

TWENTY-SIXTH ANNUAL



2009 *WESTERN* *DAKOTA* CROPS DAY

RESEARCH REPORT



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26th Annual Western Dakota Crops Day

December 17, 2009

Hettinger Armory

MST

9:00 am Registration

Coffee and doughnuts. Free time to view exhibits and visit with Ag. Industry Program Sponsors.

10:00 Earlybird Drawing and Opening Announcements

10:15 Crop Variety Updates and Highlights of Ongoing Crop Production Research

Dr. Pat Carr, Research Agronomist, NDSU Dickinson Research Extension Center

Eric Eriksmoen, Research Agronomist, NDSU Hettinger Research Extension Center

12:00 Lunch

Provided by Program Sponsors. Free time to visit with sponsors.

1:00 Ag Industry Update

1:30 Variable Rate Fertilization: Why and How to Get Started. John Nowatzki, Ag. Machine Systems Specialist, NDSU Ext. Ag. & Biosystems Engineering, Fargo.

2:15 Wheat Stem Sawfly Update. Dr. Janet Knodel, Extension Entomologist, NDSU Dept. of Entomology, School of Natural Resource Sciences, Fargo.

3:00 Conclusion

Drawing for door prizes, coffee and opportunity to visit with sponsors.

Acknowledgments

The Hettinger Research Extension Center gratefully acknowledge and thank the following companies and organizations for their financial support and participation in this year's Western Dakota Crops Day. Those listed below have provided for the noon meal and have sponsored the event in total. We thank them for their commitment and support.

2009 Western Dakota Crops Day Sponsors

Hettinger Area Chamber of Commerce	Pulse USA
North Dakota Grain Growers Assn.	Seeds 2000 Inc.
AgriPro Wheat	Farm Credit Services of Mandan
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North Dakota Soybean Council	Homestead Seeds and Precision Planting
Croplan Genetics	Gartner Seed Farm
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United Pulse Trading	Bayer Crop Science
Minn-Dak Growers Ltd.	Pioneer Hi-Bred Int'l
Valent	

We also acknowledge and thank the following individuals for their willingness to cooperate with us at off-station plot sites and in providing us with materials for this publication. Their participation has enabled us to compile the enclosed information which would not otherwise be possible.

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Interpreting Statistical Analysis

Field research involves the testing of one or more variables such as crop varieties, fertilizers, weed control methods, etc. Field testing of such variables are conducted in order to determine which variety, fertilizer, herbicide, etc. is best for the particular area of production. The main objectives of crop production research are to determine the best means of producing a crop and how to maximize yield and economic return from farming.

Agricultural researchers use statistics as a tool to help differentiate production variables so that real and meaningful conclusions can be drawn from a relatively large amount of data gathered from relatively small research plots.

One of these tools is the Coefficient of Variability (C.V.). This statistic gives an indication of the amount of variation in an experimental trial and is a measure of the precision or effectiveness of the trial and the procedures used in conducting it. Attempts are made to control human error and some environmental conditions such as soil variability by replicating the variable in question. For example, there were four plots (replications) of the variety RB07 grown in the Hettinger HRSW variety trial. The plots are mixed and dispersed throughout the trial to help eliminate differences that might be a result of soil or other variations. The numbers that you see in the tables are an average of all four replications. The C.V. for yield in the 2009 Hettinger HRSW variety trial was 16.4 meaning that there was an 16.4 percent average variation between high and low yields among replications. In summation, a trial with a C.V. of 6 is more precise and more can be concluded from it than a trial with a C.V. of 16.

Another important statistical tool is the Least Significant Difference or LSD. If the yield of variety A exceeds variety B by more than the LSD value, you can conclude that under like environmental conditions, variety A is expected to significantly out-yield variety B. The LSD value allows you to separate varieties, fertilizers, herbicides, or any other variable and determine whether or not they are actually different. The LSD .01 or 1% value is always larger and gives you more precision than the LSD .05 or 5% value. Little confidence can be placed in a variety or treatment unless the results differ by more than the LSD value.

Table . 2009 Weather Summary for the Dickinson Research Extension Center, Dickinson, ND.

Month	-----Maximum temp.-----		-----Minimum temp.-----		-----Precipitation -----		-----Small grains GDD ¹ -----		-----Corn GDD ² -----	
	Long Term 1897 - 2009	Current Year	Long Term 1897 - 2009	Current Year	Long Term 1897 - 2009	Current year	Long Term 1897 - 2009	Current year	Long Term 1897 - 2009	Current year
	°F		°F		inches					
November - 08	39.9	41.6	16.9	20.8	0.51	1.27				
December - 08	27.9	19.1	5.7	-2.1	0.40	1.12				
January	23.0	22.5	0.1	-0.3	0.50	0.27				
February	27.1	24.5	3.9	4.4	0.41	1.33				
March	38.0	34.9	14.9	11.7	0.75	2.99				
April	54.6	50.2	28.4	26.0	1.42	0.81	345	297	253	254
May	66.2	65.9	39.2	36.8	2.31	2.28	645	621	382	354
June	75.0	71.2	48.9	45.7	3.57	3.99	899	794	586	466
July	83.5	77.5	54.2	51.1	2.20	3.01	1144	1001	530	465
August	82.4	78.5	51.6	50.0	1.72	0.94	1085	999	320	429
September	71.3	78.4	41.1	46.7	1.38	1.42	727	916		
October	57.5	44.5	30.0	27.7	0.97	1.52				
Mean	53.9	50.7	27.9	26.5						
Total					16.12	20.95	4845	4627	2072	1967

¹ Small grains GDD, is growing degree days calculated with 95°F as the maximum temperature and 32°F as the base temperature.

² Corn GDD, is growing degree days calculated with 86°F as the maximum temperature and 50°F as the base temperature.

Source: Dickinson Research Extension Center. Data compiled by Jeff Kubik and John Urban, Research Technician; and Sheri Schneider, Information Processing Specialist.

2009 Growing Conditions Hettinger Research Extension Center

Southwestern North Dakota's drought finally broke with more than 5 inches of fall precipitation, an abundance of snowfall and very timely rainfall throughout the growing season. Overall, the 2009 growing season received more than 23 inches of precipitation, almost 45% more than normal. The year was also relatively cool with all months having cooler temperatures than normal with the exception of September. Small grain planting generally began during the first week of May, a delay of almost a month. The crop tended to emerge very quickly, shutting down pre-emergence herbicide applications. Spring conditions continued to be cool and wet, creating ideal small grain growing conditions. A narrow band of pea-sized hail with 60 mile per hour wind hit the Hettinger research plots on June 22 and again with golf ball sized hail 2 days later. Early maturing crops like rye and canola were destroyed but most crops were able to recover nicely, although, the damage did take its toll with relatively lower yields and test weights. Mild temperatures continued throughout the summer and into the fall months. A total of 8 days reached 90 degrees or warmer and the hottest day never reached 100. These cooler temperatures delayed small grain maturity resulting in a late harvest. Most winter wheat spent 11 months in the field from planting to harvest. Small grain yields were tremendous, with reports of 60 to 70 bushel per acre spring wheat, 90 to 100 bushel barley and 2000 to 3000 pound canola and sunflowers. Warm season crops were also adversely affected by slower growth and delayed maturity. Very little corn in the area reached maturity, however, most of it was harvested at high moisture during the last week of November. Most of the sunflower crop also came off at that time.

Foliar diseases (tan spot and septoria) were prevalent early but tended to diminish as the season progressed. Leaf rust was observed but did not appear to be widespread or severe. Insects tended to be a bigger problem this year. Black-grass bugs decimated thousands of acres of grasslands and pastures and damaged some small grain crop. Wheat stem sawfly reached epidemic proportions with virtually every spring wheat field in the region being infected. Yield losses were typically 5 to 10 percent from lodging but fields with 100% lodging were documented.

Most trials at the Hettinger Research Center were grown under a no-till cropping system. The predominant soil type is classified as a silty loam. Small grain trials were typically planted into field pea stubble and broadleaf crop trials were typically planted into spring wheat stubble. Residual soil fertility levels were determined and fertilizer was applied according to specific yield goals for each crop. Urea (46-0-0) was the primary nitrogen fertilizer source and was applied with a no-till drill prior to planting. Monoammonium phosphate (11-52-0) was typically applied directly with the seed during planting. All legume crops were treated with granular *rhizobia* inoculant during seeding.

HRSW, durum and barley trials were treated post-emergence for both wild oats and for broadleaf weeds (kochia, Russian thistle and wild buckwheat). Most broadleaf crops were treated with a pre-emergence burn down, and with either a pre-emergence or a post-emergence herbicide for grassy weeds and broadleaf weeds when possible.

Weather Data Summary - Hettinger

Frost Free Days

	28°F	32°F	Normal 32°F
Date of Last Frost	May 23	June 11	May 18
Date of First Frost	October 8	September 28	September 20
Frost Free Days	138	109	125

Precipitation

Precipitation (inches)	2005 – 06	2006 – 07	2007 - 08	2008 – 09	54 Year Average
Sept. – Dec.	3.68	3.15	1.26	6.23	3.32
Jan. – March	2.34	2.18	0.87	5.16	1.43
April	2.12	1.09	0.98	1.10	1.62
May	0.97	5.97	4.01	1.38	2.64
June	2.53	3.04	4.08	3.53	3.33
July	0.58	1.62	1.23	2.20	2.01
August	1.75	3.65	1.75	3.47	1.67
Total	13.97	20.70	14.18	23.07	16.02

Air Temperature

Average Temp. F°	2005	2006	2007	2008	2009	54 Year Average
April	45.5	47.8	40.2	40.1	38.2	42.8
May	50.7	55.6	56.2	52.0	52.0	53.9
June	64.0	65.2	62.7	59.7	58.8	63.2
July	71.9	77.3	75.4	71.1	64.6	70.2
August	68.0	71.3	68.8	70.0	63.0	68.9
September	60.4	56.4	60.9	56.6	62.6	57.7

Growing Degree Units - Corn

Growing Degree Units (50-86)	2005	2006	2007	2008	2009	37 Year Average
May	226	323	272	207	265	264
June	430	465	452	346	344	420
July	609	678	672	606	458	584
August	513	593	533	579	461	537
September	388	276	353	340	421	316
Total	2166	2335	2282	2078	2006	2121

North Dakota hard red spring wheat variety descriptions, agronomic traits, 2009.

Variety	Agent or Origin ¹	Year Released	Beard	Height	Straw Strength	Maturity	Reaction to Disease ²			
							Stem Rust	Leaf Rust	Foliar Disease	Head (Scab)
AP-604 CL ³	AgriPro	2007	Yes	S.dwf.	M.strong	M.early	R	MS	MS	NA
Ada	MN	2006	Yes	S.dwf.	Strong	Med.	R	MR	MS	MS/S
Alsen	ND	2000	Yes	S.dwf.	Strong	M.early	R	MR/MS	S	MR/M
Bakker Gold	N. Star G.	2006	Yes	Med.	NA	Late	S	M	M	M
Banton	Trigen	2004	Yes	S.dwf.	Strong	M.early	R	MR	MS	S
Barlow	ND	2009	Yes	S.dwf.	Strong	M.early	R	R	MR	MS/MR
Bigg Red	WestBred	2004	Yes	S.dwf.	Med.	Med.	R/MR	S	MS	MR
Blade	WestBred/Sabre	2007	Yes	S.dwf.	M.strong	Med.	R	MR	MS	NA
Breaker	WestBred	2007	Yes	S.dwf.	Strong	Med.	R	MR	MS	NA
Brennan	AgriPro	2009	Yes	S.dwf.	Strong	Med.	R	MR	M	M
Brick	SD	2009	Yes	S.dwf.	Med.	M.early	R	R	NA	MS/MR
Briggs	SD	2002	Yes	S.dwf.	Med.	M.early	R/MR	R	MS	S
Brogan	WestBred	2009	Yes	S.dwf.	Strong	M.late	MR	MR	MS	S
Choteau ⁴	MT	2004	Yes	S.dwf.	NA	M.early	NA	NA	NA	NA
Cromwell	Thunder Seed	2007	Yes	S.dwf.	Strong	M.late	NA	MR	MR	S
Dapps	ND	2003	Yes	S.dwf.	Med.	M.early	R	R	M	S
Faller	ND	2007	Yes	S.dwf.	Strong	Med.	R	R	MR	MR/MS
FBC Dylan	FBC	2006	Yes	S.dwf.	Med.	Med.	NA	MR	S	NA
Fireball	N. Star G.	2006	Yes	S.dwf.	NA	Med.	NA	R	NA	NA
Freyr	AgriPro	2004	Yes	S.dwf.	Strong	Med.	R	MR/MS	MS	MR/M
Glenn	ND	2005	Yes	S.dwf.	Strong	M.early	R	R	M	MR
Granger	SD	2004	Yes	S.dwf.	M.strong	M.early	R	R	MS	MS
Granite	WestBred	2002	Yes	S.dwf.	V.strong	M.late	R/MR	MR	S	MS
Hanna	AgriPro	2002	Yes	Med.	Med.	M.early	MR	MS	MS	MS
Hat Trick	Trigen Seed	2007	Yes	S.dwf.	Strong	Med.	R	MR	M	MS/S
Howard	ND	2006	Yes	S.dwf.	Strong	Med.	R	R	M	M
Jenna	AgriPro	2009	Yes	S.dwf.	Strong	M.late	R	MR	M	M
Kelby	AgriPro	2006	Yes	S.dwf.	Strong	M.early	MR	R	M	MR/MS
Knudson	AgriPro	2001	Yes	S.dwf.	Strong	Med.	MR	MR	MR	M
Kuntz	AgriPro	2007	Yes	S.dwf.	Strong	M.early	R	MR	MS	NA
Mott⁴	ND	2009	Yes	Med.	Strong	Med.	MR	MS	MS	MS
Norwell	Thunder Seed	2007	Yes	Med.	M.strong	M.early	NA	MS	S	NA
Oklee	MN	2003	Yes	S.dwf.	Med.	M.early	R	MS	MR	M
Polaris	N. Star G.	2003	Yes	Med.	Strong	Late	NA	MS	MS	S
RB07	MN	2007	Yes	S.dwf.	M.strong	M.early	R	R	MS	NA
Reeder	ND	1999	Yes	S.dwf.	Strong	M.early	R	MS	S	S
Rush	WestBred	2006	Yes	S.dwf.	Strong	M.early	NA	NA	NA	NA
Sabin	MN	2009	Yes	S.dwf.	Med.	Med.	R	MR	NA	MR/MS
Samson	WestBred	2007	Yes	S.dwf.	Strong	M.early	R	MR/MS	MR/MS	S
Saturn	N. Star G.	2003	Yes	Med.	NA	M.late	NA	MR/MS	S	S
Steele-ND	ND	2004	Yes	S.dwf.	Med.	Med.	R	R	MS	M
Tom	MN	2008	Yes	S.dwf.	M.strong	Med.	R	R	NA	MR/MS
Traverse	SD	2006	Yes	S.dwf.	Med.	M.early	R	MR	NA	MR/MS
Trooper	WestBred	2004	Yes	S.dwf.	Strong	M.early	R	MR	S	S
Ulen	MN	2005	Yes	S.dwf.	Med.	M.early	R	MR	MS	S
Vantage	WestBred	2007	Yes	S.dwf.	V.strong	M.late	R	MR/MS	MS	NA

¹ Refers to agent or developer: FBC = Farm Breeders Club; MN = University of Minnesota; MT = Montana State University; ND = North Dakota State University; N. Star G. = North Star Genetics; SD=South Dakota State University. **Bold** varieties are those recently released. NA indicates insufficient information is available to make an accurate assessment.

² R = resistant; MR = moderately resistant; M = intermediate; MS = moderately susceptible; S = susceptible; VS = very susceptible.

³CL = refers to a Clearfield variety, with tolerance to Beyond™ family of herbicide.

⁴Solid stemmed or semi-solid stem, imparting resistance to sawfly.

