Southeast Research Farm
29974 University Road
Beresford, South Dakota 57004

The purpose of this page is to grab your attention and convince you to join the Southeast Experiment Farm Corporation. The Southeast Farm Corporation consists of people just like you from southeast South Dakota and the surrounding area.

Around 1955, a group of progressive farmers began efforts to create an association that would be concerned with agricultural research in southeast South Dakota. On May 3, 1956, a non-profit organization, the Southeast Experiment Farm Corporation, was formed. The purpose of the corporation was to acquire and disseminate information concerning crop and livestock production.

The business affairs of the corporation are handled by a very active Board of Directors. Members of the board are elected for a two-year term from each participating county. An annual meeting is held each year to allow members to review the activities of the corporation and hear reports on progress of research projects and make suggestions on research that may need to be added to solve upcoming problems. Because the corporation is non-profit, all funds generated by the corporation are used to advance research through improvement of buildings and facilities located at the station.

We are currently working to add more new members to the Southeast Experiment Farm Corporation. Lifetime memberships to the corporation are $25. You will not be asked for more than that. This is a one-time $25 membership. These memberships are also transferable, so if you know of someone who has retired from farming and is a member, that membership can be transferred to you or anyone else.

This membership to the corporation is not a large amount, but it helps us in many ways. If you become a member, you will automatically receive our annual report, right off the press, in January; as well as letters during the year to keep you informed of activities at the farm and what dates and times tours will be held. Another important benefit is the more members we have demonstrates strong support and proof that there is a great deal of interest and need for agricultural research throughout southeast South Dakota.

We hope if you are not a member that you will join us. If you decide to join, send a check to the Southeast Farm Corporation for $25 to the above address. If you have a membership that needs to be transferred, clip this page out on the line and fill out the information needed on the other side. We will be glad to process your certificate and add you to our permanent mailing list. Thanks.

Southeast Experiment Farm Corporation
29974 University Road
Beresford, South Dakota 57004
2007

Subject: Transfer of Membership

The Board of Directors would like to see existing memberships, that are not active, transferred to a relative or an interested party participating in agriculture located in the same county, if possible. The reason for this transfer, is that a county must maintain a certain number of voting shares in order to elect a director. The directors look after the business affairs of the research farm, make known the research needs of each county, and participate in management decisions of the farm. It is important that each county maintain their representation in order to participate in these affairs.

If this transfer meets with your approval, please enter the name of the party you wish to transfer the membership to, sign your name in the proper blanks below and send this letter, together with the membership share, if possible, to the address listed above.

If there are no interested relatives, you may wish to use Option # 2, and delegate the responsibility to the Board of Directors to locate any interested party in the same county.

Option #1:

Please transfer membership to: _____

Address: _____

_____
Signature

Address: _____

Option #2:

I wish to transfer this membership to the Board of Directors, authorizing them to give this voting membership to an interested party within the county.

_____
Signature

Address: _____

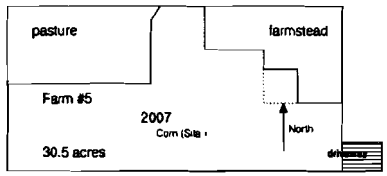
This forty-seventh annual report of the research program at the Southeast South Dakota Research Farm has special significance for those engaged in agriculture and the agriculturally related businesses in the ten county area of Southeast South Dakota. The results shown are not necessarily complete or conclusive. Interpretations given are tentative because additional data resulting from continuation of these experiments may result in conclusions different from those based on any one year.

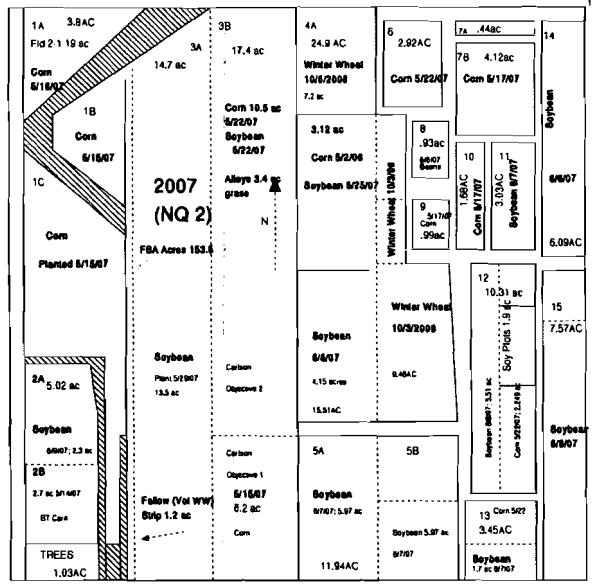
Trade names are used in this publication merely to provide specific information. A trade name quoted here does not constitute a guarantee or warranty and does not signify that the product is approved to the exclusion of other comparable products. Some herbicide treatments may be experimental and not labeled. Read and follow the entire label before using.

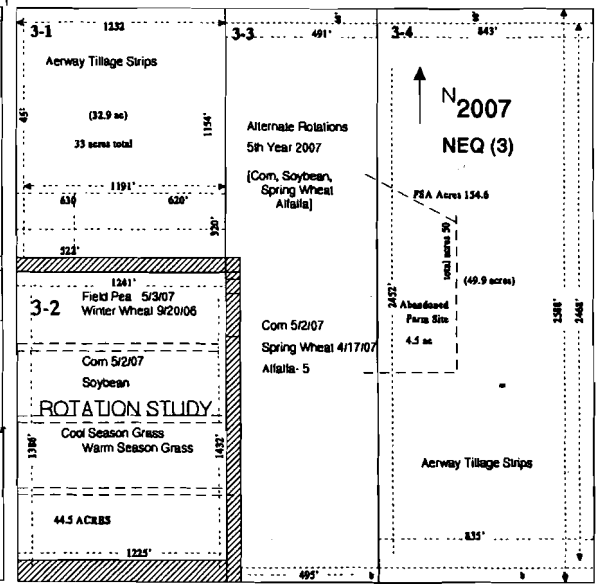
South Dakota Agricultural Experiment Station
Brookings, SD 57007

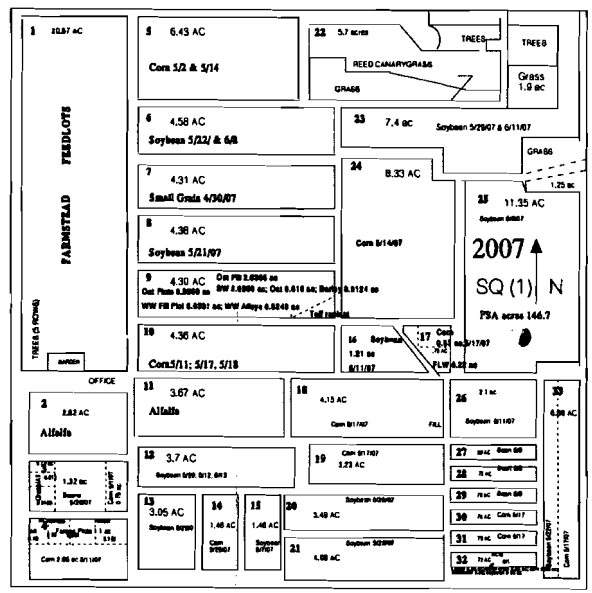
Dr. Gary Lemme, Dean Dr. John Kirby, Director

2007 LAND USE MAP
Southeast Research Farm
Beresford, South Dakota









2007 RESEARCH & DEMONSTRATION TRIALS	SE Research Farm; Beresford, SD	
SERF Repoprt available [online] http://plantsci.sdstate.edu/southeastfarm/		
PROJECT TITLE	**PRINCIPAL INVESTIGATORS**	**STATUS**
PLANT SCIENCE		
Cropping Systems		
Crop & Tillage Rotations for Eastern SD	R. Berg	pending
Alternative Crop Rotations	R. Berg, M. Catangui, J. Keickhefer, K. Tilmon	pending
Aerway Tillage Timing - Corn	R. Berg	pending
Aerway Tillage Timing - Soybean	R. Berg	pending
Deep Tillage (Objective 1)	G. Carlson & C. Reese	pending
Deep Tillage (Objective 2)	G. Carlson & C. Reese	pending
Recrop Corn After Camelina & Spring Wheat Demo	R. Berg, D. Beck,T. Nleya	pending
Soil Fertility		
N Rate on Corn (Long term tilled)	R. Gelderman, A. Bly	SERF Report
Fertility Soybean (Long-term P)	R. Gelderman, A. Bly	none
Micro-Lime Study	R. Gelderman, A. Bly	none
Nitrogen Management for C-S Rotations	R. Gelderman, A. Bly	none
Manure on Corn	R. Gelderman, A. Bly	SERF Report
Crop Performance Variety Trials & Demos		
Precision-Planted Corn Hybrid Performance Trial		
Early Maturity non Roundup Ready Corn	Bob Hall	SERF Report
Late Maturity non Roundup Ready Corn	Bob Hall	SERF Report
Early Maturity Roundup Ready Corn	Bob Hall	SERF Report
Late Maturity Roundup Ready Corn	Bob Hall	SERF Report
Soybean Variety Performance Results at Beresford and Geddes		
Non Roundup Ready Maturity Group I Soybean	Bob Hall	SERF Report
Non Roundup Ready Maturity Group II Soybean	Bob Hall	SERF Report
Roundup Ready Maturity Group I Soybean	Bob Hall	SERF Report
Roundup Ready Maturity Group II Soybean	Bob Hall	SERF Report
Eastern South Dakota Oat Variety Performance Results	B. Hall, L. Hall	SERF Report
Third Year Alfalfa Variety Performance	V. Owens	SERF Report
First-year Alfalfa Variety Performance	V. Owens	none
Perennial Cool-season Grass Nursery	P. Jeranyama	pending
Perennial Alfalfa/Grass Nursery	P. Jeranyama	pending
Annual Warm-season Grass Biomass	V. Owens	pending
Cool-season Perennial Grass Forage (2 trials)	V. Owens	pending
Perennial Grass Forage Trial	V. Owens	pending
Alfalfa Wheel Traffic Studies (completed)	V. Owens	pending
Small Grain Demo	L. Hall, R. Berg, T. Bortnem	none
Corn Demo	R. Berg	pending
Soybean Demo	R. Berg	pending
Teff Demo	R. Berg	none
Cool-season Annual Cover Crop Demo	R. Berg, D. Beck, T. Nleya	demo in progress
Developing Rice Varieties	M. Catangui, X. Gu, R. Berg, and M. Moechnig	relocated to another site

2007 RESEARCH & DEMONSTRATION TRIALS	SE Research Farm; Beresford, SD	
SERF Repoprt available [online] http://plantsci.sdstate.edu/southeastfarm/		
PROJECT TITLE	**PRINCIPAL INVESTIGATORS**	**STATUS**
Crop Breeding		
Non Roundup Ready Soybean Nurseries	R. Scott	pending
Roundup Ready Soybean Nurseries	R. Scott	pending
Oat Nurseries	Lon Hall	SERF Report
Crop Improvement Oat Seed Increase	Lon Hall	none
2006/2007 Winter Wheat Nurseries	A. Ibrahim	pending
2007/2008 Winter Wheat Nurseries	S. Kalsbeck	trial in progress
Entomology		
BT & Corn Rootworm Hybrids	M. Catangui, J. Keickhefer, R. Berg	pending
Corn Seed Trait & Relative Maturity	R. Berg, J. Keickhefer, M. Catangui	pending
Soybean Aphid Variety Trial	M. Catangui	pending
Making in South Dakota	K. Tilmon, S. Blodgett	SERF Report
Soybean Insect Populations	K. Tilmon	pending
Plant Pathology		
Soybean Rust Sentinel Plot	R. Berg, B. Ruden	NA
Corn Diseases	B. Ruden	pending
2007 Soybean Foliar Fungicide Trials	B. Ruden	SERF Report
Weed Control Demonstrations and Evaluation Tests for 2007		
Corn		
Conventional Corn Herbicide Demonstration	M. Moechnig, D. Deneke	SERF Report
Herbicide Resistant Corn Demonstration	M. Moechnig, D. Deneke	SERF Report
Impact Programs	M. Moechnig, D. Deneke	SERF Report
Valor in Field Corn	M. Moechnig, D. Deneke	SERF Report
Burndown Treatments in No-Till Corn	M. Moechnig, D. Deneke	SERF Report
Adjuvants with Liberty in Corn	M. Moechnig, D. Deneke	SERF Report
AMS Replacement Studies w/350 ppm Hardness Water Quality	M. Moechnig, D. Deneke	SERF Report
Cornbelt Adjuvants with Corn Herbicides	M. Moechnig, D. Deneke	SERF Report
Performance of Harness and Degree Applied Mid-Post to Corn	M. Moechnig, D. Deneke	SERF Report
Weed Control in Conventional and RR Corn	M. Moechnig, D. Deneke	SERF Report
Liberty Weed Control Programs	M. Moechnig, D. Deneke	SERF Report
RR Corn 2 System Comparisons	M. Moechnig, D. Deneke	SERF Report
Balance and Radius in LL and RR Corn	M. Moechnig, D. Deneke	SERF Report
Permit/Postemergence Weed Control Combinations	M. Moechnig, D. Deneke	SERF Report
Soybean		
Conventional Soybean Herbicide Demonstration	M. Moechnig, D. Deneke	SERF Report
Herbicide Resistant Soybean Demonstration	M. Moechnig, D. Deneke	SERF Report
Touchdown Programs with Prefix in RR Soybeans	M. Moechnig, D. Deneke	SERF Report
Liberty Link Soybean - Weed Control Programs	M. Moechnig, D. Deneke	SERF Report
Authority Products in Soybeans	M. Moechnig, D. Deneke	SERF Report
Broadleaf Weed Control in RR Soybeans	M. Moechnig, D. Deneke	SERF Report
Sencor with Valor for Weed Control in Soybeans	M. Moechnig, D. Deneke	SERF Report
Early-Season Weed Competition With and Without a Pre	M. Moechnig, D. Deneke	SERF Report
Soybean Row Spacing and Density Effects on Weed Management	M. Moechnig, D. Deneke	SERF Report
Adjuvants with Micronutrients	M. Moechnig, D. Deneke	SERF Report
Adjuvants for Volunteer Corn Control in Soybeans	M. Moechnig, D. Deneke	SERF Report
Burndown and Residual Weed Control in No-Till Soybeans	M. Moechnig, D. Deneke	SERF Report
Select Max for Control of Volunteer RR Corn	M. Moechnig, D. Deneke	SERF Report
Control of Volunteer Glyphosate-Tolerant Corn	M. Moechnig, D. Deneke	SERF Report

2007 RESEARCH & DEMONSTRATION TRIALS	SE Research Farm; Beresford, SD	
SERF Repoprt available [online] http://plantsci.sdstate.edu/southeastfarm/		
PROJECT TITLE	**PRINCIPAL INVESTIGATORS**	**STATUS**
Volunteer GT Corn Control in Soybeans	M. Moechnig, D. Deneke	SERF Report

2007 RESEARCH & DEMONSTRATION TRIALS	SE Research Farm; Beresford, SD	
SERF Repoprt available [online] http://plantsci.sdstate.edu/southeastfarm/		
PROJECT TITLE	**PRINCIPAL INVESTIGATORS**	**STATUS**
General Rotations & Miscellaneous		
BT Corn Refuge Yield Strips	R. Berg	none
High Moisture Corn	R. Berg	none
Corn for Grain & Silage	R. Berg	none
Corn Fill	R. Berg, J. Smolik	pending
Soybean Cyst Nematode Yield Strips	R. Berg	pending
Planter Comparison - Soybean	R. Berg	pending
Legume Inoculant Technology	R. Berg	pending
Soybean Fill	R. Berg	none
Winter Wheat Fill	R. Berg	none
Weed & IPM Fill	M. Moechnig, D. Deneke	none
Alfalfa Hay	R. Berg	none
Cool Season Grass Hay	R. Berg	none
ANIMAL & RANGE SCIENCE		
Cattle		
Bovatec and Rumensin with differing levels of modified distiller's grains	E. Loe, B. Rops	pending
Gain Pro and Rumensin with differing levels of modified distiller's grains	E. Loe, B. Rops	pending
Finished yearlings from Cottonwood water quality study for growth and carcass data	E. Loe, B. Rops	pending
Finished steers from the cow calf unit for carcass data	E. Loe, B. Rops	pending
Effects of medicinal feed additives fed with two levels of modified distiller's grains on growth performance and health of growing/finishing beef steers	E. Loe, B. Rops	written
Evaluation of mixing characteristics of diets containing modified distiller's grains.	E. Loe, B. Rops, J. Keimig	2007 SDSU Beef Report
Swine		
Interaction of dry distiller's grains and Paylean	R. Thaler, B.Rops	pending
Biofilter swine disease prevention study	D. Nicolai, B. Rops	in progress
AG & BIOSYSTEMS ENGINEERING		
SDSU State Climatology Data	D. Todey	NA
Confinement Biofilter Demonstration	D. Nicolai, S. Pohl, B. Rops	NA
GENERAL		
National Weather Service Data	R. Stevens, J. Landeen, R. Berg, D. Morin	SERF Report
Field to Table Demonstrations	A. Borders, et al	postponed
Corn Stove Demonstration	R. Berg, et al	pending
Nutrient Management Workshop (USDA/NRCS/CES)	Jeff Hemmingway	NA
Rainfall Simulator Infiltration & Erosion Demonstration (USDA/NRCS)	Jeff Hemmingway	NA
Corn Rootworm Population Cages (USDA/ARS)	Deidra Prishman	NA
Beanleaf Beetle Population Samples (USDA/ARS)	Janet Fergen	NA
Hail Crop Insurance Adjuster Training (National Crop Ins. Service)	D. Deneke	NA
Row Crop Planter Wheel Design Testing	R. Hesla, B. Jurgensen	NA
Compost & Manure Application	R. Berg, B. Rops, etc.	NA
Auto Steer Equipment Demo	R. Berg, BOD	None

SOUTHEAST SOUTH DAKOTA EXPERIMENT FARM
47th ANNUAL PROGRESS REPORT 2007

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This is an annual report some testing is on-going and will require more information before a final conclusion can be made.

WEATHER AND CLIMATE SUMMARY

R. Stevens, R. Berg, J. Landeen, and G. Williamson

Southeast Farm 0701

Climate for 2007 is summarized in tables and graphs on pages 2 to 7. Annual precipitation was normal for the year; however growing season precipitation was below normal this year. We received 25.1 inches of annual precipitation, which is our long-term average (100% of normal). Our growing season precipitation measured from April through September was 15.6 inches (83% of normal, -3.1 inches). This was also a year of extremes with July and November receiving no measurable precipitation (-3.1 and -1.2 inches, respectively) while October received 5.3 inches of rainfall (301% of normal, +3.5). Precipitation was normal or above for sevens months of the year; averaging 0.7 inches above normal (0.1 - 3.5), while the other five months averaged 1.4 inches below normal (0.1 to 3.1 inches). Our annual snowfall was 34 inches, with 24 inches received the first half of the year and 10 inches during the last half.

The growing season accumulation of heat units was 3,358 units, slightly above normal (105% of normal). The coldest temperature of the year was recorded on January 16 and 17 at -23°F and the hottest temperature recorded was 98°F on July 8 and 18, giving a 121-degree temperature range. Our frost-free season was 179 and 197 days on a 32°F and 28°F-basis, respectively. The average annual high temperature was 58°F and our average annual low temperature was 37°F. Evaporation exceeded rainfall during April through September by 0.7 to 10.3 inches per month. We lost more than twice as much moisture by open pan evaporation than we gained by rainfall, with a total of nearly 39 inches of water evaporated from May through September while receiving 16 inches of precipitation.

Table 1. Temperatures[a] at the Southeast Research Farm - 2007

	2007Average Air Temps. (°F)		55-year Average Air Temps. (°F)		Departure from 55-year Average	
	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum
January	27.9	8.4	26.6	5.6	+1.3	+2.8
February	22.7	4.8	32.5	11.3	-9.8	-6.5
March	49.8	29.0	43.9	22.7	+5.9	+6.3
April	57.2	34.6	60.4	35.2	-3.2	-12.7
May	75.3	52.7	72.3	57.6	+3.0	+5.4
June	80.4	59.4	81.6	62	-1.2	+1.8
July	87.8	29.7	86.2	62	+1.6	+1.0
August	82.5	63.3	84.4	59.4	-1.9	+3.9
September	77.0	50.5	75.6	48.9	+1.4	+1.6
October	65.2	42.3	63.8	37.6	+1.4	+4.7
November	48.2	23.8	45.1	23.7	+3.1	+0.1
December	24.8	7.6	30.9	11.5	-6.1	-3.9

[a]Computed from daily observations

Table 2. Precipitation at the Southeast Research Farm - 2007

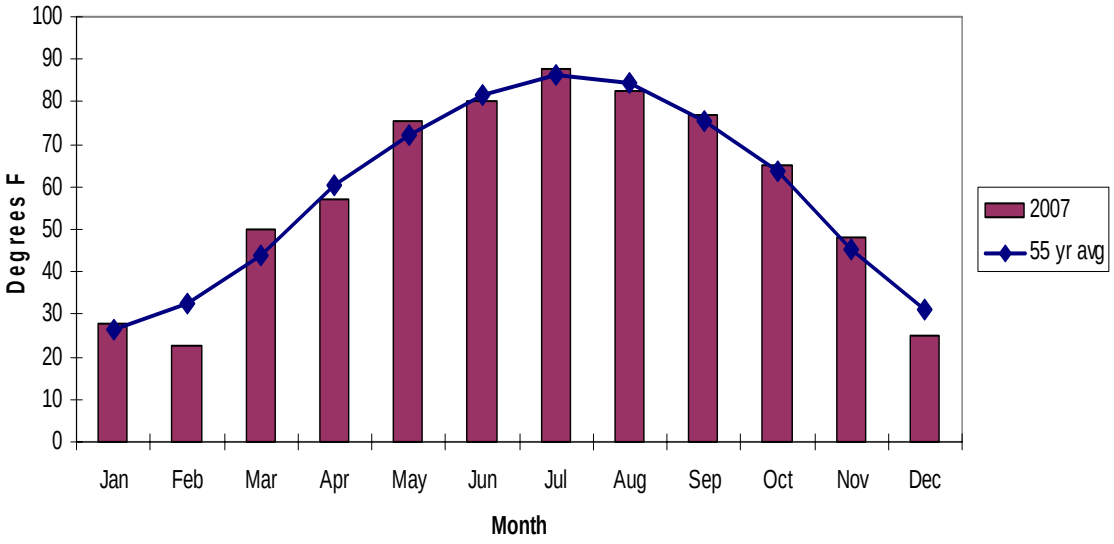
Month	Precipitation 2007 (inches)	55-year Average (inches)	Departure from Avg. (inches)
January	0.36	0.45	-0.09
February	0.97	0.82	+0.15
March	1.89	1.49	+0.40
April	3.04	2.57	+0.47
May	3.49	3.36	+0.13
June	2.16	4.05	-1.89
July	0.00	3.13	-3.13
August	4.95	2.92	+2.03
September	1.96	2.72	-0.76
October	5.30	1.76	+3.54
November	0.00	1.23	-1.23
December	0.94	0.62	+0.32
Totals	25.06	25.12	-0.06

2007 CLIMATE SUMMARY
SOUTHEAST RESEARCH FARM

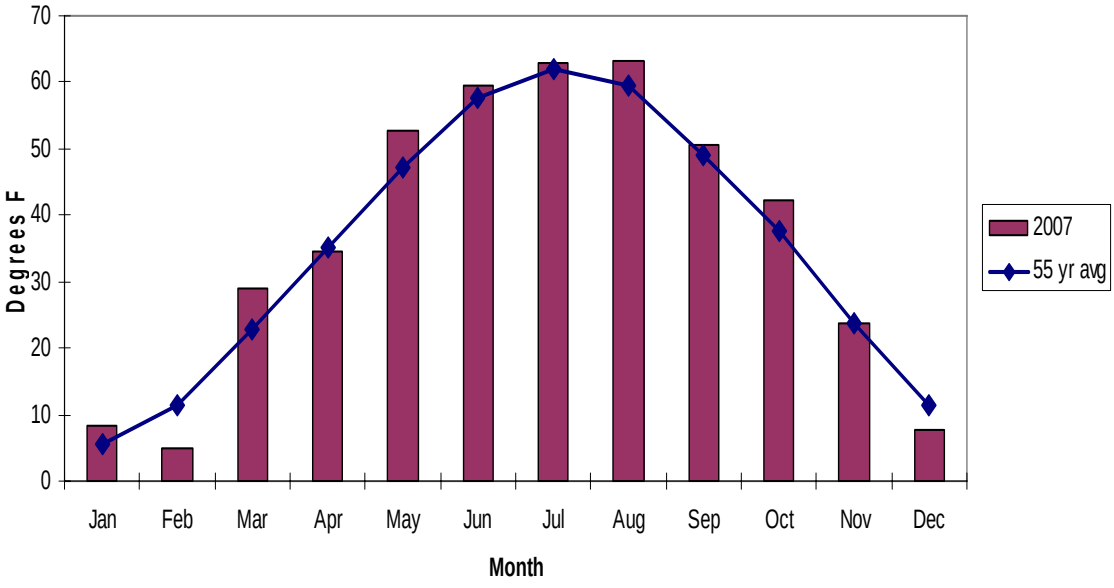
Annual Precipitation (inch)	25.1	100%*
Growing Season Precip (Apr-Sep, inch)	15.6	83%
Jan-Mar	3.2	116%
Apr-Jun	8.7	87%
Jul-Sep	6.9	79%
Oct-Dec	6.2	173%
Annual Snow (inch); (Jan-Jun/Jul-Dec)	33.7	23.9 / 9.8
Growing Degree Units (GDU)	3,358	105%
Minimum / Maximum Air Temp, ºF	Jan 16 & 17 - -23º F	July 8 & 18 - 98º F
Last Spring Frost	April 15 - 30º F	Apr 13 - 28º F
First Fall Frost	Oct 11 - 31º F	Oct 27 - 28º F
Frost Free Period (days); 32º / 28º basis	179	197
Average Annual High / Low	58.2 / 36.6	-0.4 / +1.4

*% of normal

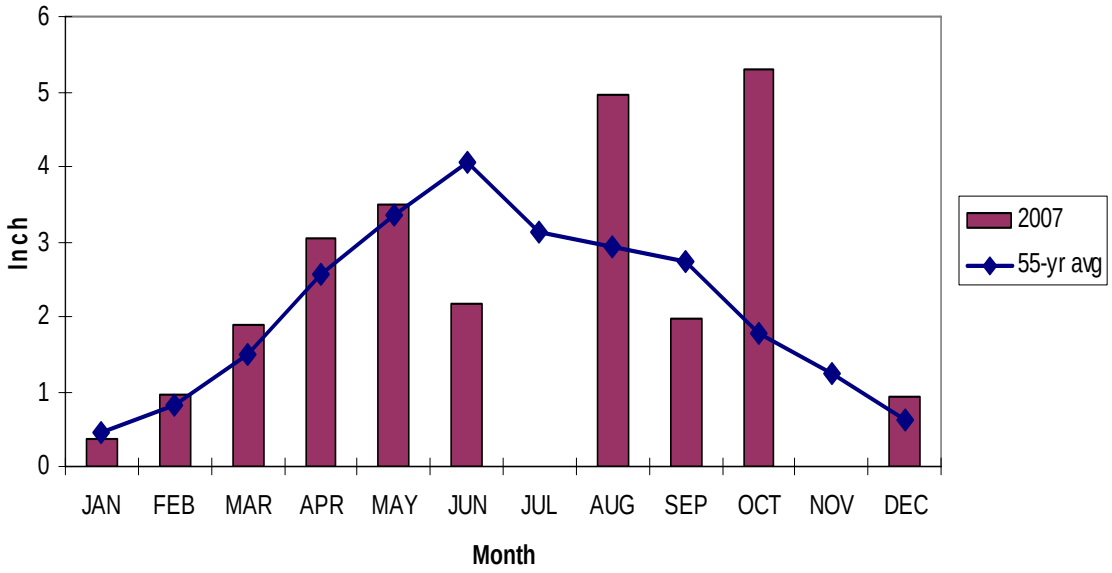
2007 Maximum Temperatures
Southeast Farm



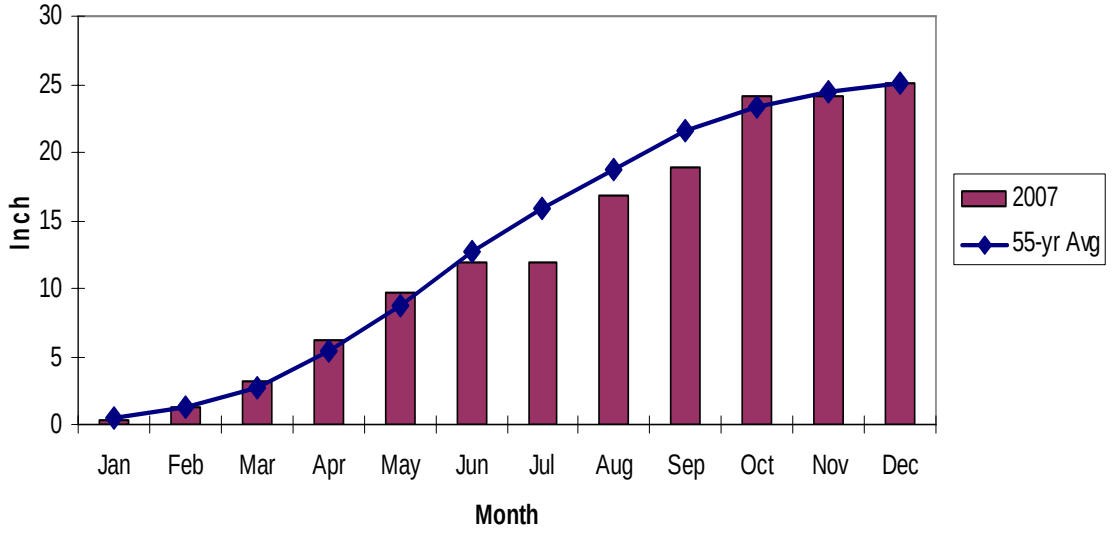
2007 Minimum Temperatures
Southeast Farm



