6/27
Rating	Soft Dough	11.2	7/20	7/18	7/19
Harvest	Mature	11.4	8/13	8/8	8/2

Results and Discussion:

Fusarium head blight development was scant in 2007, even when inoculation and mist irrigation was added. Under those supplemented conditions at Brookings, only about 7% scab developed on the susceptible variety Briggs. This low level of FHB led to non-significant differences in control among products tested.

Leaf rust was late arriving at most of the study locations. In study one (Table 2), most products gave good rust control if applied late in crop development (after flag leaf emergence). In general, there was no advantage in applying multiple fungicide applications. A single application as late as possible in the growing season gave very good leaf rust control. In study one (Table 2), yield response to fungicide application was more common among the flag leaf applications than with early fungicide applications. In study two (Table 3), the differences were more apparent, and a yield response occurred with nearly all fungicide applications. When Briggs and Forge were analyzed separately, it became apparent that there is an advantage in knowing the characteristics of the variety to understand what kind of a response a fungicide may provide. When a leaf disease-susceptible variety is treated with a fungicide under disease conditions, the chances of seeing a response in disease ratings (leaf rust area) increases, as we see with Forge. However the same results are not apparent with Briggs, a leaf disease-resistant variety. Yield responses to fungicide application were seen in both varieties in 2007. In previous years, yield response was much greater in the susceptible variety than Briggs. However, it must be noted that Forge was used as the leaf disease susceptible variety in 2007 rather than Ingot which had been used in the past.

Fungicide treatments in study one that were applied early in crop development (jointing) without being followed by a later treatment, typically did not have adequate residual protection long enough into the season to significantly reduce leaf rust severity at soft dough or increase yield at maturity with the exception of one product at NE Farm. When early treatments are made, they must be followed with a second application later in the season to increase the duration of residual protection if the season continues to favor disease development. Late season applications work well if the producer plans to only apply fungicide once. It must be noted that the Groton site experienced significant flooding shortly after planting. This flooding affected crop development and led to reduced yield responses at this location.

Acknowledgements:

This research was supported in part by grants from the SD Wheat Commission and the US Wheat and Barley Scab Initiative.

Table 2: Responses from Study One of leaf rust disease, yield, and test weight of grain on two spring wheat cultivars and several fungicide treatments applied at various crop stages at two northeastern South Dakota locations.

		Crop	Leaf Rust (% of flag leaf)			Yield (bu/A)			Test Weight (lb/bu)		
Fungicide	Rate	Stage[1]	Brookings	Groton	NE Farm	Brookings	Groton	NE Farm	Brookings	Groton	NE Farm
Untreated	N/A	N/A	6.98	12.25	4.83	47.86	28.65	48.84	52.75	58.00	61.14
Stratego	5 fl oz/A	2	9.13	12.63	6.00	**53.83**	28.27	50.94	53.93	59.12	**61.90**
Stratego	10 fl oz/A	8-9[2]	2.75	8.50	2.70	50.78	29.23	53.00	**56.20**	**59.71**	61.87
Experimental A	1.5 fl oz/A	2	8.33	10.33	4.60	54.41	34.05	**54.19**	54.53	58.72	61.55
Experimental A	2 fl oz/A	2	9.45	11.80	5.63	52.70	30.52	**56.58**	54.21	58.73	61.87
Experimental A	4 fl oz/A	8-9[2]	**0.38**	6.38	**0.53**	**57.29**	33.47	**57.15**	**56.37**	**59.53**	**62.30**
Experimental A	5 fl oz/A	8-9[2]	**0.40**	**1.98**	**0.50**	**58.14**	36.41	**55.90**	54.71	**60.07**	**62.13**
Prosaro 421 SC	6.5 fl oz/A	8-9[2]	**0.60**	**4.65**	2.55	**55.48**	29.85	**55.18**	54.96	57.96	**62.42**
Induce NIS	0.125% V/V	8-9[2]									
Headline	3 fl oz/A	2	8.45	10.30	3.15	52.27	34.44	**54.35**	**56.50**	59.31	61.05
Induce NIS	0.125% V/V	2									
Tilt	2 fl oz/A	2	10.85	11.20	6.10	50.94	36.10	**53.88**	54.15	57.52	61.85
Headline	6 fl oz/A	8-9[2]	**1.38**	**5.20**	2.33	**56.06**	**44.03**	**53.84**	55.02	59.33	**61.90**
Induce NIS	0.125% V/V	8-9[2]									
Quilt	7 fl oz/A	2	7.28	9.83	8.12	**55.51**	31.59	52.99	51.49	**59.94**	61.65
Warrior	2.56 fl oz/A	2	10.83	11.45	4.18	**63.88**	32.84	61.48	**56.95**	58.35	**62.21**
Quilt	7 fl oz/A	2									
Warrior	2.56 fl oz/A	2	11.75	10.25	7.05	**59.21**	**40.96**	62.00	**56.93**	**59.83**	**62.40**
Tilt	2 fl oz/A	2									
Quilt	14 fl oz/A	8-9[2]	1.68	**1.28**	**0.40**	**53.85**	**42.40**	54.22	**56.88**	58.95	**62.20**
Warrior	2.56 fl oz/A	8-9[2]	8.40	11.45	5.15	50.98	35.82	52.43	**56.00**	58.75	60.81
Warrior	2.56 fl oz/A	8-9[2]	**0.58**	**4.15**	**0.70**	**58.28**	**38.25**	**58.12**	54.96	**59.43**	**62.35**
Quilt	14 fl oz/A	8-9[2]									
		$LSD_{(P=0.05)}$	5.34	6.07	3.12	5.76	8.52	4.27	2.95	1.36	0.75