Variety	Days to Head	Plant Height	Sawfly **	Test Weight	Grain Protein	---- Grain Yield ----			Average Yield	
	*	inches	%	lbs/bu	%	2007	2008	2009	2 yr	3 yr
----- Bushels per acre -----										
RB07	61	32	8	57.4	15.0	39.0	51.6	42.4	47.0	44.3
Steele-ND	62	35	12	58.5	13.8	41.2	48.1	39.2	43.6	42.8
Briggs	62	33	12	58.0	14.8	47.1	43.9	36.6	40.2	42.5
Granite	66	35	3	55.4	15.4	37.2	42.8	46.1	44.4	42.0
Knudson	64	34	6	55.8	13.0	36.0	47.2	41.1	44.2	41.4
Kelby	61	30	6	57.5	14.6	38.2	50.9	33.7	42.3	40.9
Reeder	62	34	11	57.9	14.1	38.5	38.3	45.3	41.8	40.7
Freyr	63	36	9	56.4	13.0	35.7	47.9	35.6	41.8	39.7
Howard	61	35	9	57.7	13.7	37.2	39.3	41.8	40.6	39.4
Alsen	63	35	4	56.5	14.5	37.8	48.2	31.9	40.0	39.3
Barlow	61	35	11	57.2	14.4	36.1	43.1	37.2	40.2	38.8
Faller	64	35	11	55.8	13.8	42.3	37.0	36.5	36.8	38.6
Kuntz	65	34	8	53.3	13.0	37.4	44.4	33.5	39.0	38.4
Glenn	61	34	10	58.5	14.5	39.4	41.7	31.5	36.6	37.5
Brick	58	35	10	57.5	14.3	39.4	39.8	30.4	35.1	36.5
Choteau	62	32	1	56.2	14.7	38.0	40.5	31.1	35.8	36.5
Mott	66	37	1	58.6	14.5	34.9	34.1	39.0	36.6	36.0
Traverse	64	35	5	54.3	14.7	36.4	36.0	34.0	35.0	35.5
Agawam	59	32	5	58.9	13.5	42.0	37.7	26.8	32.2	35.5
Sabin	64	34	6	57.5	14.6		47.0	44.2	45.6	
Cromwell	62	33	4	59.4	14.5		42.2	46.3	44.2	
Brennan	60	31	8	60.5	14.0		50.2	37.6	43.9	
Jenna	63	33	8	56.8	13.8		42.8	45.0	43.9	
Blade	62	34	4	56.7	13.9		39.4	47.6	43.5	
Samson	63	31	11	56.6	13.8		48.7	37.6	43.2	
Vantage	67	32	4	56.1	15.4		41.9	44.1	43.0	
Breaker	64	34	5	55.5	13.9		47.8	37.6	42.7	
Alpine	66	36	8	51.8	14.1		43.6	38.3	41.0	
AC Lillian	66	37	1	55.9	15.9		36.2	25.9	31.0	
AP605CL	60	33	8	58.3	15.3			42.2		
Tom	62	34	14	57.0	14.5			41.7		
Brogan	62	32	10	58.3	13.6			41.3		
Conan	61	33	4	57.7	14.5			37.0		
Corbin	60	32	4	57.8	14.3			34.8		
Trial Mean	63	34	7	56.8	14.4	37.3	42.7	38.1	--	--
C.V. %	2.5	6.3	53.1	3.3	--	7.4	8.7	16.4	--	--
LSD .05	2	3	5	2.6	--	3.8	5.2	8.7	--	--
LSD .01	3	4	7	3.5	--	5.1	6.8	11.5	--	--

* Days to Head = the number of days from planting to head emergence from the boot.

** Sawfly: Approximate % of stems cut off (lodged) from wheat stem sawfly.

Planting Date: May 5 Harvest Date: August 29

Seeding Rate: 1.1 million live seeds / acre (approx. 1.6 bu/A).

Previous Crop: 2008 = field pea, 2007 = hrsw, 2006 = field pea.

Note: The 2009 trial sustained moderate hail damage on June 22 and 24 (boot growth stage).

2009 Hard Red Spring Wheat - Recrop

Dickinson, ND

Variety	Days to Head	Seeds per Pound	Plant Height in	Test Weight lbs/bu	Protein %	Grain Yield			Average Yield	
						2007	2008	2009	2 Year	3 Year
						-----bu/ac-----			----bu/ac----	
Alsen	61	12,260	32	64.6	14.0	51.5	29.5	70.6	50.0	50.5
Barlow	58	11,843	33	65.3	13.6	53.9	28.6	69.4	49.0	50.7
Blade	63	11,968	32	66.7	14.4	--	34.7	77.8	56.2	--
Breaker	63	12,024	32	65.8	14.5	--	36.4	78.7	57.6	--
Brenan	58	12,724	28	63.6	14.0	--	35.1	74.8	54.9	--
Brick	56	12,332	34	65.2	13.8	--	32.8	63.1	48.0	--
Briggs	61	12,195	36	65.4	15.1	50.5	29.6	70.5	50.1	50.2
Brogan	61	11,664	31	64.5	14.3	--	--	74.6	--	--
Choteau	61	12,113	29	63.2	13.8	48.5	34.2	78.5	56.4	53.7
Conan	59	11,499	30	62.6	13.8	--	--	71.8	--	--
Corbin	58	11,024	30	61.7	12.9	--	--	73.3	--	--
Faller	63	10,574	33	64.5	13.5	52.8	29.8	85.3	57.6	56.0
Freyr	61	12,114	32	63.5	14.6	50.4	33.7	72.5	53.1	52.2
Glenn	57	12,413	35	66.4	14.8	52.7	31.0	61.2	46.1	48.3
Granger	59	10,303	34	62.9	14.6	51.2	31.1	63.7	47.4	48.6
Granite	64	12,760	31	65.3	15.6	46.9	34.8	72.1	53.4	51.3
Howard	61	12,318	34	65.5	14.0	53.6	30.9	77.3	54.1	53.9
Jenna	63	11,368	31	64.3	14.1	--	35.2	81.1	58.1	--
Kelby	58	12,194	27	64.3	15.1	53.6	34.2	73.7	54.0	53.8
Knudson	60	11,474	32	64.6	13.5	53.7	32.2	87.8	60.0	57.9
Kuntz	62	13,018	29	64.0	13.2	50.8	31.3	78.2	54.7	53.4
Mott	63	13,563	36	65.8	13.6	50.0	34.0	78.7	56.4	54.2
Parshall	60	12,388	36	65.6	15.3	51.4	31.4	66.8	49.1	49.9
RB07	57	13,617	30	63.9	14.0	57.5	37.2	78.2	57.7	57.6
Reeder	63	13,437	34	65.6	14.6	43.8	28.4	72.0	50.2	48.1
Sabin	61	12,601	32	63.6	13.9	--	--	80.0	--	--
Samson	59	12,016	29	64.0	14.1	--	34.6	82.7	--	--
Steele-ND	61	11,813	33	66.5	13.7	50.8	30.4	75.3	52.8	52.2
Tom	61	10,865	32	64.3	13.6	--	32.3	76.8	54.5	--
Traverse	58	11,557	34	63.3	13.9	53.9	34.4	74.6	54.5	54.3
Vantage	64	13,091	31	65.8	14.0	--	33.0	72.5	52.7	--
AC Lillian	64	11,720	35	59.6	15.3	--	--	65.9	--	--
Agawam	57	10,295	30	64.3	12.6	--	--	74.2	--	--
Trial Mean	60	11,943	32	64.3	14.0	50.5	32.1	74.9	--	--
CV %	1.3	2.9	2.7	2.4	4.7	6.7	10.5	7.5	--	--
LSD 0.05	1	702	1	2.1	1.3	4.7	4.7	7.8	--	--

Planting Date May 6, 2009

Harvest Date: September 4, 2009

Previous Crop: Field Pea

Seeding Rate: 1.2 million live seeds/ac

2009 HRSW Variety Trial - Continuously Cropped - No-till Scranton

Cooperators: Neal and Justin Freitag, Scranton

Variety	Plant	Test	Grain	---- Grain Yield ----			Average Yield		
	Height	Weight	Protein	2007	2008	2009	2 yr	3 yr	
	inches	lbs/bu	%	----- Bushels per acre -----					
Howard	35	61.5	13.2	42.1	18.6	61.6	40.1	40.8	
Steele-ND	34	59.4	12.9	36.1	24.0	58.2	41.1	39.4	
Faller	34	59.9	12.4	36.2	18.2	62.0	40.1	38.8	
Kelby	28	62.4	13.4	32.6	26.7	56.4	41.6	38.6	
Glenn	36	63.3	14.2	38.2	18.2	47.1	32.6	34.5	
Barlow	36	61.6	12.2		19.5	74.6	47.0		
Mott	34	59.6	12.6		24.3	64.3	44.3		
Brennan	30	62.4	13.4			64.5			
Briggs	34	62.2	13.3			62.7			
Brick	36	61.8	12.8			56.9			
Trial Mean	34	61.3	12.9	37.0	21.4	60.9	--	--	
C.V. %	7.8	1.3	--	8.6	7.1	11.2	--	--	
LSD .05	4	1.2	--	4.6	2.2	9.8	--	--	
LSD .01	5	1.6	--	6.2	2.9	13.3	--	--	

Planting Date: May 7, 2009

Harvest Date: August 29, 2009

Seeding Rate: 1.1 million live seeds / acre (approx. 1.6 bu/A).

Previous Crop: 2006 = hrww, 2007 & 2008 = hrsw.

Note: The 2008 trial sustained heat and moisture stress.

2009 HRSW Variety Trial - Continuously Cropped - No-till Regent

Cooperators: August and Perry Kirschmann, Regent

Variety	Plant	Test	Grain	---- Grain Yield ----			Average Yield		
	Height	Weight	Protein	2007	2008	2009	2 yr	3 yr	
	inches	lbs/bu	%	----- Bushels per acre -----					
Kelby	28	61.2	14.2	58.5	19.6	67.4	43.5	48.5	
Howard	36	59.4	14.0	54.8	13.5	65.7	39.6	44.7	
Faller	36	59.7	13.9	49.6	12.1	70.6	41.4	44.1	
Glenn	39	61.9	13.7	48.0	14.6	60.5	37.6	41.0	
Steele-ND	34	59.2	14.2	43.0	13.6	65.0	39.3	40.5	
Barlow	33	59.6	14.1		16.1	61.6	38.8		
Mott	38	59.4	14.2		17.7	58.1	37.9		
Brennan	30	61.2	14.4			69.2			
Briggs	38	60.3	14.3			63.2			
Brick	36	60.6	14.0			62.3			
Trial Mean	35	60.2	14.1	49.4	15.0	65.1	--	--	
C.V. %	3.4	1.8	--	9.7	20.9	4.9	--	--	
LSD .05	2	1.5	--	1.4	NS	4.6	--	--	
LSD .01	2	2.1	--	1.9	NS	6.2	--	--	

Planting Date: May 7, 2009

Harvest Date: August 27, 2009

Seeding Rate: 1.1 million live seeds / acre (approx. 1.6 bu/A).

Previous Crop: 2006, 2007 & 2008 = hrsw.

NS = no statistical difference between varieties.

Note: The 2008 trial sustained severe heat and moisture stress.

2009 HRSW Variety Trial - Continuously Cropped - No-till Selfridge

Cooperator: Nick Vollmuth, Selfridge

Variety	Plant	Test	Grain	---- Grain Yield ----			Average Yield		
	Height	Weight	Protein	2006	2007	2009	2 yr	3 yr	
	inches	lbs/bu	%	----- Bushels per acre -----					
Faller	38	56.3	13.9	28.6	38.8	52.5	45.6	40.0	
Steele-ND	38	57.8	14.3	29.3	36.8	52.4	44.6	39.5	
Howard	39	57.1	15.2	25.7	39.9	52.2	46.0	39.3	
Glenn	40	60.3	14.9	23.7	40.7	45.7	43.2	36.7	
Kelby	32	58.8	14.7		42.7	53.9	48.3		
Barlow	38	57.9	14.2			50.9			
Mott	42	57.7	14.2			50.9			
Briggs	40	58.8	14.7			47.5			
Brennan	33	57.7	14.6			47.0			
Brick	40	59.5	14.6			46.0			
Trial Mean	39	58.0	14.4	26.0	38.8	50.0	--	--	
C.V. %	3.3	1.4	--	10.5	6.7	9.3	--	--	
LSD .05	2	1.2	--	3.9	3.8	6.7	--	--	
LSD .01	3	1.6	--	5.3	5.1	9.0	--	--	

Planting Date: May 11, 2009 Harvest Date: August 27, 2009
 Seeding Rate: 1.1 million live seeds / acre (approx. 1.6 bu/A).
 Previous Crop: 2005 & 2006 = hrww, 2008 = sunflower.
 Note: The 2008 trial was destroyed by hail.

2009 HRSW Variety Trial - Continuously Cropped - No-till Mandan

Cooperator: USDA-ARS NGP Research Center, Mandan

Variety	Tan	Septoria	Plant	Test	Grain	---- Grain Yield ----			Average Yield	
	Spot		Height	Weight	Protein	2007	2008	2009	2 yr	3 yr
	*	*	inches	lbs/bu	%	----- Bushels per acre -----				
Faller	5	10	37	59.7	11.9	60.4	58.5	69.2	63.8	62.7
Kelby	1	1	29	60.1	14.0	61.1	67.6	58.6	63.1	62.4
Glenn	5	2	39	62.3	13.2	64.6	56.2	54.1	55.2	58.3
Howard	5	30	36	60.2	12.2	59.3	57.6	57.3	57.4	58.1
Steele-ND	10	10	35	59.9	13.0	58.2	59.5	54.6	57.0	57.4
Barlow	1	1	36	60.7	13.1		66.2	63.2	64.7	
Mott	1	1	39	60.5	12.7		59.1	67.0	63.0	
Brennan	1	1	30	60.8	13.2			65.6		
Briggs	2	10	36	61.6	12.2			64.4		
Brick	10	1	37	62.3	13.4			58.7		
Trial Mean	4	6	36	60.8	12.8	59.0	61.7	61.9	--	--
C.V. %	--	--	3.3	0.6	--	5.3	6.0	5.0	--	--
LSD .05	--	--	2	0.6	--	5.3	5.4	4.5	--	--
LSD .01	--	--	2	0.8	--	7.3	7.2	6.0	--	--

* % of flag leaf infected with tan spot and septoria.

Planting Date: May 11, 2009 Harvest Date: September 1, 2009
 Seeding Rate: 1.1 million live seeds / acre (approx. 1.6 bu/A).
 Previous Crop: 2006 = hrww, 2007 & 2008 = hrsw.

2009 Hannover Spring Wheat - Recrop
Dickinson, ND

Variety	Seeds	Lodging Score	Test Weight	Protein %	Grain Yield			Average Yield	
	per Pound				2007	2008	2009	2	3
		0-9	lbs/bu		bu/ac			bu/ac	
Barlow	12,981	4	58.4	15.1	--	33.8	54.7	44.2	--
Brick	12,394	3	58.7	14.5	--	--	52.3	--	--
Blade	14,740	5	57.4	14.9	--	--	46.7	--	--
Choteau	12,752	3	55.9	14.4	32.5	33.7	51.1	42.4	39.1
Faller	13,186	6	53.8	14.3	30.8	30.9	54.1	42.5	38.6
Glenn	13,458	6	59.8	15.4	30.6	29.2	47.6	38.4	35.8
Howard	13,830	6	56.4	14.5	30.4	30.3	46.6	38.4	35.8
Mott	13,072	0	58.8	14.9	--	35.7	63.9	49.8	--
Steele-ND	13,872	6	57.7	14.1	29.8	29.4	43.7	36.6	34.3
Trial Mean	13,365	4	57.4	14.7	29.6	31.7	51.2	--	--
CV %	2.9	33.6	2.8	2.7	8.6	9.9	6.5	--	--
LSD 0.05	894	2	2.3	NS	3.7	NS	4.8	--	--

Planting Date: May 15, 2009

Harvest Date: September 3, 2009

Lodging: 0=No lodging, 9=Completely flat

Previous Crop: Wheat

Seeding Rate: 1.2 million live seeds/ac

2009 Glen Ullin Spring Wheat - Fallow
Dickinson, ND

Variety	Seeds	Lodging Score	Test Weight	Protein %	Grain Yield			Average Yield	
	per Pound				2007	2008	2009	2	3
		0-9	lbs/bu		bu/ac			bu/ac	
Barlow	12,987	2	63.6	14.8	--	51.0	73.2	62.1	--
Brick	12,215	0	64.7	14.5	--	--	77.7	--	--
Blade	13,747	6	64.0	14.7	--	--	64.8	--	--
Choteau	12,891	0	61.1	14.4	39.3	46.1	66.9	56.5	50.8
Faller	12,670	1	60.9	13.6	37.3	46.1	80.0	63.1	54.5
Glenn	12,926	6	64.7	15.2	35.5	40.5	65.9	53.2	47.3
Howard	14,219	4	60.6	14.0	38.2	42.1	68.2	55.2	49.5
Mott	13,381	0	63.4	14.6	--	48.6	82.4	65.5	--
Steele-ND	13,543	3	61.1	14.5	37.1	42.9	68.3	55.6	49.4
Trial Mean	13,175	2	62.7	14.5	35.1	45.2	71.9	--	--
CV %	6.4	73.6	1.7	1.4	8.8	6.8	8.2	--	--
LSD 0.05	NS	3	1.6	0.5	4.4	5.2	8.6	--	--

Planting Date: May 15, 2009

Harvest Date: September 10, 2009

Lodging: 0=No lodging, 9=Completely flat

Seeding Rate: 1.2 million live seeds/ac

2009 Organic hard red spring wheat variety trial, Dickinson, ND, 2009.¹

	Approximate	Heading date	Lodging Score	Height	Yield
Variety	Year of Release	-July-	0-9 ²	-in-	-Bu/acre-
Red Fife	1885	16	0.3	33	51
Marquis	1910	15	0.8	37	49
Kota	1921	15	4.5	37	45
Thatcher	1935	10	0.3	35	44
Vesta	1942	16	3.8	33	47
Mida	1944	12	2.3	37	51
Acadia	1951	11	1.0	36	52
Chris	1965	13	1.3	34	51
Waldron	1969	10	0.0	35	51
Coteau	1978	15	0.0	35	57
Stoa	1984	11	0.3	35	56
Glenn	2005	10	0.0	35	55
Howard	2006	10	0.0	33	61
Mean		13	1.12	35	52
C.V. (%)		8	72	6	7
LSD (0.05)		1		NS	5

¹Previous crop was spring rye; spring wheat treatments seeded on 20 May

²0 = completely flattened; 9 = upright

Hard Red Spring Wheat in the West River Region

Combined Means

Variety	Days to Head	Plant Height	Lodg	Seeds / Pound	Test Weight	Grain Protein	Grain Yield			Average Yield	
							2007	2008	2009	2 yr	3 yr
		inches	0-9*	#	lbs/bu	%	----- Bushels per acre -----				
Faller	64	35	3	12,143	59.2	13.4	41.8	30.4	59.6	45.0	43.9
Howard	61	35	4	13,456	59.9	13.8	41.9	30.6	54.5	42.6	42.3
Kelby	60	28	2	12,194	60.9	14.3	39.6	35.8	50.2	43.0	41.9
Steele – ND	62	34	4	13,076	60.5	13.8	39.7	32.5	53.1	42.8	41.8
Glenn	59	36	5	12,932	61.9	14.5	40.4	30.5	48.9	39.7	39.9
Mott	64	36	0	13,339	60.4	13.9		34.9	58.1	46.5	
Barlow	60	34	3	12,604	60.7	13.9		35.5	56.6	46.0	
Brennan	59	30	2	12,724	61.1	13.9			53.1		
Briggs	62	36	3	12,195	61.1	14.1			53.0		
Brick	57	36	2	12,314	61.4	14.0			52.5		
# of Locations**	2	8	3	3	10	8	11	9	10	19	30

* Lodging: 0 = none, 9 = lying flat on ground.