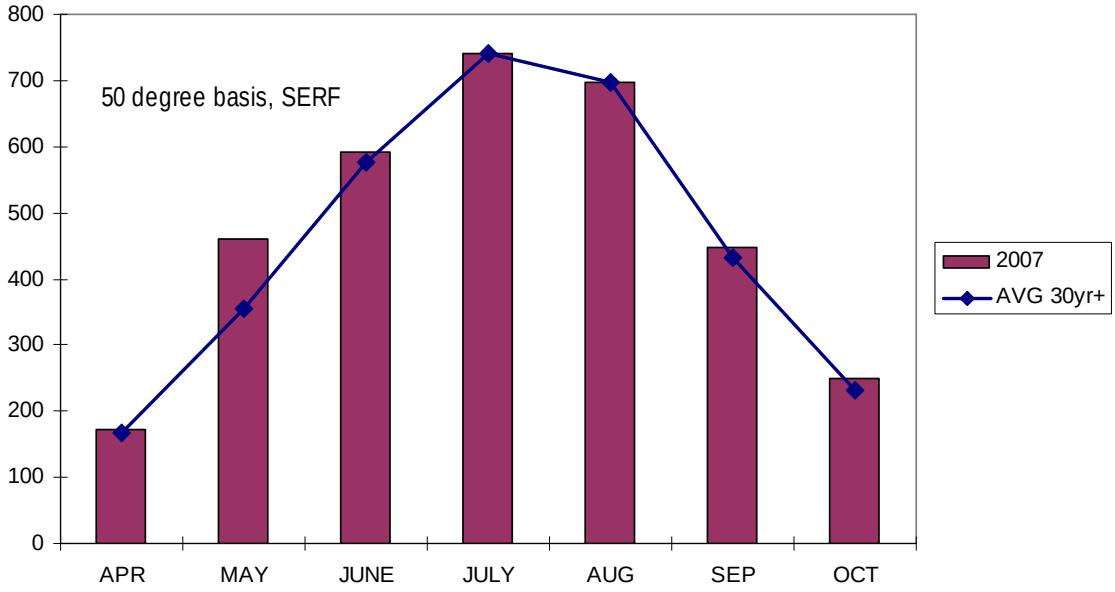
2007 Precipitation
Southeast Farm



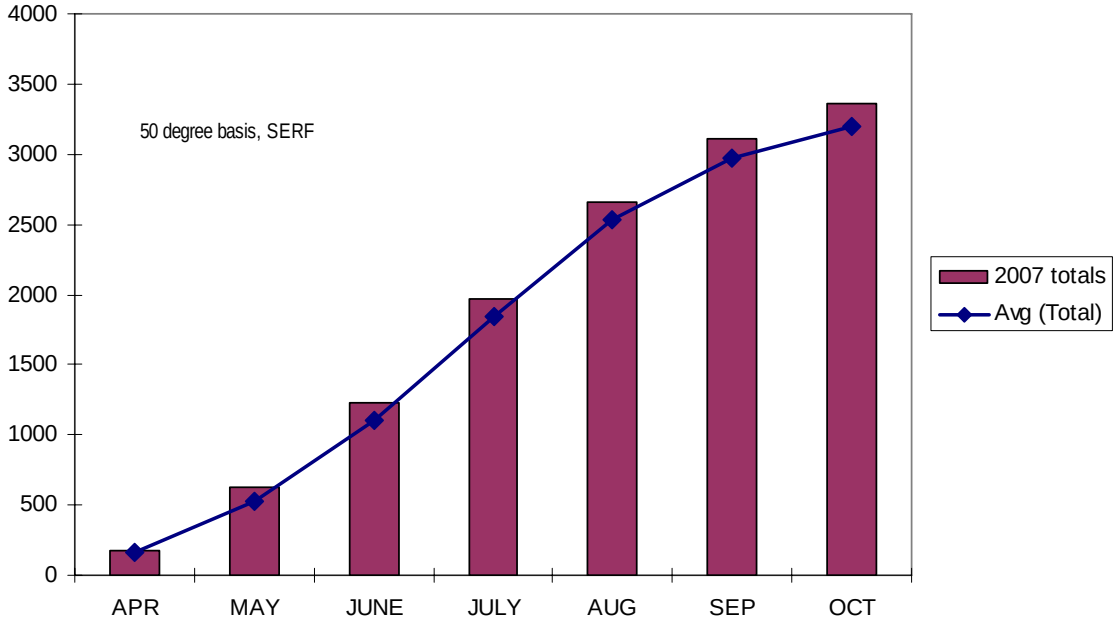
2007 Cumulative Precipitation
Southeast Farm

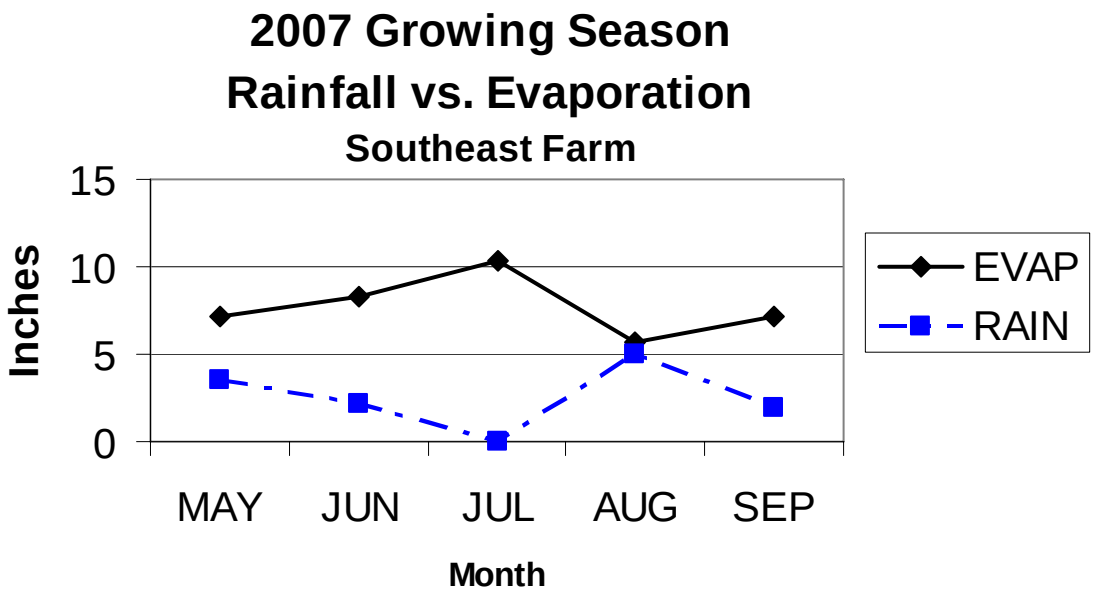


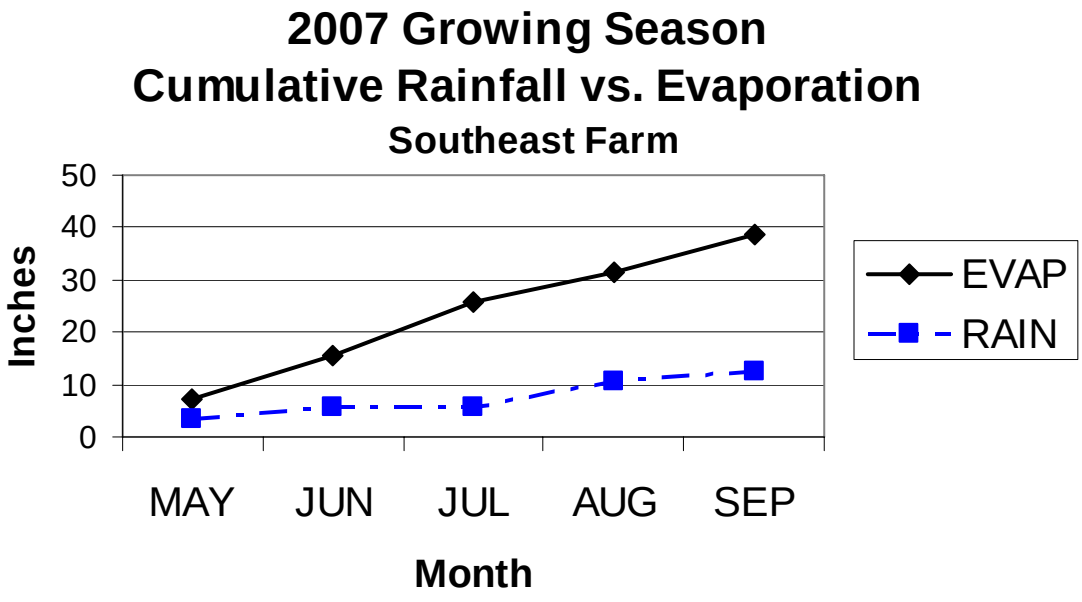
2007 Growing Degree Units (GDU)
Southeast Farm



2007 Cumulative GDU Data
Southeast Farm




2007 Growing Season
Rainfall vs. Evaporation
Southeast Farm
15
10
5
0
Inches
MAY
JUN
JUL
AUG
SEP
Month
EVAP
RAIN


2007 Growing Season
Cumulative Rainfall vs. Evaporation
Southeast Farm
50
40
30
20
10
0
Inches
MAY
JUN
JUL
AUG
SEP
Month
EVAP
RAIN

CROP NUTRIENT MANAGEMENT USING MANURE FROM RATIONS CONTAINING DISTILLERS GRAIN

R. Gelderman, J. Gerwing, R. Berg, B. Rops, and A. Bly

Plant Science 0702

INTRODUCTION

The rapid growth of the ethanol industry in South Dakota has a benefit of producing large amounts of a feedstuff in the form of distillers' grain. Utilization of the wet distillers grain (WDG) may lead to concentrated animal feeding operations (CAFOs) near the ethanol plants. Feeding of dry distillers grain (DDG) could lead to more feeding operations (especially ruminants) through out the state.

Distillers' grain is essentially corn with the starch removed resulting in a higher concentration of phosphorus (P) when compared to the original grain. Research has shown as dietary P increases above the animals P needs, excreted P increases. Therefore, manure from animal diets utilizing distillers' grain may be higher in P.

Manure has been shown to be an excellent source of plant nutrients. However, over application of manure near some CAFOs can lead to ground water (nitrate-N) and surface water (P) contamination. South Dakota has regulated land application of manure from CAFOs for a number of years based on crop nitrogen needs. Since the ratio of N to P in manure is much narrower than in grain, this can lead to over application of P because more P will be applied than is needed by the crop. In December, 2002 the EPA directed states to also consider P management in land application of manure.

There is a need to agronomically evaluate the SD Department of Environment and Natural Resources (DENR) rules (February, 2003) pertaining to manure application rates that are based on nitrogen and phosphorus. The producer needs to be assured that these rates will not limit yields when compared to commercial fertilizer application. In addition, buildup of soil nitrate-N and soil test P needs to be monitored.

Purpose- To agronomically evaluate rates of distiller's grain derived manure based on nitrogen and phosphorus crop needs.

Objectives:

1) To determine if manure rates applied according to rules set by the SD DENR for CAFOs meet crop nutrient needs (grain yield and crop growth) as compared to commercial fertilizer.
2) To compare P buildup rates when manure is applied according to either the N or P needs of the crop.
3) To compare nitrate-N carryover from manure and commercial fertilizer.

METHODS

Two field sites were established to evaluate the study objectives. A site is located on an Egan soil just south of the office building at the SE Farm near Beresford on which beef feedlot manure was applied. The other site is located on the east Agronomy Farm at Brookings on Vienna-Lamoure soils (Range D-1) on which daily-scrape solid dairy cow manure was applied.

Beginning soil tests for 2007 can be found in Table 1. The P soil test from the P manure treatment was used to calculate the manure needed for that treatment. If the P soil test is high enough where no P recommendation would be made, the average crop P removal was used to calculate manure P rate. Similarly, the nitrate-N soil test from the N manure treatment was used to calculate the manure needed for that treatment. Both the P and nitrate-N soil tests were used from

the fertilizer treatment to make the phosphate and N recommendations for the fertilizer treatment.

The manure was applied on October 28, 2006 and incorporated with a disc three days later at the Beresford site and applied on October 27, 2006 and was incorporated with a chisel plow three days later at Brookings. The analysis of the beef feedlot manure and the dairy barn manure are given in Table 2. The treatments established and nutrients applied are listed in Table 3. Treatments were arranged in a randomized complete block design with four replications.

At Beresford, Dekalb DKC 58-16 was planted on May 2, 2007 in 30 inch rows. Harvest was completed with a plot combine on October 4, 2007. At Brookings, Asgrow 1401 RR soybeans were planted in 30 inch rows on May 17, 2007. Harvest was completed with a plot combine on September 26, 2007.

RESULTS

Previous manure applications for the N and 2N treatments have increased most soil tests over the other treatments (Tables 1 and 4). Corn yields at Beresford were very stressed by low rainfall in July. Corn grain yields from the check were not significantly different from treatment yields. Although a significant difference between treatments was found, a higher than normal CV almost makes this data un-explainable (Table 3).

Soybean grain yields were not significantly influenced by the applied treatments at the Brookings site (Table 3).

Post-harvest soil tests at both sites indicate increases in soil tests especially with the higher two rates of applied manure (Table 4).

Five Year Summary

The first five years of this experiment has been summarized and results are given here. The total manure and nutrients applied are shown in Table 5. The N values are available N and not total N in the manure. More N is applied for the manure N treatment compared to the fertilizer treatment because the manure treatment is applied each year including for soybean while N is only applied on corn years for the fertilizer treatment. Phosphorus additions for the fertilizer treatment compared to the manure P treatment are similar at the Beresford site. Because soil test P is low both rates are dependent on P soil test recommendations. Soil test P in 2007 is also similar between these two treatments (Table 4).

At the Brookings site, the manure P treatment has had much more P applied compared to the fertilizer treatment. Here the soil test is high and P is applied in the manure P treatment at crop removal rates.

Five year total yields are significant among treatments even though individual year yields may not be different (Tables 6 & 7). In general higher manure rates gave higher yields than the fertilized treatment.

Phosphorus soil tests have increased over five years with the manure N and manure 2N treatments (Figures 1 and 2). In general the phosphorus applied with manure or fertilizer increased soil test P values similarly.

CONCLUSIONS

- Manured treatments produced grain yields similar or better than fertilized treatments.
- Soil test P from manure is changing soil test P similarly to fertilizer P.

The study will be continued with one change. The Brookings site needed to be moved because of the loss of Agronomy farm, therefore data summaries across years will be started over at this new site.

ACKNOWLEDGEMENTS

These studies were funded in part by the South Dakota Ag. Experiment Station, Southeast SD Research Farm, and the SDSU soil testing lab.

Table 1. Soil tests[1] after forth year of manure studies, 2007

Treatment	O.M.	NO_3-N	SO_4-S	Olsen P	K	Zinc	pH	salts
				Beresford site				
	%	-lb/ac in 2 feet-		------- ppm -------				mmho/cm
Check	3.6	28	14	6	271	0.86	6.5	0.4
Fert	3.7	28	12	15	288	0.77	6.3	0.3
P	4.0	44	210	15	483	1.51	6.4	0.3
N	4.0	90	74	37	672	2.35	6.8	0.4
2N	3.9	232	102	68	1019	3.00	7.0	0.5
				Brookings site				
Check	3.5	14	117	23	159	0.96	7.6	0.4
Fert	3.8	14	155	29	162	1.38	7.3	0.4
P	3.6	22	180	28	164	1.31	7.5	0.5
N	3.8	22	188	43	208	1.77	7.6	0.5
2N	3.6	35	204	54	270	2.04	7.4	0.4

[1] Samples taken fall of 2006.

Table2. Manure nutrient analysis for manure studies for 2007.

Analysis	units	Manure[1]	
		Beef (from apron)	Dairy (daily scrape with straw bedding)
Total N	lb/ton	49.5	13.1
Organic-N	lb/ton	39.5	10.6
Ammonium-N	lb/ton	10.0	2.5
Total Available-N	lb/ton	23.8	5.8
P_2O_5	lb/ton	37.6	3.8
K_2O	lb/ton	45.4	8.9
Moisture	%	40.7	81.1

[1] Manure collected and analyzed in November, 2006, as received basis.

Table 3. Treatments, nutrients applied and influence on grain yields, 2007.

Treatment	Manure applied[1]	Manure N-P_2O_5-K_2O applied	Fertilizer N-P_2O_5-K_2O applied	Grain Yield
	ton/ac	---------- lb/ac ----------		bu/ac
	---------- Beresford site (corn) ----------			
check	0	0-0-0	0-0-0	74.6 a
Fertilizer (Rec)[2]	0	0-0-0	112-13-0	77.9 a
Manure – P[3]	4.9	117-184-222	46-0-0	56.3 b
Manure – N[4]	4.9	117-184-222	0-0-0	73.9 a
Manure - 2N[5]	9.8	234-368-445	0-0-0	49.2 b
Fertilizer (High)[6]	0	0-0-0	200-70-0	74.5 a
LSD				15.1
Pr>F				0.02
C.V.%				18.0
	---------- Brookings site (soybeans) ----------			
check	0	0-0-0	0-0-0	57.3
Fertilizer (Rec)[2]	0	0-0-0	0-0-0	56.2
Manure – P[3]	7.04	41-26-63	0-0-0	57.1
Manure – N[4]	25.0	145-94-223	0-0-0	59.4
Manure - 1.5N[5]	37.5	218-141-335	0-0-0	60.3
$LSD_{(0.05)}$				NS
Pr>F				0.09
C.V.%				3.6

[1] Applied fall 2006

[2] Recommended fertilizer rate determined from soil test and yield goal.

[3] P manure rate based on P recommendation from soil test or on P removal from crop, which ever is greater.

[4] N manure rate is based on N requirement of 1.2 lb/bu for corn or 3.8 lb/bu for beans minus soil test nitrate-N and legume credit.

[5] 2N(Beresford) or 1.5N(Brookings) manure rate of twice and 1.5 the N rate above.

[6] High fertilizer rate to determine maximum yield from fertilizer.

* Yields followed by different letters are significantly different at the 0.05 level.

Table 4. Soil tests[1] after fourth year of manure studies, 2007.

Treatment	O.M.	NO_3-N	SO_4-S	Olsen P	K	Zinc	pH	salts
				Beresford site				
	%	-lb/a in 2 feet-		------- ppm -------				mmho/cm
Check	3.6	28	19	6	249	0.86	6.5	0.4
Fert	3.7	28	18	15	274	0.81	6.3	0.3
P	4.0	44	46	15	433	1.71	6.4	0.3
N	4.0	90	72	37	612	2.62	6.8	0.4
2N	3.9	232	118	68	968	3.13	7.0	0.5
				Brookings site				
Check	3.5	14	117	23	159	0.96	7.6	0.4
Fert	3.8	14	155	29	162	1.38	7.3	0.4
P	3.6	22	180	28	164	1.31	7.5	0.5
N	3.8	22	188	43	208	1.77	7.6	0.5
2N	3.6	35	204	54	270	2.04	7.4	0.4

[1] Samples taken fall 2007.

Table 5. Manure and nutrients applied, 2003 – 2007.

Treatment	----- Beresford -----				----- Brookings -----			
	manure	N	P_2O_5	K_2O	manure	N	P_2O_5	K_2O
	ton/a	----- lb/ac ----			- ton/ac -	----- lb/ac ----		
Fert	0	305	175	0	0	153	12	0
Man P	21.7	300 + 105[1]	370	561	47.04	240 + 44[1]	219	331
Man N	54.9	635	810	1130	124	591	548	929
Man 2N	109.8	1270	1620	2253	213.5	1050	963	1579

[1] Fertilizer N added to supplement manure

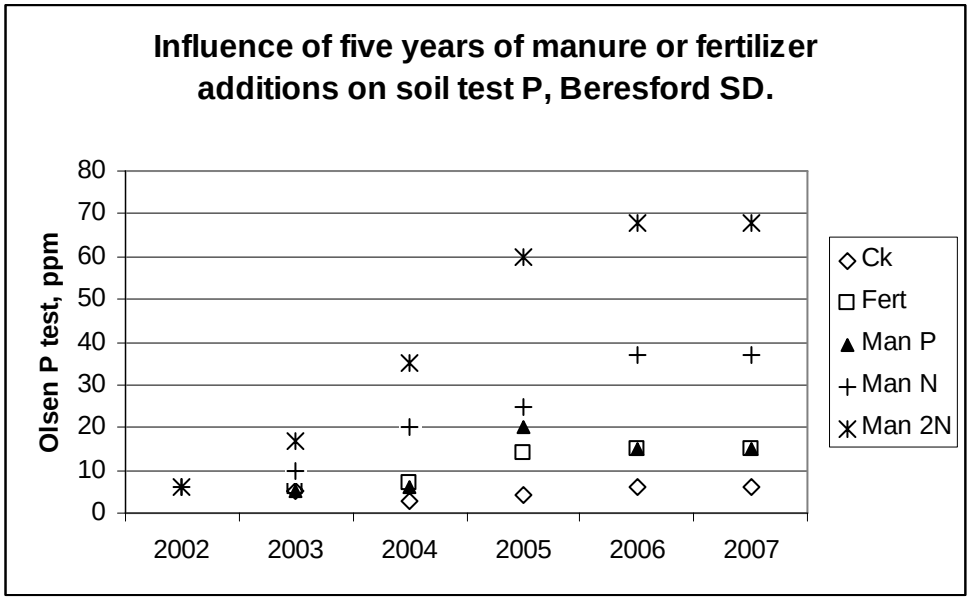
[2] Man 2N is actually 1.5 N at Brookings site.

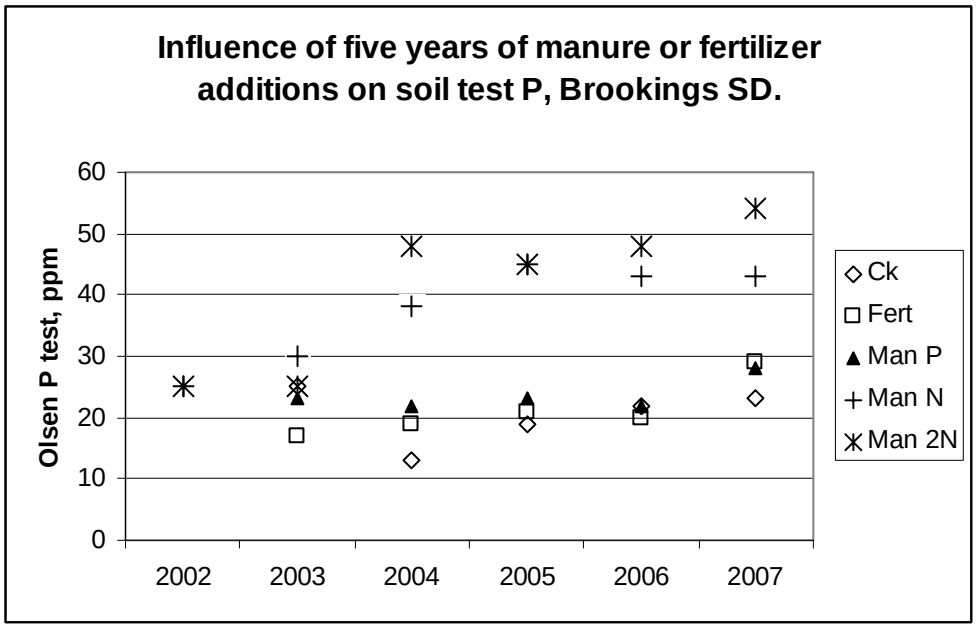
Table 6. Yields from manure study, Beresford, 2003-2007.

Treatment	2003 corn	2004 soybean	2005 corn	2006 soybean	2007 corn	4 year Total
	---------- bu/ac ----------					
Check	143	41	88	44	74.6 a	391 b
Fert.	139	45	109	48	77.9 a	419 ab
Man. P	151	44	102	47	56.3 b	401 b
Man. N	152	47	121	50	73.9 a	445 a
Man. 2N	142	48	105	48	49.2 b	391 b
High Fert.					74.5 a	
Pr>F	0.30 NS	0.14 NS	0.003	0.71 NS	0.02	0.09
L.S.D.	---	---	12	--	18	36.5

Table 7. Yields from manure study, Brookings, 2003-2007.

Treatment	2003 soybean	2004 corn	2005 soybean	2006 corn	2007 soybeans	4 year Total
	---------- bu/ac ----------					
Check	32	147	59	109	57.3	346 c
Fert.	30	151	59	120	56.2	360 bc
Man. P	33	152	60	117	57.1	362 bc
Man. N	32	166	61	125	59.4	383 ab
Man. 2N	32	172	61	132	60.3	397 a
Pr>F	0.30 NS	0.04	0.34 NS	0.14 NS	0.09	0.03
L.S.D.	---	18.2	---	---	3.6	24.9


Influence of five years of manure or fertilizer additions on soil test P, Beresford SD.
Olsen P test, ppm
80
70
60
50
40
30
20
10
0
2002
2003
2004
2005
2006
2007
Ck
Fert
Man P
Man N
Man 2N


Influence of five years of manure or fertilizer additions on soil test P, Brookings SD.
Olsen P test, ppm
60
50
40
30
20
10
0
2002
2003
2004
2005
2006
2007
Ck
Fert
Man P
Man N
Man 2N

NITROGEN RATES FOR CORN

R. Gelderman, R. Berg, and A. Bly

Plant Science 0703

INTRODUCTION

Nitrogen rates for corn are receiving renewed attention because of high nitrogen fertilizer prices. Environmental concerns with nitrate-N leaching, hypoxia in the Gulf, and the Conservation Security Program (CSP), are also having an impact in renewing questions about nitrogen rates for corn.

Much of the recent work for corn N rates has been on corn following soybean. However, more corn on corn rotations are also being used because of favorable economics with this rotation. Little N calibration work has been done on corn following low residue, non-legume crops such as corn silage or sunflower. In theory, N rate needed for maximum economic corn yield may be less following these crops than following a high residue corn or small grain crop. Less N may be immobilized because of lower residue amounts that contain high C:N ratios.

The nitrogen rate for corn following soybean has always been found to be lower than for corn following corn. This so called 'nitrogen credit' given for soybean is actually a misnomer. It implies that the soybean crop has provided 40 lbs of N in the soil for the corn crop. In reality it just means that corn grown after soybean takes less N for maximum yield than corn following corn or following another high residue crop. The extra N needed for the corn after corn is probably needed for the microbes breaking down the low N residue. In fact, we should probably base our N rates for corn when it follows soybean and add another 40 lbs for corn following a high residue crop. Much like we add another 30 lb N/ac if the tillage system is no-till or strip-till.

Our objectives in this study are:

1) To determine the maximum economic N rate for:

a) corn following soybean

b) corn following corn

c) corn following corn (above ground residues removed CC_{rr}).

2) To measure and compare soil nitrate-N, total soil N and total soil carbon after each of the above rotations and N treatments.

METHODS

A tilled site was established on the north quarter of the Southeast Research Farm near Beresford (SERF) in the spring of 2005 to answer the above objectives. The site consists of Egan silty clay loam soils which are deep well drained soils found in glacial till. The slope is from 2-3%. Beginning soil tests are OM % = 3.5, P ppm=13, K ppm=301, Zn ppm=1.4, Sulfate-S lb/a in 2'=46, pH=7.2 and salts=0.8 mmho/cm. All nutrients are high to very high levels. The beginning 2007 soil nitrate-N values after soybean ranged from 50 to 60 lb/ac in 2 feet.

Nitrogen treatments are 0, 30, 60, 90, 120, 150, and 180 lb N/ac as urea. The N rates are over-laid on three rotations; corn on soybean (CS), corn on corn (CC), and corn on corn with above-ground residue removed ($CC_{rr)}$. The experimental design is a split-strip with four replications. The N rates are the splits within each rotation strip. Plot size is 15 by 50 feet. The urea was broadcast with a Gandy air applicator on May 1, 2007. The field was disked and field cultivated the same day.

Corn (Dekalb DKC58-16) was planted at 30,000 seeds/ac on May 2, 2007. Weeds were controlled as needed. SPAD 502 meter readings (indicates greenness of plant tissue) were taken on mid-V6 leaf and whole plant samples were taken at V6 stage on June 8, 2007. Ear leaf samples were obtained for N concentration analysis on July 7, 2007. Grain was harvested in the four center rows, each 45 foot in length with a plot combine. Four soil cores were sampled in 0-12, 12-24, and 24-36 inch increments and composited by depth on November 1, 2007. Stalks were chopped, raked and baled on the low residue strips. No fall tillage was done.

RESULTS

N rate did not significantly increase plant greenness at V6 (Table 1). Rotation significantly influenced plant greenness. On average the plants on the corn after corn with residue were 4 SPAD meter units less than the other two rotations.

Rotation was the only factor to significantly influenced plant growth at V6 (Table 1). Much like the response with the SPAD meter, CC plants were the smallest at V6. Across all N rates, plants under the CC rotation were smaller when compared to the other two rotations. Ear leaf N concentrations are not yet complete.

Grain yield was significantly increased by rotation and not by the N rate or the interaction (Table 2). Because of drought stress, there is variability with yield response to N rate. The response to N over all rotations indicates a grain yield increase to 30 lb N/ac, then yields are quite variable due to the extreme drought conditions in June, July and August.