[1]-Crop Stage refers to Feekes growth stage (See Table 1 for descriptive crop stages).
[2]- NE Farm was sprayed at Feekes growth stage 10.5 because the crop grew quickly.

Table 3: Responses from Study Two of leaf rust disease, yield, and test weight of grain on two spring wheat cultivars and several fungicide treatments applied at various crop stages at three northeastern South Dakota locations.

			Crop	Leaf Rust (% of flag leaf)			Yield (bu/A)			Test Weight (lb/bu)		
Fungicide	Rate		Stage[1]	Brookings	NE Farm	Groton	Brookings	NE Farm	Groton	Brookings	NE Farm	Groton
Untreated				6.38	5.27	8.68	28.73	48.73	35.53	56.61	60.53	58.90
Folicur +	4	fl oz/A	10.51	**0.62**	**0.62**	**0.23**	**34.97**	**53.61**	39.53	57.13	**61.90**	**60.25**
Induce NIS	0.125	% V/V	10.51									
Prosaro +	6.5	fl oz/A	10.51	**1.18**	**0.50**	**0.03**	**39.88**	**53.82**	37.56	**58.96**	**61.78**	**60.10**
Induce NIS	0.125	% V/V	10.51									
Caramba +	13.5	fl oz/A	10.51	**0.40**	**0.47**	**0.27**	**39.97**	**53.45**	35.23	**59.01**	**61.20**	**59.61**
Induce NIS	0.125	% V/V	10.51									
Topguard +	14	fl oz/A	10.51	5.45	**1.87**	**1.22**	**40.99**	**52.14**	33.93	**59.44**	**62.24**	**59.99**
Induce NIS			10.51									
Proline +	5	fl oz/A	10.51	4.58	**1.53**	**1.17**	**40.95**	**54.86**	37.17	**59.58**	**61.75**	**59.91**
Induce NIS	0.125	% V/V	10.51									
Tilt +	4	fl oz/A	10.51	5.13	**1.68**	**0.58**	**39.05**	51.35	33.74	**59.07**	**61.50**	**59.85**
Induce NIS	0.125	% V/V	10.51									
Laredo +	7	fl oz/A	10.51	7.37	**3.25**	**3.08**	**37.37**	**51.81**	**42.78**	**58.29**	61.03	**59.69**
Induce NIS	0.125	% V/V	10.51									
Headline +	3	fl oz/A	2	**0.45**	**0.38**	**0.00**	**45.85**	**57.59**	**41.26**	**59.92**	**61.50**	**60.17**
Induce NIS	0.125	% V/V	2									
Fb- Caramba +	13.5	fl oz/A	10.51									
Induce NIS	0.125	% V/V	10.51									
Headline +	3	fl oz/A	2	**0.84**	**0.22**	**0.08**	**43.57**	**57.67**	**42.82**	**59.32**	**61.82**	**60.43**
Induce NIS	0.125	% V/V	2									
Fb- Folicur +	4	fl oz/A	10.51									
Induce NIS	0.125	% V/V	10.51									
Stratego +	4	fl oz/A	2	**1.15**	**0.38**	**0.13**	**43.87**	**56.56**	36.50	**59.62**	**61.88**	**60.36**
Prosaro	6.5	fl oz/A	10.51									
Induce NIS	0.125	% V/V	10.51									
Experimental A +	1.5	fl oz/A	2	**0.80**	**0.17**	**0.10**	**42.26**	**58.35**	**43.03**	**59.31**	**61.61**	**59.98**
Prosaro	6.5	fl oz/A	10.51									
Induce NIS	0.125	% V/V	10.51									
Warrior	2.56	fl oz/A	10.5	10.72	4.77	10.48	**34.48**	51.17	33.89	57.41	60.38	**58.97**
Punch +	6	fl oz/A	10.51	**2.57**	**0.70**	**2.90**	**41.18**	**54.21**	34.79	**59.44**	**61.68**	**59.85**
Induce NIS	0.125	% V/V	10.51									
			$LSD_{(P=0.10)}$	2.15	0.94	1.54	5.61	2.87	4.81	1.02	0.59	0.58