** Locations: 2007 = Hettinger, Dickinson, Scranton, Regent, New Leipzig, Selfridge, Mandan, Hannover, Glen Ullin, Ralph & Bison, SD.

2008 = Hettinger, Dickinson, Scranton, Regent, New Leipzig, Mandan, Hannover, Glen Ullin & Bison, SD.

2009 = Hettinger, Dickinson, Scranton, Regent, Selfridge, Mandan, Hannover, Glen Ullin, Ralph & Bison, SD.

WHEAT STEM SAWFLY

Sawfly damage occurs annually in North Dakota. This insect primarily affects wheat in the central and western areas of the state. The larvae tunnel in the stem, reducing grain yield by 10% to 25% or higher yield losses when infestations are severe. Additional loss occurs when infested stems lodge, rendering the grain unharvestable. Larvae overwinter in the wheat stubble making infested sites the source of next year's problems.

Managing Wheat Stem Sawfly:

Chemical control. Insecticides have been found to be ineffective in controlling wheat stem sawfly.

Harvesting. Swath the most heavily infested fields at 30% to 35% moisture before significant lodging occurs. This requires field surveys to determine infestation levels. Infested stems have a reddish-brown spot below the second or third node. Examine 50 consecutive stems in a drill row from at least two sites (one near the field margin, another near the center). Determine the percent of stems infested at each site. **If more than 15% of stems are infested by sawflies, producers should swath the wheat crop.** Producers should swath sawfly-infested wheat as soon as kernel moisture drops below 40% to save infested stems before they lodge. If producers decide to swath grain, use a high swathing height to conserve the parasitoids that attack wheat stem sawfly. Research from Montana State University has shown that taller residue (at least the lower 1/3 of the plant) is better for conserving the parasitoids. If 10 to 15% of the crop was cut by sawfly during the current field season, a solid-stemmed variety of wheat is recommended for the upcoming field season.

Fall tillage. A shallow fall tillage to dislodge stubble and leave it on the soil surface can result in 90% mortality of overwintering larvae. Tillage can be limited to areas where surveys indicated infestations within the field or strip.

Crop rotation. Non-host crops are oats, flax, sunflower, legumes, and to a lesser extent barley, rye, durum or winter wheat.

Resistant wheat varieties. Resistant wheats have a solid-stem trait which is unsuitable for sawfly development. Please note the 2009 release of the NDAES solid-stem hard red spring wheat release named 'Mott' which has good resistance to wheat stem sawfly and high yield.

Wheat Stem Sawfly Resistant Wheat Variety Descriptions

Variety	Type ¹	Height	Origin ²	Year Released	Straw Strength	Maturity	Test Weight	Protein	Yield ³
Older varieties that were released prior to 1990 (may be difficult to find):									
Cutless	HRS	semidwarf	NDAES	1986	med	med early	high	avg	med
Glenman	HRS	semidwarf	MAES	1985	strong	med	avg	low	high
Fortuna	HRS	standard	NDAES & MAES	1966	med	med	high	avg	high
Lew*	HRS	standard	MAES & ARS	1976	med	med	high	low	high
Leader	HRS	standard	AC	1981	med	med	high	high	med
Rambo	HRS	semidwarf	WPB	1986	very strong	med early	high	avg	high
Tioga	HRS	standard	NDAES & ARS	1974	med	med	high	avg	low
Newer varieties that were released after 1990:									
AC Abbey	HRS	standard	AC	1998	med	med	high	high	high
AC Eatonia	HRS	standard	AC	1996	med	med	high	high	high
AC Lilian	HRS	standard	AC	2006	med	med	high	high	high
Agawam	HWS	semidwarf	WPB	2005	strong	med	high	avg	high
Choteau	HRS	semidwarf	MAES	2003	strong	med	avg	avg	high
Ernest	HRS	standard	NDAES	1995	med	med	high	high	high
Explorer*	HWS	semidwarf	MAES	2002	strong	med	high	high	high
Genou	HRW	standard	MAES	2004	strong	med	high	high	high
Mott	HRS	standard	NDAES	2009	strong	med-late	high	high	high
Rampart	HRW	standard	MAES	1996	med	med	high	high	high
Vanguard	HRW	standard	MAES	1995	med	med	avg	high	high

*Indicates semi-solid lines that provide partially resistance.

¹HRS = Hard Red Spring Wheat, HRW = Hard Red Winter Wheat, HWS = Hard White Spring Wheat..

²AC = Agriculture Canada, ARS = Agriculture Research Service (USDA), MAES = Montana Agricultural Experiment Station, NDAES = North Dakota Agricultural Experiment Station, WPB = Western Plant Breeders, Inc.

³Yields are relative to sawfly resistant varieties.

2009 Spring Wheat Sawfly Variety Trial **Scranton**

Cooperators: Neal and Justin Freitag, Scranton

Variety	Sawfly	Plant	Test	Grain	Grain Yield		
	*	Height	Weight	Protein	2008	2009	2 yr
	%	inches	lbs/bu	%	bushels per acre		
Hard Red Spring Wheat							
Mott	2	34	61.0	12.8	18.3	58.5	38.4
Vida	4	36	58.8	12.0	11.4	54.9	33.2
Reeder	10	35	61.1	12.1	11.6	52.4	32.0
Steele-ND	14	36	61.7	12.9	10.0	53.1	31.6
Ernest	5	36	61.0	12.5	11.0	51.5	31.2
Choteau	9	31	61.3	12.2	8.3	53.0	30.6
AC Lillian	6	34	59.8	13.3	11.7	47.3	29.5
Howard	12	35	61.5	12.9	5.8	53.2	29.5
Conan	6	32	61.3	12.8	10.7	45.4	28.0
Glenn	11	35	62.7	12.4	6.8	44.2	25.5
Durum Wheat							
Mountrail	14	34	60.7	11.2	9.6	54.4	32.0
Divide	14	34	60.8	11.2	8.8	50.5	29.6
Alkabo	39	35	61.2	10.7	8.9	47.1	28.0
Trial Mean	10	34	61.1	12.1	10.3	51.6	--
C.V. %	82	8.9	1.9	--	27.7	11.1	--
LSD .05	12	NS	1.6	--	4.7	8.2	--
LSD .01	16	NS	2.2	--	6.4	11.0	--

* Sawfly: Approximate % of stems cut off (lodged) by wheat stem sawfly.
NS = no statistical difference between varieties.

Planting Date: May 7

Harvest Date: August 29

Seeding Rate: 1.1 million live seeds / acre (approx. 1.6 bu/A).

Previous Crop: hrsw.

Note: The 2008 trial sustained severe heat & moisture stress.

2009 Spring Wheat Sawfly Variety Trial **Regent**

Cooperators: August and Perry Kirschmann, Regent

Variety	Plant	Test	Grain	---- Grain Yield ----		
	Height	Weight	Protein	2008	2009	2 yr
	inches	lbs/bu	%	bushels per acre		
<i>Hard Red Spring Wheat</i>						
Vida	34	57.5	13.5	11.6	58.4	35.0
Glenn	37	60.4	14.4	17.0	50.3	33.6
Howard	36	57.7	13.8	13.3	51.0	32.2
Steele-ND	35	58.9	13.8	14.4	49.8	32.1
Reeder	37	56.2	14.2	8.2	55.0	31.6
Choteau	35	58.4	14.1	8.1	52.7	30.4
AC Lillian	36	58.1	14.5	10.6	49.1	29.8
Conan	32	56.2	13.6	13.4	44.8	29.1
Ernest	40	58.8	13.9	10.2	44.6	27.4
Mott	35	58.9	13.5	7.0	47.8	27.4
<i>Durum Wheat</i>						
Divide	40	56.9	12.9	11.4	53.2	32.2
Mountrail	40	57.3	13.4	6.9	52.4	29.6
Alkabo	38	58.0	12.6	4.2	47.7	26.0
Trial Mean	36	58.2	13.5	10.5	51.9	--
C.V. %	5.9	1.8	--	19.2	5.6	--
LSD .05	3	1.5	--	3.4	4.2	--
LSD .01	4	2.0	--	4.5	5.5	--

Planting Date: May 7

Harvest Date: August 27

Seeding Rate: 1.1 million live seeds / acre (approx. 1.6 bu/A).

Previous Crop: hrsw.

Note: The 2008 trial sustained severe heat & moisture stress.

Variety	Days to Head	Plant Height	Test Weight	Grain Protein	---- Grain Yield ----			Average Yield	
					2007	2008	2009	2 yr	3 yr
	*	inches	lbs/bu	%	----- Bushels per acre -----				
AC Vista	62	35	57.8	12.1	58.5	36.4	56.7	46.6	50.5
AC Karma	63	35	57.5	12.7	43.6	36.1	55.4	45.8	45.0
Pennewawa	64	32	57.4	10.9	42.8	32.7	57.2	45.0	44.2
Otis	63	38	54.4	11.9	45.1	32.0	49.8	40.9	42.3
Lolo	61	34	58.1	12.0	39.9	31.4	54.8	43.1	42.0
Waikea	59	35	53.7	13.0	42.9	33.2	47.9	40.6	41.3
Lochsa	63	35	54.6	12.8	43.5	31.3	47.3	39.3	40.7
Agawam	58	31	58.2	12.4	42.0	37.7	40.0	38.8	39.9
Snow Crest	58	26	57.8	13.2	47.0	33.7	37.9	35.8	39.5
Diamond	62	36	59.0	12.1	36.6	30.5	46.8	36.6	38.0
Golden 86	60	31	57.8	12.4	40.2	29.2	41.9	35.6	37.1
Kanata	61	36	58.2	14.2	38.8	33.9	37.8	35.8	36.8
AC Snowbird	64	39	57.2	13.5	35.6	29.9	43.8	36.8	36.4
Explorer	59	34	56.3	13.2	37.2	32.4	36.6	34.5	35.4
Alpine	62	36	56.1	13.5		43.6	54.8	49.2	
ID0377S	62	34	56.4	13.1		30.7	51.3	41.0	
AC Snowstar	62	37	59.9	13.3		30.9	49.7	40.3	
Hard Red Spring Wheat									
Reeder	61	36	58.2	14.2	49.0	34.3	59.4	46.8	47.6
Glenn	62	36	58.8	13.8	48.7	35.9	46.6	41.2	43.7
Steele-ND	62	38	59.0	13.8	39.3	34.8	51.9	43.4	42.0
Trial Mean	61	34	57.3	13.0	42.6	33.4	48.0	--	--
C.V. %	1.4	4.5	1.3	--	10.5	11.0	4.8	--	--
LSD .05	1	2	1.1	--	7.4	5.2	3.3	--	--
LSD .01	2	3	1.4	--	9.9	6.9	4.3	--	--

* Days to Head = the number of days from planting to head emergence from the boot.

Planting Date: May 5, 2009

Harvest Date: August 29, 2009

Seeding Rate: 1.1 million live seeds / acre (approx. 1.6 bu/A).

Previous Crop: 2008 = hrsw, 2007 = barley, 2006 = hrsw.

Note: The 2008 trial sustained late season heat and moisture stress.

The 2009 trial sustained moderate hail damage on June 22 and 24.

2009 Commercial White Wheat - Recrop

Dickinson, ND

Variety	Days to Head	Seeds per Pound	Plant Height in	Test Weight lbs/bu	Protein %	-----Grain Yield-----			Average Yield	
						2007	2008	2009	2	3
						-----bu/ac-----			----bu/ac----	
AC Karma	69	10,591	32	61.7	11.7	40.5	29.6	78.3	53.9	49.5
AC Snowbird	70	12,082	38	63.7	13.1	41.4	26.2	59.0	42.6	42.2
AC Snowstar	67	13,111	34	64.3	12.7	--	--	50.1	--	--
AC Vista	70	9,889	33	61.6	10.9	47.0	28.0	66.1	47.0	47.0
Agawam	67	9,861	29	64.6	12.4	49.9	24.8	75.2	50.0	50.0
Alpine	70	11,635	33	62.6	11.9	--	34.0	79.8	56.9	--
Diamond	70	10,558	38	64.1	11.4	44.3	28.1	61.7	44.9	44.7
Explorer	68	13,701	30	61.8	12.8	45.8	29.7	71.6	50.6	49.0
Glenn (hrsw)	67	12,377	36	66.1	13.3	49.4	27.5	52.1	39.8	43.0
Golden 86	69	10,003	29	61.7	12.4	45.8	24.4	72.8	48.6	47.7
IDO377S	70	11,881	30	63.8	10.9	--	27.3	69.3	48.3	--
Kantana	70	13,643	37	62.1	14.5	36.4	24.7	48.7	36.7	36.6
Lochsa	70	10,514	30	59.3	11.3	46.6	27.5	64.5	46.0	46.2
Lolo	70	10,485	32	64.4	11.3	47.8	29.8	76.0	52.9	51.2
Otis	70	9,941	34	65.0	11.8	46.4	27.8	79.5	53.6	51.2
Penewawa	71	11,329	30	61.4	10.0	42.3	29.1	80.5	54.8	50.6
Reeder (hrsw)	69	11,244	31	62.8	13.0	45.5	26.8	67.0	46.9	46.4
Snow Crest	64	12,777	25	60.2	12.6	40.8	25.1	68.8	47.0	44.9
Steele-ND (hrsw)	70	12,152	33	64.2	12.8	47.2	26.7	57.7	42.2	43.8
Waikea	68	9,927	32	59.6	11.8	52.6	27.7	71.1	49.4	50.5
Trial Mean	69	11,385	32	62.7	12.1	44.9	27.6	67.5	--	--
CV %	1.2	4.9	3.0	1.3	4.0	5.6	6.8	11.2	--	--
LSD 0.05	1	1,161	2	1.4	1.0	3.6	2.7	12.5	--	--

Planting Date: April 22, 2009

Harvest Date: August 26, 2009

Previous Crop: Field Pea

Seeding Rate: 1.2 million live seeds/ac

Note: Trial received hail damage

North Dakota durum wheat variety descriptions, agronomic traits, 2009.

Variety	Agent or Origin ¹	Year Released	Chaff Color	Height	Straw Strength	Maturity	Reaction to Disease ²			
							Stem Rust	Leaf Rust	Foliar Disease	Scab
AC Avonlea	Can.	1997	White	Med.	Med.	Med.	R	R	MS	S
AC Commander	Can.	2002	White	S.dwf.	Med.	Med.	R	R	MS	NA
AC Melita	Can.	1995	White	Tall	Med.	Med.	R	NA	NA	S
AC Morse	Can.	1996	White	S.dwf.	Strong	Med.	R	R	M	NA
AC Napoleon	Can.	2001	White	S.dwf.	Med.	Med.	R	R	S	NA
AC Navigator	Can.	1999	White	S.dwf.	Weak	Med.	R	R	M	S
AC Pathfinder	Can.	1999	White	Med.	Weak	Med.	R	R	M	S
Alkabo	ND	2005	White	Med.	V.strong	Med.	R	R	M	MS
Alzada	WB	2004	White	S.dwf.	Strong	Early	R	R	S	VS
Belzer	ND	1997	White	Tall	Med.	Late	R	R	M	MR
Ben	ND	1996	White	Med.	Strong	Med.	R	R	MR	S*
Cando	ND	1975	Tan	S.dwf.	V.strong	Med.	R	R	M	VS
DG Max	DGP	2008	White	Med.	Strong	Med.	R	MR	MR	MS
DG Star	DGP	2007	White	Med.	Strong	Early	R	R	M	NA
Dilse	ND	2002	White	Med.	Strong	Late	R	R	M	MS
Divide	ND	2005	White	Med.	Strong	Med.	R	R	M	MR
Dressler	AgriPro	1996	White	Tall	Med.	Med.	R	MR	NA	VS
Fjord	AgriPro	1986	White	Tall	Strong	M.early	R	R	M	S
Grande D'Oro	WB/DGP	2005	White	Med.	Strong	Med.	R	R	M	NA
Grenora	ND	2005	White	Med.	Strong	Med.	R	R	M	MS
Kari	AgriPro	1998	White	Med.	Strong	Med.	R	R	M	S
Kyle	Can.	1984	White	Tall	Weak	Med.	R	MR	M	NA
Laker	WB	1985	White	S.dwf.	Strong	Med.	R	MR	S	S
Lebsock	ND	1999	White	Med.	Strong	Med.	R	R	M	MS
Lloyd	ND	1983	White	S.dwf.	V.strong	Med.	R	MR	S	VS
Maier	ND	1998	White	Med.	Strong	M.late	R	R	M	S*
Medora	Can.	1983	White	Tall	Strong	M.early	R	R	MS	VS
Monroe	ND	1985	White	Tall	Med.	Early	R	R	M	VS
Mountrail	ND	1998	White	Med.	Strong	Late	R	R	M	S*
Munich	ND	1995	White	Med.	V.strong	Med.	R	R	MR	S*
Pierce	ND	2001	White	Med.	M.strong	Med.	R	R	MS	S
Plaza	ND	1999	White	S.dwf.	V.strong	Late	R	R	M	MS
Plenty	Can.	1990	White	Tall	Weak	Late	R	R	MR	MS
Primo D'Oro	WB/DGP	2004	White	Tall	Med.	M.early	R	R	MS	NA
Renville	ND	1988	White	Tall	Med.	Med.	R	R	M	S*
Rugby	ND	1973	Tan	Tall	Strong	M.early	R	R	MR	S*
Strongfield	Can	2004	White	Med.	Med.	Med.	R	R	MS	NA
Vic	ND	1979	White	Tall	Med.	M.early	R	R	MR	S*
Voss	AgriPro	1994	White	S.dwf.	V.strong	Med.	R	MR	MS	S
Wales	Westbred	2008	White	Med.	M.strong	Med.	R	R	M	S*

¹Refers to agent or developer: Can = Agriculture Canada, WB = Westbred, ND = North Dakota State University, DGP = Dakota Growers Pasta.