Average grain yield (over all N rates) is highest after soybean, followed by the rotation with the corn residue removed (Table 2). The CC rotation averages 214% lower in yield than the corn after soybean rotation. This is much higher than the 10 to 15% lower yields reported by other studies in good years. The relative decrease is much greater when compared with other studies under a stressed environment. Less extensive roots with the CC rotation is thought to have limited water uptake. The CCrr rotation produced 116% less yield than the CS rotation. In general, residual soil nitrate-N increased with additional N for all rotations (Table 2). Soil nitrate increase occurred quite evenly with each 30 lb N/ac addition. This makes sense in that little yield response was seen from each N rate addition. The effect of rotation was significant at the 0.10 level with regard to carryover nitrate. Even though the CC rotation had significantly less yield, the carryover nitrate-N was lower compared to the other rotations. This effect may suggest that microbial immobilization of N is a factor with this high C:N residue rotation (i.e. the microbes are utilizing the available soil N to breakdown residue). Carryover nitrate-N was relatively the same when compared with the CCrr rotation.

SUMMARY AND CONCLUSIONS

Drought decreased yields for the second year of this long term study. Nitrogen rate did not significantly affect early plant green color, early growth, or grain yield, but did significantly influence carryover soil nitrate-N. The corn after corn rotation with residue produced less green plants, early growth, grain yield and soil N carryover. Lower N efficiency occurred in this stress year. It is too early in the study to suggest N rate needs for each rotation/residue combination.

ACKNOWLEDGEMENTS

Funding for this research provided by South Dakota Ag Experiment Station, SDSU Soil Testing Lab, and Southeast SD Research Farm.

Table 1. Influence of N rate, crop rotation and residue removal on SPAD meter readings and dry plant weight at V6 stage, Beresford SD, 2007.

N Rate	------- Rotation/residue -----			
	CS[1]	CC[2]	CC_{rr}[3]	**Mean**
	---------- SPAD meter reading[4] ----------			
0	48.7	44.5	47.5	**46.9**
30	47.6	45.6	49.0	**47.4**
60	47.2	44.0	48.2	**46.5**
90	48.4	45.5	49.4	**47.8**
120	48.9	43.5	47.8	**46.7**
150	48.7	44.2	50.4	**47.8**
180	47.4	46.2	48.6	**47.4**
Mean	**48.1**	**44.8**	**48.7**	
Stats	CV=3.8%. Pr>F: rate=0.649, rot. = 0.029, rate x rot. = 0.413			
	---------- V6 dry weight, gm ----------			
0	39.0	33.0	38.5	**36.8**
30	45.3	32.0	40.8	**39.3**
60	38.0	35.0	37.5	**36.8**
90	40.3	29.5	37.5	**35.8**
120	38.0	31.0	32.0	**33.7**
150	40.5	34.5	36.8	**37.3**
180	37.8	31.0	38.0	**35.6**
Mean	**39.8**	**32.3**	**37.3**	
Stats	CV = 13.1%. Pr>F: rate = 0.694, rot. = 0.006, rate x rot. = 0.665			

[1] CS = corn after soybean
[2] CC = corn after corn
[3] CC_{rr} = corn after corn, residue removed
[4] higher readings = higher measure of greenness or chlorophyll

Table 2. Influence of N rate, crop rotation and residue removal on corn grain yields and residual soil nitrate-N, Beresford SD, 2007.

N Rate	------- Rotation/residue -----			
	CS[1]	CC[2]	CC_{rr}[3]	**Mean**
	---------- corn grain yield, bu/ac ----------			
0	81.1	30.3	38.2	**49.9**
30	113.0	38.4	66.5	**72.6**
60	105.5	35.1	43.8	**61.5**
90	99.9	41.5	37.9	**59.7**
120	80.6	16.6	26.2	**41.1**
150	100.6	42.0	57.7	**66.8**
180	127.1	22.4	55.8	**68.5**
Mean	**101.1**	**32.2**	**46.6**	
Stats	CV=26.2%. Pr>F: rate = 0.387, rot. = 0.001, rate x rot. = 0.134			
	---------- nitrate-N, lb/ac in 3 feet [4] ----------			
0	90.0	58.2	70.5	**72.9**
30	72.7	62.9	62.8	**66.1**
60	108.8	74.5	89.4	**90.9**
90	131.7	99.4	120.9	**117.3**
120	145.1	169.5	146.3	**153.6**
150	192.4	139.6	227.1	**186.3**
180	203.3	225.8	232.4	**220.5**
Mean	**134.8**	**118.6**	**135.6**	
Stats	CV=39%. Pr>F: rate = 0.001, rot. = 0.10, rate x rot. = 0.517			

[1] CS = corn after soybean
[2] CC = corn after corn
[3] CC_{rr} = corn after corn, residue removed
[4] sampled Oct. 25 2006.

TESTING THE SPEED SCOUTING METHOD FOR SOYBEAN APHID THRESHOLD DECISION-MAKING IN SOUTH DAKOTA

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Plant Science 0704

INTRODUCTION

The soybean aphid, *Aphis glycines*, has emerged in recent years as the most important new insect pest of Midwestern soybeans. This Asian aphid was first detected in North America in 2000, and quickly became a pest through most of the Midwest. By 2005, entomologists in six states (IA, MI, MN, NE, ND, and WI) had performed 19 yield-loss experiments over a three year period, encompassing a wide range of environmental conditions and geographic locations. The result of this large-scale cooperative project was a common threshold recommendation now in effect through most of the Midwest (Ragsdale et al. 2007). Research in 2006 by the Soybean Entomology Program at South Dakota State University has confirmed the validity of this threshold recommendation for this state (Tilmon et al. in prep.)

Using appropriate thresholds for the treatment of soybean aphid provides producers with significant cost-savings. However, following threshold guidelines requires weekly scouting during soybean aphid season (typically late-June or July through August) to determine which fields have reached threshold. Typical scouting plans call for whole-plant counts of the total number of aphids per plant on 20-30 plants per field. This can be time-consuming. To increase scouting efficiency, researchers at the University of Minnesota developed a binomial sequential sampling plan, dubbed "Speed Scouting" (Hodgson et al. 2007). The basis of this scouting scheme is to determine if plants are "infested" or not (without counting the total aphids per plant), and to base a treatment decision on the number of infested plants encountered for a given amount of sampling effort. This binomial sampling plan is designed to estimate when a field has reached a threshold level of 250 aphid/plant on average.

The purpose of this study was to examine the Speed Scouting method for possible use in South Dakota. This report represents a preliminary analysis of this study, with more detailed analyses to follow.

METHODS

This experiment was performed at the Southeast Research Station in Beresford, South Dakota in the summer of 2007. Sixteen plots of ½ acre each were established in a field planted in 30"rows of the soybean variety S19R5. Plots were eight rows wide with a buffer of two rows between each plot. Plots were assigned to one of four treatments in a randomized complete block design, replicated four times. In three treatments we used a conventional

scouting method on 20 plants per plot (whole-plant aphid counts), and made treatment decisions at either (1) 5 aphids per plant [prophylactic insecticide approach], (2) 250 aphids/plant [Midwest standard threshold], or (3) maximum aphids per plant [a no-treatment control]. In the fourth treatment, we employed the Speed Scouting method as described by Hodgson et al. (2007). This method requires determining the number of plants infested with aphids (where infestation = 40 or more aphids per plant), in a range of 6 to 31 plants on a sliding scale depending on infestation rates, with a treatment decision reached according to details outline in Hodgson et al. (2007).

We scouted each plot either weekly or every other week from July 5 through August 30, recording the time it took to scout each plot and the number of aphids per plant or infestation level (depending on the scouting method). Scouting the Speed Scouting plots required determining the number of plants infested with aphids between a range of 6 and 31 plants in a sliding scale depending on infestation rates. Only one insecticide treatment was warranted, on the 5-aphid prophylactic treatment, applied on August 9 (Warrior at 3.2 oz/acre). On October 5, plots were harvested and yield data taken. Data were analyzed using one-way ANOVA and Tukey HSD multiple comparisons.

RESULTS

Aphid Density

The peak average number of aphids/plant in each of the 16 plots (i.e., the average number of aphids per plant during the *one week* in the season when a given plot reached its maximum aphid peak for the season) ranged from 4 to 99 aphids per plant. The peak average number of aphids by treatment was 7, 52, and 47 aphids per plant in the 5-aphid, 250-aphid, and max-aphid treatments, respectively [we did not count total aphids per plant in the Speed Scouting treatment as this treatment only required us to determine if a given plant was “infested.”]. Thus, aphid numbers were generally low. Only one treatment reached a treatment threshold point – the 5-aphid per plant prophylactic treatment, applied on August 9. The 250-aphid, max-aphid, and Speed Scouting treatments did not reach threshold aphid densities.

Yield

Average treatment yields ranged from 46 to 49 bu/ac (Figure 1). Analysis of variance showed no significant treatment effects on yield. Tukey HSD multiple comparison of yields by treatment showed no significant differences among any treatments.

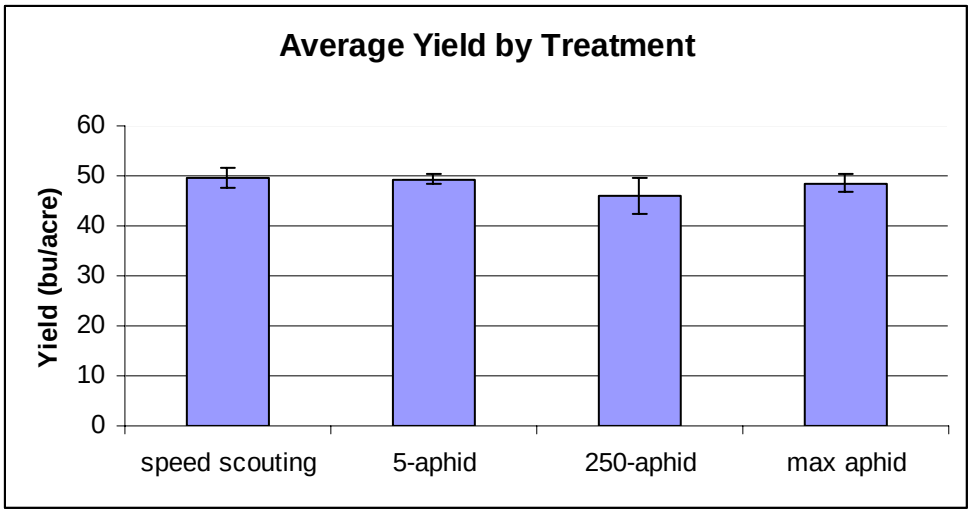

Figure 1. Average yield by treatment. The only treatment to receive insecticide application was the 5-aphid prophylactic threshold treatment. There was no significant difference in yield by treatment, or between the 5-aphid treatment and any of the other three treatments which received no insecticide.

Scouting Time

There was a significant difference in the scouting time per plot among treatments ($p < 0.001$). Scouting in the 5-aphid, 250-aphid, and max-aphid treatments all required whole-plant total aphid counts on 20 plants per plot per sampling date. The average time to scout each of these treatments was 12.3, 13.7, and 14.1 minutes/plot, respectively. The Speed Scouting treatment required an average of 7.5 minutes/plot to scout – only slightly above half the amount of time required to scout equal-sized plots conventionally.

DISCUSSION

Aphid numbers in our field at the Southeast Research Farm were generally too low to provide a full test of the Speed Scouting method for arriving at treatment decisions for soybean aphid. An ideal test would employ treatments that reached the standard Midwestern threshold level, as determined by either conventional or Speed Scouting. This would allow a comparison of the yield protection provided by conventional vs. Speed Scouting methods. Because our treatments did not reach threshold as determined by either method, this comparison was not possible. This is a relevant comparison in light of the fact that other experiments have shown Speed Scouting to be inherently more conservative than traditional scouting, consistently yielding a “treat” decision before conventional scouting does (Hodgson et al. 2007).

We did find an appreciable time-savings for scouting by the Speed Scouting method, which allowed us to reach a “no treat” decision significantly faster than in the traditional-scouting treatments. This time difference would likely have been even larger if there had been more aphids to count in the whole-

plant scouting treatments (as there would be in years or locations of greater aphid density).

Finally, this experiment further reinforces previous findings that a prophylactic insecticide treatment at 5 aphids/plant provides no yield advantage compared to employing an appropriate threshold.

ACKNOWLEDGMENTS

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OAT PROJECT

Lon Hall

Plant Science 0705

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 SD950864/3/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.

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 experimental 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		

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2007 ALFALFA PRODUCTION

Vance Owens and Chris Lee

Plant Science 0706

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 their selection process. Even though our yield trial does not contain all available cultivars, it should be a helpful tool in identifying those suitable for the area.

Table 1 provides forage production data for 15 alfalfa cultivars planted in 2005. Tons of dry matter yield are shown for four cuttings in 2007, total production in 2006, 2005, and a cumulative total for 2005-07. Cultivars are ranked from highest to lowest based on the total cumulative yield. The least significant difference (LSD) listed at the bottom of Tables 1 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.

Six replications of each cultivar were planted at 18 lbs pure live seed/acre. Fifty pounds of super phosphate (P_2O_5) was applied and incorporated before planting each trial. 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 (Table 1).

Table 1. Forage yield of 15 alfalfa cultivars entered in the South Dakota State University alfalfa testing program. Trial is located at the Southeast Research Station near Beresford, SD. Alfalfa was planted 2 May 2005 into plots arranged in a randomized complete block design with six replications.

	2007					2006	2005	3-year
Entry	26-May	27-Jun	1 Aug.	12-Sep	Total	Total	Total	Total
	Tons Dry Matter/Acre							
4S419	2.02	1.84	0.69	0.68	5.22	5.36	1.51	12.10
6400 HT	2.11	1.75	0.81	0.71	5.38	5.08	1.61	12.06
Genoa	1.95	1.94	0.86	0.69	5.44	5.16	1.34	11.95
54V46	1.93	1.73	0.66	0.61	4.93	5.00	1.49	11.42
Integrity	2.16	1.69	0.48	0.56	4.89	4.99	1.29	11.17
Meadowlark	1.87	1.63	0.58	0.62	4.69	5.02	1.41	11.12
6415	1.92	1.83	0.55	0.53	4.83	4.80	1.36	10.99
WL 357HQ	1.91	1.78	0.56	0.51	4.76	4.91	1.32	10.99
FSG 408DP	1.86	1.59	0.50	0.66	4.61	4.93	1.43	10.97
Marvel	1.90	1.76	0.50	0.51	4.67	5.01	1.29	10.96
4A421	1.82	1.75	0.42	0.48	4.46	4.94	1.09	10.50
Escalade	1.88	1.59	0.45	0.55	4.46	4.71	1.31	10.48
361 HY	1.95	1.62	0.33	0.47	4.38	4.87	1.11	10.36
Vernal	2.03	1.38	0.33	0.53	4.27	4.70	1.31	10.27
54H91	1.74	1.47	0.46	0.48	4.16	4.58	1.38	10.12
Average	1.94	1.69	0.54	0.57	4.74	4.94	1.35	11.03
Maturity (Kalu & Fick)	3.7	5.1	5.8	5.1				
LSD (P=0.10)	NS	NS	NS	0.15	NS	NS	0.25	NS
CV (%)	12.1	17.5	59.7	26.9	18.4	9.2	19.3	13.2
P-value	0.261	0.145	0.193	0.074	0.325	0.376	0.098	0.335

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

Acknowledgements

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2007 SOYBEAN FOLIAR FUNGICIDE TRIALS

Kay R. Ruden and Bradley E. Ruden

Plant Science 0707

INTRODUCTION

Soybeans can be damaged by several foliar diseases throughout the growing season. Major foliar diseases in the United States cause significant yield losses each year throughout soybean production areas and fungicide applications for the control of these diseases are required. Although South Dakota has, to date, been free of the major yield robbing foliar diseases present in the southern United States, such as soybean rust (*Phakopsora pachyrhiza*), frogeye leafspot (*Cercospora sojina*) and target spot (*Corynespora cassiicola*), yield losses from foliar diseases may still occur, but are largely undocumented. Foliar diseases were of minor importance in 2007. Septoria brown spot (*Septoria glycines*), a common disease in SD was fairly minor and generally not observed until August when the crop was in the R4 to R6 growth stage. Late in the season, Septoria brown spot become more common, but remained low in the canopy at insignificant levels. Downy mildew (*Peronospora manshurica*) was identified late in the season at a few locations at low severity. Powdery mildew (*Microsphaera diffusa*) was commonly present in wetter areas of Eastern South Dakota on susceptible varieties but levels rarely reached economic significance. Bacterial blight (*Pseudomonas syringae glycinea*) was present but not as common as in 2006 due to drought and when present was at a very low incidence and severity. Brown spot and occasionally bacterial blight can cause economic yield loss if environmental conditions are favorable for disease development.

Brown spot is the most commonly observed fungal foliar disease of soybean and therefore presumably the most important. Wet, humid conditions and heavy crop canopies tend to favor foliar disease development. Brown spot occurs in South Dakota every year in every field at varying severities. The brown spot pathogen survives in crop residues. The pathogen can be dispersed from the infected residues to soybean plants by splashing rain. The brown spot pathogen normally infects older leaves, but soybeans weakened by other diseases or environmental conditions become susceptible to this disease. Normally, no significant yield losses results from brown spot unless premature defoliation occurs in the mid and upper canopy. Fungicide application, if environmental conditions favor development of the disease, may be an effective management strategy. However, fungicides vary in their activity against this pathogen. Fungicide application for the purpose of increasing plant health, even in the absence of obvious disease, is also receiving significant producer interest and is being investigated.

MATERIALS AND METHODS

Asgrow AG1903RR was planted at 150,000 seeds/acre at the Southeast Research Farm (SERF) near Beresford, SD and at the SDSU Experiment Farm at Brookings.

The experiment was planted in

randomized complete blocks (RCBD) with four replications of each treatment. The plots were planted, rated and harvested on the dates listed in Table 1. Plants were rated for fungal foliar diseases and yield. While Asian soybean rust was being scouted for, it did not occur in SD in 2007, so only brown spot was rated. Treatments in this study were compared to an untreated check.

RESULTS AND DISCUSSION

No significant differences were observed among treatments for brown spot and yield at the SE Farm. At Brookings, there were significant differences among treatments for brown spot although those differences did not translate to differences in yield. As such, while there were identifiable differences statistically, under the level of disease observed under the dry conditions of 2007, no specific recommendations can be made for which fungicides best control brown spot. It can be inferred that under the conditions of 2007, when brown spot remains in the lower canopy, it is not causing any significant impact on yield.

ACKNOWLEDGEMENT

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Table 1. Dates of planting, plot evaluations, and harvest at study locations.

Activity	Date of activity by location	
	SE Research Farm	Brookings AES
Planting	June 11, 2007	May 24,2007
Disease Rating	September 12, 2007	September 14, 2007
Harvest	October 31, 2007	October 30, 2007

Table 2. Products, rates and growth stages of fungicides applied as foliar treatments in 2007.

Product	Rate		Growth Stage
Untreated			
Folicur 3.6F	4	fl oz/A	R3 + 14-21 days after
Absolute 500 SC	5	fl oz/A	R3 + 14-21 days after
Stratego	10	fl oz/A	R3 + 14-21 days after
Induce NIS	0.125	% V/V	R3 + 14-21 days after
Domark 230 ME	3	fl oz/A	R3
Domark 230 ME	4	fl oz/A	R3
Domark 230 ME	3	fl oz/A	R3
Orthene	0.75	lb/A	R3
Domark 230 ME	4	fl oz/A	R3
Orthene	0.75	lb/A	R3
Cobra	6	fl oz/A	R1
Induce NIS	0.25	% V/V	R1
Folicur	4	fl oz/A	R3
Headline	4.7	fl oz/A	R3
Folicur	3.1	fl oz/A	R3
Quadris Flowable	9.2	fl oz/A	R3
Topguard	7	fl oz/A	R1-R2
Topguard	7	fl oz/A	R1-R2
Topguard	7	fl oz/A	R3-R4
Topguard	14	fl oz/A	R1-R2
Folicur	4	fl oz/A	R1-R2
Headline	6	fl oz/A	R3
Induce NIS	0.25	% V/V	R3
Alto	4	fl oz/A	R3
Induce NIS	0.25	% V/V	R3
Quilt	14	fl oz/A	R3
Prime Crop Oil	1	% V/V	R3
Tilt	4	fl oz/A	R3
Laredo	7	fl oz/A	R3
Induce NIS	0.125	% V/V	R3
Punch	4	fl oz/A	R3
Induce NIS	0.25	% V/V	R3
Caramba	8.2	fl oz/A	R3
Headline	3.6	fl oz/A	R3
Folicur	2.4	fl oz/A	R3

Table 3. Soybean Foliar Fungicide Study: Disease rating and yield associated with various foliar treatments at Beresford and Brookings, SD.

Foliar Treatment	Brown Spot Disease Rating %		Yield (bu/ac)	
	SE Farm	Brookings	SE Farm	Brookings
Untreated	0.75	2.00	48.01	53.12
Folicur 3.6F	0.38	**0.38**	45.50	55.66
Absolute 500 SC	0.00	**0.00**	44.54	54.55
Stratego	0.00	**0.00**	44.14	53.30
Induce NIS				
Domark 230 ME	1.00	**0.25**	41.65	54.56
Domark 230 ME	0.38	**0.13**	45.39	53.33
Domark 230 ME	1.25	**0.25**	46.69	48.00
Orthene				
Domark 230 ME	0.63	**0.25**	48.74	53.55
Orthene				
Cobra	2.00	2.63	44.55	50.59
Induce NIS				
Folicur	0.63	1.38	47.28	55.62
Headline	0.25	**0.00**	44.25	52.94
Folicur				
Quadris Flowable	0.63	**0.25**	45.87	50.30
Topguard	1.38	2.50	42.03	49.94
Topguard	0.50	**0.25**	42.67	51.03
Topguard				
Topguard	0.75	1.75	51.30	54.11
Folicur	0.63	2.75	46.11	52.45
Headline	0.00	**0.00**	41.24	47.30
Induce NIS				
Alto	0.38	**0.25**	42.76	51.22
Induce NIS				
Quilt	0.13	**0.38**	42.81	52.85
Prime Crop Oil				
Tilt	0.50	**0.50**	46.54	54.50
Laredo	0.50	**0.38**	50.05	52.61
Induce NIS				
Punch	0.88	**0.13**	45.91	51.23
Induce NIS				
Caramba	0.50	**0.75**	48.06	53.50
Headline	0.13	**0.13**	47.36	54.49
Folicur				
F-LSD(P=0.05)	NS	1.083	NS	NS
CV	125.25	106.58	9.29	8.86

EASTERN SOUTH DAKOTA OAT VARIETY PERFORMANCE RESULTS[1]

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Plant Science 0708

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 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. Plots were seeded at 28 pure-live-seeds (PLS) per square foot or 1,219,680 PLS seeds per acre.

PERFORMANCE TRIAL RESULTS

General comments – Small grain performance results for the Southeast Research Station and two other locations are presented in tables 1 and 2. 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 data column. Look for TPG values identified with a plus sign (+).

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.

DISCUSSION OF PERFORMANCE RESULTS AND TABLES

Oat (Tables 1 and 2) - The top performing entries for yield for the past 3 years as determined by state top yield frequency (3-Yr column in Table 1) 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 of50% or higher.

The top bushel weight entry (Table 2) was 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 Hi Fi 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 SD 020301-20.

Table 1. Oat performance results at the Southeast Research Station, Beresford, SD and at two other east river locations in 2005-07.

Variety (Hdg.)*- by 3-yr then 2007 state yield avg.	Location Yield Avg. (Bu/ac at 13% moist.)						State Yield Avg.** (BU/A)		State Top-Yield Freq. *** (%)	
	Brookings		South Shore		Beresford					
	2007	3-Yr	2007	3-Yr	2007	3-Yr	2007	3-Yr	2007	3-Yr
Hulled types:										
Stallion (8)	123+	119+	141+	129+	133+	126+	113	122	63	100
HiFi (8)	115	123+	134	131+	102	112+	104	122	25	100
Beach (6)	124+	117+	139+	125+	122	114+	107	118	38	100
Morton (7)	114	110+	137	129+	113	111+	105	115	0	100
Loyal (8)	115	117+	130	119+	108	113+	100	113	13	100
Don (1)	112	112+	130	114+	113	99	107	106	0	75
Jerry (5)	117	113+	119	107	112	107+	100	106	0	75
Reeves (2)	107	105+	133	112	119	101	103	103	0	50
Hytest (4)	84	89	91	94	65	70	74	84	0	0
SD 041405 (-)	119	.	149+	.	131+	.	119	.	88	
SD 041451 (-)	119	.	148+	.	125+	.	115	.	75	
SD 041445 (-)	130+	.	139+	.	128+	.	114	.	75	
Souris (6)	123+	.	141+	.	117	.	112	.	63	
SD 030888 (-)	127+	.	146+	.	125+	.	112	.	75	
SD 020883-10 (-)	109	.	148+	.	127+	.	110	.	50	
SD 020883-29 (-)	115	.	136	.	122	.	109	.	38	
SD 020883-11 (-)	111	.	146+	.	124+	.	109	.	38	
SD 020883-17 (-)	117	.	142+	.	115	.	108	.	25	
SD 041117 (-)	113	.	144+	.	121	.	108	.	25	
SD 020301-20 (-)	86	.	116	.	91	.	84	.	0	
Hulless types:										
Buff Hls (3)	78	84	97	91	93	85	76	84	0	
Stark Hls (6)	39	60	77	77	63	63	49	67	0	
Test avg. :	109	104	131	112	112	100	102	104		
High avg. :	130	123	149	131	133	126	119	122		
Low avg. :	39	60	77	77	63	63	49	67		
# LSD (.05) :	8	18	11	18	10	23				
## TPG-value :	122	105	138	113	123	103				
### C.V. :	5	8	6	8	7	11				

* Heading, the relative days to heading, compared to the variety - Don.
** This average includes eight statewide test locations.
*** The frequency or percentage that a variety was in the TPG for yield over eight statewide locations.
# LSD, the amount two values in a column must differ to be significantly different.
TPG-value - 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 South Dakota and state oat averages for bushel weight (BW), height (HT), lodging (LDG), and grain protein (PRT) in 2007.

Variety (Hdg.)* - by state BW avg.	Eastern Avg.** - BW, HT, LDG, PRT				State Avg.*** - BW, HT, LDG, PRT			
	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.

** Average includes six locations: Brookings, South Shore, Beresford, Miller, Selby, and Brown Co.

*** Average includes eight statewide test locations.

§ 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 (TPG).
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 RESULTS AT BERESFORD AND GEDDES[1]

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Plant Science 0709

This reports the 2007 Southeast Research Station performance trials for both non-Roundup-Ready™ and Roundup-Ready™ soybean entries and the Roundup-Ready™ soybean entries at Beresford; and for the Curtis Sybesma farm trial at Geddes, SD that were conducted by the South Dakota State University Crop Performance Testing program.

Experimental Procedures

Entries were placed in either maturity group-I or group-II trials by to the maturity rating reported by the seed company. There are, however, no standard regional or national check entries for maturity. Consequently, in some trials, borderline entries with maturity group ratings at or near the break between the late group-I's and early-group-II's may crossover.

Entries were seeded in three replications (plots) with each replicate randomly located within a block of a randomized complete block experimental design. Plots consisted of four 30-inch rows, 20 feet long; and were seeded on June 9 and May 26, 2007 at Beresford and Geddes, respectively. A Monosem precision planter was 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 Beresford was an Egan-Clarno-Trent silt clay loam with a 0-2% slope and at Geddes it was a Highmore-Walke silt loam with a 0-2% slope. Both locations were 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/Kicker plus at Beresford and Roundup at Geddes. Weed control in the non-Roundup-Ready™ trials at Beresford consisted of a post-emergence split application of Harmony/Poast at label rates.

Yields (bu/ac) 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 year protein and oil values were obtained from each of three samples (one per replicate) using a FOSS TECATOR Model Infratec 1229 grain analyzer with each sample rounded-off to the nearest tenth (0.1).

[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 are a plot average where the 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 year's LSD value equals 4 bu/ac, it can be used to compare the yields of two entries. If entry A yields 50 bu/ac and entry B yields 48 their yield difference is 2 bu/ac (50 - 48 = 2). This means the two entries do not differ in yield because their difference of 2 bu/ac is less than the LSD value of 4 bu/ac. In contrast, if variety C yields 45, the difference between entry A and C is 5 bu/ac (50-45 = 5). This means varieties A and C differ in yield because their difference of 5 bu/ac is more than the LSD value of 4 bu/ac, therefore, 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/ac and the LSD value at the bottom of the column is 4 bu/ac one can determine that the minimum yield value needed for TPG this year is 50 bu/ac (54 - 4 = 50). Technically, a yield of 51 is in the TPG while a yield of 50 bu/ac is not. However, because the yield averages and LSD values are rounded to the nearest whole number, one can say 50 bu/ac, 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 the 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 (0.1) 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 of a number instead of a whole number.

PERFORMANCE TRIAL RESULTS FOR 2006-07

ROUNDUP READY™ ENTRIES:

Beresford, Group-I (Tables 1a & 1b): The 2007 and 2-yr. yield averages were 57 and 55 bushels per acre, respectively (Table 1a). Entries had to average 55 and 54 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 and 7 bushels per acre for two years to be significantly different. The 2007 protein and oil averages were 35.4% and 21.1%, respectively (Table 1b). Entries had to average 36.5% or higher in protein and 21.8% or

higher in oil content to be in the TPG for 2007. Entry protein and oil content averages had to differ by 0.8% and 0.4%, respectively, to be significantly different. The 2007 lodging score average was 1 (Table 1b) and entries had to average 1 in lodging score to be in the TPG, and scores had to differ by 1 to be significantly different.