[1]-Crop Stage refers to Feekes growth stage (See Table 1 for descriptive crop stages)
- Fb- Followed by

Table 4: Disease responses on Briggs spring wheat at Brookings.

Fungicide	Rate		Crop Stage[1]	Total Leaf Disease % Leaf Area 7/23/2007	Leaf Rust % Leaf Area 7/23/2007	FHB Incidence % 7/23/2007	FHB Severity % 7/23/2007	FHB Disease Index % 7/23/2007	Yield bu/A 8/13/2007	Test Weight lb/bu	Protein %	FDK %	DON PPM
Untreated				82.03	0.17	2.00	39.92	0.94	28.59	56.47	13.98	1.17	0.00
Folicur +	4	fl oz/A	10.51	72.33	0.17	2.33	10.47	0.44	25.25	56.69	13.98	0.83	0.00
Induce NIS	0.125	% V/V	10.51										
Prosaro +	6.5	fl oz/A	10.51	**56.97**	0.10	0.67	3.92	0.16	**38.82**	**58.52**	13.53	0.67	0.00
Induce NIS	0.125	% V/V	10.51										
Caramba +	13.5	fl oz/A	10.51	**37.73**	0.10	1.00	9.42	0.35	**41.57**	**59.42**	13.95	0.50	0.00
Induce NIS	0.125	% V/V	10.51										
Topguard +	14	fl oz/A	10.51	**58.60**	0.57	1.67	23.92	0.62	**40.54**	**59.27**	13.37	0.83	0.00
Induce NIS			10.51										
Proline +	5	fl oz/A	10.51										
Induce NIS	0.125	% V/V	10.51	**41.17**	0.43	1.00	2.92	0.09	**42.52**	**59.85**	13.77	0.67	0.00
Tilt +	4	fl oz/A	10.51										
Induce NIS	0.125	% V/V	10.51										
Laredo +	7	fl oz/A	10.51	**51.77**	1.10	2.00	15.42	0.55	**40.41**	**59.05**	13.52	0.83	0.00
Induce NIS	0.125	% V/V	10.51										
Headline +	3	fl oz/A	2	70.20	1.03	1.67	14.00	0.39	35.94	**58.33**	13.93	0.50	0.00
Induce NIS	0.125	% V/V	2										
Fb-Caramba +	13.5	fl oz/A	10.51										
Induce NIS	0.125	% V/V	10.51										
Headline +	3	fl oz/A	2	**40.77**	0.27	1.00	26.83	0.54	**47.45**	**60.12**	14.12	0.50	0.00
Induce NIS	0.125	% V/V	2										
Fb- Folicur +	4	fl oz/A	10.51										
Induce NIS	0.125	% V/V	10.51										
Stratego +	4	fl oz/A	2	**37.19**	0.17	2.33	8.17	0.26	**43.60**	**59.38**	14.63	0.83	0.00
Prosaro	6.5	fl oz/A	10.51										
Induce NIS	0.125	% V/V	10.51										
Experimental A +	1.5	fl oz/A	2	**41.83**	0.37	1.33	12.00	0.43	**43.99**	**59.62**	13.55	0.83	0.00
Prosaro	6.5	fl oz/A	10.51										
Induce NIS	0.125	% V/V	10.51										
Warrior	2.56	fl oz/A	10.5	**47.80**	0.77	1.00	4.67	0.14	**38.52**	**59.26**	13.92	0.50	0.00
Punch +	6	fl oz/A	10.51	75.80	0.60	3.00	5.06	0.30	**36.24**	57.83	13.97	1.01	0.00
Induce NIS	0.125	% V/V	10.51	**56.17**	0.10	1.67	11.33	0.25	**39.98**	**59.74**	12.78	0.67	0.00
			$LSD_{(P=0.10)}$	22.57	NS	NS	NS	NS	7.85	1.51	NS	NS	NS