²R = resistant; MR = moderately resistant (slow rusters); M = intermediate; MS = moderately susceptible; S = susceptible; VS = very susceptible; Foliar Disease = reaction to tan spot and septoria leaf spot complex. Letter ratings for head blight (scab) based on visual head symptoms. * Indicates yields and/or quality often have been higher than would be expected based on visual symptoms. NA = Not adequately tested.

Variety	Days to Head	Plant Height	Sawfly **	Test Weight	Grain Protein	---- Grain Yield ----			Average Yield	
						2007	2008	2009	2 yr	3 yr
	*	inches	%	lbs/bu	%	----- Bushels per acre -----				
AC Commander	64	35	2	55.7	14.1	43.3	45.1	51.7	48.4	46.7
AC Navigator	65	36	2	57.7	14.0	37.1	37.5	52.6	45.0	42.4
Maier	64	36	10	57.0	14.3	40.6	31.0	52.3	41.6	41.3
Alkabo	64	36	5	56.6	13.2	37.5	30.3	52.0	41.2	39.9
Alzada	62	35	5	54.0	14.3	40.7	39.1	39.4	39.2	39.7
Grenora	66	36	4	55.2	12.6	36.9	33.3	48.4	40.8	39.5
DG Star	64	38	1	54.2	13.6	37.6	37.1	43.6	40.4	39.4
Ben	63	38	10	58.3	13.9	40.1	28.2	48.0	38.1	38.8
Dilse	65	37	9	56.6	14.3	37.7	28.4	49.8	39.1	38.6
Mountrail	65	38	1	54.9	14.0	38.4	23.2	50.7	37.0	37.4
Pierce	64	38	8	58.6	13.5	36.3	27.5	46.7	37.1	36.8
Divide	66	37	1	56.0	12.7	30.7	30.3	46.9	38.6	36.0
AC Napoleon	62	38	6	55.1	14.1	33.7	25.9	46.2	36.0	35.3
Rugby	67	41	2	53.2	14.1	30.1	27.3	33.1	30.2	30.2
Lebsock	64	36	3	57.6	13.2		33.8	51.1	42.4	
Grande Doro	66	38	2	55.5	14.1		28.1	50.0	39.0	
DG Max	62	38	8	57.5	13.8		26.5	50.6	38.6	
Strongfield	63	36	4	53.9	13.5		32.2	43.0	37.6	
Wales	64	35	3	56.4	13.3		25.9	48.1	37.0	
Westhope	62	36	3	57.2	15.2			49.6		
Trial Mean	64	37	6	56.5	14.0	36.6	31.8	48.6	--	--
C.V. %	2.9	6.1	53	2.4	--	13.0	11.6	7.2	--	--
LSD .05	2	3	5	1.9	--	6.6	5.1	4.9	--	--
LSD .01	3	4	6	2.5	--	8.8	6.8	6.4	--	--

* Days to Head = the number of days from planting to head emergence from the boot.

** Sawfly: Approximate % of stems cut off (lodged) from wheat stem sawfly.

Planting Date: May 5

Harvest Date: August 29

Seeding Rate: 1.25 million live seeds / acre (approx. 2.2 bu/A).

Previous Crop: 2008 = field pea, 2007 & 2006 = hrsw.

Note: The 2009 trial sustained moderate hail damage on June 22 and 24 (early boot stage).

The 2008 trial sustained late season heat and moisture stress.

2009 Durum - Recrop

Dickinson, ND

Variety	Days to Head	Seeds per Pound	Plant Height in	Test Weight lbs/bu	Protein %	----- Grain Yield-----			Average Yield	
						2007	2008	2009	2	3
						-----bu/ac-----			----bu/ac----	
AC Commander	64	8,945	30	60.0	13.4	61.4	12.3	93.3	52.8	55.7
AC Napoleon	64	9,240	35	59.6	13.6	46.9	13.8	82.6	48.2	47.8
AC Navigator	64	9,788	31	62.1	13.0	48.3	12.7	83.9	48.3	48.3
Alkabo	64	10,084	33	61.6	13.4	46.9	13.5	75.0	44.2	45.1
Alzada	59	9,296	28	59.8	13.4	--	17.5	69.4	43.5	--
Ben	64	9,829	34	61.4	14.1	45.1	13.2	75.6	44.4	44.6
CDC Verona	66	10,063	34	62.2	13.3	--	--	87.0	--	--
DG Max	64	11,187	35	62.7	13.5	--	12.5	87.2	49.8	--
DG Star	60	9,884	34	60.2	13.8	--	11.2	80.4	45.8	--
Dilse	65	9,808	33	62.4	14.1	46.8	13.6	84.4	49.0	48.3
Divide	65	10,172	35	61.5	13.6	44.7	16.6	87.1	51.8	49.4
Grenora	64	9,560	32	61.2	12.9	47.8	13.7	89.6	51.7	50.4
Lebsock	64	9,629	34	61.9	13.4	45.9	15.0	77.9	46.5	46.3
Maier	64	10,064	32	62.0	14.3	45.2	14.7	85.3	50.0	48.4
Mountrail	65	9,450	33	62.1	12.7	46.6	12.4	92.2	52.3	50.4
Pierce	64	11,370	34	62.5	13.3	46.5	17.5	87.7	52.6	50.6
Strongfield	64	10,243	33	61.6	13.9	46.7	13.2	78.0	45.6	45.9
Wales	64	10,988	33	61.7	13.1	--	14.2	92.7	53.5	--
Trial Mean	64	9,923	33	62.0	13.5	48.4	13.6	85.2	--	--
CV %	0.9	5.7	4.0	1.2	4.3	6.7	19.5	7.5	--	--
LSD 0.05	1	1,139	2	1.0	1.2	4.6	NS	8.9	--	--

Planting Date: May 4, 2009

Harvest Date: September 10, 2009

Previous Crop: Field Pea

Seeding Rate: 1.2 million live seeds/ac

2009 Durum Variety Trial - Continuously Cropped - No-till Scranton

Cooperators: Neal and Justin Freitag, Scranton

Variety	Plant Height	Test Weight	Grain Protein	---- Grain Yield ----			Average Yield		
	inches	lbs/bu	%	2007	2008	2009	2 yr	3 yr	
				----- Bushels per acre -----					
Divide	37	61.6	10.9	28.4	17.8	63.9	40.8	36.7	
Alkabo	38	61.5	11.6	26.7	17.9	62.4	40.2	35.7	
Grenora	41	61.2	10.8	18.2	18.3	68.3	43.3	34.9	
Mountrail	37	61.5	11.1	21.0	16.6	63.6	40.1	33.7	
Ben	38	62.2	11.6	21.9	15.2	58.7	37.0	31.9	
Trial Mean	38	61.7	11.2	23.3	17.6	62.8	--	--	
C.V. %	6.1	0.7	--	9.1	16.2	3.1	--	--	
LSD .05	NS	0.6	--	3.3	NS	2.9	--	--	
LSD .01	NS	0.9	--	4.6	NS	4.0	--	--	

NS = no statistical difference between varieties.

Planting Date: May 7, 2009

Harvest Date: August 29, 2009

Seeding Rate: 1.25 million live seeds / acre (approx. 2.2 bu/A).

Previous Crop: 2006 = hrww, 2007 & 2008 = hrsw.

Note: The 2008 trial sustained severe heat and moisture stress.

2009 Durum Variety Trial - Continuously Cropped - No-till Regent

Cooperators: August and Perry Kirschemann, Regent

Variety	Plant Height	Test Weight	Grain Protein	---- Grain Yield ----			Average Yield		
	inches	lbs/bu	%	2007	2008	2009	2 yr	3 yr	
				----- Bushels per acre -----					
Grenora	38	59.3	12.9	55.6	10.5	66.1	38.3	44.1	
Alkabo	37	58.6	12.4	52.2	8.9	62.3	35.6	41.1	
Mountrail	37	58.3	12.6	47.2	10.0	64.5	37.2	40.6	
Ben	38	60.0	13.7	45.2	11.5	61.6	36.6	39.4	
Divide	39	58.6	13.2	46.7	10.0	60.7	35.7	39.1	
Trial Mean	38	59.1	12.8	49.4	9.7	63.2	--	--	
C.V. %	3.0	0.5	--	4.7	50.6	4.3	--	--	
LSD .05	NS	0.5	--	3.6	NS	NS	--	--	
LSD .01	NS	0.7	--	5.0	NS	NS	--	--	

NS = no statistical difference between varieties.

Planting Date: May 7, 2009

Harvest Date: August 27, 2009

Seeding Rate: 1.25 million live seeds / acre (approx. 2.2 bu/A).

Previous Crop: 2006, 2007 & 2008 = hrsw.

Note: The 2008 trial sustained severe heat and moisture stress.

2009 Hannover Durum - Recrop**Dickinson, ND**

Variety	Seeds per Pound	Test Weight lbs/bu	Protein %	-----Grain Yield-----			Average Yield	
				2007	2008	2009	2	3
				-----bu/ac-----			----bu/ac----	
Alkabo	10,321	58.5	14.3	38.6	34.3	62.1	48.2	45.0
DG Max	10,171	57.7	14.2	--	--	60.5	--	--
Divide	10,583	58.9	14.1	37.5	34.2	60.9	47.5	44.2
Grenora	9,972	57.0	14.2	37.5	35.6	61.4	48.5	44.8
Mountrail	10,398	58.4	13.9	40.3	32.4	67.0	49.7	46.6
Trial Mean	10,279	58.3	14.2	38.5	33.1	63.0	--	--
CV %	4.2	1.6	1.7	4.5	10.0	3.2	--	--
LSD 0.05	NS	1.4	NS	NS	NS	3.0	--	--

Planting Date: May 15, 2009

Harvest Date: September 3, 2009

Previous Crop: Wheat

Seeding Rate: 1.2 million live seeds/ac

2009 Glen Ullin Durum - Fallow**Dickinson, ND**

Variety	Seeds per Pound	Test Weight lbs/bu	Protein %	-----Grain Yield-----			Average Yield	
				2007	2008	2009	2	3
				-----bu/ac-----			----bu/ac----	
Alkabo	9,889	62.5	14.1	35.7	36.4	68.8	52.60	47.0
DG Max	10,546	62.0	14.0	--	--	71.2	--	--
Divide	9,890	62.1	14.0	36.2	42.9	64.8	53.86	48.0
Grenora	10,218	60.7	13.3	38.4	37.6	69.5	53.57	48.5
Mountrail	10,531	62.4	13.2	44.6	37.0	75.7	56.33	52.4
Trial Mean	10,034	62.3	13.7	39.5	37.0	71.7	--	--
CV %	9.3	2.0	4.2	8.6	23.1	10.0	--	--
LSD 0.05	NS	1.9	NS	5.2	NS	NS	--	--

Planting Date: May 15, 2009

Harvest Date: September 10, 2009

Seeding Rate: 1.2 million live seeds/ac

SDSU Durum Wheat Variety Trial - Perkins County (Bison), 2009.

Variety	Height Inches	Lodging 0-9*	Test Wt Lb/Bu	Yield Bu/A	Protein %
ALKABO	28	0	56.3	17.0	13.6
BEN	31	0	58.4	22.4	14.5
GRENORA	29	0	57.8	24.5	13.7
LEB SOCK	28	0	54.8	19.0	14.3
MOUNTRAIL	30	0	57.7	23.2	13.1
DIVIDE	30	0	59.7	27.4	14.6
Average	29.1	0.0	57.4	22.3	14.0
LSD (P=.05)	3.0	0.0	2.5	6.4	--
CV	4.0	0.0	2.7	18.9	--

* 0 = no lodging, 9 = 100% lodged.

Planted: May 14, 2009 Herbicide: Widematch (1 pt/A) + MCPA (8 oz/A) +
Axial XL (1 pt/A)

Harvested: Sept. 10, 2009 Additional Nitrogen: 75 Lb/A

Previous crop: Wheat, no-till planted.

SDSU Durum Wheat Variety Trial - Harding County (Ralph), 2009.

Variety	Height Inches	Lodging 0-9*	Test Wt Lb/Bu	Yield Bu/A	Protein %
ALKABO	33	1.0	62.9	47.9	13.3
BEN	35	0.8	62.5	46.5	13.6
GRENORA	31	1.0	62.8	50.2	13.6
LEB SOCK	35	0.5	63.5	47.1	13.5
MOUNTRAIL	33	0.3	62.8	53.4	13.9
DIVIDE	36	0.5	63.5	55.1	14.4
Average	33.7	0.7	63.0	50.0	13.7
LSD (P=.05)	1.6	0.6	1.2	6.0	--
CV	3.1	61.2	1.3	7.9	--

* 0 = no lodging, 9 = 100% lodged.

Planted: May 12, 2009 Herbicide: Widematch (1.3 pt/A) + MCPA (8 oz/A) +
Axial XL (1 pt/A)

Harvested: Sept. 1, 2009 Additional Nitrogen: 65 Lb/A

Previous crop: Conventional Fallow.

2009 Durum Variety Trial - Continuously Cropped - No-till

Mandan

Cooperator: USDA-ARS NGP Research Center, Mandan

Variety	Tan Spot	Septoria	Plant Height	Test Weight	Grain Protein	---- Grain Yield ----			Average Yield	
	*	*	inches	lbs/bu	%	2007	2008	2009	2 yr	3 yr
						----- Bushels per acre -----				
Alkabo	1	1	39	60.1	12.6	56.1	60.2	70.2	65.2	62.2
Grenora	2	2	39	59.4	13.3	57.3	57.7	68.1	62.9	61.0
Ben	1	1	42	60.0	11.8	61.6	55.1	64.6	59.8	60.4
Divide	1	5	41	60.1	12.9	54.2	55.8	69.6	62.7	59.9
Mountrail	1	1	41	59.8	11.8	59.6	56.9	63.0	60.0	59.8
Trial Mean	1	2	41	60.0	12.7	57.8	57.1	67.1	--	--
C.V. %	--	--	2.9	0.5	--	4.5	6.0	4.2	--	--
LSD .05	--	--	2	0.5	--	4.9	NS	4.3	--	--
LSD .01	--	--	2	0.7	--	NS	NS	5.9	--	--

* % of flag leaf infected with tan spot and septoria.

Planting Date: May 11, 2009

Harvest Date: September 1, 2009

Seeding Rate: 1.25 million live seeds / acre (approx. 2.2 bu/A).

Previous Crop: 2006 = hrww, 2007 & 2008 = hrsw.

Durum in the West River Region

Combined Means

Variety	Days to Head	Plant Height	Seeds / Pound	Test Weight	Grain Protein	---- Grain Yield ----			Average Yield	
		inches	#	lbs/bu	%	2007	2008	2009	2 yr	3 yr
						----- Bushels per acre -----				
Grenora	65	35	9,917	59.4	13.0	39.3	29.3	60.7	45.0	43.1
Mountrail	65	36	10,126	59.8	12.9	39.7	27.0	61.5	44.2	42.7
Divide	66	36	10,215	60.2	13.4	37.5	29.1	59.6	44.4	42.1
Alkabo	64	35	10,098	59.8	13.2	40.1	28.0	57.5	42.8	41.9
Ben	64	37	9,829	60.4	13.3	39.2	27.0	53.9	40.4	40.0
Lebsock	64	33	9,629	59.4	13.6		26.9	48.8	37.8	
# of Locations*	2	7	3	9	9	9	8	9	17	26

* Locations: 2007 = Hettinger, Dickinson, Scranton, Regent, Mandan, Hannover, Glen Ullin, Ralph & Bison, SD.

2008 = Hettinger, Dickinson, Scranton, Regent, Mandan, Hannover, Glen Ullin & Bison, SD.

2009 = Hettinger, Dickinson, Scranton, Regent, Mandan, Hannover, Glen Ullin, Ralph & Bison, SD.

North Dakota barley variety descriptions.