Geddes, Group-I (Tables 1a & 1b The 2007 and 2-yr. yield averages were 55 and 51 bushels per acre, respectively (Table 1a). Entries had to average 54 and 50 bushels or higher to be in the TPG for 2007 and for two years, respectively. Variety yield averages had to differ by 6 bushels in both 2007 and for two years to be significantly different. The 2007 protein and oil averages were 32.5% and 20.8%, respectively (Table 1b). Entries had to average 33.3% or higher in protein and 21.3% 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 0.4%, respectively, to be significantly different. The 2007 lodging score average was 1 (Table 1b); and because all entries averaged 1, all entries were in the TPG.

Beresford, Group-II (Tables 2a & 2b): The 2007 and 2-yr. yield averages were 54 and 60 bushels per acre, respectively (Table 2a). Entries had to average 55 and 59 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 and 7 bushels per acre for two years to be significantly different. The 2007 protein and oil averages were 35.4% and 20.2%, respectively (Table 2b). Entries had to average 37.0% or higher in protein and 20.9% or higher in oil content to be in the TPG for 2007. Entry protein and oil content averages had to differ by 0.8% and 0.5%, respectively, to be significantly different. The 2007 lodging score average was 1 (Table 2b); and entries had to average 1 to be in the TPG, and had to differ by 1 to be significantly different.

Geddes, Group-II (Tables 2a & 2b): The 2007 and 2-yr. yield averages were 56 and 51 bushels per acre, respectively (Table 2a). Entries had to average 58 and 47 bushels or higher to be in the TPG for 2007 and for two years, respectively. Variety yield averages had to differ by 7 bushels per acre in 2007 to be significantly different. The variety yield differences for two years did not differ significantly. The 2007 protein and oil averages were 33.3% and 19.7%, respectively (Table 2b). Entries had to average 34.6% or higher in protein and 20.4% or higher in oil content to be in the TPG for 2007. Entry protein and oil content averages had to differ by 1.5% and 0.8%, respectively, to be significantly different. The 2007 lodging score average was 1 (Table 2b); entries had to average 1 to be in the TPG, and had to differ by 1 to be significantly different.

Table 1a. Roundup Ready™ maturity group-I soybean variety yield averages- southern South Dakota, 2006-07.

Brand/Variety (By 2-yr then 2007 zone yield)	Average DTM*	Southern Averages by Location				Southern Zone Averages	
		Beresford		Geddes			
		Bu/Acre 2007	Bu/Acre 2-Yr	Bu/Acre 2007	Bu/Acre 2-Yr	Bu/Acre 2007	Bu/Acre 2-Yr
PRAIRIE/ BR. PB-1956RR	115	56	61	60	56	58	59
ASGROW/ AG1702	109	57	59	56	53	57	56
NUTECH/ NT-1991RR	114	55	58	58	53	57	56
KRUGER/ K-194RR	113	54	57	57	53	56	55
PRAIRIE/ BR. PB-1954RR	112	59	59	53	50	56	55
WENSMAN/ W 2172NRR	110	55	59	56	51	56	55
KRUGER/ K-195+RR/SCN	112	54	59	55	51	55	55
WENSMAN/ W 2195NRR	110	54	57	53	51	54	54
KRUGER/ K-140RR	108	53	54	59	50	56	52
SD/ 1161RR/SCN	110	52	56	53	48	53	52
SD/ 1111RR	109	47	47	48	43	48	45
NUTECH/ NT-7205+RR	116	59	.	58	.	59	.
KRUGER/ EXP19A07	110	56	.	59	.	58	.
WENSMAN/ W 2166RR	110	56	.	60	.	58	.
PRAIRIE/ BR. PB-EX228RR	116	56	.	58	.	57	.
NUTECH/ NT-7193RR/SCN	111	54	.	58	.	56	.
PRAIRIE/ BR. PB-1914RR	114	54	.	56	.	55	.
PRAIRIE/ BR. PB-EX147RR	113	56	.	54	.	55	.
KRUGER/ K-142RR	109	51	.	57	.	54	.
KRUGER/ K-170RR/SCN	110	56	.	51	.	54	.
PRAIRIE/ BR. PB-1754RR	110	57	.	51	.	54	.
KRUGER/ K-120RR	105	52	.	53	.	53	.
PRAIRIE/ BR. PB-1737NRR	110	54	.	52	.	53	.
PRAIRIE/ BR. PB-EX117NRR	113	55	.	51	.	53	.
PRAIRIE/ BR. PB-EX207RR	113	55	.	51	.	53	.
NUTECH/ NT-1808RR/SCN	112	55	.	49	.	52	.
KALTENBERG/ KB196RR	109	57	.	.	.	.	.
ZILLER/ BT 7186NR	108	58	.	.	.	.	.
Test avg. :	111	55	57	55	51	55	54
High avg. :	116	59	61	60	56	59	59
Low avg. :	105	47	47	48	43	48	45
# LSD(.05) :		4	7	6	6	4	5
## TPG-avg. :		55	54	54	50	55	54
@ Coef. Var. :		4	5	6	7	5	10
No. Entries :	28	28	11	26	11	26	11

* DTM= days to maturity at Beresford and Geddes when seeded June 9 and May 26, 2007, respectfully.

LSD(.05)= amount column values must differ to be significantly different or if they were 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-I soybean variety protein, oil, and lodging score averages- southern South Dakota, 2007.

Brand/Variety (By 2007 zone protein)	Average DTM*	Southern Averages by Location						Southern Zone Averages		
		Beresford			Geddes					
		Protein (%)	Oil (%)	Lodging (1-5)*	Protein (%)	Oil (%)	Lodging (1-5)*	Protein (%)	Oil (%)	Lodging (1-5)*
KRUGER/ K-170RR/SCN	.	36.7	20.3	1	34.4	20.2	1	35.6	20.3	1
PRAIRIE/ BR. PB-1754RR	.	37.2	20.2	1	33.3	20.1	1	35.3	20.2	1
PRAIRIE/ BR. PB-1737NRR	.	36.6	20.7	1	33.7	20.2	1	35.2	20.5	1
SD/ 1161RR/SCN	.	36.2	20.6	1	33.3	20.3	1	34.8	20.4	1
KRUGER/ EXP19A07	.	35.6	21.1	1	33.6	20.9	1	34.6	21.0	1
PRAIRIE/ BR. PB-EX147RR	.	35.6	20.8	1	33.2	20.5	1	34.4	20.7	1
ASGROW/ AG1702	.	35.3	21.1	1	33.5	20.4	1	34.4	20.7	1
PRAIRIE/ BR. PB-1914RR	.	35.8	20.8	1	33.0	20.6	1	34.4	20.7	1
NUTECH/ NT-7205+RR	.	36.0	20.9	1	32.7	20.7	1	34.4	20.8	1
NUTECH/ NT-1808RR/SCN	.	35.2	21.2	1	33.2	20.5	1	34.2	20.9	1
NUTECH/ NT-1991RR	.	35.3	20.7	1	32.6	20.2	1	34.0	20.5	1
SD/ 1111RR	.	35.8	22.0	2	32.1	21.6	1	34.0	21.8	2
PRAIRIE/ BR. PB-EX117NRR	.	35.8	21.1	1	32.0	21.2	1	33.9	21.1	1
WENSMAN/ W 2195NRR	.	35.4	21.4	1	32.3	21.4	1	33.9	21.4	1
KRUGER/ K-140RR	.	35.3	21.5	1	32.4	21.0	1	33.8	21.3	1
NUTECH/ NT-7193RR/SCN	.	35.2	21.4	1	32.5	21.3	1	33.8	21.4	1
KRUGER/ K-142RR	.	34.8	21.9	1	32.5	21.0	1	33.7	21.5	1
KRUGER/ K-195+RR/SCN	.	34.9	21.7	1	32.4	21.4	1	33.7	21.6	1
WENSMAN/ W 2172NRR	.	35.1	21.8	1	32.1	21.5	1	33.6	21.7	1
PRAIRIE/ BR. PB-1954RR	.	35.1	20.9	1	32.0	20.7	1	33.6	20.8	1
KRUGER/ K-194RR	.	34.9	20.9	1	32.0	20.2	1	33.5	20.6	1
KRUGER/ K-120RR	.	34.8	20.7	1	32.1	20.0	1	33.4	20.3	1
PRAIRIE/ BR. PB-EX228RR	.	35.1	20.5	1	31.5	20.4	1	33.3	20.4	1
PRAIRIE/ BR. PB-1956RR	.	34.4	21.2	1	31.8	20.8	1	33.1	21.0	1
PRAIRIE/ BR. PB-EX207RR	.	34.2	21.2	1	30.7	21.3	1	32.5	21.3	1
WENSMAN/ W 2166RR	.	33.5	22.1	1	31.3	21.5	1	32.4	21.8	1
KALTENBERG/ KB196RR	.	35.8	21.3	1	.	.	.	.	.	.
ZILLER/ BT 7186NR	.	36.3	20.6	1	.	.	.	.	.	.
Test avg. :	.	35.4	21.1	1	32.5	20.8	1	34.0	20.9	1
High avg. :	.	37.2	22.1	2	34.4	21.6	1	35.6	21.8	2
Low avg. :	.	33.5	20.2	1	30.7	20.0	1	32.4	20.2	1
# LSD(.05) :		0.8	0.4	1	1.2	0.4	NS	***	***	1
## TPG-avg. :		36.5	21.8	1	33.3	21.3	1			1
@ Coef. Var. :		1	1	0	2	1	0	2	1	0
No. Entries :	0	28	28	28	26	26	26	26	26	26

* DTM= average days from seeding (Beresford- May 17, Geddes- May 25, 2007) to maturity; a missing value indicates the site received a hard frost before the variety reached maturity.

** Lodging, 1= all plants erect, 5= all plant flat.

*** The effect of variety differed significantly between locations for 2007. Therefore, evaluate varieties by looking at the 2007 columns at each location, not by looking at the Southern zone 2007 column.

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

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

Table 2a. Roundup Ready™ maturity group-II soybean variety yield averages- southern South Dakota, 2006-07.

Brand/Variety (By 2-yr then 2007 zone yield)	Average DTM*	Southern Averages by Location				Southern Zone Averages	
		Beresford		Geddes			
		Bu/Acre 2007	Bu/Acre 2-Yr	Bu/Acre 2007	Bu/Acre 2-Yr	Bu/Acre 2007	Bu/Acre 2-Yr
ASGROW/ DKB25-51	115	56	66	62	55	59	61
PRAIRIE/ BR. PB-2243RR	115	59	61	64	54	62	58
LATHAM/ L2810R	118	57	62	59	54	58	58
NUTECH/ NT-2220RR	115	53	61	58	54	56	58
PRAIRIE/ BR. PB-2421RR	115	55	62	59	52	57	57
DAIRYLAND/ DSR-2200/RR	113	52	60	58	53	55	57
MUSTANG/ M-264RR	119	56	61	57	51	57	56
KRUGER/ K-234RR	114	57	61	57	51	57	56
KRUGER/ K-259RR	118	54	60	56	52	55	56
MUSTANG/ M-237RR	114	57	59	57	51	57	55
DAIRYLAND/ DSR-2600/RR	115	57	60	56	49	57	55
DAIRYLAND/ DSR-2300/RR	113	52	60	51	50	52	55
PRAIRIE/ BR. PB-2636NRR	117	52	55	59	52	56	54
WENSMAN/ W 2200NRR	111	55	60	52	48	54	54
WENSMAN/ W 2253RR	118	51	57	52	50	52	54
LATHAM/ L2500R	113	54	61	48	47	51	54
MUSTANG/ M-246NRR	113	53	56	56	49	55	53
PUBLIC/ SD02R-5	112	53	57	57	49	55	53
PRAIRIE/ BR. PB-2565RR	117	53	56	53	50	53	53
NUTECH/ NT-6211	113	58	.	65	.	62	.
LATHAM/ EXP-E2250R	115	58	.	62	.	60	.
ASGROW/ DKB27-52	117	56	.	62	.	59	.
NUTECH/ NT-7206	115	56	.	61	.	59	.
NUTECH/ NT-6255	116	57	.	60	.	59	.
MUSTANG/ M-238NRR	113	56	.	60	.	58	.
LATHAM/ L2337R	113	56	.	59	.	58	.
PRAIRIE/ BR. PB-2515RR	116	52	.	64	.	58	.
WENSMAN/ W 2222NRR	114	55	.	61	.	58	.
ASGROW/ AG2603	116	55	.	59	.	57	.
NUTECH/ NT-6219	115	55	.	58	.	57	.
NUTECH/ NT-7222	113	57	.	56	.	57	.
KRUGER/ K-239RR	115	54	.	60	.	57	.
LATHAM/ L2158R	114	57	.	57	.	57	.
GOLD/ COUNTRY 9822RR	114	53	.	60	.	57	.
PRAIRIE/ BR. PB-2447RR	115	55	.	59	.	57	.
PRAIRIE/ BR. PB-2667NRR	116	55	.	58	.	57	.
PUBLIC/ SDX00R-035-56	116	54	.	57	.	56	.
KRUGER/ K-256RR	115	56	.	53	.	55	.
LATHAM/ EXP-E2458RV	115	54	.	56	.	55	.
LATHAM/ L2780RV	117	53	.	56	.	55	.
DAIRYLAND/ DSR-2770/RR	118	53	.	56	.	55	.
PRAIRIE/ BR. PB-2707RR	118	54	.	55	.	55	.
PRAIRIE/ BR. PB-EX271RR	116	52	.	57	.	55	.
PUBLIC/ SD(LD)05-16137	111	54	.	56	.	55	.
PUBLIC/ SD03-2006R	112	52	.	58	.	55	.
ASGROW/ AG2406	113	55	.	53	.	54	.
NUTECH/ NT-6242	117	52	.	55	.	54	.
NUTECH/ NT-6281	118	52	.	56	.	54	.
KRUGER/ K-275RR/SCN	116	52	.	56	.	54	.
LATHAM/ L2085R	112	52	.	56	.	54	.

Table 2a. Roundup Ready™ maturity group-II soybean variety yield averages- southern locations (continued).

Brand/Variety (By 2-yr then 2007 zone yield)	Average DTM*	Southern Averages by Location				Southern Zone Averages	
		Beresford		Geddes			
		Bu/Acre 2007	Bu/Acre 2-Yr	Bu/Acre 2007	Bu/Acre 2-Yr	Bu/Acre 2007	Bu/Acre 2-Yr
PUBLIC/ SDX00R-020-18	111	52	.	55	.	54	.
PUBLIC/ SD(LD)05-16118	114	53	.	54	.	54	.
ASGROW/ AG2906	118	50	.	55	.	53	.
MUSTANG/ M-228NRR	113	53	.	53	.	53	.
KRUGER/ K-201RR/SCN	111	54	.	51	.	53	.
KRUGER/ K-271RR	118	52	.	54	.	53	.
PUBLIC/ SDX01R-007039	115	51	.	54	.	53	.
MUSTANG/ M-318RR	120	49	.	54	.	52	.
NUTECH/ NT-7282	119	54	.	49	.	52	.
GOLD/ COUNTRY 3825NRR	116	52	.	52	.	52	.
PRAIRIE/ BR. PB-2697NRR	116	52	.	51	.	52	.
WENSMAN/ W 2300RR	119	49	.	54	.	52	.
ASGROW/ AG2606	116	50	.	52	.	51	.
MUSTANG/ M-277NRR	117	51	.	51	.	51	.
NUTECH/ NT-7293	117	51	.	50	.	51	.
HEFTY/ 277RN	117	52	.	49	.	51	.
KRUGER/ K-248RR/SCN	115	52	.	50	.	51	.
PUBLIC/ SD03-2222R	118	50	.	50	.	50	.
COYOTE/ 4523RR	109	50	.	.	.	.	.
COYOTE/ 4527RR	122	.	.	61	.	.	.
COYOTE/ EXP722NRR	118	.	.	56	.	.	.
COYOTE/ EXP725NRR	110	56	.	.	.	.	.
COYOTE/ EXP728NRR	117	53	.	.	.	.	.
FARM/ ADVANTAGE 7254N	111	56	.	.	.	.	.
FARM/ ADVANTAGE 7223N	116	.	.	59	.	.	.
FARM/ ADVANTAGE 7233N	119	.	.	59	.	.	.
HEFTY/ 226R	115	.	.	57	51	.	.
HEFTY/ 266R	119	.	.	53	49	.	.
HEFTY/ EXP218RN	106	55	.	.	.	.	.
HEFTY/ 257RN	109	50	.	.	.	.	.
HEFTY/ EXP298RN	117	55	.	.	.	.	.
HEFTY/ EXP248R	119	.	.	55	.	.	.
KALTENBERG/ KB247RR	112	51	.	.	.	.	.
KALTENBERG/ KB268RR	114	51	.	.	.	.	.
STINE/ 2523-4	108	53	.	.	.	.	.
STINE/ 2862-4	112	47	.	.	.	.	.
ZILLER/ BT 7217NR	112	55	.	.	.	.	.
RENK/ RS253RR	112	54	.	.	.	.	.
RENK/ RS277NRR	115	58	.	.	.	.	.
RENK/ RS247NRR	106	52	.	.	.	.	.
Test avg. :	115	54	60	56	51	55	56
High avg. :	122	59	66	65	55	62	61
Low avg. :	106	47	55	48	47	50	53
# LSD(.05) :		4	7	7	NS	**	**
## TPG-avg. :		55	59	58	47		
@ Coef. Var. :		5	7	8	7	6	13
No. Entries :	90	83	19	75	21	68	19

* DTM= days to maturity at Beresford and Geddes when seeded June 9 and May 26, 2007, respectfully.

LSD(.05)= amount column values must differ to be significantly different or if they were 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.

** The effect of variety differed significantly between locations for both 2007 and two years. Therefore, evaluate varieties by looking at the 2007 and 2-yr columns at each location, not by looking at the Southern zone columns.

Table 2b. Roundup Ready™ maturity group-II soybean variety protein, oil, and lodging score averages- southern South Dakota locations, 2007.

Brand/Variety (By 2007 zone protein)	Average DTM*	Southern Averages by Location						Southern Zone Averages		
		Beresford			Geddes					
		Protein (%)	Oil (%)	Lodging (1-5)*	Protein (%)	Oil (%)	Lodging (1-5)*	Protein (%)	Oil (%)	Lodging (1-5)*
ASGROW/ AG2606	.	37.7	18.9	1	36.0	18.8	1	36.9	18.9	1
PUBLIC/ SDX01R-007039	.	37.3	19.3	2	36.0	18.9	1	36.6	19.1	2
MUSTANG/ M-238NRR	.	36.8	20.3	1	35.2	19.8	1	36.0	20.0	1
DAIRYLAND/ DSR-2770/RR	.	36.6	20.1	1	35.4	18.9	1	36.0	19.5	1
MUSTANG/ M-277NRR	.	36.5	19.1	1	35.1	18.7	1	35.8	18.9	1
NUTECH/ NT-6281	.	36.9	19.7	1	34.6	19.4	1	35.7	19.6	1
LATHAM/ L2780RV	.	37.0	19.4	1	34.5	19.4	1	35.7	19.4	1
PRAIRIE/ BR. PB-2707RR	.	36.9	19.7	2	34.4	19.2	1	35.7	19.4	2
GOLD/ COUNTRY 9822RR	.	36.4	20.4	1	34.9	19.4	1	35.6	19.9	1
MUSTANG/ M-318RR	.	36.6	19.6	1	34.5	19.0	1	35.6	19.3	1
KRUGER/ K-271RR	.	36.4	20.0	1	34.6	19.2	1	35.5	19.6	1
KRUGER/ K-239RR	.	36.0	20.7	1	34.7	19.4	1	35.4	20.1	1
WENSMAN/ W 2253RR	.	35.9	20.0	1	34.8	18.8	1	35.4	19.4	1
ASGROW/ AG2906	.	36.6	19.3	1	33.9	19.0	1	35.3	19.2	1
DAIRYLAND/ DSR-2200/RR	.	36.3	20.4	1	34.1	19.7	1	35.2	20.1	1
PRAIRIE/ BR. PB-2565RR	.	36.0	19.7	1	34.2	19.2	1	35.1	19.5	1
LATHAM/ L2500R	.	36.3	19.9	1	34.0	19.6	1	35.1	19.7	1
ASGROW/ AG2603	.	35.8	19.8	1	34.4	18.9	1	35.1	19.4	1
LATHAM/ L2158R	.	35.8	20.7	1	34.2	19.9	1	35.0	20.3	1
MUSTANG/ M-246NRR	.	35.9	20.2	1	33.8	19.6	1	34.8	19.9	1
MUSTANG/ M-228NRR	.	36.0	19.9	1	33.4	19.5	1	34.7	19.7	1
NUTECH/ NT-7293	.	35.8	18.8	1	33.4	18.4	1	34.6	18.6	1
GOLD/ COUNTRY 3825NRR	.	35.4	20.4	1	33.8	19.7	1	34.6	20.1	1
LATHAM/ EXP-E2458RV	.	35.2	20.3	1	34.0	19.5	1	34.6	19.9	1
KRUGER/ K-256RR	.	36.1	19.4	1	33.0	19.5	1	34.6	19.5	1
WENSMAN/ W 2300RR	.	36.1	19.9	1	33.0	19.4	1	34.6	19.7	1
NUTECH/ NT-7282	.	36.2	19.8	2	32.8	19.6	1	34.5	19.7	2
LATHAM/ L2085R	.	35.7	20.6	1	33.4	20.1	1	34.5	20.3	1
NUTECH/ NT-2220RR	.	35.2	20.1	1	33.8	19.1	1	34.5	19.6	1
KRUGER/ K-201RR/SCN	.	35.1	20.7	1	33.5	20.0	1	34.3	20.4	1
PUBLIC/ SDX00R-020-18	.	35.0	20.7	1	33.6	19.8	1	34.3	20.3	1
ASGROW/ AG2406	.	35.4	20.9	1	33.1	20.7	1	34.3	20.8	1
NUTECH/ NT-6242	.	35.6	20.3	1	32.9	19.9	1	34.3	20.1	1
NUTECH/ NT-6211	.	34.9	20.8	1	33.5	20.1	1	34.2	20.4	1
PRAIRIE/ BR. PB-2421RR	.	35.1	20.2	1	33.3	19.6	1	34.2	19.9	1
MUSTANG/ M-264RR	.	34.7	20.5	1	33.6	19.4	1	34.1	20.0	1
NUTECH/ NT-7206	.	35.4	20.5	1	32.8	20.4	1	34.1	20.5	1
KRUGER/ K-234RR	.	34.8	20.3	1	33.4	19.7	1	34.1	20.0	1
PRAIRIE/ BR. PB-2243RR	.	35.2	20.3	1	33.0	20.1	1	34.1	20.2	1
NUTECH/ NT-6255	.	34.8	19.8	1	33.4	19.4	1	34.1	19.6	1
HEFTY/ 277RN	.	35.2	20.0	1	32.8	19.5	1	34.0	19.8	1
PRAIRIE/ BR. PB-EX271RR	.	35.4	20.8	1	32.5	20.5	1	34.0	20.6	1
WENSMAN/ W 2200NRR	.	35.0	20.7	1	33.0	20.1	1	34.0	20.4	1
KRUGER/ K-248RR/SCN	.	35.4	20.3	1	32.4	20.3	1	33.9	20.3	1
LATHAM/ L2337R	.	35.0	20.6	1	32.7	20.0	1	33.9	20.3	1
PRAIRIE/ BR. PB-2667NRR	.	34.8	20.1	1	32.9	19.3	1	33.9	19.7	1
MUSTANG/ M-237RR	.	34.7	20.3	1	32.7	19.8	1	33.7	20.1	1
LATHAM/ L2810R	.	34.7	20.4	1	32.7	19.6	1	33.7	20.0	1
KRUGER/ K-259RR	.	35.0	20.5	1	32.3	19.8	1	33.7	20.2	1
PRAIRIE/ BR. PB-2697NRR	.	34.7	20.4	1	32.5	19.9	1	33.6	20.2	1

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

Brand/Variety (By 2007 zone protein)	Average DTM*	Southern Averages by Location						Southern Zone Averages		
		Beresford			Geddes					
		Protein (%)	Oil (%)	Lodging (1-5)*	Protein (%)	Oil (%)	Lodging (1-5)*	Protein (%)	Oil (%)	Lodging (1-5)*
DAIRYLAND/ DSR-2300/RR	.	35.5	20.3	1	31.7	20.2	1	33.6	20.2	1
WENSMAN/ W 2222NRR	.	34.7	20.6	1	32.3	20.4	1	33.5	20.5	1
ASGROW/ DKB27-52	.	34.8	20.3	1	32.1	19.7	1	33.5	20.0	1
DAIRYLAND/ DSR-2600/RR	.	35.1	20.1	1	31.8	19.6	1	33.5	19.9	1
PRAIRIE/ BR. PB-2447RR	.	34.7	20.7	1	32.1	19.9	1	33.4	20.3	1
PUBLIC/ SD02R-5	.	34.5	21.1	1	32.2	20.7	1	33.3	20.9	1
PUBLIC/ SD03-2222R	.	34.4	20.9	1	32.3	20.2	1	33.3	20.6	1
PRAIRIE/ BR. PB-2636NRR	.	33.8	20.9	2	32.7	20.1	2	33.2	20.5	2
PUBLIC/ SD(LD)05-16118	.	33.9	20.6	1	32.5	19.7	1	33.2	20.2	1
KRUGER/ K-275RR/SCN	.	34.2	20.9	1	32.3	20.1	1	33.2	20.5	1
NUTECH/ NT-7222	.	34.2	20.9	1	32.0	20.6	1	33.1	20.8	1
PUBLIC/ SD03-2006R	.	33.6	21.3	1	32.1	21.1	1	32.9	21.2	1
PUBLIC/ SD(LD)05-16137	.	33.1	20.9	1	32.0	20.2	1	32.6	20.6	1
PUBLIC/ SDX00R-035-56	.	34.3	20.0	2	30.7	20.4	1	32.5	20.2	2
NUTECH/ NT-6219	.	33.7	20.9	1	31.1	20.7	1	32.4	20.8	1
LATHAM/ EXP-E2250R	.	33.5	21.0	1	31.1	20.4	1	32.3	20.7	1
ASGROW/ DKB25-51	.	33.4	21.0	1	31.2	20.8	1	32.3	20.9	1
PRAIRIE/ BR. PB-2515RR	.	33.5	20.9	1	30.7	20.4	1	32.1	20.7	1
COYOTE/ 4523RR	.	35.4	19.7	1	.	.	.	.	.	.
COYOTE/ 4527RR	.	.	.	.	33.6	19.6	1	.	.	.
COYOTE/ EXP722NRR	.	.	.	.	34.8	19.9	1	.	.	.
COYOTE/ EXP725NRR	.	35.9	20.0	1	.	.	.	.	.	.
COYOTE/ EXP728NRR	.	36.3	19.9	2	.	.	.	.	.	.
FARM/ ADVANTAGE 7254N	.	35.7	19.7	1	.	.	.	.	.	.
FARM/ ADVANTAGE 7223N	.	.	.	.	34.1	19.6	1	.	.	.
FARM/ ADVANTAGE 7233N	.	.	.	.	35.3	19.6	1	.	.	.
HEFTY/ 226R	.	.	.	.	33.1	19.4	1	.	.	.
HEFTY/ 266R	.	.	.	.	34.2	19.3	1	.	.	.
HEFTY/ EXP218RN	.	34.5	21.3	1	.	.	.	.	.	.
HEFTY/ 257RN	.	35.7	20.2	1	.	.	.	.	.	.
HEFTY/ EXP298RN	.	35.7	19.9	1	.	.	.	.	.	.
HEFTY/ EXP248R	.	.	.	.	32.2	19.3	1	.	.	.
KALTENBERG/ KB247RR	.	35.7	20.7	1	.	.	.	.	.	.
KALTENBERG/ KB268RR	.	36.5	20.1	1	.	.	.	.	.	.
STINE/ 2523-4	.	36.0	19.6	1	.	.	.	.	.	.
STINE/ 2862-4	.	36.1	18.9	1	.	.	.	.	.	.
ZILLER/ BT 7217NR	.	35.7	20.9	1	.	.	.	.	.	.
RENK/ RS253RR	.	37.0	19.6	1	.	.	.	.	.	.
RENK/ RS277NRR	.	34.8	20.0	1	.	.	.	.	.	.
RENK/ RS247NRR	.	35.1	20.7	1	.	.	.	.	.	.
Test avg. :	.	35.4	20.2	1	33.3	19.7	1	34.3	20.0	1
High avg. :	.	37.7	21.3	2	36.0	21.1	2	36.9	21.2	2
Low avg. :	.	33.1	18.8	1	30.7	18.4	1	32.1	18.6	1
# LSD(.05) :		0.8	0.5	1	1.5	0.8	1	***	***	1
## TPG-avg. :		37.0	20.9	1	34.6	20.4	1			1
@ Coef. Var. :		1	1	8	3	2	7	2	2	8
No. Entries :	0	83	83	83	75	75	75	68	68	68

* DTM= average days from seeding (Beresford- May 17, Geddes- May 25, 2007) to maturity; a missing value indicates the site received a hard frost before the variety reached maturity.

** Lodging, 1= all plants erect, 5= all plant flat.

*** The effect of variety differed significantly between locations for 2007. Therefore, evaluate varieties by looking at the 2007 columns at each location, not by looking at the Southern zone 2007 column.

LSD(.05)= amount column values must differ to be significantly different or if they were 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:

Beresford, Group-I (Tables 3a & 3b): The 2007 and 2-yr. yield averages were 41 and 51 bushels per acre, respectively (Table 3a). There was no difference in yield among the maturity group-I entries tested in 2007 or for two years; therefore, all entries were in the TPG. The 2007 protein and oil averages were 35.0% and 20.4%, respectively (Table 3b). Entries had to average 36.2% or higher in protein and 20.7% 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 0.3%, respectively, to be significantly different. The 2007 lodging score average was 1; and entries had to average 1 to be in the TPG, and had to differ by 1 to be significantly different (Table 3b).