[1]-Crop Stage refers to Feekes growth stage (See Table 1 for descriptive crop stages)
- Fb- Followed by

Table 5: Disease responses on Forge spring wheat at Brookings

Fungicide	Rate		Crop Stage[1]	Total Leaf Disease % Leaf Area 7/23/2007	Leaf Rust % Leaf Area 7/23/2007	FHB Incidence % 7/23/2007	FHB Severity % 7/23/2007	FHB Disease Index % 7/23/2007	Yield bu/A 8/13/2007	Test Weight lb/bu	Protein %	FDK %	DON PPM
Untreated				100.00	12.60	1.33	13.72	0.49	28.87	56.75	12.78	1.17	0.00
Folicur +	4	fl oz/A	10.51	**65.23**	**1.07**	2.00	22.00	0.51	30.77	57.57	13.22	1.00	0.00
Induce NIS	0.125	% V/V	10.51										
Prosaro +	6.5	fl oz/A	10.51	**55.87**	**2.27**	0.00	0.00	0.00	**40.93**	**59.40**	13.23	**0.67**	0.00
Induce NIS	0.125	% V/V	10.51										
Caramba +	13.5	fl oz/A	10.51	**65.47**	**0.70**	0.00	0.00	0.00	**38.36**	**58.59**	13.27	**0.67**	0.00
Induce NIS	0.125	% V/V	10.51										
Topguard +	14	fl oz/A	10.51	**81.23**	10.33	0.67	18.50	0.37	**41.45**	**59.60**	12.57	1.17	0.00
Induce NIS			10.51										
Proline +	5	fl oz/A	10.51	**53.60**	8.73	0.00	0.00	0.00	**39.38**	**59.32**	11.37	**0.67**	0.00
Induce NIS	0.125	% V/V	10.51										
Tilt +	4	fl oz/A	10.51	**65.40**	9.17	0.67	7.83	0.16	**37.68**	**59.08**	13.28	**0.67**	0.00
Induce NIS	0.125	% V/V	10.51										
Laredo +	7	fl oz/A	10.51	92.97	13.70	1.67	30.39	0.72	**38.81**	**58.26**	13.08	0.83	0.00
Induce NIS	0.125	% V/V	10.51										
Headline +	3	fl oz/A	2	**38.87**	**0.63**	2.00	11.25	0.62	**44.24**	**59.72**	13.57	1.17	0.00
Induce NIS	0.125	% V/V	2										
Fb-Caramba +	13.5	fl oz/A	10.51										
Induce NIS	0.125	% V/V	10.51										
Headline +	3	fl oz/A	2	**33.20**	**1.67**	2.00	5.25	0.19	**43.54**	**59.26**	14.22	1.00	0.00
Induce NIS	0.125	% V/V	2										
Fb- Folicur +	4	fl oz/A	10.51										
Induce NIS	0.125	% V/V	10.51										
Stratego +	4	fl oz/A	2	**46.87**	**1.93**	0.67	6.67	0.27	**43.75**	**59.62**	13.20	**0.33**	0.00
Prosaro	6.5	fl oz/A	10.51										
Induce NIS	0.125	% V/V	10.51										
Experimental A +	1.5	fl oz/A	2	**51.97**	**0.83**	1.33	19.92	0.56	**46.00**	**59.35**	13.48	0.83	0.00
Prosaro	6.5	fl oz/A	10.51										
Induce NIS	0.125	% V/V	10.51										
Warrior	2.56	fl oz/A	10.5	99.93	20.83	1.67	14.50	0.49	33.27	57.06	12.92	1.17	0.00
Punch +	6	fl oz/A	10.51	**62.83**	**5.03**	1.00	9.25	0.32	**42.39**	**59.14**	13.00	0.83	0.00
Induce NIS	0.125	% V/V	10.51										
			$LSD_{(P=0.10)}$	17.17	3.89	NS	NS	NS	8.36	1.30	NS	0.45	NS

[1]-Crop Stage refers to Feekes growth stage (See Table 1 for descriptive crop stages)
- Fb- Followed by