Variety	Use ¹	Origin ²	Year Released	Awn Type ³	Rachilla Hair Length ⁴	Aleurone Color	Height	Straw Strength	Relative Maturity	Reaction to Disease ⁵			
										Stem Rust	Loose Smut	Spot Blotch	Net Blotch
Six-rowed													
Azure	M/F	ND	1982	S	L	Blue	Med.	M.strg.	M.early	S	S	MR-R	MS-S
Celebration	MT	BARI	2008	S	S	White	M.short	Strg.	Med.	S	S	MR-R	MS-MS
Drummond	M/F	ND	2000	S	L	White	M.short	V.strg.	Med.	S	S	MR-R	MS-S
Excel	M/F	MN	1990	S	L	White	M.short	Strg.	Med.	S	S	MR-R	MS-S
Foster	M/F	ND	1995	S	L	White	M.short	Strg.	Med.	S	S	MR-R	MS-S
Hazen	F	ND	1984	S	L	White	Med.	M.strg.	Med.	S	S	MR-R	MS-S
Lacey	M/F	MN	1999	S	S	White	M.short	Strg.	Med.	S	S	MR-R	MS-S
Legacy	M/F	BARI	2000	S	L	White	Med.	Strg.	M.late	S	S	MR-R	MS-S
MNBrite ⁶	F	MN	1997	S	S	White	Tall	Med.	Early	S	S	MR-R	MS-S
Morex	M/F	MN	1978	S	S	White	Tall	Med.	Early	S	S	MR	S
Rasmusson	MT	MN	2008	S	S	White	M.short	Strg.	Med.	S	S	MR-R	MS-S
Robust	M/F	MN	1983	S	S	White	Med.	M.strg.	Med.	S	S	MR-R	MS-S
Stander	F	MN	1993	S	S	White	M.short	V.strg.	M.late	S	S	MR-R	MS-S
Stellar-ND	M/F	ND	2005	S	L	White	M.short	V.strg.	Med.	S	S	MR-R	MS-S
Tradition	M/F	BARI	2003	S	L	White	M.short	V.strg.	Med.	S	S	MR-R	MS-S
Two-rowed													
AC Metcalfe	M	Can	1997	R	L	White	Med.	Med.	Late	S	NA	MS	MS
Bowman	F	ND	1984	S	L	White	M.short	Med.	Early	S	S	MS-S	S-MS
CDC Copeland	M	Can	1999	R	L	White	Tall	Med.	M.late	S	S	MS	MR
Conlon ⁷	M/F	ND	1996	S	L	White	M.short	Med.	Early	S	S	MS	MR-R
Conrad	M	BARI	2007	R	L	White	Tall	M.weak	Late	S	NA	NA	NA
Eslick	F	MT	2003	R	L	White	Med.	M.weak	M.late	S	NA	MS	NA
Gallatin	F	MT	1986	R	L	White	Med.	Med.	Late	S	S	MS-S	MS
Harrington ⁸	F	Can	1981	R	L	White	Med.	M.weak	V.late	S	S	S	MS
Haxby	F	MT	2003	R	L	White	Med.	Med.	Med.	S	NA	MS	NA
Logan	F	ND	1995	S	L	White	Med.	Strg.	Med.	S	S	MR	MR
Pinnacle	MT	ND	2006	S	L	White	Med.	Strg.	M.late	S	S	MR	MS
Rawson	F	ND	2005	R	L	White	Med.	Med.	Med.	S	S	MR	MS
Scarlett	M	Germany	1995	R	L	White	Short	Med.	Late	S	NA	NA	NA
Stark	F	ND	1991	S	L	White	M.tall	Med.	Late	S	S	S-MS	MS-S
Valier	F	Can	1999	R	L	White	Med.	M.weak	M.late	S	NA	MS	NA
Specialty													
Wanubet	SP	MT	1990	R	L	White	Med.	Weak	Late	S	S	S	S

¹ M = malting; MT = Being tested in plant scale tests for malting and brewing quality; F = feed; SP = special uses (hullless)

² BARI = Busch Agricultural Resources, Inc.; MN = University of Minnesota; MT = Montana State University; ND = North Dakota State University.

³ R = rough; S = smooth.

⁴ S = short; L = long.

⁵ R = resistant; MR = moderately resistant; MS = moderately susceptible; S = susceptible; NA = not available.

⁶ Moderately resistant to Fusarium head blight.

⁷ Lower DON accumulations than other varieties tested.

⁸ Recommended as a malting barley in western U.S.A.

Variety	Days to	Plant	Test	%	Grain	----- Grain Yield -----			Avg. Yield	
	Head	Height	Weight	Plump	Protein	2007	2008	2009	2 yr	3 yr
	*	Inches	lbs/bu	>6/64	%	----- Bushels per acre -----				
2 Row Types										
Haxby	61	33	44.7	84	12.5	97.6	91.1	78.8	85.0	89.2
Conlon	58	34	43.9	88	12.7	78.0	102.7	74.9	88.8	85.2
Conrad	65	33	44.2	80	13.3	89.8	78.3	81.7	80.0	83.3
Pinnacle	61	36	43.5	81	12.0	75.6	94.0	79.6	86.8	83.1
Rawson	62	37	42.9	79	11.7	90.9	80.6	66.0	73.3	79.2
CDC Copeland	67	39	43.5	87	12.8	76.1	73.9	70.6	72.2	73.5
AC Metcalf	63	36	43.8	8.8	12.9	75.9	67.4	68.0	67.7	70.4
Harrington	67	36	42.9	82	13.2	74.3	58.7	73.3	66.0	68.8
Scarlett	67	33	45.2	91	13.2	76.0	89.5	82.1	85.8	52.5
6 Row Types										
Tradition	62	34	43.9	78	12.1	87.1	88.0	71.4	79.7	82.2
Lacey	62	33	44.3	89	12.6	88.9	76.7	77.1	76.9	80.9
Legacy	66	36	43.6	85	11.9	78.0	69.0	79.4	74.2	75.5
Rasmusson	62	33	44.2	83	12.0	86.9	63.7	72.1	67.9	74.2
Drummond	61	33	42.3	87	12.1	81.7	66.2	73.5	69.8	73.8
Stellar-ND	61	34	42.2	73	12.8	86.4	60.4	64.8	62.6	70.5
Robust	62	38	44.7	81	13.3	79.5	64.2	66.7	65.4	70.1
Celebration	62	36	41.8	84	13.5			81.7		
Trial Mean	62	35	43.4	83	12.6	81.8	76.5	74.2	--	--
C.V. %	2.5	5.3	1.8	--	--	7.6	8.4	11.3	--	--
LSD .05	2	3	1.1	--	--	8.8	9.0	11.8	--	--
LSD .01	3	4	1.5	--	--	11.7	12.0	15.7	--	--

* Days to Head = the number of days from planting to head emergence from the boot.

Planting Date: May 5

Harvest Date: August 29

Seeding Rate: 750,000 live seeds / acre (approx. 1.4 bu/A).

Previous Crop: 2008 & 2007 = hrsw, 2006 = field pea.

Note: The 2009 trial sustained moderate hail damage on June 22 and 24 (late boot stage).

Variety	Days to Head	Seeds per Pound	Plant Height in	Test Weight lbs/bu	Protein %	% Plump >6/64	----- Grain Yield-----			Average Yield	
							2007	2008	2009	2	3
							-----bu/ac-----			----bu/ac----	
Six Row											
Celebration	68	13,874	28	45.3	11.4	96.4	--	57.8	74.6	66.2	--
Drummond	66	12,433	31	45.8	11.5	95.6	71.2	53.8	71.5	62.7	65.5
Lacey	69	11,491	29	46.1	10.9	96.2	79.3	53.6	74.9	64.3	69.3
Legacy	70	12,005	29	43.9	9.4	97.5	68.1	51.7	72.2	62.0	64.0
Rasmusson	66	11,915	27	47.6	11.9	96.1	75.1	53.5	86.4	69.9	71.7
Robust	69	11,810	31	46.6	11.5	96.8	70.8	49.2	66.2	57.7	62.0
Stellar-ND	68	11,357	28	45.8	12.1	97.7	69.3	50.4	72.0	61.2	63.9
Tradition	68	12,394	28	45.7	11.2	97.7	75.4	53.3	72.5	62.9	67.1
Two Row											
AC Metcalfe	71	10,501	28	51.7	11.4	96.0	70.9	52.3	107.2	79.8	76.8
BG 705	70	11,432	23	60.1	9.7	93.9	--	--	73.1	--	--
BZ493-46E	72	13,381	28	48.6	11.4	12.9	--	--	75.2	--	--
CDC Copeland	76	9,841	28	50.6	11.0	96.8	68.7	45.8	110.0	77.9	74.8
Champion	71	9,987	28	50.9	9.6	98.2	--	--	102.4	--	--
Conlon	67	9,711	25	48.6	11.3	98.4	63.9	49.1	74.5	61.8	62.5
Conrad	71	10,576	26	50.4	10.2	99.0	76.3	52.7	105.6	79.2	78.2
Enduro	71	11,229	24	58.7	8.0	95.5	--	--	83.7	--	--
Harrington	71	10,065	28	49.5	9.8	98.5	63.3	47.5	92.1	69.8	67.6
Haxby	68	9,652	28	53.1	11.0	98.5	76.7	55.1	105.0	80.0	78.9
Pinnacle	69	9,127	30	49.4	9.7	98.3	69.3	54.1	89.3	71.7	70.9
Pronghorn	70	12,628	26	56.1	8.9	80.0	--	--	71.8	--	--
Prowashonupana	69	14,636	24	42.4	13.5	19.9	--	--	73.2	--	--
Rawson	70	8,630	25	48.7	10.8	98.6	66.4	54.9	81.4	68.1	67.6
Salute	70	10,405	26	49.4	11.0	98.1	--	--	113.2	--	--
Scarlett	76	10,380	23	49.0	10.1	98.8	76.7	50.4	104.6	77.5	77.2
Trial Mean	69	11,285	27	48.6	10.7	92	71.8	52.3	83.5	--	--
CV %	1.1	3.2	6.2	2.5	8.11	1.1	9.7	7.1	13.2	--	--
LSD 0.05	1	729	3	2.0	1.8	2	NS	5.2	18.0	--	--

Planting Date: April 22, 2009

Harvest Date: August 24, 2009

Previous Crop: Field Pea

Seeding Rate: 1.2 million live seeds/ac

Note: Trial received hail damage

2009 Barley Variety Trial - Continuously Cropped - No-till

Scranton

Cooperators: Neal and Justin Freitag, Scranton

Variety	Plant	Test	%	Grain	---- Grain Yield ----			Average Yield	
	Height	Weight	Plump	Protein	2007	2008	2009	2 yr	3 yr
	inches	Lbs/bu	>6/64	%	----- Bushels per acre -----				
2 Row Types									
Pinnacle	38	50.4	93	11.6	59.6	20.6	91.1	55.8	57.1
Rawson	38	49.9	97	11.3	65.4	22.1	72.9	47.5	53.5
Conlon	30	Consumed by wildlife			42.1				
6 Row Types									
Stellar-ND	37	48.0	98	12.0	68.7	15.6	108.2	61.9	64.2
Tradition	36	49.9	97	11.5			100.0		
Celebration	37	49.4	98	12.9			91.2		
Trial Mean	36	49.5	97	11.9	61.1	17.2	92.7	--	--
C.V. %	5.1	1.1	--	--	5.4	28	3.5	--	--
LSD .05	3	0.8	--	--	4.9	NS	4.9	--	--
LSD .01	4	1.1	--	--	6.6	NS	6.8	--	--

NS = no statistical difference between varieties.

Planting Date: May 7, 2009 Harvest Date: August 29, 2009

Seeding Rate: 750,000 live seeds / acre (approx. 1.4 bu/A).

Previous Crop: 2006 = hrww, 2007 & 2008 = hrsw.

Note: The 2008 trial sustained severe heat and moisture stress.

2009 Barley Variety Trial - Continuously Cropped - No-till

Regent

Cooperators: August and Perry Kirschmann, Regent

Variety	Plant	Test	%	Grain	---- Grain Yield ----			Average Yield	
	Height	Weight	Plump	Protein	2007	2008	2009	2 yr	3 yr
	inches	lbs/bu	>6/64	%	----- Bushels per acre -----				
2 Row Types									
Rawson	35	48.6	97	11.8	86.0	23.8	97.4	60.6	69.1
Pinnacle	39	49.5	98	11.3	84.8	20.5	92.5	56.5	65.9
Conlon	37	49.4	96	12.0	84.2	12.3	101.3	56.8	65.9
6 Row Types									
Stellar-ND	37	48.3	98	12.6	69.0	13.9	88.0	51.0	57.0
Celebration	37	48.2	96	13.1			92.0		
Tradition	38	48.2	98	13.1			85.5		
Trial Mean	37	48.7	97	12.3	80.0	16.1	92.8	--	--
C.V. %	5.0	0.8	--	--	4.5	27	3.8	--	--
LSD .05	NS	0.7	--	--	5.3	6.6	6.3	--	--
LSD .01	NS	1.0	--	--	7.2	9.2	9.0	--	--

NS = no statistical difference between varieties.

Planting Date: May 7, 2009 Harvest Date: August 27, 2009

Seeding Rate: 750,000 live seeds / acre (approx. 1.4 bu/A).

Previous Crop: 2006, 2007 & 2008 = hrsw.

Note: The 2008 trial sustained severe heat and moisture stress.

2009 Barley Variety Trial - Continuously Cropped - No-till

Selfridge

Cooperator: Nick Vollmuth, Selfridge

Variety	Plant Height	Test Weight	% Plump	Grain Protein	Grain Yield			Average Yield	
	inches	lbs/bu	>6/64	%	2006	2007	2009	2 yr	3 yr
----- Bushels per acre -----									
2 Row Types									
Conlon	35	46.7	96	13.1	47.8	59.2	76.9	68.0	61.3
Rawson	39	45.2	95	12.5	47.1	54.6	76.1	65.4	59.3
Pinnacle	37	43.9	92	11.9	44.3	46.2	63.4	54.8	51.3
6 Row Types									
Stellar-ND	36	45.4	93	12.4	25.7	51.4	71.4	61.4	49.5
Tradition	37	46.3	95	12.9			89.4		
Celebration	36	44.8	96	12.6			82.8		
Trial Mean	37	45.4	94	12.6	40.5	59.3	76.6	--	--
C.V. %	4.0	1.5	--	--	10.9	6.8	7.4	--	--
LSD .05	2	1.0	--	--	6.5	5.9	8.6	--	--
LSD .01	3	1.4	--	--	8.8	8.0	11.8	--	--

Planting Date: May 11, 2009

Harvest Date: August 27, 2009

Seeding Rate: 750,000 live seeds / acre (approx. 1.4 bu/A).

Previous Crop: 2005 & 2006 = hrww, 2008 = sunflower.

Note: The 2008 trial was destroyed by hail.

2009 Barley Variety Trial - Continuously Cropped - No-till, Mandan

Cooperator: USDA-ARS NGP Research Center, Mandan

Variety	Plant Height	Lodging	Test Weight	% Plump	Grain Protein	Grain Yield
	inches	0 – 9*	lbs/bu	>6/64	%	bu/A
2 Row Types						
Pinnacle	36	3.0	48.0	95	10.9	79.4
Rawson	35	1.8	46.1	96	11.4	73.3
Conlon	33	6.5	47.9	97	12.4	72.2
6 Row Types						
Tradition	34	1.5	46.8	94	11.2	90.1
Stellar-ND	35	1.8	46.2	97	11.7	88.0
Celebration	35	3.8	46.0	98	11.1	83.7
Trial Mean	35	3.0	46.9	96	11.4	81.1
C.V. %	3.6	34	1.0	--	--	3.9
LSD .05	2	1.5	0.7	--	--	4.8
LSD .01	NS	2.1	1.0	--	--	6.6

* Lodging: 0 = none, 9 = lying flat on ground.

NS = no statistical difference between varieties.

Planting Date: May 11, 2009

Harvest Date: September 1, 2009

Seeding Rate: 750,000 live seeds / acre (approx. 1.4 bu/A).

Previous Crop: hrsw

2009 Hannover Barley - Recrop
Dickinson, ND

Variety	Seeds per Pound	Test Weight lbs/bu	% Plump >6/64	Protein %	Grain Yield ----bu/ac----
Six Row					
Celebration	10,588	41.0	99.2	12.8	112.1
Stellar-ND	10,159	41.2	99.3	12.3	111.3
Tradition	10,370	43.3	99.2	12.3	113.2
Two Row					
Pinnacle	8,226	46.0	99.0	11.3	107.9
Rawson	8,037	45.3	98.0	11.8	98.8
Trial Mean	9,476	43.4	99.0	12.1	108.6
CV %	2.5	2.0	0.3	1.8	3.0
LSD 0.05	667	1.3	0.7	0.6	5.0

Planting Date: May 15, 2009

Harvest Date: September 3, 2009

Previous Crop: Wheat

Seeding Rate: 1.2 million live seeds/ac

2009 Glen Ullin Barley - Fallow
Dickinson, ND

Variety	Seeds per Pound	Test Weight lbs/bu	% Plump >6/64	Protein %	Grain Yield ----bu/ac----
Six Row					
Celebration	11,085	45.4	98.2	12.9	126.2
Stellar-ND	10,239	45.3	98.7	11.8	132.1
Tradition	10,717	48.1	98.7	12.4	121.1
Two Row					
Pinnacle	8,519	48.3	98.0	11.6	125.3
Rawson	8,136	48.1	97.4	11.8	122.0
Trial Mean	9,739	47.0	98.2	12.1	125.3
CV %	3.7	2.1	0.6	1.4	4.7
LSD 0.05	994	1.5	NS	0.5	NS

Planting Date: May 15, 2009

Harvest Date: September 3, 2009

Seeding Rate: 1.2 million live seeds/ac

SDSU Spring Barley Variety Trial - Perkins County (Bison), 2009.

Variety	Height Inches	Lodging 0-9*	Test Wt Lb/Bu	Yield Bu/A
TWO ROW				
CONLON +	22	0	**	12.8
ESLICK	19	0	46.6	43.4
PINNACLE	22	0	46.0	31.7
RAWSON	22	0	46.0	36.1
SIX ROW				
LACEY	22	0	46.0	32.5
STELLAR-ND	23	0	44.8	27.2
DRUMMOND	23	0	44.1	32.3
M122	25	0	44.8	27.4
ROBUST	23	0	45.9	28.3
RASMUSSEN	21	0	46.7	33.0
Average	21.9	0.0	45.7	30.5
LSD (P=.05)	3.6	0.0	2.1	6.0
CV	7.3	0.0	3.1	13.5

+ Colon yield was adversely affected by wildlife damage.