Beresford, Group-II (Tables 3a & 3b): The 2007 and 2-yr. yield averages were 44 and 54 bushels per acre, respectively (Table 3a). There was no difference in yield among the maturity group-II entries tested in 2007 or for two years; therefore, all entries were in the TPG. The 2007 protein and oil averages were 35.4% and 19.9%, respectively (Table 3b). Entries had to average 36.5% or higher in protein and 20.2% or higher in oil content to be in the TPG. Entry protein and oil content averages had to differ by 0.9% and 0.5%, respectively, to be significantly different. The 2007 lodging score average was 1; but the lodging score differences among the entries did not differ significantly, so all entries were in the TPG (Table 3b).

Table 3a. Non-Roundup Ready™ maturity group-I & -II soybean variety yield averges-
Beresford, South Dakota, 2006-2007.

Brand/Variety (By maturity group & 2007 yield)	Average DTM*	Averages by Maturity Group			
		MG-I		MG-II	
		Bu/Acre 2007	Bu/Acre 2-Yr	Bu/Acre 2007	Bu/Acre 2-Yr
PUBLIC/ SD03-1607	107	43	51	.	.
PUBLIC/ SD04CV-254	108	42	.	.	.
PUBLIC/ SD02-906	108	42	50	.	.
PUBLIC/ SD02-911	108	42	.	.	.
PUBLIC/ SD03-1537	105	42	.	.	.
PUBLIC/ SD04CV-620	109	41	.	.	.
PUBLIC/ SD02-833	106	40	.	.	.
PUBLIC/ SD04CV-277	110	37	.	.	.
PUBLIC/ SD00-732	108	.	.	49	55
DAIRYLAND/ DSR-22/STSUL	111	.	.	47	54
PUBLIC/ SD02-22	111	.	.	45	54
PUBLIC/ SD02-96	111	.	.	45	51
PUBLIC/ SD04CV-263	110	.	.	44	.
PUBLIC/ SD03-483	111	.	.	44	.
PUBLIC/ SD04CV-907	113	.	.	43	.
PUBLIC/ SD04CV-460	115	.	.	42	.
PUBLIC/ SD04CV-941	112	.	.	41	.
Test avg. :	109	41	51	44	54
High avg. :	115	43	51	49	55
Low avg. :	105	37	50	41	51
# LSD(.05) :		NS	NS	NS	NS
## TPG-avg. :		37	50	41	51
@ Coef. Var. :		11	10	6	6
No. Entries :	17	8	2	9	4

* DTM= average days from seeding on May 17, 2007 to maturity.

LSD(.05)= amount column values must differ to be significantly different or if differences 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-I & -II soybean variety protein, oil, and score averages- Beresford, South Dakota, 2007.

Brand/Variety (By maturity group & protein)	Average DTM*	2007 Averages by Maturity Group					
		MG-I			MG-II		
		Protein %	Oil %	Lodging * (1-5)	Protein %	Oil %	Lodging * (1-5)
PUBLIC/ SD04CV-620	.	37.0	20.3	2	.	.	.
PUBLIC/ SD02-833	.	35.3	20.2	2	.	.	.
PUBLIC/ SD03-1607	.	35.0	20.5	1	.	.	.
PUBLIC/ SD02-911	.	34.9	20.4	1	.	.	.
PUBLIC/ SD03-1537	.	34.8	20.2	2	.	.	.
PUBLIC/ SD02-906	.	34.7	20.9	1	.	.	.
PUBLIC/ SD04CV-254	.	34.3	20.0	1	.	.	.
PUBLIC/ SD04CV-277	.	33.6	20.9	1	.	.	.
PUBLIC/ SD03-483	.	.	.	.	37.3	19.9	1
PUBLIC/ SD04CV-907	.	.	.	.	36.9	19.8	1
PUBLIC/ SD02-96	.	.	.	.	36.0	20.6	1
PUBLIC/ SD00-732	.	.	.	.	35.9	20.4	1
PUBLIC/ SD04CV-460	.	.	.	.	35.5	19.7	1
PUBLIC/ SD02-22	.	.	.	.	35.2	19.6	1
DAIRYLAND/ DSR-	.	.	.	.	34.2	19.8	1
PUBLIC/ SD04CV-941	.	.	.	.	34.2	18.5	2
PUBLIC/ SD04CV-263	.	.	.	.	33.4	20.4	1
Test avg. :	.	35.0	20.4	1	35.4	19.9	1
High avg. :	.	37.0	20.9	2	37.3	20.6	2
Low avg. :	.	33.6	20.0	1	33.4	18.5	1
# LSD (.05) :		0.9	0.3	1	0.9	0.5	NS
## TPG-avg. :		36.2	20.7	1	36.5	20.2	2
@ Coef. Var. :		1	1	28	1	1	24
No. Entries :		8	8	8	9	9	9

* DTM= days to maturity when seeded May 17, 2007; a missing value indicates the site a hard frost before the variety reached maturity.

** Lodging, 1= all plants erect, 5= all plant flat.

LSD(.05)= amount column values must differ to be significantly different 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 TRIAL RESULTS[1]

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Plant Science 0710

This reports the 2007 Southeast Research Station performance trials for the non-Roundup-Ready™ and Roundup-Ready™ corn hybrids conducted by the South Dakota State University Crop Performance Testing program.

EXPERIMENTAL PROCEDURES

Entries were placed in an early or late relative maturity trial according to seed company ratings. The relative maturity break between the early and late trials was 110-days. Three replicates (plots) of each entry were seeded on May 2, 2007 in a randomized complete block design. Plots consisted of four 30-inch rows, 20 feet long. The seedbed was a conventionally tilled Egan-Carnot-Tent silt clay loam with a 0-2% slope previously cropped to soybean. A Monism precision planter was calibrated to deliver 28,750 seeds per acre, regardless of seed germination and purity percentage; thus, harvest population is an indication of seed quality. At 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 and then later fertilized for a yield goal of 210 bushels/acre. Force insecticide applied in-furrow at the label rate was used for corn rootworm control at planting. Weed control (label rates) consisted of single post emergence applications of Roundup in the Roundup-Ready and a tank mix of Prowl/Clarity in the non-Roundup Ready 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 of the shelled grain at harvest.

Check the "least significant difference" (LSD) value at the bottom of each data column. The LSD values can be used in two ways. First, the LSD value can indicate how much a variable like yield must differ between two hybrids before there is a significant yield difference. For example, if the 2-year LSD value equals 12 bu/ac acre it can be used to compare the yields of two hybrids. If hybrid A averages 190 and hybrid B averages 189 bu/ac their yield difference is 11 bu/ac (190 - 189 = 11). This means the two hybrids do not differ in yield because their yield difference of 11 is less

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

than the listed LSD value of 12 bu/ac. In comparison, if hybrid C yields 185 bu/ac the difference between hybrids A and C is 15 bu/ac (190-185 = 15). This means the two hybrids differ in yield because their difference of 15 is more than the listed LSD value of 12 bu/ac; therefore, hybrid A is significantly higher in yield than hybrid C.

The second use for the LSD value is to identify the top performance group (TPG) for the current year yield, two-year yield, bushel weight, grain moisture at harvest, and stalk lodging below the ear percentage. For example, if the highest yield average this year is 190 bu/ac and the LSD value listed at the bottom of the yield column equals 12 bu/ac, the minimum TPG for yield this year equals 178 bu/ac or higher (190-12 = 178). Technically, a yield of 179 bu/ac is included in the TPG while a yield of 178 bu/ac is not. However, since all yields and LSD values are rounded to the nearest whole number. We can say 178 bu/ac, because of the rounding-off, is an appropriate minimum value for top yield hybrids. Top yield hybrids are equal to or higher than the minimum TPG value. In addition, the minimum top yield group value is also indicated for the two-year yield average. Again minimum TPG values needed for a hybrid to qualify for **the TPG for yield for the current year or for the last two-year period are 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 the listed current year- 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 listed as 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 value must exceed a minimum value; while grain moisture and lodging below ear percentage values must be equal to or less than a maximum value to qualify for the TPG a given variable.

Non-Roundup Ready™ Performance Trial Results

Early - Non-Roundup Ready™, Tables 1. The trial yield average was 192 for 2007 and 189 bu/ac for the 2-yr. average. Hybrids that yielded 195 or more for 2007 and 178 bu/ac or more for the 2 yr. average qualified for the top performance groups (TPG) in yield. Hybrids had to differ by 17 bu/ac in 2007 to be significantly different; while yield differences between the 2-yr. averages were non-significant (NS). Bushel weights averaged 57 lbs; grain moisture 17%, lodging 0%, and final percent stand 97%. In order for hybrids to be in the TPG for these variables they had to equal 58 lbs. or more in bushel weight, 15% or less in grain moisture, 0% or 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 - Southeast Experiment Station,

Beresford, SD, 2006-07.

Brand/Hybrid (By 2-year then '07 yields)	Brand Rel. Mat.	Hybrid performance variable at harvest: 2-year Yield bu/ac	'07 Yield bu/ac	'07 Bu.Wt. lb	'07 Grain Moist. %	'07 Lodging %	'07 Pct.* Stand
TWO-YEAR ENTRIES:	.	.	.	.	.	.	.
HEINE/ H818YGCB	108	200	209	55	18	0	99
MYCOGEN/ 2R572	104	178	191	56	15	0	96
ONE-YEAR ENTRIES:	.	.	.	.	.	.	.
HOEGEMEYER/ HB+651	109	.	212	57	18	0	100
HEINE/ H818	105	.	208	56	18	0	96
HEINE/ H819	108	.	198	55	17	0	100
KRUGER/ 5210YGCB	110	.	196	57	19	0	99
MYCOGEN/ 2D675	109	.	196	56	19	0	100
KRUGER/ 8308HX	108	.	194	58	18	0	95
HOEGEMEYER/ 9326HX	107	.	191	58	17	0	98
KRUGER/ EXP9106HXT	105	.	190	57	14	0	97
KRUGER/ EXP9010HXT	110	.	190	59	17	0	98
HEINE/ H734	103	.	189	58	15	0	94
MYCOGEN/ 2C597	107	.	188	55	16	0	99
RENK/ RK852LLYGCB	110	.	180	55	16	0	91
WENSMAN/ 5343BT	105	.	179	56	14	0	96
FARM ADVANTAGE/ 86X06	106	.	160	56	16	0	91
Trial avg.:	107	189	192	57	17	0	97
Highest (H)-avg.:	110	200	212	59	19	0	100
Lowest (L)-avg.:	103	178	160	55	14	0	91
H-L avg. difference:	7	22	52	3	5	0	9
** LSD (.05):		NS	17	1	1	NS	3
# Min. TPG-value:		178	195	58	-	-	97
## Max. TPG-value:		-	-	-	15	0	-
+ Coef. of var.:		2	5	2	4	0	2
No. of entries:	16	2	16	16	16	16	16

* Seeded May 2, 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.

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

Late - Non-Roundup Ready™, Tables 2. The trial yield average was 190 bu/ac for both 2007 and the 2-yr. average. Hybrids that yielded 173 or more in 2007 and 174 bu/ac or more for the 2-yr. average qualified for the TPG because differences among entries were non-significant. Bushel weights averaged 57 lbs, grain moisture 19%, lodging below the ear slightly more than 0%, and the final percent stand 97%. Hybrids did not differ in lodging below the ear and final percent stand. In order for hybrids to be in the TPG for these variables they had to equal 58 lbs. or more in bushel weight, 18% or less in grain moisture, 1% or less in lodging below the ear, and 95% or more for percent stand.

Table 2. Late maturity Non-Roundup Ready corn hybrid test trial results - Southeast Experiment Station,

Beresford, SD, 2006-07.

Brand/Hybrid (By 2-year then '07 yields)	Brand Rel. Mat.	Hybrid performance variable at harvest: 2-year Yield bu/ac	'07 Yield bu/ac	'07 Bu.Wt. lb	'07 Grain Moist. %	'07 Lodging %	'07 Pct.* Stand
TWO-YEAR ENTRIES:	.	.	.	.	.	.	.
KRUGER/ 8616HX	115	199	204	56	21	0	99
MYCOGEN/ 2C727	112	199	188	58	19	0	100
MYCOGEN/ 2T787	114	186	193	55	20	0	95
MYCOGEN/ 2K718	111	174	173	58	18	1	100
ONE-YEAR ENTRIES:	.	.	.	.	.	.	.
KRUGER/ 5013YGCB	113	.	194	58	18	0	97
KRUGER/ 5114YGCB	114	.	194	59	19	1	96
KRUGER/ 9414HXT	114	.	192	57	20	0	99
KRUGER/ 5111	111	.	191	59	19	0	99
KRUGER/ 8112HX	112	.	191	57	17	0	95
RENK/ RK884YGCB	112	.	178	55	21	0	95
Trial avg.:	113	190	190	57	19	0	97
Highest (H)-avg.:	115	199	204	59	21	1	100
Lowest (L)-avg.:	111	174	173	55	17	0	95
H-L avg. difference:	4	25	31	4	4	1	5
** LSD (.05):		NS	NS	1	1	NS	NS
# Min. TPG-value:		174	173	58	-	-	95
## Max. TPG-value:		-	-	-	18	1	-
+ Coef. of var.:		8	7	1	3	398	3
No. of entries:	10	4	10	10	10	10	10

* Seeded May 2, 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.

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

Roundup-Ready™ Performance Trial Results

Early - Roundup Ready™, Tables 3. The test trial yield average was 183 bu/ac for 2007 and 182 for the 2-yr. average. Hybrids that yielded 182 or more in 2007 and 170 bu/ac or more for the 2-yr. average qualified for the TPG. Hybrids had to differ by 24 bu/ac to be significantly different in 2007; while the yield differences for the 2-yr. averages were non-significant. Bushel weights averaged 57 lbs, grain moisture 17%, lodging below the ear slightly more than 1%, and the final percent stand averaged 96%. In order for hybrids to be in the TPG for these variables they had to equal 57 lbs. or more in bushel weight, 15% or less in grain moisture, 1% or less in lodging below the ear, and 96% or more for final percent stand.

Table 3. Early maturity Roundup Ready corn hybrid test trial results- Southeast Experiment Station,

Beresford, SD., 2006-07.

Brand/Hybrid (By 2-year then '07 yields)	Brand Rel. Mat.	Test trial variable at harvest					
		2-year Yield bu/ac	'07 Yield bu/ac	'07 Bu. Wt. lb	'07 Grain Moist. %	'07 Lodging %	'07 Pct.* Stand
TWO-YEAR ENTRIES:	.	.	.	.	.	.	.
NUTECH/ 5210 RR/YGCB	110	190	190	58	19	0	96
FARM/ ADVANTAGE 6504	104	187	191	56	15	0	100
WENSMAN/ W6374BTRR	104	170	185	57	14	0	100
ONE-YEAR ENTRIES:	.	.	.	.	.	.	.
FIELDERS/ CHOICE NG6686	107	.	206	58	18	0	97
FONTANELLE/ 7K456	110	.	201	57	18	0	100
NUTECH/ 3T-808A VT3	108	.	200	58	18	0	99
DEKALB/ DKC52-63RR2YGCB	102	.	198	55	14	0	92
KRUGER/ 6208VT3	108	.	198	57	16	1	100
DEKALB/ DKC58-16(VT3)	108	.	196	57	17	0	99
KRUGER/ 1008RR	107	.	196	57	17	0	100
FONTANELLE/ 7T683	108	.	196	57	18	1	98
AGSOURCE/ 3C-007RR/YGCB	107	.	195	58	17	0	100
DEKALB/ DKC53-18(RR2)	103	.	194	57	14	3	97
KRUGER/ 6007VT3	107	.	194	57	16	0	98
CROWS/ 4846T	110	.	193	57	19	0	98
FOUR/ STAR EX9744RRBT	108	.	192	58	18	0	96
WENSMAN/ W6431RR	107	.	192	55	15	0	95
FONTANELLE/ 7N866	108	.	191	58	16	0	98
AGSOURCE/ 5H-008 RR/HX	108	.	191	58	18	0	96
CROWS/ 3846T	105	.	190	59	17	0	94
HEINE/ H818RRYG	108	.	189	56	19	0	96
FONTANELLE/ 6T226	106	.	187	59	19	0	99
HOEGEMEYER/ 5142 RRBT	110	.	186	57	19	0	96
AGSOURCE/ 3T-808 VT3	108	.	186	58	19	0	93
AGSOURCE/ 3C-310RR/YGCB	110	.	186	57	19	0	97
PANNAR/ 8A-410RR/BT	110	.	184	55	17	0	95
HEINE/ H711RRYGPL	100	.	184	54	14	0	97
DEKALB/ DKC50-48RR2YGCB	100	.	183	56	14	0	97
FIELDERS/ CHOICE NG6745	110	.	182	57	19	0	99
GCS/ 107-01CBRCRW	107	.	182	57	16	0	94
HEINE/ H764RRYGPL	105	.	181	57	16	0	94
FIELDERS/ CHOICE NG6721	110	.	180	56	16	0	96
EPLEY/ E25R52YGPL	110	.	180	58	16	0	96
AGSOURCE/ 3C-504ARRYGCB	100	.	180	59	16	0	97
KALTENBERG/ K5685RRBT	105	.	178	58	15	0	95
KRUGER/ 6210TS	110	.	178	57	18	1	99
HEINE/ H727RRYGPL	103	.	178	56	14	0	91
WENSMAN/ W7309VT3	101	.	175	57	15	0	99

Table 3. Early maturity Roundup Ready corn hybrid test trial results- Southeast Experiment Station

(continued).

Brand/Hybrid (By 2-year then '07 yields)	Brand Rel. Mat.	Test trial variable at harvest					
		2-year Yield bu/ac	'07 Yield bu/ac	'07 Bu. Wt. lb	'07 Grain Moist. %	'07 Lodging %	'07 Pct.* Stand
EPLEY/ E24R32YGPL	108	.	174	57	15	0	99
HEINE/ H798RRYG	108	.	174	56	17	0	91
WENSMAN/ W7375BTRWRR	104	.	173	58	14	0	100
NUTECH/ 3P-302 RR/YGPL	102	.	172	58	16	0	96
NUTECH/ 3C-409 RR/YGCB	109	.	167	59	19	0	91
HEINE/ H726RR	103	.	166	53	14	0	95
KALTENBERG/ K6235RRBT	107	.	165	56	16	0	93
HEINE/ H751RRYG	105	.	165	57	17	0	94
HOEGEMEYER/ 4373	105	.	164	56	16	0	94
FOUR/ STAR EX9762RRYGPL	110	.	158	57	19	0	94
DEKALB/ DKC57-47(RR2)	107	.	154	58	16	0	96
HEINE/ H792RR	108	.	150	58	15	0	93
Trial avg.:	107	182	183	57	17	>0	96
Highest (H)-avg.:	110	190	206	59	19	3	100
Lowest (L)-avg.:	100	170	150	53	14	0	91
H-L avg. difference:	10	20	56	6	5	3	9
** LSD (.05):		NS	24	2	1	1	4
# Min. TPG-value:		170	182	57	-	-	96
## Max. TPG-value:		-	-	-	15	1	-
+ Coef. of var.:		9	8	2	4	593	3
No. of entries:	50	3	50	50	50	50	50

* Seeded May 2, 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.

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

Late - Roundup Ready™, Tables 4. The trial yield average was 189 and entries that yielded 195 bu/a or more qualified for the TPG. Hybrids yield averages had to differ by 24 bu/a to be significant. Bushel weights averaged 59 lbs; grain moisture 19%, lodging below the ear 0%, and final percent stand 97%. In order for hybrids to be in the TPG for these variables they had to equal 59 lbs. or more in bushel weight, 18% or less in grain moisture, 0% 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- Southeast Experiment Station, Beresford,

SD, 2007. Note: All late maturity entries were new for 2007.

Brand/Hybrid (By 2-year then '07 yields)	Brand Rel. Mat.	Test trial variable at harvest					
		2-year Yield bu/ac	'07 Yield bu/ac	'07 Bu. Wt. lb	'07 Grain Moist. %	'07 Lodging %	'07 Pct.* Stand
DEKALB/ DKC61-69(VT3)	111	.	219	58	17	0	100
DEKALB/ RX715VT3	112	.	217	59	19	0	99
DEKALB/ DKC63-42(VT3)	113	.	203	58	19	0	100
KRUGER/ 6111VT3	111	.	200	60	19	0	99
EPLEY/ E3245RR	112	.	196	57	18	0	96
KRUGER/ 2114RR/YGCB	114	.	195	60	20	0	95
KRUGER/ 6314TS	114	.	194	59	21	0	95
NUTECH/ 3A-113 RR	113	.	193	61	19	0	98
FIELDERS/ CHOICE NG6780	111	.	193	59	20	0	93
KRUGER/ 6011TS	111	.	191	59	18	0	98
NUTECH/ 3P-612 RR/YGPL	112	.	186	59	19	0	98
DEKALB/ DKC62-33RR2YGCB	112	.	183	60	19	0	92
FIELDERS/ CHOICE NG6785	112	.	181	60	18	0	99
RENK/ RK888RRYGPL	112	.	181	58	19	0	95
NUTECH/ 5H-312 RR/HX	112	.	179	59	18	0	97
NUTECH/ 3A-113A RR	112	.	177	61	20	0	94
KRUGER/ 6412VT3	112	.	177	60	21	0	100
KRUGER/ 6015VT3	115	.	175	60	20	0	96
NUTECH/ 3C-712 RR/YGCB	112	.	174	59	18	0	96
FOUR/ STAR 6880VT3	112	.	164	59	20	0	95
Trial avg.:	112	.	189	59	19	0	97
Highest (H)-avg.:	115	.	219	61	21	0	100
Lowest (L)-avg.:	111	.	164	57	17	0	92
H-L avg. difference:	4	.	55	4	4	0	8
** LSD (.05):			24	2	1	NS	4
# Min. TPG-value:			195	59	-	-	96
## Max. TPG-value:			-	-	18	0	-
+ Coef. of var.:			8	2	5	0	2
No. of entries:	20	0	20	20	20	20	20

* Seeded May 2, 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.

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

WEED CONTROL DEMONSTRATIONS AND EVALUATION TEST FOR 2007

M. J. Moechnig, D. L. Deneke, and D. A. Vos

PLANT SCIENCE 0711

INTRODUCTION:

Conducting weed control research at the Southeast Experiment Farm provides an opportunity to evaluate weed control techniques in an environment that reflects the climate and weed species spectrum of the region. Corn and soybean cropping systems are the primary focus for weed control evaluation. Primary weed species present often include common waterhemp, velvetleaf, cocklebur, common lambsquarters, and foxtail.

RESEARCH SUMMARY for 2007:

There was significant early season precipitation that delayed planting and tillage. The late tillage eliminated the first flush of weeds in some areas, but weed populations in the crops was generally moderate. Spring weather conditions generally allowed timely herbicide applications. Conditions were very dry in mid to late summer, but crop yields were generally good.

Several studies were established to evaluate new weed control technologies. Liberty Link soybean studies were established to evaluate effective and economical programs for varieties that may be marked in 2009. A new corn herbicide, Laudis (tembotrione), was evaluated for use in conventional and Roundup Ready programs. An experimental pre-emergence herbicide from BASF was evaluated for controlling cocklebur. The Southeast Research Station has one field with a very high cocklebur seed bank that is an excellent site for evaluating some herbicide chemistries. The experimental BASF herbicide is scheduled for EPA registration in the spring of 2008. Sites with good velvetleaf seed banks allowed evaluation of Authority First and Sonic (sulfentrazone+cloransulam) for residual control in soybeans. Other new herbicides evaluated included SureStart (acetochlor+flumetsulam+clopyralid) for corn and Prefix (S-metolachlor+fomesafen) for soybeans. New glyphosate formulations from Monsanto (PowerMax) and Dow (Duramax and Durango) were evaluated in soybeans. Valor was evaluated for use as a preplant burndown tank mix partner in no-till corn for possible future registration. Therefore, the Southeast Research Station provided us several great sites to evaluate new weed control tools for growers in that region.

Studies funded by the Soybean Research and Promotion Council were established to evaluate agronomic issues and glyphosate resistance management techniques in soybeans. One study was established to evaluate the effects of soybean row spacing and density on soybean weed control programs. The study was repeated in Highmore to evaluate the effects in different moisture environments. Additional studies were established to evaluate rate responses with preemergence herbicides to identify cost efficient rates in herbicide tolerant soybeans and identify optimal tank mix combinations. Additional research funded by the South Dakota commodity groups included evaluation of weed seed banks in the long-term cropping systems study established by Bob Berg. This research was part of a multi-disciplinary approach to identify optimal cropping systems.

NOTE: **Data reported in this publication are results from field tests that include product uses, experimental products or experimental rates, combinations or other unlabeled uses for herbicide products. Tradenames of products used are listed; there frequently are other brand products available in the market. Users are responsible for applying herbicide according to label directions. Refer to the appropriate weed control fact sheet available from county extension offices for herbicide reocmmendations.**

Studies listed below are summarized in the following tables. Information for each study is included as part of the summary.

CORN

Herbicide Demonstration

1. Conventional Corn Herbicide Demonstration
2. Herbicide Resistant Corn Demonstration

New Products

3. Laudis Programs in Corn
4. Impact Programs

No-Till

5. Valor in Field Corn
6. Burndown Treatments in No-Till Corn

Adjuvants

7. Adjuvants with Liberty in Corn
8. AMS Replacement Studies w/350 ppm Hardness Water Quality
9. Cornbelt Adjuvants with Corn Herbicides

Herbicide Programs

10. Performance of Harness and Degree Applied Mid-Post to Corn
11. Weed Control in Conventional and RR Corn
12. Liberty Weed Control Programs
13. RR Corn 2 System Comparisons
14. Balance and Radius in LL and RR Corn
15. Permit/Postemergence Weed Control Combinations

SOYBEANS

Herbicide Demonstration

16. Conventional Soybean Herbicide Demonstration
17. Herbicide Resistant Soybean Demonstration

New Products

18. Touchdown Programs with Prefix in RR Soybeans
19. Liberty Link Soybean - Weed Control Programs
20. Authority Products in Soybeans

Herbicide Programs

21. Broadleaf Weed Control in RR Soybeans
22. Sencor with Valor for Weed Control in Soybeans
23. Early-Season Weed Competition With and Without a Pre
24. Soybean Row Spacing and Density Effects on Weed Management

Adjuvants

25. Adjuvants with Micronutrients
26. Adjuvants for Volunteer Corn Control in Soybeans

No-Till

27. Burndown and Residual Weed Control in No-Till Soybeans

Volunteer Corn Control

28. Select Max for Control of Volunteer RR Corn
29. Control of Volunteer Glyphosate-Tolerant Corn
30. Volunteer GT Corn Control in Soybeans

The most relevant results are presented in this publication. Additional research trials were also conducted at this station to evaluate experimental herbicides or additives.

ACKNOWLEDGEMENTS:

We greatly appreciate the cooperation and assistance provided by the station personnel. Due to the distance from the SDSU campus, assistance with field preparation and daily oversight of the fields is critical to the success of the weed control research. We also appreciate the participation of extension educators who provide assistance with tours and use the research results for their recommendations to growers. In addition to the Southeast Farm Report, research results will be published in the annual Weed Control Field Test Data Book (EMC 678), weed control fact sheets updated annually for major South Dakota commodities, and on the internet at http://plantsci.sdstate.edu/weeds/

Program support was provided by the South Dakota Soybean Research and Promotion Council and crop protection industries.

Table 1. Conventional Corn Herbicide Demonstration

Demonstration
Variety: DKC 58-16
Planting Date: 5/1/07
PRE: 5/1/07
EPOST: 5/31/07; Corn 4 collar, 8 in; Cowh 2-5 in; Grft 1-3 in.
POST: 6/5/07; Corn V5, 10 in; Cowh 3-6 in; Grft 2-5 in.
Soil: Silty clay; 3.5% OM; 6.0 pH

Precipitation:

PRE:	1st week	1.45 inches
	2nd week	0.03 inches
EPOST:	1st week	1.23 inches
	2nd week	0.06 inches
POST:	1st week	0.03 inches
	2nd week	0.03 inches

Cowh=Common waterhemp
Grft=Green foxtail

Comments: This demonstration was intended to evaluate several herbicide programs in conventional corn, including preemergence, pre- followed by postemergence, and postemergence programs. Weed competitive ability was relatively low at this site, resulting in very good weed control among most treatments.

Preemergence programs: Most treatments resulted in greater than 90% control of common waterhemp and green foxtail, but Balance+Resolve+Atrazine and Atrazine+Harness resulted in 86% and 84% foxtail control, respectively.

Pre- followed by postemergence programs: Most treatments resulted in greater than 90% control of common waterhemp and green foxtail, but Harness fb. Aim+Atrazine and Balance fb. Callisto+Atrazine resulted in 89% and 82% foxtail control, respectively.

Early postemergence: All treatments resulted in very good weed control.

Treatment	***Rate/A***	***% Cowh 7/20/07***	***% Grft 7/20/07***
PREEMERGENCE			
Epic	14.5 oz	94	99
Radius	18 oz	93	90
Lumax	3 qt	99	92
Bicep Lite II Magnum	2 qt	96	94
Stalwart Xtra	2.1 qt	94	92
G-Max Lite	3.5 pt	97	97
Harness Xtra 6L	2.1 qt	99	95
Keystone LA	2.2 qt	99	93
Balance Pro+Atrazine	3 oz+35 oz	96	96
Balance Pro+Define SC+Atrazine	2.1 oz+7 oz+1 qt	98	95
Balance Pro+Resolve+Atrazine	1.5 oz+1.5 oz+1 qt	99	86
Atrazine+Harness	33 oz+29 oz	99	84
PREEMERGENCE & POSTEMERGENCE			
Harness&Aim+Atrazine+COC+28% N	1.5 pt&.5 oz+1 qt+1%+2 qt	99	89
Balance Pro&Callisto+Atrazine+COC+28% N	1.5 oz&3 oz+1 pt+1%+2 qt	99	82
Balance Pro&Laudis+Atrazine+MSO+28% N	1.5 oz&3 oz+1 pt+1%+1.5 qt	99	94
Balance Pro&Impact+Atrazine+MSO+28% N	1.5 oz&.5 oz+1 pt+1%+1.5 qt	98	96
Balance Pro&Option+MSO+28% N	1.5 oz&1.5 oz+1.5 pt+2 qt	99	90
Balance Pro&Stout+COC+AMS	1.5 oz&.75 oz+1%+2 lb	96	96
Balance Pro+Atrazine&Stout+COC+AMS	1.5 oz+1.5 pt&.75 oz+1%+2 lb	97	98
Resolve+Atrazine&Stout+COC+AMS	1.5 oz+1 qt&.75 oz+1%+2 lb	92	99

Table 1. Conventional Corn Herbicide Demonstration (Continued . . .)