* 0 = no lodging, 9 = 100% lodged.

** Not enough sample for a test weight.

Planted: May 14, 2009 Herbicide: Widematch (1 pt/A) + MCPA (8 oz/A) + Axial XL (1 pt/A)

Harvested: Sept. 10, 2009 Additional Nitrogen: 75 Lb/A

Previous crop: Wheat, no-till planted.

SDSU Spring Barley Variety Trial - Harding County (Ralph), 2009.

Variety	Height Inches	Lodging 0-9*	Test Wt Lb/Bu	Yield Bu/A
TWO ROW				
CONLON +	29	0	**	9.4
ESLICK	27	0	51.1	90.1
PINNACLE	28	0	49.0	70.0
RAWSON	29	0	50.2	73.4
SIX ROW				
LACEY	29	0	50.1	63.6
STELLAR-ND	28	0	48.2	60.8
DRUMMOND	28	0	49.1	58.3
M122	31	0	46.9	58.0
ROBUST	31	0	50.1	50.6
RASMUSSEN	29	0	49.0	65.7
Average	28.7	0.0	49.3	60.0
LSD (P=.05)	3.3	0.0	1.9	10.0
CV	5.0	0.0	2.7	11.5

+ Colon yield was adversely affected by wildlife damage.

* 0 = no lodging, 9 = 100% lodged.

** Not enough sample for a test weight.

Planted: May 12, 2009 Herbicide: Widematch (1.3 pt/A) + MCPA (8 oz/A) + Axial XL (1 pt/A)

Harvested: Sept. 1, 2009 Additional Nitrogen: 65 Lb/A

Previous crop: Conventional Fallow.

North Dakota oat variety descriptions.

Variety	Origin ¹	Year Released	Grain Color	Height	Straw Strength	Maturity ²	Reaction to Diseases			Bu/Wt.	Protein ⁵
							Stem Rust ³	Crown Rust ³	Barley Y.Dwf ⁴		
AC Assiniboia	Can. Proven Seed	1997	Red	Med.	Strong	L	S	S	T	Good	ML
AC Gwen	Can. SeCan	2000	Hulless	Tall	Strong	L	S	S	R	Good	L
AC Kaufman	Can.	2000	Yellow	Tall	Strong	L	S	S	MT	V.good	ML
AC Medallion	Can. Cargill	1997	White	Tall	Med.	L	S	S	MT	Good	ML
AC Morgan	Can. SeCan	1999	White	Med.	Strong	L	S	S	S	V.good	ML
AC Pinnacle	Can. QAS	1999	White	Tall	Med.	L	S	S	S	V.good	L
AC Ronald	Can. SeCan	2001	White	M. short	V. strg.	L	S	S	T	V.good	M
Beach	ND	2004	White	Tall	M.strg.	ML	S	MR/MS	MS	V.good	M
Buff	SD	2002	Hulless	Med.	M.strg.	L	S	MR/MS	MT	Good	H
CDC Boyer	Sask. Value Added	1994	White	Tall	M.strg.	L	S	MS	S	V.good	ML
CDC Dancer	Can. Cargill	2000	White	Tall	Strong	L	S	MS	S	V.good	M
CDC Minstrel	Sask.	2006	White	Tall	M.strg.	L	S	S	S	Good	M
CDC Orrin	Can. QAS Cargill	2001	White	Tall	Strong	L	S	S	S	Good	ML
CDC Pacer	Sask. Value Added	1996	White	Tall	M.strg.	L	S	S	S	Good	L
CDC Weaver	Can.	2005	White	Med.	M.strg.	L	R	R	S	Good	M
Drumlin	WI	2003	Yellow	Med.	Strong	M	S	MR	VT	Good	M
Ebeltoft	ND	1999	White	Tall	Strong	V	S	MS	S	V.good	M
Excel	IN	2006	White	Med.	Strong	M	S	MR	T	V.good	M
Furlong	AAFC Winnipeg	2003	Red	Tall	M.strg.	L	S	S	T	V.good	M
HiFi	ND	2001	White	Tall	Strong	L	MR/MS	R	T	Good	M
Hyttest	SD	1986	White	Tall	M.strg.	E	S	MS	S	V.good	H
Jerry	ND	1994	White	Tall	Strong	M	S	MS	MT	V.good	M
Jud	ND	1997	Ivory	Tall	Med.	L	R	MR/MS	T	Good	MH
Killdeer	ND	2000	White	Med.	Strong	M	S	MS	MT	Good	M
Leggett	AAFC Winnipeg	2005	White	Tall	M.strg.	L	MR	R	S	Good	M
Leonard	MN	2001	Yellow	Tall	M.strg.	L	S	S	T	Fair	ML
Loyal	SD	2000	Ivory	Tall	M.strg.	L	S	MR	T	Good	MH
Maida	ND	2005	Yellow	Med.	Strong	M	R	S	MS	V.good	MH
Monida	MT/ID	1985	White	M.tall	Strong	L	S	S	NA	Good	ML
Morton	ND	2001	White	Tall	V.strg.	L	S	R	MT	V.good	M
Otana	MT	1977	White	M.tall	M.weak	L	S	S	S	V.good	ML
Paul	ND	1994	Hulless	V.tall	Strong	L	R	MR/MS	T	Good	H
Reeves	SD	2002	White	M.tall	Med.	E	S	MR	MT	Good	H
Sesqui	MN	2001	Yellow	M.tall	Strong	L	S	S	T	Good	M
Souris	ND	2006	White	Med.	Strong	M	MS	R	MS	V.good	M
Stallion	SD	2006	White	Tall	Med.	L	S	MR	NA	V.good	M
Stark	ND	2004	Hulless	Tall	M.strg.	L	R	MR/MS	T	V.good	M
Vista	WI	2000	Yellow	Tall	Strong	L	S	R	MT	Good	M
Youngs	ND	1999	White	Med.	Strong	L	S	MS/S	MT	Good	M

¹ Can = Canada; ND = North Dakota State University; SD = South Dakota State University; WI = Univ. of Wisconsin; IN = Purdue University; MT = Montana, ID = Idaho; Sask. = Saskatchewan.

² E = Early; M = medium; L = Late; V = very late.

³ R = resistant; MR = moderately resistant; MS = moderately susceptible; S = susceptible.

⁴ Barley Yellow Dwarf Virus; S = susceptible; MS = moderately susceptible; MT = moderately tolerant; T = tolerant; VT = very tolerant; NA = not available.

Varieties rated MT or T have a relatively good degree of protection against barley yellow dwarf virus.

⁵ H = high; M = medium; L = low.

2009 Oat Variety Trial – Continuously Cropped - No-till

Hettinger

Variety	Days to Head	Plant Height	Test Weight	---- Grain Yield ----			Average Yield	
				2007	2008	2009	2 yr	3 yr
	*	inches	lbs/bu	----- Bushels per acre -----				
Rockford	62	44	34.7	79.6	124.4	90.6	107.5	98.2
AC Pinnacle	67	40	33.1	72.9	115.3	98.5	106.9	95.6
Stallion	62	40	37.4	77.1	111.1	91.3	101.2	93.2
Monida	66	38	32.7	67.6	112.8	97.1	105.0	92.5
Killdeer	62	37	34.4	78.0	101.7	97.0	99.4	92.2
Souris	62	36	32.5	74.7	108.2	82.1	95.2	88.3
HiFi	63	43	34.4	69.0	108.8	85.9	97.4	87.9
Maida	64	44	31.9	68.9	108.6	80.9	94.8	86.1
Beach	62	44	35.6	65.9	108.7	80.5	94.6	85.0
Youngs	63	44	31.8	64.9	106.7	81.5	94.1	84.4
CDC Dancer	64	41	32.8	64.7	110.7	75.0	92.8	83.5
Jerry	61	40	35.6	70.4	101.4	70.2	85.8	80.7
Hystest	60	44	36.8	70.5	96.5	66.9	81.7	78.0
Morton	64	43	31.1	74.3	98.1	61.4	79.8	77.9
Otana	64	44	31.3	47.4	90.7	72.9	81.8	70.3
Buff**	60	38	41.8	52.2	82.0	57.7	69.8	64.0
Stark**	66	44	37.2	47.8	75.8	59.5	67.6	61.0
CDC Minstrel	65	39	33.3		112.0	101.9	107.0	
Furlong	67	39	33.1		115.4	98.5	107.0	
Leggett	66	41	33.3			94.9		
Trial Mean	63	41	34.5	65.6	105.9	85.1	--	--
C.V. %	2.2	4.6	3.8	10.3	5.3	9.8	--	--
LSD .05	3	3	1.8	9.5	7.8	11.8	--	--
LSD .01	3	4	2.4	12.6	10.4	15.6	--	--

*Days to Head = the number of days from planting to emergence of panicle.

** Naked (hulless) type.

Planting Date: May 5

Harvest Date: August 24

Seeding Rate: 750,000 live seeds / acre (approx. 1.7 bu/A).

Previous Crop: 2008 = HRSW, 2007 = fallow, 2006 = HRSW.

Note: The 2009 trial sustained moderate hail damage on June 22 and 24 (late boot).

2009 Oat - Recrop

Dickinson, ND

Variety	Days to Head	Seeds per Pound	Plant Height in	Test Weight lbs/bu	----- Grain Yield-----			Average Yield	
					2007	2008	2009	2	3
					-----bu/ac-----			----bu/ac----	
AC Pinnacle	62	13,135	39	36.7	108.5	55.2	213.3	134.2	125.6
Beach	61	12,973	42	39.5	102.4	51.2	167.8	109.5	107.1
Buff*	57	16,205	38	41.6	71.5	48.9	151.2	100.1	90.5
CDC Dancer	61	12,216	41	38.3	112.2	57.8	172.9	115.4	114.3
CDC Minstrel	61	11,301	39	36.8	--	52.1	188.9	120.5	--
Furlong	63	9,195	38	35.7	--	57.4	182.1	119.7	--
HiFi	60	13,615	40	38.0	93.9	50.7	174.8	112.8	106.5
Hyttest	59	12,636	41	39.6	96.3	57.0	151.0	104.0	101.5
Jerry	59	13,825	39	37.6	110.0	53.5	157.5	105.5	107.0
Killdeer	59	12,544	37	37.9	115.6	56.3	199.5	127.9	123.8
Leggett	61	11,547	38	38.2	--	--	194.2	--	--
Maida	61	11,922	40	37.5	100.6	50.4	164.6	107.5	105.2
Monida	63	14,224	39	35.2	96.5	60.1	179.2	119.6	111.9
Morton	62	13,409	42	37.9	104.6	49.2	162.8	106.0	105.5
Otana	62	14,243	42	39.1	109.7	66.0	167.9	116.9	114.5
Paul*	63	14,381	40	40.8	81.7	33.7	139.5	86.6	85.0
Rockford	61	13,778	41	40.1	127.4	51.5	187.1	119.3	122.0
Souris	60	13,447	36	36.9	112.9	55.9	175.1	115.5	114.6
Stallion	60	14,833	40	40.0	109.5	61.8	170.9	116.4	114.1
Stark*	63	13,981	40	42.7	73.3	39.9	149.1	94.5	87.4
Youngs	62	9,673	42	36.7	116.8	52.1	178.9	115.5	116.0
Trial Mean	61	12,709	40	38.3	104.3	52.8	173.0	--	--
CV %	1.0	5.4	2.9	1.8	10.1	9.3	6.0	--	--
LSD 0.05	1	1,397	2	1.0	14.8	6.9	14.6	--	--

Planting Date: May 7, 2009

Harvest Date: August 31, 2009

* Hulless

Previous Crop: Field Pea

Seeding Rate: 1 million live seeds/ac

2009 Oat Variety Trial - Continuously Cropped - No-till Selfridge

Cooperator: Nick Vollmuth, Selfridge

Variety	Plant Height	Test Weight	Grain Yield			Average Yield	
			2006	2007	2009	2 yr	3 yr
	inches	lbs/bu	Bushels per acre				
Killdeer	43	37.2	38.3	117.6	169.3	143.4	108.4
Souris	42	36.4	36.3	118.4	164.1	141.2	106.3
Jerry	50	37.4	40.0	100.7	124.8	112.8	88.5
Maida	51	35.3	21.0	96.1	145.1	120.6	87.4
Morton	50	36.9	28.1	89.6	143.2	116.4	87.0
Rockford	51	38.3			170.3		
Trial Mean	49	37.1	33.1	99.3	154.9	--	--
C.V. %	3.1	1.2	11.2	4.8	3.2	--	--
LSD .05	2	0.7	5.6	7.2	7.3	--	--
LSD .01	3	0.9	7.7	9.7	9.9	--	--

Planting Date: May 11, 2009

Harvest Date: August 27, 2009

Seeding Rate: 750,000 live seeds / acre (approx. 1.7 bu/A).

Previous Crop: 2005 & 2006 = hrww, 2008 = sunflower.

Note: The 2006 trial sustained severe heat and moisture stress. The 2008 trial was destroyed by hail.

2009 Oat Variety Trial - Continuously Cropped - No-till Mandan

Cooperator: USDA-ARS NGP Research Center, Mandan

Variety	Plant Height	Test Weight	Grain Yield			Average Yield	
			2007	2008	2009	2 yr	3 yr
	inches	lbs/bu	Bushels per acre				
Souris	43	37.8	141.5	137.0	159.0	148.0	145.8
Killdeer	45	37.3	124.5	142.1	166.7	154.4	144.4
Maida	49	36.0	136.8	119.0	153.8	136.4	136.5
Morton	54	37.4	119.9	124.6	154.1	139.4	132.9
Jerry	49	37.9	111.5	127.2	127.5	127.4	122.1
Rockford	53	38.3			172.4		
Trial Mean	49	37.7	121.9	126.2	157.8	--	--
C.V. %	2.9	1.0	6.5	6.0	4.1	--	--
LSD .05	2	0.6	13.9	11.3	9.6	--	--
LSD .01	3	0.8	19.3	15.5	13.2	--	--

Planting Date: May 11, 2009

Harvest Date: September 1, 2009

Seeding Rate: 750,000 live seeds / acre (approx. 1.7 bu/A).

Previous Crop: 2006 = hrww, 2007 & 2008 = hrsw.

SDSU Oat Variety Trial - Perkins County (Bison), 2009.

Variety	Height Inches	Lodging 0-9*	Test Wt Lb/Bu	Yield Bu/A	Protein %
BUFF (hulless)	28	0	44.7	78.0	15.4
STARK (hulless)	37	0	39.4	84.2	14.6
STREAKER (hulless)	35	0	44.6	89.7	15.7
DON	29	0	37.3	79.7	13.7
REEVES	32	0	36.7	79.1	14.7
COLT	31	0	38.8	80.6	13.9
STALLION	34	0	40.0	92.3	14.4
SOURIS	31	0	36.8	85.7	13.5
JERRY	32	0	37.2	74.0	14.1
BEACH	36	0	38.7	90.1	13.3
HYTEST	34	0	38.7	66.8	16.5
HIFI	35	0	37.0	84.7	13.5
MORTON	37	0	37.9	76.8	13.7
ROCKFORD	36	0	37.7	97.3	13.5
Average	33.1	0.0	39.3	82.1	14.3
LSD (P=.05)	2.8	0.0	1.2	7.4	--
CV	4.0	0.0	2.2	6.4	--

* 0 = No Lodging, 9 = 100% lodged.

Planted: May 14, 2009 Herbicide: Widematch (1 pt/A) + MCPA (8 oz/A)
 Harvested: Sept. 1, 2009 Additional Nitrogen: 75 Lb/A
 Previous crop: Wheat, no-till planted.

Oat in the West River Region

Combined Means

Variety	Days to Head	Plant Height inches	Seeds / Pound #	Test Weight lbs/bu	---- Grain Yield ----			Average Yield	
					2007	2008	2009	2 yr	3 yr
					----- Bushels per acre -----				
Killdeer	60	40	12,544	36.7	100.2	100.0	158.1	129.0	119.4
Souris	61	38	13,447	36.1	96.4	100.4	133.2	116.8	110.0
Maida	62	46	11,922	35.2	96.6	92.7	136.1	114.4	108.5
Morton	63	45	13,409	36.2	86.0	90.6	119.7	105.2	98.8
Jerry	60	42	13,825	37.1	88.1	94.0	110.8	102.4	97.6
Rockford	62	45	13,778	37.8			143.5		
# of Locations*	2	5	1	5	6	3	5	8	14

* Locations: 2007 = Hettinger, Dickinson, New Leipzig, Selfridge, Mandan & Bison, SD.
 2008 = Hettinger, Dickinson & Mandan.
 2009 = Hettinger, Dickinson, Selfridge, Mandan & Bison, SD.

2009 North Dakota hard winter wheat variety descriptions and agronomic traits.

Variety	Agent or Origin	Year	Quality ¹	Reaction to Disease ²			Maturity	Straw Strength	Height	Winter ⁴ Hardiness
				Leaf Rust	Stem Rust	Scab ³				
Alice ⁵	SD	2006	Good	S	MR	S	Early	M. strong	Short	Fair
Art	Agripro	2008	Average	R	R	NA	M. early	Strong	M. short	Fair
Boomer	WB ⁶	2009	NA	MR	NA	NA	Med.	Strong	Med.	Good
CDC Accipiter	Can.	2008	Good	MS	R	NA	Med.	Strong	Short	Good
CDC Buteo	Can/WB	2004	Average	MS	NA	S	Med.	Med.	Med.	Good
CDC Falcon	Can/WB	2000	Average	MS	NA	S	Med.	M. strong	Short	Good
CDC Peregrine	Can.	2008	Average	MR	R	NA	Med.	Strong	Med.	Good
CDC Raptor	Can.	2002	NA	MS	NA	NA	Med.	M. strong	M. short	Good
Crimson	SD	1997	Good	S	MS	NA	Med.	M. strong	Med.	Fair-Good
Darrell	SD	2006	Average	MS	R	MS	Med.	Strong	Med.	Good
Elkhorn	ND	1995	Average	MR	R	NA	Med.	Med.	Med.	Good
Erhardt	MT	1996	NA	S	R	NA	Med.	Strong	Med.	Good
Expedition	SD	2002	Average	MS	R	S	Med.	Strong	Med.	Good
Goodstreak	NE	2002	Average	S	MR	S	M. early	Med.	Tall	Fair
Harding	SD	1999	Average	MS	NA	S	Med.	M. strong	Med.	Good
Hawken	Agripro	2007	Good	MR	MR	NA	Early	Strong	V. short	Fair-Poor
Jagalene	Agripro	2002	Average	S	MR	VS	Early	Strong	Short	Fair
Jerry	ND	2001	Good	MR	R	MS	Med.	Strong	Med.	Good
Lyman	SD	2008	NA	R	R	MS	Med.	Med.	Med.	Good
Mace	ARS-NE	2008	NA	MS	R	NA	M. early	Strong	Short	Fair
McClintock	Can.	2003	Average	S	NA	S	Med.	Strong	Med.	Fair
Millennium	NE/SD	1999	Average	MR	MR	S	Med.	Strong	M. short	Fair
Overland	NE	2006	Avg-Fair	MR/R	MR	MS	Med.	Strong	Short	Fair
Paul	MT	2003	Average	S	NA	NA	Med.	Med.	Med.	Fair
Radiant ⁷	Can.	2005	Average	S	S	S	Late	V. strong	Tall	Good
Ransom	ND	1998	Good	MR	NA	S	M. early	Med.	Med.	Good
Roughrider	ND	1975	Good	S	R	MS	Med.	M. strong	Med.	Good
Striker	WB	2009	NA	MR	NA	NA	Med.	Strong	Med.	Good
Wahoo	NE/WY	2001	Poor	S	R	S	Med.	M. strong	Med.	Fair
Wendy ⁵	SD	2004	NA	MS	MR	S	M. early	M. strong	Short	Fair-Good
Wesley	NE/SD/WY	2000	Average	MS	R	VS	M. early	M. strong	Short	Fair
Yellowstone	MT	2005	NA	NA	S	VS	Med.	Med.	Med.	Good

¹NA = data not available or data insufficient to give rating.

²R = resistant; MR = moderately resistant; MS = moderately susceptible; S = susceptible; VS = very susceptible; NA = not available.

³Primarily based on data collected in 2005 from several locations.

⁴Varieties with less than good winter hardiness should be seeded only in tall stubble.

⁵White wheat.

⁶WB = WestBred

⁷Curl mite resistant.

2009 Winter Wheat Variety Trial - Continuously Cropped - No-till

Hettinger

Variety	Winter Surv.	Heading Date	Plant Height	Test Weight	Grain Protein	---- Grain Yield ----			Average Yield	
	%	June	inches	lbs/bu	%	2007	2008	2009	2 yr	3 yr
						----- Bushels per acre -----				
CDC Falcon	92	24	29	57.5	11.1	65.9	53.2	50.5	51.8	56.5
Hawken	78	19	29	58.3	12.2	63.0	48.4	52.4	50.4	54.6
Millennium	91	21	34	59.3	11.4	63.0	49.4	45.2	47.3	52.5
Darrell	74	24	32	57.0	11.9	57.0	50.3	48.9	49.6	52.1
Radiant	92	26	36	57.9	11.2	59.5	48.1	46.5	47.3	51.4
Yellowstone	95	26	32	56.5	11.7	59.3	51.3	42.9	47.1	51.2
Jerry	92	25	37	58.2	12.5	59.3	49.0	44.3	46.6	50.9
Expedition	82	20	31	58.7	12.0	60.5	47.2	44.6	45.9	50.8
Wesley	86	19	28	57.8	12.4	57.8	50.5	43.6	47.0	50.6
Jagalene	90	22	30	58.7	11.9	60.5	46.1	43.3	44.7	50.0
CDC Buteo	92	24	37	59.9	11.5	60.1	43.8	43.4	43.6	49.1
Alice*	89	20	28	58.0	11.7	54.3	49.7	42.0	45.8	48.7
CDC Accipiter	80	28	33	57.9	11.8		49.8	51.0	50.4	
Overland	66	23	32	57.0	12.0		50.0	45.2	47.6	
Lyman	82	20	30	59.4	12.8		42.8	49.5	46.2	
Boomer	94	25	33	57.9	12.0			53.4		
Striker	86	24	31	57.8	11.5			47.0		
CDC Peregrine	90	26	37	58.5	11.5			44.5		
Mace	86	21	29	58.5	11.0			42.8		
Art	81	20	29	58.5	12.3			36.2		
Trial Mean	85	24	32	58.2	11.9	58.1	48.3	46.7	--	--
C.V. %	18.9	5.3	6.3	2.0	--	6.7	6.8	7.7	--	--
LSD .05	23	2	3	1.6	--	5.5	4.6	5.1	--	--
LSD .01	30	4	4	2.2	--	7.2	6.1	6.7	--	--

* Hard white winter wheat.

Planting Date: September 29, 2008 Harvest Date: August 18, 2009
 Seeding Rate: 1 million live seeds / acre (approx. 1.4 bu/A).
 Previous Crop: 2006 = field pea, 2007 = durum, 2008 = hrsw.
 Note: The 2009 trial sustained moderate hail damage.

2009 Winter Wheat - Recrop

Dickinson, ND

Variety	Heading Date	Seeds per Pound	Plant Height	Test Weight	Protein	----- Grain Yield-----			----- Average Yield-----	
						2007	2008	2009	2	3
						-----bu/ac-----			-----bu/ac-----	
	June		in	lbs/bu	%					
Alice	22	14,289	24	59.8	10.2	79.0	15.4	61.5	38.5	52.0
Art	22	13,209	24	61.4	11.8	--	--	55.8	--	--
Striker	22	15,616	24	60.0	11.3	--	--	61.1	--	--
Boomer	26	13,421	26	60.1	10.5	--	--	70.9	--	--
CDC Accipiter	27	14,482	27	61.4	8.9	--	18.6	68.5	43.6	--
CDC Buteo	25	13,346	29	62.5	9.9	82.7	17.6	63.2	40.4	54.5
CDC Falcon	25	13,922	24	60.9	10.2	79.8	17.9	70.4	44.2	56.0
CDC Peregrine	25	12,467	34	62.2	10.0	--	17.5	68.2	42.9	--
Darrell	24	11,134	29	61.5	9.8	79.9	19.4	71.8	45.6	57.0
Expedition	22	12,558	27	61.6	10.3	71.0	15.0	67.1	41.1	51.0
Hawken	21	13,292	23	61.5	9.5	--	13.9	61.7	37.8	--
Jagalene	24	12,517	24	60.6	10.5	64.5	16.4	56.0	36.2	45.7
Jerry	26	11,389	30	60.4	9.1	82.9	18.3	58.9	38.6	53.4
Lyman	21	11,782	26	60.9	9.6	--	18.2	61.4	39.8	--
Mace	24	14,859	26	59.8	9.1	--	--	72.2	--	--
Millennium	24	12,462	28	61.8	10.1	86.7	17.6	60.4	39.0	54.9
Overland	24	12,877	27	61.0	9.4	--	21.4	72.1	46.7	--
Radiant	26	12,742	29	60.8	8.6	70.7	19.5	57.3	38.4	49.1
Wesley	20	12,186	23	59.0	9.8	78.9	14.1	57.3	35.7	50.1
Yellowstone	26	12,725	29	61.4	10.0	75.4	18.8	73.7	46.3	56.0
Trial Mean	24	13,092	27	60.9	9.9	77.7	16.9	65.0	--	--
CV %	4.3	5.4	8.6	1.6	8.2	10.4	12.8	23.9	--	--
LSD 0.05	1	1,474	3	1.6	NS	11.4	3.1	NS	--	--

Planting Date: September 26, 2008

Harvest Date: August 24, 2009

Previous Crop: Field Pea

Seeding Rate: 1 million live seeds/ac

Note: Trial received hail damage

2009 Winter Wheat Variety Trial - Continuously Cropped - No-till Mandan

Cooperator: USDA-ARS, Northern Great Plains Research Lab., Mandan

This trial was partially funded by Ducks Unlimited, Bismarck

Variety	Plant Height inches	Lodging 0 – 9*	Test Weight lbs/bu	Grain Protein %	Grain Yield			Average Yield	
					2007	2008	2009	2 yr	3 yr
					----- Bushels per acre -----				
Millennium	34	1	59.3	11.4	84.2	55.5	77.7	66.6	72.5
Darrell	32	2	58.5	11.2	73.5	60.1	77.1	68.6	70.2
Jagalene	32	1	59.2	10.2	60.1	56.7	86.7	71.7	67.8
CDC Buteo	34	2	60.5	11.3	70.7	49.2	80.1	64.6	66.7
Radiant	34	1	58.3	9.4	55.7	57.3	85.7	71.5	66.2
Hawken	34	1	59.5	10.0	74.3	39.1	83.2	61.2	65.5
Jerry	34	2	57.5	10.2	60.5	57.7	76.3	67.0	64.8
Wesley	32	0	58.0	11.5	73.1	38.0	81.7	59.8	64.3
CDC Falcon	32	1	58.1	11.0	54.1	52.6	78.7	65.6	61.8
Expedition	32	2	59.4	10.1	55.7	47.9	80.9	64.4	61.5
Alice**	31	2	58.0	10.3	61.6	42.1	78.3	60.2	60.7
Yellowstone	38	1	56.6	10.6	50.6	53.6	75.7	64.6	60.0
Overland	34	2	59.3	10.0		58.9	84.4	71.6	
CDC Peregrine	35	4	59.5	9.7		52.3	86.0	69.2	
CDC Accipiter	34	1	58.8	10.6		55.0	80.8	67.9	
Lyman	32	4	59.6	11.5		43.5	87.5	65.5	
Art	30	3	58.9	10.5			80.4		
Mace	31	2	56.3	10.7			76.5		
Striker	31	1	58.3	10.3			74.0		
Boomer	34	1	57.2	10.2			81.8		
Trial Mean	33	1	58.0	10.5	62.7	49.2	81.3	--	--
C.V. %	10	63	1.1	--	14.3	14.0	7.1	--	--
LSD .05	NS	1	0.9	--	14.7	9.7	8.1	--	--
LSD .01	NS	2	1.2	--	19.6	12.9	10.8	--	--

* Lodging: 0 = none. 9 = lying flat on ground.

** Hard white winter wheat.

Planting Date: September 16, 2008

Harvest Date: August 14, 2009

Seeding Rate: 1 million live seeds / acre (approx. 1.4 bu/A).

Previous Crop: 2006 = hrww, 2007 = soybean, 2008 = hrsw.

Note: All varieties had 90% + winter survival.

SDSU Hard Winter Wheat Variety Trial - Perkins County (Bison), 2009.

Variety	Height Inches	Lodging 0-9*	Test Wt Lb/Bu	Yield Bu/A	Protein %
Hard Red					
ARAPAHOE	28	0	60.5	36.4	12.8
ART	24	0	60.9	31.4	12.6
DARRELL	27	0	60.4	40.1	12.6
EXPEDITION	25	0	61.1	35.2	11.8
FULLER	23	0	60.0	26.4	13.1
HARDING	29	0	61.2	44.0	12.7
HAWKEN	23	0	59.5	30.7	13.8
HATCHER	25	0	61.6	33.1	12.3
JAGALENE	26	0	59.7	29.1	13.3
JERRY	26	0	60.5	35.9	11.9
LYMAN	27	0	61.8	41.9	13.6
MILLENNIUM	28	0	60.9	34.1	11.9
OVERLAND	26	0	61.3	36.7	11.6
RADIANT	30	0	58.0	51.1	11.5
SMOKY HILL	25	0	62.4	34.0	12.2
STRIKER	23	0	61.3	32.6	11.9
WAHOO	27	0	59.7	39.9	11.6
WESLEY	22	0	59.5	32.5	13.3
INFINITY CL	27	0	62.2	36.2	12.4
SETTLER CL	25	0	61.0	31.0	10.9
AP503 CL2	22	0	62.4	30.0	11.9
SD05118	25	0	60.6	28.2	11.4
SD03164-2	26	0	60.4	27.4	12.5
SD06069	25	0	61.9	38.0	11.9
SD06158	26	0	61.0	38.0	11.8
SD06163	28	0	60.1	30.3	12.5
Hard White					
ALICE	24	0	59.9	26.2	13.8
NUDAKOTA	23	0	59.2	34.0	12.0
WENDY	22	0	60.2	36.7	13.2
SD05W018	27	0	59.5	30.1	11.6
Average	25.3	0.0	60.6	34.4	12.4
LSD (P=.05)	2.5	0.0	2.4	9.4	.
CV	4.8	0.0	2.7	19.4	.

* 0 = no lodging, 9 = 100% lodged.

Planted: September 23, 2008

Herbicide: Fall - Olympus (.9 oz/A)
Spring - Starane NXT (20 oz/A)

Harvested: August 12, 2009

Previous crop: Wheat, no-till planted.

Additional Nitrogen: 75 Lb/A

2009 Winter Triticale Variety Trial**Hettinger**

Variety	Winter Survival	Heading Date	Plant Height	Test Weight	Grain Yield		
	%	July	inches	lbs/bu	2008	2009	2 yr
					-----	lbs/A	-----
Boreal	62	26	51	40.7	43.4	36.4	39.9
Pika	98	13	50	51.0		41.2	
HR003	95	24	43	47.7	48.8	64.0	56.4
KPB003	85	24	36	48.9		67.6	
NE426GT	91	18	38	50.0	48.0	84.2	66.1
KWT07178	89	26	42	46.3		75.6	
KWT07186	86	25	42	49.1		75.1	
Trial Mean	87	22	43	47.7	47.2	63.4	--
C.V. %	4.5	2.3	4.0	1.0	7.2	5.8	--
LSD .05	6	1	2	0.7	NS	5.5	--
LSD .01	8	1	3	0.9	NS	7.5	--

NS = no statistical difference between varieties.

Planting Date: September 29, 2008

Harvest Date: August 29, 2009

Previous Crop: 2007 = durum, 2008 = hrsw

Note: The 2008 trial sustained severe late season heat and moisture stress.

The 2009 trial sustained moderate hail damage.

2009 Winter Spelt Variety Trial**Hettinger**

Variety	Winter Survival	Heading Date	Plant Height	Test Weight	Grain Yield		
	%	July	inches	lbs/bu	2008	2009	2 yr
					-----	lbs/A	-----
Frank	65	9	45	35.6	2620	1296	1958
PI348159	60	11	44	28.6	2782	1734	2258
Trial Mean	62	10	44	32.1	2582	1515	--
C.V. %	11.3	3.6	5.4	2.5	5.5	19.0	--
LSD .05	NS	1	NS	1.8	NS	NS	--
LSD .01	NS	2	NS	3.3	NS	NS	--

NS = no statistical difference between varieties.

Planting Date: September 29, 2008

Harvest Date: August 25, 2009

Previous Crop: 2007 = durum, 2008 = hrsw

Note: The 2008 trial sustained severe late season heat and moisture stress.

The 2009 trial sustained moderate hail damage and severe leaf and stem rust.

2009 Spring Triticale Variety Trial – Continuously Cropped No-till, Hettinger

Variety	Days to Head	Plant Height	Test Weight	---- Grain Yield ----			Average Yield		
	*	inches	lbs/bu	2007	2008	2009	2 yr	3 yr	
				----- bushels per acre -----					
RSI 310	64	41	48.6	62.4	58.5	51.9	55.2	57.6	
Trical 2700	67	49	46.3	51.9	39.6	53.2	46.4	48.2	
Companion	66	50	47.1	48.8	46.6	37.5	42.0	44.3	
Laser	66	49	48.0	51.8	44.9	33.2	39.0	43.3	
Wapiti	65	51	46.0	39.7	45.1	40.1	42.6	41.6	
Marvel	66	48	45.9	41.2	46.5	29.2	37.8	39.0	
Trial Mean	66	48	47.0	49.3	46.9	40.9	--	--	
C.V. %	1.7	6.2	3.1	5.9	8.7	18.1	--	--	
LSD .05	NS	5	NS	4.4	6.2	11.1	--	--	
LSD .01	NS	6	NS	6.0	8.5	15.4	--	--	

* Days to Head = the number of days from planting to head emergence from the boot.
NS = no statistical difference between varieties.

Planting Date: May 5, 2009 Harvest Date: August 30, 2009
Seeding Rate: 1 million live seeds / acre.
Previous Crop: 2006 = field pea, 2007 = durum, 2008 = field pea.
Note: The 2009 trial sustained moderate hail damage on June 22 and 24.