Treatment	***Rate/A***	***% Cowh 7/20/07***	***% Grft 7/20/07***
PREEMERGENCE & POSTEMERGENCE (Continued . . .)			
Outlook&Status+COC+28% N	21 oz&7.5 oz+1%+2 qt	98	97
Outlook&Marksman+NIS+28% N	21 oz&2 pt+.125%+2 qt	99	99
Micro-Tech&Hornet WDG+MSO+28% N	2.5 qt&3 oz+1%+2 qt	99	94
Micro-Tech&WideMatch	2.5 qt&1.33 pt	97	96
Surpass&2,4-D amine	2.5 pt&1 pt	99	95
Breakfree+Atrazine&Accent+COC+28% N	1.5 pt+1.5 pt&.67 oz+1%+2 qt	99	96
Breakfree+Atrazine&Stout+COC+28% N	1.5 pt+1.5 pt&.5 oz+1%+2 qt	99	97
Dual II Magnum&Northstar+NIS+28% N	1.67 pt&5 oz+.25%+2 qt	99	98
Dual II Magnum&Callisto+28% N	1.67 pt&3 oz+2 qt	99	96
Dual II Magnum&Callisto+Atrazine+ COC+AMS	1.5 pt&3 oz+1 pt+ 1%+2 lb	99	98
Dual II Magnum&Impact+Atrazine+ MSO+28% N	1.5 pt&.5 oz+1 pt+ 1%+1.5 qt	99	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	99	97
Cinch&Steadfast+Marksman+ COC+28% N	1 pt&.75 oz+1 pt+ 1%+2 qt	99	98
Keystone LA&Hornet WDG+Clarity+ NIS+AMS	2 qt&3 oz+4 oz+ .25%+2.5 lb	99	98
EARLY POSTEMERGENCE			
Stout+Atrazine+COC+AMS	.75 oz+1.5 pt+1.5 pt+2 lb	97	98
Option+Callisto+COC+28% N	1.5 oz+2 oz+1%+1.5 qt	97	94
Laudis+Atrazine+Resolve+MSO+28% N	3 oz+1 pt+1 oz+1%+1.5 qt	99	97
Laudis+Atrazine+Stout+MSO+28% N	2 oz+1 pt+.5 oz+1%+1.5 qt	99	97
Impact+Atrazine+Stout+MSO+28% N	.5 oz+1 pt+.5 oz+1%+1.5 qt	99	99
Impact+Outlook+Atrazine+NIS+28% N	.5 oz+12 oz+1 qt+1%+2 qt	99	99
Option+Distinct+NIS+28% N	1.5 oz+4 oz+1%+2 qt	99	95
Option+Status+MSO+28% N	1.5 oz+5 oz+1.5 pt+2 qt	99	96
Steadfast+Atrazine+COC+28% N	.75 oz+1.5 pt+1%+2 qt	95	93
Steadfast+Starane+Atrazine+COC+28% N	.75 oz+.5 pt+1 qt+1%+2 qt	95	97
Steadfast+Callisto+Atrazine+COC+28% N	.75 oz+2 oz+1 pt+1%+2 qt	99	99
Lumax+Steadfast+COC+AMS	1.5 qt+.75 oz+1%+2.5 lb	99	94
Steadfast+Atrazine+Callisto+COC+AMS	.75 oz+3 pt+2 oz+1%+2.5 lb	99	97

Table 2. Herbicide Resistant Corn Demonstration

Demonstration
Variety: Pioneer 38H72 and DKC 58-16
Planting Date: 5/1/07
PRE: 5/1/07
EPOST: 5/31/07; Corn 4 collar, 8 in; Cowh 2-5 in; Grft 1-3 in.
POST: 6/5/07; Corn V5, 10 in; Cowh 3-6 in; Grft 2-5 in.
Soil: Silty clay; 3.5% OM; 6.0 pH

Precipitation:

PRE:	1st week	1.45 inches
	2nd week	0.03 inches
EPOST:	1st week	1.23 inches
	2nd week	0.06 inches
POST:	1st week	0.03 inches
	2nd week	0.03 inches

Cowh=Common waterhemp
Grft=Green foxtail

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: Most treatments resulted in greater than 90% control of common waterhemp and green foxtail, but the early postemergence application of Liberty+Atrazine resulted in only 85% green foxtail control.

Roundup Ready corn: On application of Roundup applied early post- or mid postemergence resulted in nearly complete weed control, so the addition of tank mix partners or preemergence applications did not improve weed control. Weed competition was relatively low at this site, so these results demonstrated that single applications of Roundup alone may be adequate when weed populations are low.

Treatment	***Rate/A***	***% Cowh 7/20/07***	***% Grft 7/20/07***
Liberty Link Check	----	0	0
EARLY POSTEMERGENCE			
Liberty+Atrazine+AMS	32 oz+1 pt+3 lb	99	85
POSTEMERGENCE			
Liberty+Atrazine+AMS	32 oz+1 pt+3 lb	95	90
Liberty+Resolve+AMS	32 oz+1 oz+3 lb	90	95
Liberty+Callisto+AMS	32 oz+1.5 oz+3 lb	92	97
EARLY POSTEMERGENCE & POSTEMERGENCE			
Liberty+Atrazine+AMS&Liberty+AMS	24 oz+1 pt+3 lb&24 oz+3 lb	99	97
PREEMERGENCE & POSTEMERGENCE			
Define SC&Liberty+Atrazine+AMS	12 oz&32 oz+1 pt+3 lb	90	97
Balance Pro&Liberty+Atrazine+AMS	1.5 oz&32 oz+1 pt+3 lb	99	99
Roundup Ready Check	----	0	0
EARLY POSTEMERGENCE			
Roundup WeatherMax+AMS	22 oz+2.5 lb	94	99
Touchdown Total+AMS	32 oz+2.5 lb	85	98
Touchdown Total+Lumax+AMS	24 oz+1 qt+2.5 lb	99	99
Roundup WeatherMax+Resolve+AMS	22 oz+1 oz+2.5 lb	90	99
Roundup WeatherMax+Revolve+ Atrazine+AMS	22 oz+1 oz+ 1 pt+2.5 lb	99	99

Table 2. Herbicide Resistant Corn Demonstration

Treatment	***Rate/A***	***% Cowh 7/20/07***	***% Grft 7/20/07***
EARLY POSTEMERGENCE (Continued . . .)			
Roundup WeatherMax+Atrazine+AMS	22 oz+1 pt+2.5 lb	99	99
Roundup WeatherMax+Harness+AMS	22 oz+1 pt+2.5 lb	99	99
Roundup WeatherMax+Stalwart C+AMS	22 oz+1 pt+2.5 lb	99	97
Roundup WeatherMax+Outlook+AMS	22 oz+12 oz+2.5 lb	97	99
Roundup WeatherMax+Prowl H_2O+AMS	22 oz+2.5 pt+2.5 lb	99	99
POSTEMERGENCE			
Roundup WeatherMax+AMS	22 oz+2.5 lb	95	99
Roundup WeatherMax+Resource+AMS	22 oz+4 oz+2.5 lb	93	99
Roundup WeatherMax+Aim+AMS	22 oz+.5 oz+2.5 lb	95	99
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	97	99
Roundup WeatherMax+Impact+AMS	22 oz+.5 oz+2.5 lb	99	99
Roundup WeatherMax+Status+AMS	22 oz+2.5 oz+2.5 lb	99	99
Roundup WeatherMax+2,4-D amine+AMS	22 oz+8 oz+2.5 lb	97	99
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	96	97
PREEMERGENCE & POSTEMERGENCE			
Atrazine&Roundup WeatherMax+AMS	1 qt&22 oz+2.5 lb	99	97
Atrazine+Resolve&Roundup WeatherMax+AMS	1 pt+1.5 oz&22 oz+2.5 lb	99	99
Harness&Roundup WeatherMax+AMS	1.5 pt&22 oz+2.5 lb	97	99
Harness Xtra 6L&Roundup WeatherMax+AMS	1 qt&22 oz+2.5 lb	99	99
Micro-Tech&Roundup WeatherMax+AMS	2 qt&22 oz+2.5 lb	99	99
Dual II Magnum&Roundup WeatherMax+AMS	1.67 pt&22 oz+2.5 lb	99	99
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	97	99
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	97	99
Balance Pro+Atrazine& Roundup WeatherMax+AMS	1.5 oz+1 pt& 22 oz+2.5 lb	99	99
Define SC+Atrazine& Roundup WeatherMax+AMS	7 oz+1.5 pt& 22 oz+2.5 lb	98	99
Balance Pro+Define SC& Roundup WeatherMax+AMS	1.7 oz+4 oz& 22 oz+2.5 lb	99	99
Balance Pro+Define SC& Roundup WeatherMax+AMS	1 oz+3.5 oz& 22 oz+2.5 lb	99	99

Table 3. Laudis Programs in Corn

RCB; 4 reps
Variety: Pioneer 38H72
Planting Date: 5/2/07
PRE: 5/2/07
EPOST: 6/5/07; Corn V4, 8-10 in; Cowh 3-6 in; Grft 2-5 in; Bygr 3-5 in.
MIDPOST: 6/14/0; Corn V6, 20 in; Cowh 3-7 in; Grft 3-6 in; Bygr 3-6 in.
Soil: Silty clay loam; 3.0% OM; 6.8 pH

Precipitation:

PRE:	1st week	1.45 inches
	2nd week	0.03 inches
EPOST:	1st week	0.03 inches
	2nd week	0.03 inches
MIDPOST:	1st week	0.00 inches
	2nd week	0.01 inches

Cowh=Common waterhemp
Grft=Green foxtail
Bygr=Barnyardgrass

Comments: The objective of this study was to evaluate Laudis (tembotrione) programs in corn. Laudis is a new HPPD-inhibitor or "bleacher" intended for broadleaf control, but may suppress green foxtail and barnyardgrass. Yield loss in the untreated check indicated high weed competition. Prior to the postemergence applications, preemergence applications of atrazine+Balance (isoxaflutole) resulted in slightly greater weed control than Balance alone. By August, all the two-pass programs for conventional corn resulted in nearly complete weed control. Treatments with Liberty(glufosinate) resulted in less barnyardgrass control than several of the conventional two-pass programs or the Roundup programs. Incomplete weed control in some of the Liberty treatments may have contributed to lower yield. Liberty+Laudis (2 oz/A) resulted in similar weed control as Liberty+atrazine. Adding atrazine at 1 qt/A to Laudis improved barnyardgrass control relative to Laudis alone. Laudis alone resulted in nearly complete waterhemp control, but additional herbicides will be needed for adequate grass control.

Treatment	***Rate/A***	***% Cowh 6/6/07***	***% Grft 6/6/07***	***% Cowh 6/26/07***	***% Grft 6/26/07***	***% Grft 8/17/07***	***% Bygr 8/17/07***	***Corn Yield bu/A***
Check	----	0	0	0	0	0	0	45
PREEMERGENCE & MID-POSTEMERGENCE								
Balance Pro&Laudis+ Atrazine+COC+28% N	1.5 oz&3 oz+ 1 qt+1%+1.5 qt	92	90	99	99	97	99	142
Balance Pro+Atrazine& Laudis+MSO+28% N	1.5 oz+1 qt& 3 oz+1%+1.5 qt	97	97	99	99	98	99	142
Bicep II Magnum&Callisto+ Atrazine+COC+28% N	2.1 qt&3 oz+ 1 pt+1%+2.5%	99	99	99	99	99	99	140
Keystone LA& Hornet WDG+NIS	2.6 qt& 4 oz+.25%	99	99	99	99	99	99	137
Resolve+Balance Pro& Laudis+Atrazine+ COC+28% N	1 oz+1 oz& 3 oz+1 pt+ 1%+1.5 qt	97	95	99	98	98	98	136
MID-POSTEMERGENCE								
Laudis+ Liberty+AMS	2 oz+ 32 oz+8.5 lb/100 gal	—	—	92	97	98	89	119
Liberty+ Atrazine+AMS	32 oz+ 1 qt+8.5 lb/100 gal	—	—	94	95	97	83	114
Laudis+ Roundup Original Max+ AMS	3 oz+ 22 oz+ 8.5 lb/100 gal	—	—	98	97	98	97	128
Roundup Original Max+ Atrazine+AMS	22 oz+ 1 qt+8.5 lb/100 gal	—	—	96	98	98	97	132

Table 3. Laudis Programs in Corn (Continued . . .)

Treatment	*Rate/A*	*% Cowh 6/6/07*	*% Grft 6/6/07*	*% Cowh 6/26/07*	*% Grft 6/26/07*	*% Grft 8/17/07*	*% Bygr 8/17/07*	*Corn Yield bu/A*
EARLY POSTEMERGENCE								
Laudis+Atrazine+ Roundup Original Max+ AMS	3 oz+1 qt+ 11 oz+ 8.5 lb/100 gal	—	—	99	93	99	90	137
Laudis+Accent+ MSO+28% N	3 oz+.33 oz+ 1%+1.5 qt	—	—	99	87	87	88	134
Laudis+MSO+28% N	3 oz+1%+1.5 qt	—	—	96	91	88	89	132
Laudis+Atrazine+ COC+28% N	3 oz+1 qt+ 1%+1.5 qt	—	—	99	93	90	97	137
Camix+ Touchdown Total+AMS	1.3 qt+ 32 oz+8.5 lb/100 gal	—	—	99	99	99	98	141
PREEMERGENCE & MID-POSTEMERGENCE								
Harness Xtra 6L& Roundup Original Max+ AMS	1.5 qt& 22 oz+ 8.5 lb/100 gal	99	99	99	99	99	99	142
MID-POSTEMERGENCE								
Roundup Original Max+ AMS	22 oz+ 8.5 lb/100 gal	—	—	95	95	97	95	125
Liberty+AMS	32 oz+8.5 lb/100 gal	—	—	78	98	98	94	113
LSD (.05)		4	4	4	4	3	4	13

Table 4. Impact Programs

RCB; 4 reps
Variety: DKC 46-60
Planting Date: 5/22/07
PRE: 5/31/07; Corn - spike
EPOST: 6/8/07; Corn 6 in; Bygr 1-4 in; Pesw 2-5 in; Cowh 2-4 in.
POST: 6/28/07; Corn 18 in; Bygr 4-6 in; Pesw 3-7 in; Cowh 2-8 in.
Soil: Silty clay loam; 3.0% OM; 6.8 pH

Precipitation:

PRE:	1st week	1.23 inches
	2nd week	0.06 inches
EPOST:	1st week	0.03 inches
	2nd week	0.00 inches
POST:	1st week	0.00 inches
	2nd week	0.00 inches

Bygr=Barnyardgrass
Pesw=Pennsylvania smartweed
Cowh=Common waterhemp

Comments: The objective of this study was to evaluate several weed control programs that include Impact. Impact is an HPPD-inhibiting herbicide (or "bleacher"). An application of Dual II Magnum alone (1 pt/A) did not result in complete control of barnyardgrass, Pennsylvania smartweed, or common waterhemp. The single application of Breakfree (acetochlor)+ Impact+atrazine resulted in nearly complete control of the broadleaf species, but only 83% control of barnyardgrass. Weed control was similar among the two-pass programs (PRE followed by POST) that included Impact, Callisto, or Laudis. When followed by a preemergence application of Harness, tank mixing Impact with Roundup did not increase weed control relative to Roundup alone. Barnyardgrass control was greater with Impact compared to Callisto when tank-mixed with Steadfast+Atrazine.

Treatment	***Rate/A***	***% Bygr 8/31/07***	***% Pesw 8/31/07***	***% Cowh 8/31/07***
Untreated Check	----	0	0	0
PREEMERGENCE				
Dual II Magnum	1 pt	70	33	82
EARLY POSTEMERGENCE				
Breakfree+Impact+Atrazine+ COC+28% N	28 oz+.503 oz+ 2 pt+ 1%+2.5%	83	98	99
PREEMERGENCE & POSTEMERGENCE				
Dual II Magnum&Impact+Atrazine+ MSO+28% N	1 pt&.503 oz+1 pt+ 1%+2.5%	91	87	94
Dual II Magnum&Callisto+Atrazine+ COC+28% N	1 pt&2.02 oz+1 pt+ 1%+2.5%	88	90	97
Dual II Magnum&Laudis+Atrazine+ COC+28% N	1 pt&2 oz+1 pt+ 1%+2.5%	93	94	99
Harness&Impact+ Roundup WeatherMax+AMS	20 oz&.503 oz+ 22 oz+8.5 lb/100 gal	99	99	99
Harness&Impact+ Roundup WeatherMax+Atrazine+AMS	20 oz+.503 oz+ 22 oz+1 pt+8.5 lb/100 gal	98	99	99
Harness&Roundup WeatherMax+AMS	20 oz&22 oz+8.5 lb/100 gal	97	97	98
POSTEMERGENCE				
Impact+Steadfast+Atrazine+ MSO+28% N	.503 oz+.75 oz+1 pt+ 1%+2.5%	78	87	98
Callisto+Steadfast+Atrazine+ COC+28% N	2.02 oz+.75 oz+1 pt+ 1%+2.5%	65	86	99
LSD (.05)		5	6	3

Table 5. Valor in Field Corn

RCB; 3 reps
Variety: DKC 46-60
Planting Date: 5/31/07
EPP: 5/2/07
7 Day EPP: 5/16/07; Cowh .5-1 in; Colq 1-2 in.
PRE: 5/31/07; Cowh 4-8 in; Colq 4-8 in.
POST: 6/28/07; Corn 16 in; Cowh 2-4 in; Colq 2-4 in.
Soil: Silty clay loam; 3.0% OM; 6.8 pH

Precipitation:

EPP:	1st week	1.45 inches
	2nd week	0.03 inches
7 Day EPP:	1st week	0.34 inches
	2nd week	1.03 inches
PRE:	1st week	1.23 inches
	2nd week	0.06 inches
POST:	1st week	0.00 inches
	2nd week	0.00 inches

VCRR=Visual Crop Response Rating
(0=no injury; 100=complete kill)
Cowh=Common waterhemp
Colq=Common lambsquarter

Comments: The objectives of this study were to evaluate weed control efficacy and crop tolerance with Valor (flumioxazin) applied preplant or preemergence in corn and compare weed control with alternative herbicides. Valor is currently not registered for use in corn, but crop tolerance may enable future registration for this use. Corn injury was not noticed in any treatment. Early preplant applications of Valor resulted in nearly complete control of common waterhemp and common lambsquarters as the corn was emerging whereas common lambsquarters plants were still present immediately after the preemergence application of Roundup + other residual herbicides. Common waterhemp and common lambsquarters were nearly completely controlled in most treatments by June 19. At this time, broadleaf weed control was only 17% in the EPP application of Roundup without a residual tankmix partner. Immediately prior to the postemergence Roundup application on June 28, the EPP treatments with Valor were still providing at least 84% control of common waterhemp and common lambsquarters and treatments with Valor+atrazine were providing at least 91% control. Treatments with a preemergence application of a residual herbicide were providing nearly complete weed control on June 26. The postemergence application of Roundup on June 28 controlled all escapes. Consequently, all treatments provided nearly complete weed control on September 19.

Treatment	***Rate/A***	***% Cowh 6/6/07***	***% Colq 6/6/07***	***% Colq 6/19/07***	***% Cowh 6/19/07***	***Corn % VCRR 6/19/07***	***% Cowh 6/26/07***	***% Colq 6/26/07***	***Corn % VCRR 6/26/07***	***% Cowh 9/19/07***	***% Colq 9/19/07***
Untreated Check	----	0	0	0	0	0	0	0	0	0	0
EARLY PREPLANT - 14 DAYS*											
Roundup WeatherMax+AMS	22 oz+2.5 lb	97	83	17	17	0	0	0	0	99	99
Roundup WeatherMax+Valor+AMS	22 oz+2 oz+2.5 lb	99	99	93	93	0	85	84	0	99	99
Roundup WeatherMax+AMS+ Valor SX+Atrazine	22 oz+2.5 lb+ 2 oz+1 qt	99	99	99	99	0	91	97	0	99	99

Table 5. Valor in Field Corn (Continued . . .)

Treatment	*Rate/A*	*% Cowh 6/6/07*	*% Colq 6/6/07*	*% Colq 6/19/07*	*Corn % Cowh 6/19/07*	*% VCRR 6/19/07*	*% Cowh 6/26/07*	*Corn % Colq 6/26/07*	*% VCRR 6/26/07*	*% Cowh 9/19/07*	*% Colq 9/19/07*
EARLY PREPLANT - 7 DAYS*											
Roundup WeatherMax+ Valor SX+AMS	22 oz+ 2 oz+2.5 lb	99	99	99	99	0	88	91	0	99	99
Roundup WeatherMax+Valor SX+ Atrazine+AMS	22 oz+2 oz+ 1 qt+2.5 lb	99	99	99	99	0	93	98	0	99	99
PREEMERGENCE*											
Roundup WeatherMax+ Balance+AMS	22 oz+ 1.5 oz+2.5 lb	97	71	99	99	0	98	98	0	99	99
Roundup WeatherMax+ Bicep Lite II Magnum+AMS	22 oz+ 1.3 qt+2.5 lb	97	70	99	99	0	98	96	0	99	99
Roundup WeatherMax+ Lumax+AMS	22 oz+ 2 pt+2.5 lb	98	73	99	99	0	98	98	0	99	99
Roundup WeatherMax+ Atrazine+AMS	22 oz+ 1 qt+2.5 lb	97	74	99	99	0	97	98	0	99	99
Roundup WeatherMax+Epic+AMS	22 oz+5 oz+2.5 lb	97	74	99	99	0	98	95	0	99	99
LSD (.05)		1	3	13	13	0	3	2	0	0	0

**Roundup WeatherMax+AMS (22 oz+2.5 lb/A) was applied to each treatment on June 28.*

Table 6. Burndown Treatments in No-Till Corn

RCB; 4 reps
Variety: DKC 58-16
Planting Date: 5/1/07
PRE: 5/2/07; Dali - early bloom
Soil: Silty clay loam; 3.4% OM; 6.4 pH

Precipitation:
PRE: 1st week 1.45 inches
2nd week 0.03 inches

Dali=Dandelion

Comments: The objective of this study was to evaluate Rage D-Tech (carfentrazone + 2,4-D) as a burndown option in no-till corn. The primary weed in this study was dandelion. 2,4-D ester alone (1.5 pt/A) resulted in the least dandelion control. On May 15, treatments with Roundup resulted in similar control as Rage D-Tech but on June 6 the Roundup treatments resulted in slightly greater control than Rage D-Tech. Combining atrazine (1 qt/A) with Rage D-Tech improved control slightly.

Treatment	***Rate/A***	***% Dali 5/15/07***	***% Dali 6/6/07***
PREEMERGENCE			
Rage D-Tech+COC	.75 pt+1 qt	92	81
Rage D-Tech+Roundup Original+AMS	.5 pt+22 oz+3 lb	91	89
2,4-D ester	1.5 pt	73	65
Roundup Original Max+AMS	22 oz+3 lb	89	95
2,4-D ester+Roundup Original Max+AMS	1 pt+22 oz+3 lb	86	96
Rage D-Tech+Atrazine	.5 pt+2 pt	89	86
Untreated Check	----	0	0
LSD (.05)		8	9

Table 7. Adjuvants with Liberty in Corn

RCB; 4 reps
Variety: Pioneer 38H72
Planting Date: 5/2/07
POST: 6/5/07; Corn V4, 8-10 in; Cowh 3-6 in.
Soil: Silty clay loam; 3.0% OM; 6.8 pH

Precipitation:
POST: 1st week 0.03 inches
2nd week 0.03 inches

Cowh=Common waterhemp

Comments: The objective of this study was to evaluate the effects of adjuvants on weed control in Liberty Link corn. Liberty was applied at a reduced rate (20 oz/A) to simulate difficult conditions for weed control. Class Act Next Generation is a water conditioning agent and NIS. N–Tense is a water conditioning agent and pH acidifier that is intended to reduce antagonism from hard water impurities. All spray additives increased weed control relative to Liberty alone. Weed control was similar among the treatments with spray additives.

Treatment	***Rate/A***	***% Cowh 6/19/07***	***% Cowh 7/3/07***
Check	----	0	0
POSTEMERGENCE			
Liberty	20 oz	60	55
Liberty+AMS	20 oz+3 lb	81	79
Liberty+Class Act NG	20 oz+2.5%	84	73
Liberty+Premium AMS	20 oz+3 lb	82	77
Liberty+N–Tense	20 oz+.75%	84	72
LSD (.05)		5	7

Table 8. AMS Replacement Studies w/350 PPM Hardness Water Quality

RCB; 3 reps
Variety: DKC 46-60
Planting Date: 5/22/07
POST: 6/19/07; Corn Vr, 5-6 lf, 10-12 in; Cowh 1-3 in.
Soil: Clay; 3.0% OM; 6.9 pH

Precipitation:
POST: 1st week 0.01 inches
2nd week 0.00 inches

Cowh=Common waterhemp

Comments: The objective of this study was to evaluate alternative to AMS when using Roundup in hard water (350 ppm calcium). Roundup was applied at reduced rates (6 to 11 oz/A) to enhance potential difference among adjuvant treatments. N–Pak AMS and Alliance are liquid formulations of AMS. Placement ProPak is liquid AMS plus a drift retardant. N–Tense is a water conditioning agent and pH acidifier that is intended to reduce antagonism from hard water impurities. When Roundup was applied at 6 oz/A, all tank mix additives increased weed control. Weed control was similar among treatments with AMS and the alternative adjuvants. When Roundup was applied at 11 oz/A, there was no difference between Roundup alone and Roundup with spray additives. Adding the spray additives to Roundup at 6 oz/A resulted in similar weed control as Roundup alone at 11 oz/A. Results from this study suggest that AMS or other AMS replacements may improve weed control when hard water is used and Roundup alone will not adequately control the weeds present.

Treatment	***Rate/A***	***% Cowh 7/3/07***	***% Cowh 9/28/07***
Check	----	0	0
POSTEMERGENCE			
Roundup WeatherMax	6 oz	75	63
Roundup WeatherMax+N–Pak AMS Liquid	6 oz+5%	89	85
Roundup WeatherMax+Class Act NG	6 oz+2.5%	88	84
Roundup WeatherMax+Alliance	6 oz+1.25%	89	86
Roundup WeatherMax+AMS	11 oz+17 lb/100 gal	88	82
Roundup WeatherMax+Class Act NG	11 oz+5 qt/100 gal	94	92
Roundup WeatherMax+N–Tense	11 oz+1 qt/100 gal	92	91
Roundup WeatherMax+Placement ProPak	6 oz+1%	88	80
Roundup WeatherMax+N–Tense	11 oz+2 qt/100 gal	94	92
Roundup WeatherMax	11 oz	90	86
LSD (.05)		6	8

Table 9. Cornbelt Adjuvants with Corn Herbicides

RCB; 4 reps
Variety: DKC 51-45
Planting Date: 5/14/07
POST: Corn 8 in; Cowh 2-4 in; Colq 2-4 in; Grft 1-3 in.
Soil: Silty clay loam; 3.0% OM; 6.8 pH

Precipitation:
POST: 1st week 0.03 inches
2nd week 0.03 inches

Cowh=Common waterhemp
Colq=Common lambsquarter
Grft=Green foxtail

Comments: The objective of this study was to determine if different Cornbelt adjuvants improved weed control in tank-mixes with Stout (nicosulfuron+thifensulfuron) + Callisto (mesotrione) or Steadfast (nicosulfuron+rimsulfuron) + Status (dicamba+diflufenzopyr). Adjuvants included Premium COC, Premium AMS, N–Tense, Trophy Gold, Soystik, and Gardian Plus. Premium COC is a mineral base oil plus a surfactant/emulsifier. N–Tense is marketed as an AMS replacement. Trophy Gold is an ethoxylated soybean oil surfactant that may be used where either a NIS or COC is required. Soystik is a blend of methylated soybean oil and surfactant emulsifier. Gardian Plus is a drift management aid and water conditioning agent. The adjuvants significantly increased control of broadleaf and grass weed species when mixed with Stout+Callisto (0.33 oz+2 oz). Weed control was similar among the Steadfast+Status treatments that contained Soystik alone or with Gardian Plus or N–Tense.

Treatment	***Rate/A***	***% Cowh 6/26/07***	***% Colq 6/26/07***	***% Grft 6/26/07***
Untreated Check	----	0	0	0
POSTEMERGENCE				
Stout+Callisto+ Premium COC+Premium AMS	.33 oz+2 oz+ 1%+8.5 lb/100 gal	95	99	91
Stout+Callisto+ Preimum COC+N–Tense	.33 oz+2 oz+ 1%+.5%	97	99	86
Stout+Callisto+ Trophy Gold+N–Tense	.33 oz+2 oz+ .25%+.5%	91	99	88
Stout+Callisto	.33 oz+2 oz	24	26	25
Steadfast+Status+ Soystik+Gardian Plus	.5 oz+1.75 oz+ 1 pt+1.25%	88	99	98
Steadfast+Status+ Soystik+N–Tense	.5 oz+1.75 oz+ 1 pt+.5%	90	99	95
Steadfast+Status+ Soystik	.5 oz+1.75 oz+ 1 pt	88	99	94
LSD (.05)		6	3	4

Table 10. Performance of Harness and Degree Applied Mid-Post to Corn

RCB; 4 reps
Variety: DKC 58-16
Planting Date: 5/2/07
PRE: 5/2/07
POST: 6/14/07; Corn V6, 20 in; Grft 3-6 in; Cowh 5-7 in.
LPOST: 6/19/07; Corn 24 in.
Soil: Silty clay loam; 3.0% OM; 68 pH

Precipitation:

PRE:	1st week	1.45 inches
	2nd week	0.03 inches
POST:	1st week	0.00 inches
	2nd week	0.01 inches
LPOST:	1st week	0.01 inches
	2nd week	0.00 inches

VCRR=Visual Crop Response Rating
(0=no injury; 100=complete kill)
Grft=Green foxtail
Cowh=Common waterhemp

Comments: The objective of this study was to evaluate weed control and corn tolerance when Harness (acetochlor) is applied late postemergence. Current registration requires that acetochlor must be applied when corn is <11 inches tall. In this study, the POST treatments were applied on 20 inch tall corn and the LPOST treatments were applied to 24 inch tall corn. Green foxtail and waterhemp were nearly completely controlled in each treatment. There was no visible corn injury on July 3 and corn yield was not reduced by the late application Harness.

Treatment	***Rate/A***	***% VCRR 7/3/07***	***% Grft 9/19/07***	***% Cowh 9/19/07***	***Yield bu/A***
Check	----	0	0	0	96
PREEMERGENCE & POSTEMERGENCE					
Harness Xtra 6L&	2.4 pt&				
Roundup Original Max+AMS	21.3 oz+2%	0	99	99	159
Harness Xtra 6L&Harness+	2.4 pt&1.5 pt+				
Roundup Original Max+AMS	21.3 oz+2%	0	99	99	164
Harness Xtra 6L&Harness+	2.4 pt&3 pt+				
Roundup Original Max+AMS	21.3 oz+2%	0	99	99	163
Harness Xtra 6L&Callisto+	2.4 pt&3 oz+				
Roundup Original Max+AMS	21.3 oz+2%	0	99	99	161
Harness Xtra 6L&Status+	2.4 pt&2.4 oz+				
Roundup Original Max+AMS	21.3 oz+2%	0	99	99	164
Harness Xtra 6L&Impact+	2.4 pt&.5 oz+				
Roundup Original Max+AMS	21.3 oz+2%	0	99	99	162
PREEMERGENCE & LATE POSTEMERGENCE					
Harness Xtra 6L&Harness+	2.4 pt&3 pt+				
Roundup Original Max+AMS	21.3 oz+2%	0	99	99	158
Harness Xtra 6L&Harness+	2.4 pt&1.5 pt+				
Roundup Original Max+AMS	21.3 oz+2%	0	99	99	154
PREEMERGENCE					
Harness Xtra 6L	2.1 qt	0	99	99	145
Lumax	3 qt	0	97	99	153
LSD (.05)		0	1	0	17

Table 11. Weed Control in Conventional and RR Corn

RCB; 4 reps
Variety: DKC 58-16
Planting Date: 5/15/07
PRE: 5/16/07
POST: 6/8/07; Corn V4, 10-12 in; Cowh 1-2 in; Cocb 1-3 in.
LPOST: 6/14/07; Corn V6, 18 in; Cowh 3-5 in; Cocb 3-6 in.
Soil: Clay; 2.7% OM; 7.1 pH

Precipitation:

PRE:	1st week	0.34 inches
	2nd week	1.03 inches
POST:	1st week	0.03 inches
	2nd week	0.00 inches
LPOST:	1st week	0.00 inches
	2nd week	0.01 inches

VCRR=Visual Crop Response Rating (0=no injury; 100=complete kill)
Cocb=Common cocklebur
Cowh=Common waterhemp

Comments: The objective of this study was to evaluate several weed control programs in corn, including programs with SureStart (acetochlor+flumetsulam+clopyralid). Yield loss was approximately 42% in the untreated check indicating moderate weed competition. All herbicide treatments resulted in nearly complete weed control. Yield was similar among all treatments. These results indicated that weed control and yield was similar among the conventional and RR corn programs and one application of Roundup applied on June 8 or June 14 was adequate for nearly complete weed control.

		% VCRR			*Corn*		
Treatment	*Rate/A*	*% Cocb 6/26/07*	*% Cowh 6/26/07*	*Lodging 9/19/07*	*% Cocb 9/19/07*	*% Cowh 9/19/07*	*Yield bu/A*
Check	----	0	0	4	0	0	76
PREEMERGENCE & POSTEMERGENCE							
Outlook&Status+ NIS+AMS	21 oz&5 oz+ .25%+5 lb/100 gal	99	99	9	99	99	131
Dual II Magnum&Callisto+ Atrazine+COC+AMS	2 pt&3 oz+ .5 lb+1%+8.5 lb/100 gal	99	99	4	98	99	134
Surpass&WideMatch+ Atrazine+Callisto+ COC+AMS	2.5 pt&10 oz+ 8 oz+.75 oz+ 1%+2.5 lb	99	99	1	98	99	132
Outlook+ Roundup WeatherMax+AMS	12 oz& 22 oz+8.5 lb/100 gal	97	98	3	97	98	141
Outlook+ Roundup WeatherMax+ Status+AMS	12 oz& 22 oz+ 2.5 oz+8.5 lb/100 gal	97	98	1	98	98	135
Surestart&Durango+AMS	1.75 pt&24 oz+2.5 lb	99	99	3	99	99	123
Surpass&WideMatch+ Durango+AMS	1.5 pt&10 oz+ 24 oz+2.5 lb	99	99	5	97	99	129
POSTEMERGENCE							
Roundup WeatherMax+AMS	22 oz+8.5 lb/100 gal	98	96	1	97	97	127
Roundup WeatherMax+ Status+AMS	22 oz+ 2.5 oz+8.5 lb/100 gal	98	97	0	97	98	128
Roundup WeatherMax+ Callisto+Atrazine+AMS	22 oz+ 1.5 oz+.5 lb+8.5 lb/100 gal	98	98	4	98	99	130

Table 11. Weed Control in Conventional and RR Corn (Continued . . .)

Treatment	Rate/A	% VCRR % Cocb 6/26/07	% VCRR % Cowh 6/26/07	Lodging 9/19/07	Corn % Cocb 9/19/07	Corn % Cowh 9/19/07	Yield bu/A
POSTEMERGENCE (Continued . . .)							
Roundup WeatherMax+	22 oz+						
Outlook+Clarity+AMS	12 oz+8 oz+8.5 lb/100 gal	98	99	1	98	99	130
Surestart+Durango+AMS	1.75 pt+24 oz+2.5 lb	99	99	0	98	99	130
LATE POSTEMERGENCE							
Roundup WeatherMax+AMS	22 oz+8.5 lb/100 gal	99	98	3	98	97	128
LSD (.05)		1	1	4	2	1	17

Table 12. Liberty Weed Control Programs

RCB; 4 reps
Variety: Pioneer 38H72 LL RR
Planting Date: 5/2/07
PRE: 5/2/07
EPOST: 6/5/07; Corn V4, 8-10 in; Grft 2-5 in; Cowh 3-6 in; Colq 3-6 in.
POST: 6/14/07; Corn V6, 20 in; Grft 3-6 in; Cowh 5-7 in; Colq 4-7 in
Soil: Silty clay loam; 3.0% OM; 6.8 pH

Precipitation:

PRE:	1st week	1.45 inches
	2nd week	0.03 inches
EPOST:	1st week	0.03 inches
	2nd week	0.03 inches
POST:	1st week	0.00 inches
	2nd week	0.01 inches

Grft=Green foxtail
Cowh=Common waterhemp
Colq=Common lambsquarter

COMMENTS: The obejctive of this study was to evaluate weed control programs in Liberty Link corn. Yield loss was approximately 61% in the untreated check suggesting moderate weed competition. Prior to the postemergence application, the preemergence herbicides resulted in >90% control of lambsquarters and waterhemp. Green foxtail control was 71-79% in the atrazine treatments, 88% in the Balance treatments, and 92-98% in the Harness treatments. By July 3, all treatments resulted in nearly complete weed control. Yield was similar among all treatmetns. These results suggested that weed control was similar between one- and two-pass programs.

Treatment	***Rate/A***	***% Grft 6/14/07***	***% Cowh 6/14/07***	***% Colq 6/14/07***	***% Cowh 7/3/07***	***% Colq 7/3/07***	***% Grft 7/3/07***	***% Grft 8/17/07***	***% Colq 8/17/07***	***% Cowh 8/17/07***	***Yield bu/A***
Check	----	0	0	0	0	0	0	0	0	0	49
PREEMERGENCE & POSTEMERGENCE											
Atrazine&Liberty+Laudis+AMS	2 pt&32 oz+2 oz+8.5 lb/100 gal	79	94	97	99	99	99	98	99	99	125
Harness Xtra 6L& Roundup Original Max+AMS	1.2 qt& 22 oz+8.5 lb/100 gal	98	97	98	99	99	99	99	99	99	132
EARLY POSTEMERGENCE											
Liberty+Atrazine+AMS	25 oz+1 pt+8.5 lb/100 gal	—	—	—	96	98	95	94	94	89	120
Liberty+Atrazine+Laudis+AMS	25 oz+1 pt+2 oz+8.5 lb/100 gal	—	—	—	99	99	98	94	98	98	132
LSD (.05)		6	3	2	2	2	1	2	3	4	10

Table 13. RR Corn 2 System Comparisons

RCB; 4 reps
Variety: DKC 58-16
Planting Date: 5/2/07
PRE: 5/2/07
EPOST: 5/31/07; Corn 4 in; Yeft 1-3 in; Cowh 1-3 in.
POST: 6/8/07; Corn V4, 8-10 in; Yeft 3-6 in; Cowh 2-5 in.
Soil: Silty clay loam; 3.0% OM; 6.5 pH

Precipitation:

PRE:	1st week	1.45 inches
	2nd week	0.03 inches
EPOST:	1st week	1.23 inches
	2nd week	0.06 inches
POST:	1st week	0.03 inches
	2nd week	0.00 inches

Yeft=Yellow foxtail
Cowh=Common waterhemp

Comments: The objective of this study was to evaluate weed control programs in RR corn. Yield loss was approximately 39% in the untreated check indicating moderate weed competition. Weeds were nearly completely controlled in all treatments and corn yield was similar among treatments. These results indicated that one Roundup application was adequate for weed control. However, conditions were dry in late-spring which may have suppressed late weed emergence.

Treatment	***Rate/A***	***% Yeft 6/26/07***	***% Cowh 6/26/07***	***% Yeft 9/19/07***	***% Cowh 9/19/07***	***Corn Yield bu/A***
PREEMERGENCE & POSTEMERGENCE						
Harness Xtra 6L&	2.4 pt&					
Roundup Original Max+AMS	21.3 oz+2%	98	99	96	99	154
Degree Xtra&	2 qt&					
Roundup Original Max+AMS	21.3 oz+2%	98	99	99	99	148
G-Max Lite&Roundup Original Max+AMS	1 qt&21.3 oz+2%	98	99	98	99	145
G-Max Lite&Roundup Original Max+AMS	1.25 qt&21.3 oz+2%	98	99	98	99	148
Harness&Roundup Original Max+AMS	23.8 oz&21.3 oz+2%	97	98	98	99	151
Degree&Roundup Original Max+AMS	1.5 qt&21.3 oz+2%	99	99	99	99	157
Outlook&Roundup Original Max+AMS	.75 pt&21.3 oz+2%	98	99	98	99	148
Outlook&Roundup Original Max+AMS	1 pt&21.3 oz+2%	99	99	96	99	138
Lumax&Touchdown Total+AMS	2 qt&1.5 pt+2%	99	99	99	99	154
Bicep Lite II Magnum&	2.67 pt&					
Touchdown Total+AMS	1.5 pt+2%	99	99	98	99	161
Atrazine&Roundup Original Max+AMS	1.5 qt&21.3 oz+2%	98	99	98	99	148
Balance Pro&Roundup Original Max+AMS	2 oz&21.3 oz+2%	99	99	98	99	161
Resolve DF+Atrazine&	1 oz+1 qt&					
Steadfast+Callisto+COC	12 oz+2 oz+1%	99	99	99	99	150
PREEMERGENCE						
Lumax	3.02 qt	98	99	98	99	152
POSTEMERGENCE						
Roundup Original Max	21.3 oz	98	97	98	98	151
EARLY POSTEMERGENCE& POSTEMERGENCE						
Roundup Original Max&	21.3 oz&					
Roundup Original Max	21.3 oz	98	99	97	99	153
Check	----	0	0	0	0	92
LSD (.05)		2	1	2	0	15

Table 14. Balance and Radius in LL and RR Corn

RCB; 4 reps
Variety: Pioneer 38H72
Planting Date: 5/2/07
PRE: 5/2/07
POST: 6/5/07; Corn V4, 8-10 in; Cowh 3-6 in; Colq 3-6 in; Vema 1-3 in; Grft 2-5 in.
Soil: Silty clay loam; 3.0% OM; 6.8 pH

Precipitation:

PRE:	1st week	1.45 inches
	2nd week	0.03 inches
POST:	1st week	0.03 inches
	2nd week	0.03 inches

Cowh=Common waterhemp
Colq=Common lambsquarter
Vema=Venice mallow
Grft=Green foxtail

Comments: The objective of this study was to evaluate weed control with Radius (flufenacet+ isoxaflutole) alone and Balance (isoxaflutole) in Liberty Link and Roundup Ready corn. Preemergence applications of Radius, Radius+atrazine, or Balance+atrazine resulted in nearly complete weed control, but some green foxtail escaped the Balance+atrazine treatment resulting in only 90% green foxtail control on August 17. The pre- followed by postemergence treatments resulted in nearly complete weed control. Roundup applied postemergence resulted slightly greater grass control than Liberty. Crop yields were similar among the herbicide programs.

Treatment	***Rate/A***	***% Cowh 6/6/07***	***% Colq 6/6/07***	***% Vema 6/6/07***	***% Cowh 6/26/07***	***% Colq 6/26/07***	***% Grft 8/17/07***	***Corn Yield bu/A***
Untreated Check	----	0	0	0	0	0	0	72
PREEMERGENCE								
Radius	23 oz	99	99	99	99	99	98	126
Radius+Atrazine	23 oz+2 pt	99	99	99	99	99	99	124
Balance Pro+Atrazine	2.5 oz+1 qt	99	99	99	99	99	90	125
PREEMERGENCE & POSTEMERGENCE								
Balance Pro&Liberty+ Atrazine+AMS	1.5 oz&32 oz+ 1 pt+8.5 lb/100 gal	98	99	99	99	99	97	123
Balance Pro&Atrazine+ Roundup Original Max+ AMS	1.5 oz+1 pt& 22 oz+ 8.5 lb/100 gal	99	99	99	99	99	97	128
POSTEMERGENCE								
Liberty+AMS	32 oz+8.5 lb/100 gal	0	0	0	92	98	97	116
Roundup Original Max+ AMS	22 oz+ 8.5 lb/100 gal	0	0	0	98	99	98	120
LSD (.05)		1	0	1	2	1	2	13

Table 15. Permit/Postemergence Weed Control Combinations

RCB; 4 reps
Variety: DKC 58-16
Planting Date: 5/2/07
EPOST: Corn V4, 8-10 in; Cowh 3-6 in; Grft 2-5 in.
Soil: Silty clay loam; 3.0% OM; 6.8 pH

Precipitation:
EPOST: 1st week 0.03 inches
2nd week 0.03 inches

Cowh=Common waterhemp
Grft=Green foxtail

Comments: The objective of this study was to determine if conventional herbicide rates could be reduced if tank-mixed with Permit (halosulfuron) or Yukon (halosulfuron+dicamba). Treatments included Impact at 0.125 to 0.25 oz/A (standard rate is 0.5 oz/A), Callisto at 1 oz/A (standard rate is 3 oz/A), and Laudis at 1 oz/A (standard rate is 3 oz/A). Impact, Callisto, and Laudis are HPPD-inhibiting herbicides or "bleachers" that are intended for broadleaf weed control but may also suppress some grass species. In August, common waterhemp control ranged from 58 to 87% among the treatments containing Permit + low rates of HPPD-inhibiting herbicides or atrazine whereas control was 94% with the standard rate of Callisto+atrazine.

Treatment	***Rate/A***	***% Cowh 6/6/07***	***% Cowh 8/27/07***	***% Grft 8/27/07***	***Yield bu/A***
EARLY POSTEMERGENCE					
Permit+atrazine+COC+AMS	.67 oz+1.5 pt+1%+2.5 lb	77	62	79	95
Permit+atrazine+COC+AMS	.67 oz+1 qt+1%+2.5 lb	79	70	80	105
Permit+Impact+COC+AMS	.67 oz+.125 oz+1%+2.5 lb	65	58	80	66
Permit+Impact+COC+AMS	.67 oz+.25 oz+1%+2.5 lb	70	64	80	89
Permit+Callisto+COC+AMS	.67 oz+.5 oz+1%+2.5 lb	77	71	81	102
Permit+Callisto+COC+AMS	.67 oz+1 oz+1%+2.5 lb	88	84	80	123
Permit+Laudis+COC+AMS	.67 oz+1 oz+1%+2.5 lb	88	87	82	129
Yukon+COC+AMS	4 oz+1%+2.5 lb	83	83	82	103
Callisto+atrazine+COC+AMS	3 oz+.67 pt+1%+2.5 lb	97	94	87	141
Untreated Check	----	0	0	0	45
LSD (.05)		7	4	5	24

Table 16. Conventional Soybean Herbicide Demonstration

Demonstration
Variety: PB 2141
Planting Date: 5/29/07
PRE: 5/31/07
EPOST: 6/19/07; Soybean 1 tri, 4 in; Grft 2-4 lf, 1-3 in; Cowh .5-1 in.
POST: 6/28/07; Soybean 3 tri, 6-7 in; Grft 3-6 in; Cowh 2-7 in.
Soil: Silty clay, 3.4% OM; 6.6 pH

Precipitation:

PRE:	1st week	1.23 inches
	2nd week	0.06 inches
EPOST:	1st week	0.01 inches
	2nd week	0.00 inches
POST:	1st week	0.00 inches
	2nd week	0.00 inches

Grft=Green foxtail
Cowh=Common waterhemp

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

Preemergence programs: Most treatments resulted in greater than 97% common waterhemp control, but Prowl resulted in 90% control. Prowl was not incorporated in this demonstration, although the label indicates Prowl must be incorporated to optimize weed control and minimize the risk of soybean stem injury. Green foxtail control was greater than 85% in all treatments. Green foxtail cotnrol was 85-87% with FirstRate+Valor or Authority First (sulfentrazone+cloransulam), but these herbicides are primarily intended for broadleaf weed control.

Pre- followed by postemergence programs: Several treatments resulted in nearly complete weed control. Tank mixing FirstRate (cloransulam) with Select Max (clethodim) may have antagonized grass control when applied after Valor (flumioxazin) as control declined from 99% to 87%. Dual (S-metolachlor) and Reflex (fomesafen) are components of the co-pack Prefix, which is intended for preemergence applications. Treatments were established to evaluate the option of applying Reflex postemergence with Raptor rather than preemergence. The results indicated that grass control was greater with Reflex+Dual followed by Raptor compared to Dual followed by Reflex+Raptor (97% and 83% control, respectively). Prefix may be packaged as a premix in the future. Green foxtail control was less in the treatments with Intrro (alachlor) compared to several other treatments.

Postemergence programs: Tank mixing either Phoenix (lactofen) or Harmony (thifensulfuron) with Poast Plus (sethoxydim) did not antagonize grass control relative to sequential applications of these herbicides. Green foxtail control was 70-72% with Raptor or Raptor+Flexstar. All postemergence applications resulted in nearly complete common waterhemp control.

Treatment	***Rate/A***	***% Grft 7/20/07***	***% Cowh 7/20/07***
Untreated Check	----	0	0
PREEMERGENCE			
Prowl H_2O	2.75 pt	88	90
Intrro	2 qt	94	98
Pursuit Plus	2.5 pt	95	97
Dual II Magnum+Reflex	1 pt+1 pt	93	99
Boundary	2.5 pt	97	99
Outlook+Valor+Python	16 oz+2 oz+1 oz	90	99
FirstRate+Valor	.3 oz+1.5 oz	85	99
Authority First	6.45 oz	87	99
Sonic	6.45 oz	90	99
Sencor 4F+Intrro	16 oz+99 oz	93	99

Table 16. Conventional Soybean Herbicide Demonstration (Continued . . .)

Treatment	***Rate/A***	***% Grft 7/20/07***	***% Cowh 7/20/07***
PREEMERGENCE & POSTEMERGENCE			
Prowl H_2O&Pursuit DG+Flexstar+ MSO+28% N	2.25 pt&.72 oz+10 oz+ 1 qt+1 qt	95	99
Prowl H_2O&Raptor+Ultra Blazer+COC	32 oz&4 oz+10 oz+1%	88	99
Boundary&Poast Plus+COC	2.5 pt&1.5 pt+1 qt	99	99
Boundary&Flexstar+Fusion+NIS	33.5 oz&20 oz+9.6 oz+.5%	99	99
Valor&Poast Plus+COC	3 oz&1.5 pt+1 qt	99	95
Valor+Python&Select Max+COC	2 oz+1 oz&14 oz+1 qt	99	90
Valor+FirstRate&Select Max+COC	1.5 oz+.3 oz&14 oz+1 qt	99	86
Valor&FirstRate+Select Max+COC	2 oz&.3 oz+14 oz+1 qt	87	83
Dual II Magnum+Reflex& Raptor+MSO+28% N	1 pt+1 pt& 4 oz+1%+2.5%	97	99
Dual II Magnum&Reflex+Raptor+ MSO+28% N	1 pt&1 pt+4 oz+ 1%+2.5%	83	99
Intrro&Flexstar+Fusion+NIS	2 qt&20 oz+9.6 oz+.5%	85	99
Intrro&Raptor+MSO+28% N	2 qt&4 oz+1qt+1 qt	87	99
Intrro&Harmony GT 75WG+NIS	2 qt&.083 oz+.25%	80	98
Python&FirstRate+Select Max+COC	1.33 oz&.3 oz+14 oz+1 qt	95	97
Authority First&Select Max+COC	6.45 oz&14 oz+1 qt	99	99
EARLY POSTEMERGENCE & POSTEMERGENCE			
Poast Plus+COC&Phoenix+COC	1.5 pt+1 qt&.8 pt+1 qt	97	99
Poast Plus+COC& Harmony GT 75WG+NIS	1.5 pt+1 qt& .083 oz+1 qt	98	99
EARLY POSTEMERGENCE			
Poast Plus+Phoenix+COC	1.5 pt+8 pt+1 qt	96	98
Poast Plus+Harmony GT 75WG+NIS	1.5 pt+.083 oz+.25%	98	98
FirstRate+Flexstar+Select Max+ MSO+28% N	.3 oz+10 oz+12 oz+ 1 qt+1 qt	98	99
Flexstar+Select Max+MSO+28% N	15 oz+12 oz+1 qt+1 qt	98	99
Raptor+MSO+28% N	5 oz+1%+2.5%	70	99
Raptor+Flexstar+MSO+28% N	4 oz+10 oz+1%+2.5%	72	99

Table 17. Herbicide Resistant Soybean Demonstration

Demonstration
Variety: PB 2141
Planting Date: 5/29/07
PRE: 5/31/07
EPOST: 6/19/07; Soybean 1 tri, 4 in; Grft 2-4 lf, 1-3 in; Cowh .5-1 in.
POST: 6/28/07; Soybean 3 tri, 6-7 in; Grft 3-6 in; Cowh 2-7 in.
POST2: 7/9/07; Soybean 12 in; Grft 5-10 in; Cowh 5-12 in.
Soil: Silty clay; 3.4% OM; 6.6 pH

Precipitation:

PRE:	1st week	1.23 inches
	2nd week	0.06 inches
EPOST:	1st week	0.01 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

Grft=Green foxtail
Cowh=Common waterhemp

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. All treatments resulted in nearly complete weed control, regardless of application timing.

Treatment	***Rate/A***	***% Grft 7/20/07***	***% Cowh 7/20/07***
Untreated Check	----	0	0
PREEMERGENCE & POSTEMERGENCE			
Prowl H_2O&Extreme+NIS+AMS	2.25 pt&1.5 qt+.25%+2.5 lb	99	99
Python&Roundup WeatherMax+AMS	.8 oz&22 oz+2.5 lb	99	99
Valor&Roundup WeatherMax+AMS	1.5 oz&22 oz+2.5 lb	99	99
Valor+Python&Roundup WeatherMax+AMS	1.5 oz+1 oz&22 oz+2.5 lb	99	99
Valor+FirstRate&Roundup WeatherMax+AMS	1.5 oz+.3 oz&22 oz+2.5 lb	99	99
Spartan 4F&Roundup WeatherMax+AMS	3 oz&22 oz+2.5 lb	99	99
Sencor DF&Roundup WeatherMax+AMS	8 oz&22 oz+2.5 lb	99	99
Boundary&Roundup WeatherMax+AMS	1.5 pt&22 oz+2.5 lb	99	99
Dual II Magnum+Reflax& Touchdown Total+AMS	1 pt+1 pt& 24 oz+2.5 lb	99	99
Authority First&Roundup WeatherMax+AMS	3 oz&22 oz+2.5 lb	99	98
Domain&Roundup WeatherMax+AMS	10 oz&22 oz+2.5 lb	99	99
Intrro&Roundup WeatherMax+AMS	1.5 qt&22 oz+2.5 lb	99	99
EARLY POSTEMERGENCE			
Roundup WeatherMax+AMS	22 oz+2.5 lb	98	99
Extreme+NIS+AMS	1.5 qt+.25%+2.5 lb	96	98
Roundup WeatherMax+Dual II Magnum+AMS	22 oz+1 pt+2.5 lb	97	98
Roundup WeatherMax+FirstRate+AMS	22 oz+.3 oz+2.5 lb	95	98
POSTEMERGENCE			
Roundup WeatherMax+AMS	22 oz+2.5 lb	98	99
Roundup WeatherMax+ Harmony GT 75SG+AMS	11 oz+ .083 oz+2.5 lb	98	99
Roundup WeatherMax+Aim+AMS	11 oz+.25 oz+2.5 lb	98	99
Roundup WeatherMax+Resource+AMS	11 oz+2 oz+2.5 lb	99	99
Roundup WeatherMax+Flexstar+AMS	11 oz+8 oz+2.5 lb	98	98

Table 17. Herbicide Resistant Soybean Demonstration (Continued . . .)

Treatment	***Rate/A***	***% Grft 7/20/07***	***% Cowh 7/20/07***
POSTEMERGENCE 2			
Roundup WeatherMax+AMS	22 oz+2.5 lb	99	99
Roundup WeatherMax+AMS	44 oz+2.5 lb	99	99
Roundup WeatherMax+ Harmony GT 75WG+AMS	22 oz+ .083 oz+2.5 lb	99	99
Roundup WeatherMax+Aim+AMS	22 oz+.25 oz+2.5 lb	99	99
Roundup WeatherMax+Resource+AMS	22 oz+2 oz+2.5 lb	99	99
Roundup WeatherMax+Flexstar+AMS	22 oz+8 oz+2.5 lb	99	99
Roundup WeatherMax+FirstRate+AMS	22 oz+.3 oz+2.5 lb	99	99

Table 18. Touchdown Programs with Prefix in RR Soybeans

RCB; 4 reps
Variety: DKB 26-53
Planting Date: 5/17/07
PRE: 5/19/07
EPOST: 6/14/07; Soybean 2 tri, 5 in; Cowh 1-3 in; Colq 1-3 in; Cocb 3-6 in; Vele 1-4 in; Yeft 2-4 in.
POST: 6/23/07; Soybean 4 tri, 8 in; Cowh 1-8 in; Colq 3-8 in; Vele 1-5 in; Yeft
Soil: Silty clay loam; 3.0% OM; 6.8 pH

Precipitation:

PRE:	1st week	0.86 inches
	2nd week	0.73 inches
EPOST:	1st week	0.00 inches
	2nd week	0.01 inches
POST:	1st week	0.00 inches
	2nd week	0.00 inches

Cowh=Common waterhemp
Colq=Common lambsquarter
Cocb=Common cocklebur
Vele=Velvetleaf
Yeft=Yellow foxtail

Comments: The objective of this study was to evaluate various programs with Touchdown (glyphosate), including one-pass postemergence, two-pass postemergence, and pre-followed by postemergence applications with residual weed control. Yield loss in the untreated check was approximately 65% suggesting moderate weed competition. Two rates of Prefix (S-metolachlor+fomesafen) were applied to represent rates for different regions in SD where rates of fomesafen (e.g. Reflex) are restricted. Prefix may be applied at 1.5 pt/A east of Hwy 281 or 2 pt/A east of Hwy 81 (check label for specific locations for rate restrictions). Weed control was similar between Prefix rates for each species at each evaluation date. Treatments that included Prefix or Valor resulted in excellent waterhemp control by September 19, but less than 67% velvetleaf control. Velvetleaf control on September 19 increased greatly with preemergence applications of Gangster FR (cloransulam)+Gangster V (flumioxazin) or Sonic (sulfentrazone+cloransulam). One postemergence application of Touchdown resulted in season-long control of common waterhemp and yellow foxtail, but only 60% control of velvetleaf. Even two postemergence Touchdown applications resulted in only 73% velvetleaf control by September 19. These results indicated a residual herbicide was necessary to obtain season-long control of velvetleaf. Soybean yield was similar among all the herbicide treatments.

Treatment	***Rate/A***	***% Cowh 6/15/07***	***% Colq 6/15/07***	***% Cocb 6/23/07***	***% Vele 6/23/07***	***% Cocb 7/31/07***	***% Cowh 7/31/07***	***% Vele 7/31/07***	***% Cowh 9/19/07***	***% Yeft 9/19/07***	***% Vele 9/19/07***	***Yield bu/A***
Untreated Check	----	0	0	0	0	0	0	0	0	0	0	11
PREEMERGENCE & POSTEMERGENCE												
Prefix&Touchdown Total+AMS	1.5 pt&24 oz+2%	98	97	90	81	99	99	89	99	99	64	31
Prefix&Touchdown Total+AMS	2 pt&24 oz+2%	98	98	94	82	99	99	86	99	99	59	34
Valor&Touchdown Total+AMS	2 oz&24 oz+2%	98	97	91	93	98	99	87	98	99	67	31
Gangster FR+Gangster V& Touchdown Total+AMS	.3 oz+1.5 oz& 24 oz+2%	98	98	99	99	98	99	96	97	99	94	31
Sonic&Touchdown Total+AMS	3 oz&24 oz+2%	98	98	99	99	99	99	99	98	98	98	29
POSTEMERGENCE												
Touchdown Total+AMS	24 oz+2%	—	—	—	—	94	99	83	95	98	60	33
EARLY POSTEMERGENCE & LATE POSTEMERGENCE												
Touchdown Total+AMS& Touchdown Total+AMS	24 oz+2%& 24 oz+2%	—	—	—	—	98	99	82	97	98	73	28
LSD (.05)		0	1	4	5	2	0	9	3	1	13	8

Table 19. Liberty Link Soybean - Weed Control Programs

RCB; 4 reps
Variety: Liberty Link
Planting Date: 5/17/07
PRE: 5/19/07
EPOST: 6/14/07; Soybean 2 tri, 5 in; Cocb 4-6 in; Cowh 1-2 in; Colq 1-2 in; Vele 1-4 in.
MIDPOST: 6/19/07; Soybean 3 tri, 7 in; Cocb 6-8 in; Cowh 2-4 in; Colq 2-4 in; Vele 1-5 in.
POST2: 6/28/07; Soybean 10 in.
Soil: Clay; 2.7% OM; 7.1 pH

Precipitation:

PRE:	1st week	0.86 inches
	2nd week	0.73 inches
EPOST:	1st week	0.00 inches
	2nd week	0.01 inches
MIDPOST:	1st week	0.01 inches
	2nd week	0.00 inches
POST2:	1st week	0.00 inches
	2nd week	0.00 inches

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

Cocb=Common cocklebur
Cowh=Common waterhemp
Colq=Common lambsquarter
Vele=Velvetleaf

COMMENTS: The objective of this study was to evaluate weed control programs in Liberty Link soybeans. All the preemergence herbicides resulted in very good control of waterhemp and common lambsquarters prior to applications of postemergence herbicides. Authority First and Gangster (flumioxazin+cloransulam) were the only preemergence herbicides that resulted in at least 95% control of cocklebur. On July 31, most treatments with preemergence applications resulted in greater weed control than Liberty alone. The treatment with Prefix (S-metolachlor+fomesafen) resulted in approximately 85% control of cocklebur and velvetlaf. Treatments with Gangster, Sencor, Authority First, and Valor resulted in at least 94% control of cocklebur and velvetleaf on July 31. Two applications of Liberty resulted in nearly complete weed control. Results from this study suggests two-pass programs including either a preemergence herbicide or two applications of Liberty may be important for adequate weed control in Liberty Link soybeans.

Treatment	***Rate/A***	***% Cocb 6/15/07***	***% Cowh 6/15/07***	***% Colq 6/15/07***	***% Cowh 7/3/07***	***% Colq 7/3/07***	***% Cocb 7/3/07***	***% VCRR 7/3/07***	***% Cowh 7/31/07***	***% Cocb 7/31/07***	***% Vele 7/31/07***
Check	----	0	0	0	0	0	0	0	0	0	0
PREEMERGENCE & MIDPOSTEMERGENCE											
Authority First&Liberty+AMS	4 oz&32 oz+8.5 lb/100 gal	96	99	99	99	99	99	0	99	98	99
EARLY POSTEMERGENCE & POSTEMERGENCE 2											
Liberty+AMS&Liberty+AMS	32 oz+8.5 lb/100 gal&32 oz+8.5 lb/100 gal	—	—	—	99	98	99	1	96	99	99
MIDPOSTEMERGENCE											
Liberty+AMS	32 oz+8.5 lb/100 gal	—	—	—	90	90	97	0	84	88	88
PREEMERGENCE & MIDPOSTEMERGENCE											
Gangster FR+Gangster V& Liberty+AMS	.3 oz+1.5 oz& 32 oz+8.5 lb/100 gal	96	98	99	99	99	99	0	97	99	97
Intrro&Liberty+AMS	1.5 qt&32 oz+8.5 lb/100 gal	5	97	94	98	94	98	0	97	91	87
Boundary&Liberty+AMS	1.5 pt&32 oz+8.5 lb/100 gal	45	98	98	99	99	97	0	98	97	91
LSD (.05)		14	2	3	3	2	2	1	3	4	4

Table 20. Authority Products in Soybeans

RCB; 4 reps
Variety: DKB 26-53
Planting Date: 5/17/07
PRE: 5/19/07
POST: 6/23/07; Soybean 4 tri, 8 in; Cowh 1-7 in; Colq 3-8 in; Vele 1-5 in; Yeft 3-6 in.
Soil: Clay; 3.4% OM; 6.8 pH

Precipitation:

PRE:	1st week	0.86 inches
	2nd week	0.73 inches
POST:	1st week	0.00 inches
	2nd week	0.00 inches

Cowh=Common waterhemp
Colq=Common lambsquarter
Vele=Velvetleaf
Yeft=Yellow foxtail

Comments: The objective of this study was to evaluate weed control in soybeans with Authority First (sulfentrazone+cloransulam) or Authority MTZ (sulfentrazone+metribuzin). Preemergence applications of these products improved velvetleaf control relative to one application of Roundup. Velvetleaf control was similar between the treatments with Authority First and Authority MTZ.

Treatment	***Rate/A***	***% Cowh 6/15/07***	***% Colq 6/15/07***	***% Vele 6/23/07***	***% Cowh 7/31/07***	***% Vele 7/31/07***	***% Vele 9/19/07***	***% Cowh 9/19/07***	***% Yeft 9/19/07***
Check	----	0	0	0	0	0	0	0	0
PREEMERGENCE & POSTEMERGENCE									
Authority First& Roundup Original Max+AMS	3.2 oz& 22 oz+3 lb	97	97	99	99	99	97	97	96
Authority MTZ& Roundup Original Max+AMS	10 oz& 22 oz+3 lb	98	98	98	99	97	89	98	97
Roundup Original Max+AMS	22 oz+3 lb	—	—	—	92	76	21	85	93
LSD (.05)		2	2	2	2	4	11	10	4

Table 21. Broadleaf Weed Control in RR Soybeans

RCB; 4 reps
Variety: DKB 26-53
Planting Date: 5/17/07
PRE: 5/19/07
POST: 6/23/07; Soybean 4 tri, 8 in; Cowh 1-8 in; Colq 3-8 in; Cocb 4-8 in; Vele 1-5 in.
POST2: 6/28/07; Soybean 10 in.
Soil: Clay; 2.7% OM; 7.1 pH

Precipitation:

PRE:	1st week	0.86 inches
	2nd week	0.73 inches
POST:	1st week	0.00 inches
	2nd week	0.00 inches
POST2:	1st week	0.00 inches
	2nd week	0.00 inches

Cowh=Common waterhemp
Colq=Common lambsquarter
Cocb=Common cocklebur
Vele=Velvetleaf

COMMENTS: The objective of this study was to evaluate broadleaf weed control programs in RR soybeans. Some treatments included Durango (glyphosate) or Durango DMA (a new formulation of Durango as a DMA salt of glyphosate). All treatments included a glyphosate application on June 23. Yield loss in the untreated check was approximately 61% suggesting moderate weed competition. The combination of Dual II Magnum (S-metolachlor) and Reflex (fomesafen) is sold as Prefix. The standard rate of Prefix may be equivalent to 1 pt of Dual II Magnum and 1 pt of Reflex in areas where Reflex rates are not restricted in SD. The treatment with a lower Reflex rate (4 oz/A) resulted in less broadleaf control on June 23, but a subsequent application of Roundup caused weed control to be similar to the standard Prefix rate until the end of the season. Treatments with Boundary (S-metolachlor+metribuzin) or Prefix resulted in less early-season velvetleaf control than several of the other preemergence herbicides, but control of common waterhemp or common lambsquarters was similar among most treatments. Several treatments resulted in incomplete velvetleaf control by September 19. Treatments that resulted in nearly complete velvetleaf control over the growing season included Sonic (sulfentrazone+cloransulam), two passes of Durango DMA, Valor (flumioxazin) + Python (flumetsulam), or Valor+FirstRate (cloransulam). Other broadleaf weeds were nearly completely controlled in each treatment on September 19. Yields were similar among all herbicide treatments.

Treatment	***Rate/A***	***% Cowh 6/15/07***	***% Colq 6/15/07***	***% Cocb 6/23/07***	***% Vele 6/23/07***	***% Cowh 7/31/07***	***% Cocb 7/31/07***	***% Vele 7/31/07***	***% Colq 9/19/07***	***% Vele 9/19/07***	***Yield bu/A***
Untreated Check	----	0	0	0	0	0	0	0	0	0	11
PREEMERGENCE & POSTEMERGENCE											
Sonic&Durango+AMS	3 oz&24 oz+2.5 lb	97	98	98	99	99	99	98	99	95	26
POSTEMERGENCE											
FirstRate+Durango+AMS	.3 oz+24 oz+2.5 lb	—	—	—	—	96	99	84	96	64	28
POSTEMERGENCE & POSTEMERGENCE 2											
Durango DMA+AMS&Durango DMA+AMS	24 oz+2.5 lb&24 oz+2.5 lb	—	—	—	—	99	99	99	98	99	31

Table 21. Broadleaf Weed Control in RR Soybeans (Continued . . .)

Treatment	*Rate/A*	*% Cowh 6/15/07*	*% Colq 6/15/07*	*% Cocb 6/23/07*	*% Vele 6/23/07*	*% Cowh 7/31/07*	*% Cocb 7/31/07*	*% Vele 7/31/07*	*% Colq 9/19/07*	*% Vele 9/19/07*	*Yield bu/A*
PREEMERGENCE & POSTEMERGENCE											
Boundary&RU WeatherMax+AMS	1.25 pt&22 oz+2.5 lb	98	97	84	88	99	99	88	99	59	29
Valor&RU WeatherMax+AMS	2 oz&22 oz+2.5 lb	98	96	93	93	99	99	84	98	59	28
Valor+Python&RU WeatherMax+AMS	1 oz+.5 oz&22 oz+2.5 lb	98	97	92	96	99	99	98	99	93	31
Valor+Sencor DF&RU WeatherMax+AMS	1.75 oz+4 oz&22 oz+2.5 lb	98	97	89	93	99	99	88	99	63	30
Dual II Magnum+Reflex& RU WeatherMax+AMS	1 pt+1 pt& 22 oz+2.5 lb	98	97	91	76	99	99	85	99	62	28
Dual II Magnum&Reflex+ RU WeatherMax+AMS	1 pt&4 oz+ 22 oz+2.5 lb	96	93	33	28	99	99	85	99	58	26
Valor+FirstRate& RU WeatherMax+AMS	1.5 oz+.3 oz& 22 oz+2.5 lb	99	99	98	99	99	99	99	99	99	29
LSD (.05)		1	3	8	5	2	0	4	2	11	7

Table 22. Sencor with Valor for Weed Control in Soybeans

RCB; 4 reps
Variety: DKB 26-53
Planting Date: 5/17/07
PRE: 5/19/07
Soil: Clay; 3.4% OM; 6.8 pH

Precipitation:
PRE: 1st week 0.86 inches
2nd week 0.73 inches

VCRR=Visual Crop Response Rating
(0=no injury; 100=complete kill)
Pesw=Pennsylvania smartweed
Cowh=Common waterhemp
Colq=Common lambsquarter
Vele=Velvetleaf

Comments: The objective of this study was to evaluate optimal rates of Sencor (metribuzin) to mix with a low rate of Valor (flumioxazin) for preemergence applications in soybeans. Optimal control with Valor+Sencor occurred with Sencor rates at 4 to 5 oz/A. Higher Sencor rates did not increase control. Velvetleaf control was 57% with Valor alone (1.75 oz/A), but increased to 87% when tank-mixed with Sencor (4 oz/A).

Treatment	***Rate/A***	***% Pesw 6/15/07***	***% Cowh 6/15/07***	***% Colq 6/15/07***	***% VCRR 6/15/07***	***% Vele 7/17/07***	***% Cowh 7/17/07***	***% Colq 7/17/07***	***% Cowh 9/19/07***	***% Colq 9/19/07***
Untreated Check	----	0	0	0	0	0	0	0	0	0
PREEMERGENCE										
Valor SX	1.75 oz	78	98	97	0	57	89	84	84	85
Valor SX+Sencor DF	1.75 oz+3 oz	85	97	98	0	60	91	89	84	85
Valor SX+Sencor DF	1.75 oz+4 oz	93	98	98	0	87	94	91	86	86
Valor SX+Sencor DF	1.75 oz+5 oz	97	98	98	0	95	94	94	92	91
Valor SX+Sencor DF	175 oz+6 oz	94	99	99	0	87	97	95	96	91
Valor SX+Sencor DF	1.75 oz+8 oz	94	99	99	0	93	98	96	96	94
LSD (.05)		9	1	1	0	10	4	6	3	5

Table 23. Early-Season Weed Competition With and Without a Pre

RCB; 4 reps
Variety: PB 2141
Planting Date: 5/29/07
PRE: 5/31/07
POST: 6/14/07; Soybean 1 tri, 4 in; Cowh .5-1 in; Colq .5-1 in; Vele 1-4 lf; Grft 1-3 in, 2-4 lf
POST2: 7/9/07; Soybean 12 in; Cowh 5-12 in; Colq 3-10 in; Vele 4-8 in; Grft 5-10 in.
Soil: Silty clay; 3.4% OM; 6.6 pH

Precipitation:

PRE:	1st week	1.23 inches
	2nd week	0.06 inches
POST:	1st week	0.01 inches
	2nd week	0.00 inches
POST2:	1st week	0.00 inches
	2nd week	0.00 inches

Cowh=Common waterhemp
Colq=Common lambsquarter
Vele=Velvetleaf
Grft=Green foxtail

Comments: The objective of this study was to evaluate reduced rates of Authority First (sulfentrazone + cloransulam) prior to a postemergence (June 14) or late postemergence (July 9) application of Roundup. However, weed competition was low in this study as indicated by the relatively high yield in the untreated check. Weeds were nearly completely controlled in all treatments. There was no difference in soybean yield among the herbicide treatments. These results indicated that preemergence herbicides may not be beneficial in RR soybeans where weed populations are low.

Treatment	***Rate/A***	***% Cowh 9/19/07***	***% Colq 9/19/07***	***% Vele 9/19/07***	***% Grft 9/19/07***	***Soybean Yield bu/A***
Check	----	0	0	0	0	34
PREEMERGENCE & POSTEMERGENCE						
Authority First&	6 oz&					
Roundup WeatherMax+AMS	22 oz+2.5 lb	99	99	99	99	40
Authority First&	3 oz&					
Roundup WeatherMax+AMS	22 oz+2.5 lb	99	99	98	99	42
Authority First&	1.5 oz&					
Roundup WeatherMax+AMS	22 oz+2.5 lb	99	99	99	99	43
POSTEMERGENCE						
Roundup WeatherMax+AMS	22 oz+2.5 lb	99	99	99	99	40
PREEMERGENCE & POSTEMERGENCE 2						
Authority First&	6 oz&					
Roundup WeatherMax+AMS	22 oz+2.5 lb	99	99	99	99	40
Authority First&	3 oz&					
Roundup WeatherMax+AMS	22 oz+2.5 lb	99	99	99	99	42
Authority First&	1.5 oz&					
Roundup WeatherMax+AMS	22 oz+2.5 lb	99	99	99	99	41
POSTEMERGENCE 2						
Roundup WeatherMax+AMS	22 oz+2.5 lb	99	99	99	99	38
LSD (.05)		0	1	1	0	5

Table 24. Soybean Row Spacing and Density Effects on Weed Management

RCB; 3 reps
Variety: AG 1401
Planting Date: 6/7/07
PRE: 6/8/07
LPOST: 7/26/07; Soybean 18 in.
Soil: Clay loam; 3.3% OM; 7.2 pH

Precipitation:

PRE:	1st week	0.03 inches
	2nd week	0.00 inches
LPOST:	1st week	0.14 inches
	2nd week	1.62 inches

Comments: The objective of this study was to evaluate the benefit of pre-emergence herbicides in soybeans planted at a moderate and low density (180,000 to 100,000 plants/A) or in wide or narrow rows (30 to 7.5 inches). Weed pressure was relatively low, but caused approximately 23% yield loss in the untreated check. Soybean yield was approximately 25 bu/A in the weed-free treatments suggesting yield potential was relatively low in this study. Making a single application of Roundup late post-emergence (July 26), resulted in approximately 24% yield loss at 100,000 plants/A or 9% yield loss at 180,000 plants/A suggesting higher densities reduced the effect of early-season weed competition. In the untreated checks, yield was greater when soybeans were planted at 180,000 plants/A than at 100,000 plants/A providing additional evidence that soybeans were more competitive when planted at a higher density. Although it appears that average yields were greater at 180,000 plants/A than at 100,000 plants/A in both row spacings, the yields were not statistically different. Yields were also similar between row spacings. This study was also replicated at the Highmore Experiment Station to compare row spacing and density effects in different moisture environments. Partial funding was provided by the South Dakota Soybean Research and Promotion Council.

			SOYBEAN YIELD (bu/A)	
Treatment	***Rate/A***	***Population***	***Row Spacing (30 in)***	***Row Spacing (7.5 in)***
Untreated Check	----	100	18	18
		180	22	21
PREEMERGENCE & LATE POSTEMERGENCE				
Valor&Roundup WeatherMax+AMS	1 oz&22 oz+2.5 lb	100	21	24
		180	27	31
Valor&Roundup WeatherMax+AMS	2 oz&22 oz+2.5 lb	100	25	27
		180	31	32
Intrro+Spartan4F& Roundup WeatherMax+AMS	1.5 qt+4 oz& 22 oz+2.5 lb	100	22	24
		180	28	30
LATE POSTEMERGENCE				
Roundup WeatherMax+AMS	22 oz+2.5 lb	100	18	17
		180	25	28
LSD (.05)				7

Table 25. Adjuvants with Micronutrients

RCB; 4 reps
Variety: PB 2141
POST: 6/28/07; Soybean 3 tri, 6-7 in; Cowh 2-7 in; Colq 2-5 in.
Soil: Silty clay; 3.4% OM; 6.6 pH

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

VCRR=Visual Crop Response Rating (0=no injury; 100=complete kill)
Cowh=Common waterhemp
Colq=Common lambsquarter

COMMENTS: The objective of this study was to evaluate Roundup tank mixed with adjuvants and micronutrients. Max-In for Beans is a combination of boron, iron, manganese, molybdenum, and zinc. Max-In MN is sulfur and manganese. Class Act is a water conditioning agent and NIS. A reduced rate of Roundup (16 oz/A) was used in each treatment. Yield loss in the untreated check was approximately 27% suggesting light to moderate weed competition. Weed control was greater with Roundup+Class Act than Roundup alone. Adding micronutrients to Roundup did not antagonize weed control. Weed control was often greater when Class Act was added to Roundup+micronutrients relative to Roundup+micronutrients alone. The addition of micronutrients did not increase soybean yield.

Treatment	***Rate/A***	***% VCRR 7/11/07***	***% Cowh 7/11/07***	***% Colq 7/11/07***	***Yield bu/A***
Check	----	0	0	0	32
POSTEMERGENCE					
Roundup WeatherMax	16 oz	0	95	94	45
Roundup WeatherMax+Class Act NG	16 oz+2.5%	5	99	99	43
Roundup WeatherMax+Max-In for Beans	16 oz+1 qt	4	95	95	43
Roundup WeatherMax+Max-In for Beans+ Class Act NG	16 oz+1 qt+ 2.5%	6	99	99	45
Roundup WeatherMax+Max-In MN	16 oz+1 qt	0	96	94	42
Roundup WeatherMax+Max-In MN+ Class Act NG	16 oz+1 qt+ 2.5%	1	99	99	44
LSD (.05)		6	2	3	4

Table 26. Adjuvants for Volunteer Corn Control in Soybeans

RCB; 3 reps
Variety: DKB 26-53
Planting Date: 5/22/07
POST: 6/19/07; Soybean 2-3 tri, 6 in; Voco 12-14 in.
Soil: Silty clay; 3.5% OM; 6.6 pH

Precipitation:
POST: 1st week 0.01 inches
2nd week 0.00 inches

Voco=Volunteer corn

Comments: The objective of this study was to evaluate adjuvants for controlling glyphosate resistant volunteer corn in soybeans with reduced rates of Select Max. Superb is a concentrated COC that may be used at lower rates than other COC products and may not antagonize glyphosate. Preference is a NIS and antifoaming agent. Using Superb increased volunteer corn control relative to using AMS or NIS (Class Act or Preference).

Treatment	***Rate/A***	***% Voco 7/3/07***	***% Voco 7/31/07***
Check	----	0	0
POSTEMERGENCE			
Roundup WeatherMax+Class Act NG	11 oz+5 qt/100 gal	0	0
Touchdown Hi-Tech+Select Max	11 oz+4 oz	82	80
Touchdown Hi-Tech+Select Max+N–Pak AMS Liquid	11 oz+4 oz+2.5%	91	90
Touchdown Hi-Tech+Select Max+ Preference+N–Pak AMS Liquid	11 oz+4 oz+ .25%+2.5%	88	86
Touchdown Hi-Tech+Select Max+ Superb HC+N–Pak AMS Liquid	11 oz+4 oz+ .5%+2.5%	94	98
Roundup WeatherMax+Select+ Superb+Class Act NG	11 oz+2 oz+ 1 qt/100 gal+5 qt/100 gal	95	98
Roundup WeatherMax+Select Max+Class Act NG	11 oz+4 oz+5 qt/100 gal	90	94
Roundup WeatherMax+Select Max+ Superb+Class Act NG	11 oz+4 oz+ 1 qt/100 gal+5 qt/100 gal	96	96
LSD (.05)		2	3

Table 27. Burndown and Residual Weed Control in No-Till Soybeans

RCB; 4 reps
Variety: PB 2141
Planting Date: 6/7/07
PRE: 5/16/07; Cowh .5-1 in; Colq 1-2 in.
Soil: Silty clay; 3.5% OM; 6.7 pH

Precipitation:
PRE: 1st week 0.34 inches
2nd week 1.03 inches

Cowh=Common waterhemp
Colq=Common lambsquarter

Comments: The objective of this study was to evaluate the efficacy of residual herbicides applied prior to soybean planting. Harmony (thifensulfuron), Classic (chlorimuron), and Synchrony (thifensulfuron+chlorimuron) were included in the treatrments, but these herbicides are not currently registered for preplant applications in soybeans. However, no soybean injury was noted in these treatments. Also, no injury was noted in treatments with 2,4-D ester (1 pt/A) applied 4 weeks prior to soybean planting. On June 7, nearly all treatments resulted in at least 97% control of common waterhemp or common lambsquarters. However, common waterhemp control differed among treatments on June 26. Preplant applications that did not include a residual herbicide provided 66-68% control. Treatments that included Valor (flumioxazin) at 2 to 2.5 oz/A increased control up to 84-87%. The greatest residual control was identified in treatments containing Authority First (sulfentrazone+cloransulam), Prefix (S-metolachlor+fomesafen), or Classic+Harmony+Valor (0.32 oz+0.5 oz+2 oz).

Treatment	***Rate/A***	***% Cowh 6/7/07***	***% Colq 6/7/07***	***% Cowh 6/26/07***	***Yield bu/A***
PREEMERGENCE					
2,4-D ester+Classic+ Harmony GT 50SG+Valor+COC	1 pt+.32 oz+ .496 oz+2 oz+1%	99	99	93	38
2,4-D ester+Valor+COC	1 pt+2 oz+1%	99	99	84	37
2,4-D ester+Valor+COC	1 pt+2.5 oz+1%	99	99	85	40
2,4-D ester+Authority First+COC	1 pt+3.23 oz+1%	99	99	97	42
2,4-D ester+Prefix+Reflex+COC	1 pt+1.1 pt+1 pt+1%	99	99	97	39
2,4-D ester+Synchrony+COC	1 pt+.375 oz+1%	99	99	87	36
Roundup WeatherMax+2,4-D ester+ Classic+Harmony GT 50SG+ Valor+NIS	11 oz+1 pt+ .32 oz+.496 oz+ 2 oz+.25%	99	99	96	44
Roundup WeatherMax+2,4-D ester+ Valor+NIS	11 oz+1 pt+ 2 oz+.25%	97	99	87	42
Roundup WeatherMax+2,4-D ester+ Authority First+NIS	11 oz+1 pt+ 3.23 oz+.25%	99	99	97	44
Roundup WeatherMax+Prefix+ Reflex+NIS	11 oz+1.1 pt+ 1 pt+.25%	99	99	98	44
Roundup WeatherMax+Synchrony+NIS	11 oz+.375 oz+.25%	97	99	66	37
Roundup WeatherMax+2,4-D ester	11 oz+1 pt	98	99	68	36
Untreated Check	----	0	0	0	9
LSD (.05)		2	0	6	7

Table 28. Select Max for Control of Volunteer RR Corn

RCB; 3 reps
Variety: DKB 26-53
Planting Date: 5/22/07
POST: 6/19/07; Soybean 2-3 tri, 6 in; Voco 12-14 in.
Soil: Silty clay; 3.5% OM; 6.6 pH

Precipitation:
POST: 1st week 0.01 inches
2nd week 0.00 inches
Voco=Volunteer corn

Comments: The objective of this study was to evaluate volunteer corn control with Select Max (clethodim) in soybeans. An application of the lowest rate of Select Max (4 oz/A) resulted in nearly complete volunteer corn control. Volunteer corn control was similar with and without a surfactant when Select Max was applied at 9 oz/A.

Treatment	***Rate/A***	***% Voco 7/3/07***	***% Voco 7/31/07***
Untreated Check	----	0	0
POSTEMERGENCE			
Roundup Original Max+AMS	22 oz+17 lb/100 gal	0	0
Select Max+Roundup Original Max+AMS	6 oz+22 oz+17 lb/100 gal	95	99
Select Max+Roundup Original Max+AMS	9 oz+22 oz+17 lb/100 gal	98	99
Select Max+Roundup Original Max+AMS+NIS	9 oz+22 oz+17 lb/100 gal+.25%	97	99
Select Max+Roundup Original Max+AMS	14 oz+22 oz+17 lb/100 gal	99	99
LSD (.05)		1	0

Table 29. Control of Volunteer Glyphosate-Tolerant Corn

RCB; 3 reps
Variety: DKB 26-53
Planting Date: 5/22/07
POST: 6/14/07; Soybean 1 tri, 4-5 in; Voco V3, 8 in.
Soil: Silty clay; 3.5% OM, 6.6 pH

Precipitation:
POST: 1st week 0.00 inches
2nd week 0.01 inches

Voco=Volunteer corn

Comments: The objective of this study was to evaluate grass herbicides for controlling volunteer corn. Targa is quizalofop whereas Select and Select Max are formulations of clethodim. All treatments resulted in nearly complete volunteer corn control.

Treatment	***Rate/A***	***% Voco 7/3/07***	***% Voco 7/31/07***
POSTEMERGENCE			
Targa+Roundup WeatherMax+NIS+AMS	4 oz+22 oz+.125%+2.5 lb	99	99
Targa+Roundup WeatherMax+COC+AMS	4 oz+22 oz+.5%+2.5 lb	99	99
Targa+Roundup WeatherMax+NIS+AMS	5 oz+22 oz+.125%+2.5 lb	99	99
Select+Roundup WeatherMax+NIS+AMS	4 oz+22 oz+.125%+2.5 lb	99	98
Select Max+Roundup WeatherMax+NIS+AMS	6 oz+22 oz+.125%+2.5 lb	99	99
Untreated Check	----	0	0
LSD (.05)		0	1

Table 30. Volunteer GT Corn Control in Soybeans

RCB; 3 reps
Variety: DKB 26-53
Planting Date: 5/22/07
PRE: 5/22/07
POST: 6/19/07; Soybean 2-3 tri, 6 in; Voco 12-14 in.
Soil: Silty clay; 3.5% OM; 6.6 pH

Precipitation:

PRE:	1st week	0.63 inches
	2nd week	1.89 inches
POST:	1st week	0.01 inches
	2nd week	0.00 inches

Voco=Volunteer corn

Comments: The objective of this study was to evaluate volunteer corn control in soybeans with Fusilade (fluazifop) at 4 to 6 oz/A and Select Max (clethodim) at 6 oz/A. Each treatment resulted in nearly complete control of volunteer corn.

Treatment	***Rate/A***	***% Voco 7/3/07***	***% Voco 7/31/07***
Untreated Check	----	0	0
PREEMERGENCE & POSTEMERGENCE			
Boundary&Fusilade DX+Touchdown Total+AMS	2.5 pt&4 oz+24 oz+1%	95	98
Boundary&Fusilade DX+Touchdown Total+AMS	2.5 pt&6 oz+24 oz+1%	97	99
Boundary&Select Max+Touchdown Total+AMS	2.5 pt&6 oz+24 oz+1%	93	99
LSD (.05)		1	1