2009 Spring Emmer Variety Trial - Continuously Cropped - No-till Hettinger

Variety	Days to head	Plant Height	Test Weight	----- Grain Yield -----		
	*	inches	lbs/bu	2008	2009	Avg.
				- pounds per acre -		
Lucille	70	45	32.1	2465	2972	2718
Red Vernal	70	44	31.6	2216	2917	2566
ND Common	70	44	31.7	2362	2581	2472
Common H	69	43	32.2	2552	2231	2392
Bowman	69	43	31.3	2398	2229	2314
Common M	70	41	31.6	1837	2402	2120
Common R	70	43	32.2	1678	2345	2012
Trial Mean	70	43	31.8	2215	2534	--
C.V. %	1.6	3.6	2.6	12.2	9.4	--
LSD .05	NS	NS	NS	402	360	--
LSD .01	NS	NS	NS	551	500	--

* Days to head = the number of days from planting to head emergence from the boot.
NS = no statistical difference between varieties.

Planting Date: May 5, 2009. Harvest Date: August 25, 2009.
Previous Crop: 2007 = hrsw, 2008 = field pea.
Note: The 2008 trial sustained severe late season heat and moisture stress.
The 2009 trial sustained moderate hail damage on June 22 and 24.

2009 Safflower Variety Trial – Continuously Cropped - No-till

Hettinger

Variety	Days to Bloom	Plant Height	Test Weight	Oil Content	Seed Yield			Average Yield	
	*	inches	lbs/bu	%	2007	2008	2009	2 yr	3 yr
----- pounds per acre -----									
Linoleic Types									
Cardinal	88	26	43.4	33.1	2270	1377	1958	1668	1868
Finch	87	29	41.9	34.1	1958	1357	1566	1462	1627
S-541	88	23	39.0	38.8	2279	1071	1196	1134	1515
NutraSaff	88	27	33.2	44.5	1400	612	986	799	999
Oleic Types									
MonDak	89	24	41.9	34.5	1801	1386	1947	1666	1711
Montola 2003	90	26	41.0	36.5	1994	1141	1813	1477	1649
Montola 2000	88	28	40.1	35.4	1500	1474	1596	1535	1523
Hybrid 1601	86	27	38.9	34.8		1637	2073	1855	
Hybrid 9049	86	25	41.9	29.0		1665	1633	1649	
Trial Mean	88	26	39.8	35.7	1815	1319	1568	--	--
C.V. %	1.9	8.4	1.5	--	9.7	7.7	10.0	--	--
LSD .05	2	3	0.8	--	253	147	226	--	--
LSD .01	NS	NS	1.1	--	342	198	304	--	--

* Days to Bloom = the number of days from planting to 10% bloom.

Planting Date: May 6, 2009 Harvest Date: September 24, 2009

Seeding Rate: 300,000 live seeds / acre (approx. 22 lbs/A).

Previous Crop: 2006, 2007 & 2008 = hrsw.

Notes: The 2009 trial sustained moderate hail damage.

2009 Crambe Variety Trial - Continuously Cropped - No-till

Hettinger

Variety	Plant Height	Test Weight	Oil Content	Yield			Avg. Yield	
	inches	lbs/bu	%	2007	2008	2009	2 yr	3 yr
----- lbs / ac -----								
BelAnn	38	26.8	26.9	1837	1513	1802	1658	1717
Meyer	35	25.8	--	1111	1367	1550	1458	1343
Galactica	36	24.9	26.8			1826		
Nebula	34	25.8	22.8			1513		
Trial Mean	36	25.9	22.8	1459	1600	1733	--	--
C.V. %	8.4	4.1	--	13.7	8.4	14.6	--	--
LSD .05	NS	NS	--	286	197	NS	--	--
LSD .01	NS	NS	--	382	NS	NS	--	--

NS = no statistical difference between varieties.

Planting Date: May 5, 2009 Harvest Date: August 25, 2009

Seeding rate: 25 lbs/A

Previous Crop: 2006 = barley, 2007 = hrsw, 2008 = field pea.

Note: The 2009 trial sustained moderate hail damage on June 22 and 24.

2009 Flax variety descriptions.

Variety ¹	Origin ²	Year Released	Relative Maturity	Seed Color	Plant Height	Wilt ³
AC Carnduff	Can.	1998	Med.late	Brown	Med.tall	MR
AC Emerson	Can.	1994	Med.	Brown	Med.	R
AC Lightning	Can.	2002	Late	Brown	Med.tall	R
AC Linora	Can.	1993	Late	Brown	Tall	R
AC Watson	Can.	1996	Early	Brown	Short	MR
Bison	ND	1926	Med.	Brown	Med.	MR
Carter	ND	2004	Med.	Yellow	Med.	R
Cathay	ND	1998	Med.	Brown	Med.	MR
CDC Arras	Can.	1999	Med.	Brown	Med.	MR
CDC Bethune	Can.	1999	Med.late	Brown	Med.tall	MR
CDC Mons	Can.	2003	Med.late	Brown	Med.	MR
CDC Normandy	Can.	1995	Med.	Brown	Short	MR
CDC Sorrel	Can.	2007	Med.late	Brown	Med.tall	MR
CDC Valour	Can.	1996	Early	Brown	Short	MR
Flanders	Can.	1989	Late	Brown	Med.	MS
Hanley	Can.	2002	Med.early	Brown	Med.	R
Linott	Can.	1966	Med.early	Brown	Med.	MS-MR
McDuff	Can.	1993	Late	Brown	Med.tall	MR
McGregor	Can.	1980	Late	Brown	Med.tall	MR
Nече	ND	1988	Med.	Brown	Med.	R
Nekoma	ND	2002	Late	Brown	Med.	MR
NorLin	Can.	1982	Early	Brown	Med.	MS
Omega	ND	1989	Med.	Yellow	Med.	MS
Pembina	ND	1998	Med.	Brown	Med.	MR
Prairie Blue	Can.	2003	Med.late	Brown	Med.tall	MR
Prairie Grande	Can.	2008	Med.early	Brown	Med.	MR
Prairie Thunder	Can.	2006	Med.	Brown	Short	MR
Prompt	SD	1988	Early	Brown	Med.	MR
Rahab 94	SD	1994	Med.	Brown	Med.	MR
Selby	SD	2000	Late	Brown	Tall	MR
Taurus	Can.	2003	Med.late	Brown	Med.	MR
Webster	SD	1998	Late	Brown	Tall	MR
York	ND	2002	Late	Brown	Med.	R

¹ All varieties have resistance to prevalent races of rust; all have good oil yield and oil quality.

² Can. = Canada; ND = North Dakota State University; SD = South Dakota State University.

³ R = resistant; MR = moderately resistant; MS = moderately susceptible; NA = not available.

2009 Flax Variety Trial - Continuously Cropped - No-till

Hettinger

Variety	Days to Bloom	Plant Height	Test Weight	----- Grain Yield -----			Average Yield	
				2007	2008	2009	2 yr	3 yr
	*	inches	lbs/bu	----- Bushels per acre -----				
CDC Arras	66	23	54.0	20.4	12.4	42.0	27.2	24.9
York	65	22	54.8	17.3	13.4	40.8	27.1	23.8
Nekoma	66	23	50.5	18.1	11.2	39.1	25.2	22.8
CDC Bethume	65	25	51.7	16.6	10.1	41.1	25.6	22.6
Prairie Thunder	64	23	52.9	17.5	8.2	42.0	25.1	22.6
Prairie Blue	66	24	54.0	18.6	9.5	39.4	24.4	22.5
Carter**	66	26	52.0	14.6	11.3	40.6	26.0	22.2
Hanley	64	22	54.2	15.8	9.6	40.2	24.9	21.9
Rahab 94	65	24	51.7	17.0	10.3	38.3	24.3	21.9
Pembina	66	26	54.2	15.8	11.6	37.9	24.8	21.8
Webster	66	26	54.3	18.7	11.1	34.5	22.8	21.4
Neché	65	24	50.2	19.5	6.9	33.8	20.4	20.1
Omega**	68	24	47.9	9.7	4.7	39.9	22.3	18.1
Lightning	66	23	52.5		12.3	39.3	25.8	
Prairie Grande	64	23	53.6		11.6	40.1	25.8	
CDC Sorrel	66	24	50.9		10.4	39.8	25.1	
Trial Mean	66	24	52.7	16.5	10.5	39.2	--	--
C.V. %	0.9	6.7	1.3	10.9	11.8	6.9	--	--
LSD .05	1	2	1.0	2.6	1.8	3.8	--	--
LSD .01	1	3	1.3	3.4	2.4	5.1	--	--

* Days to Bloom = the number of days from planting until 10% of the plants are flowering.
 **Yellow seed type.

Planting Date: May 7

Harvest Date: September 16

Seeding Rate: 40 lbs / acre.

Previous Crop: hrsw.

Note: The 2008 trial had a poor stand and sustained late season drought stress.

2009 Oil Type Sunflower Variety Trial – Continuously Cropped, No-till

Hettinger, N. Dakota

Cooperator: Alfred Rose, Hettinger

Brand	Hybrid	Oil Type & Traits	Days to Bloom	Plant Height	Test Weight	Oil Content	Seed Yield			Avg. Yield	
							2007	2008	2009	2 yr	3 yr
		*	**	inches	lbs/bu	%	pounds / acre				
Triumph Seed	s7322	NS, SS, DMR	83	36	27.7	40.9		1403	1277	1340	
	s671	NS, SS	84	39	28.7	41.7		1683	1213	1448	
	s672	NS, SS	82	34	28.1	44.2		1309	1268	1288	
	s678	NS, SS	85	42	28.5	42.4	1839	1448	1914	1681	1734
	s878 HO	HO, SS	84	45	28.1	38.9		1220	1844	1532	
Proseed	E-8	NS, DMR	83	55	28.2	39.5			1887		
	6007	NS, CL	83	56	30.5	38.3		1038	2283	1660	
	7052	NS, CL	82	57	29.1	39.6			2072		
	7207	NS, CL	83	56	27.2	38.4		903	1766	1334	
	7001CL	NS, CL	83	53	26.9	36.9			1860		
	9001CL	NS, CL	81	49	26.8	36.6			1831		
Mycogen	8D310	NS	79	47	25.8	38.1			2290		
	8D481	NS	83	48	28.1	38.3		1655	1817	1736	
	8H449	HO, DMR	82	51	29.6	38.9	1904	1636	2798	2217	2113
	8H358	NS, CL, DMR	82	50	27.8	40.4	1447	1494	2428	1961	1790
	8H288	HO, CL, DMR	78	48	28.5	37.3			2352		
Pioneer Hi-Bred	63N82	NS, SU	81	42	28.4	38.4		1408	2545	1976	
	63M91	NS	81	46	29.4	41.8		1210	2174	1692	
Seeds 2000	Firebird	NS, SU	84	48	26.4	37.9	1647	1580	2622	2101	1950
	Sierra	HO	85	44	25.1	35.1	1929	1577	2224	1900	1910
	Blazer CL	NS, CL	83	48	28.0	36.9	2021	1207	2112	1660	1780
	Barracuda	NS, CL	84	47	27.1	37.0	1485	1203	2718	1960	1802
Integra Seed	516	NS, DMR	81	48	28.4	38.4			2078		
	735	NS, CL, DMR	82	42	26.8	37.1	1014	897	1536	1216	1149
	51139	NS, CL, DMR	82	53	28.2	37.2			1989		
	737	NS, CL, DMR	84	58	25.0	36.2	1392	1186	1737	1462	1438
Syngenta	DKF29-30	NS, DMR	78	48	27.0	40.4	997	726	1132	929	952
	IS 7120	HO, DMR	76	43	27.6	36.7	1171	825	1635	1230	1210
	DKF34-33	NS, DMR	80	49	30.2	42.2	1381	980	2814	1897	1725
	DKF37-31	NS	81	45	28.6	40.3	1141	1010	2490	1750	1547
	DKF37-32	NS	81	45	27.0	39.2			2497		
	DKF38-75	NS	82	46	28.0	39.2			2342		
	DKF38-45	HO	82	44	29.0	40.5	1637	1393	2320	1856	1783
	MH 9001	NS, CL	84	54	26.7	35.9			2131		
	MH 9002	NS, CL	82	54	29.0	37.4			1784		
	DKF39-80	NS, CL	83	50	26.4	37.3		1127	1921	1524	
	DKF34-80	NS, CL, DMR	80	47	27.1	39.7	1262	1070	2111	1590	1481

continued

Brand	Hybrid	Oil Type & Traits	Days to Bloom	Plant Height	Test Weight	Oil Content	Seed Yield			Avg. Yield	
							2007	2008	2009	2 yr	3 yr
E. mat. check	Hysun 311	*	**	inches	lbs/bu	%	pounds / acre				
M. mat. check	Mycog. 270						627	1475			
L. mat. check	P6451						975	2010			
Oil check	USDA 894						968	2495			
Trial Mean			82	48	27.8	38.8	1333	1106	2040	--	--
CV %			2.0	7.9	3.2	3.6	13.3	8.5	14.6	--	--
LSD .05			2	5	1.2	2.0	248	131	405	--	--
LSD .01			3	7	1.6	2.6	328	173	536	--	--

* Oil Type: NS = NuSun, HO = high oleic

* Traits: CL = Clearfield, DMR = downy mildew resistant, SU = Express herbicide tolerant, SS = short stature.

** Days to Bloom = the number of days from planting to 10% Bloom.

Planting Date: May 27, 2009

Harvest Date: November 9, 2009

Seeding Rate: 19,000 seeds / acre.

Row Spacing: 28" Previous Crop: HRSW Soil Type: Sandy Loam

Notes: Oil content and seed yields are based on 10% moisture. The 2008 trial sustained late season moisture stress. The 2009 trial sustained moderate hail damage on June 24.

2009 Camelina – Recrop	Dickinson, ND
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Variety	Plant Height	Test Weight	Oil Content	Grain Yield
	in	lbs/bu	%	lbsa
Blaine Creek	23.7	51.8		642.9
Calina	26.0	52.8		1102.3
Celine	28.8	52.3		1044.2
Galina	26.0	52.6		1422.9
Ligena	27.3	50.9		1424.8
Suneson	26.1	53.0		1162.0
Trial Mean	26.3	52.2		1133.2
CV %	10.8	1.7		25.8
LSD 0.05	NS	1.4		NS

Planting Date: 4/22/2009

Harvest Date: 8/18/2009

Previous Crop: Field Pea

Seeding Rate: 6 lbs/acre

Note: Trial received hail damage

Variety	Brand	Days to Plant		1000	Test	Seed Yield			Avg. Yield		
		Bloom	Height			Lodg.	Seed wt.	Weight	2007	2008	2009
		*	inches	0-9**	grams	lbs/bu	bushels per acre				
Yellow Cotyledon Types											
CDC Mozart	Crop Dev. Ctr.	58	21	3	164	60.8	47.4	46.6	40.9	43.8	45.0
DS Admiral	Pulse USA	58	18	2	174	59.4	50.5	41.6	33.8	37.7	42.0
Agassiz	Meridian Seeds	58	20	3	188	60.1		45.7	43.4	44.6	
Thunderbird	Meridian Seeds	61	20	2	152	61.8		41.6	27.7	34.6	
CDC Meadow	ASST	57	21	4	176	59.6			44.2		
CDC Centennial	ASST	59	18	7	204	59.9			42.7		
Summit	ASST	58	19	4	182	59.4			41.9		
CDC Golden	Alt. Seed Str.	58	19	4	186	60.8			40.8		
SW Midas	Legume Logic	59	18	8	172	61.2			39.6		
PUSA 09001	Pulse USA	56	21	2	174	60.7			38.3		
Commander	ASST	59	20	4	188	60.8			37.4		
PUSA 09002	Pulse USA	58	19	4	178	59.7			33.6		
PUSA 09006	Pulse USA	56	20	2	178	60.7			32.9		
Korando	Pulse USA	55	21	2	218	59.7			31.2		
SW Marquee	Legume Logic	58	18	2	146	59.8			30.9		
Noble	Pulse USA	60	18	4	176	61.2			28.5		
PUSA 09005	Pulse USA	56	20	2	172	60.2			27.2		
Green Cotyledon Types											
Majoret	Pulse USA	59	20	6	154	61.2	48.6	41.3	34.9	38.1	41.6
Cruiser	Pulse USA	58	21	5	182	59.0	49.4	36.4	36.1	36.2	40.6
Cooper	Meridian Seeds	62	20	2	194	60.4	49.2	39.7	28.7	34.2	39.2
CDC Striker	Alt. Seed. Str.	56	20	3	182	60.8	48.3	38.1	25.3	31.7	37.2
Arcadia	Legume Logic	58	19	9	174	59.6			42.1		
K2	Legume Logic	55	18	2	168	59.1			37.9		
APCM 03018	Pulse USA	56	22	2	180	60.3			29.3		
CDC Sage	ASST	59	19	4	164	60.5			28.8		
Forage Types											
CDC Tucker	ASST	61	21	4	140	61.8			30.0		
Trial Mean		58	20	4	176	60.3	46.4	40.1	34.9	--	--
C.V. %		1.3	10.7	32	--	1.6	9.3	6.1	7.7	--	--
LSD .05		1	NS	1	--	1.4	6.1	3.5	3.8	--	--
LSD .01		1	NS	2	--	1.8	8.0	4.6	5.0	--	--

* Days to Bloom = the number of days from planting to 10% bloom.

** Lodging: 0 = none, 9 = lying flat on ground.

NS = No statistical difference between varieties.

Planting Date: May 5, 2009

Harvest Date: August 24, 2009

Seeding Rate: 330,000 live seeds / acre.

Previous Crop: 2008 = durum, 2007 & 2006 = HRSW.

Note: The 2009 trial sustained moderate hail damage on June 22 and 24.

Variety	Days	Bloom Duration	Seeds per Pound	Plant Height	Test Weight	Lodging Score	Protein %	Grain Yield ---bu/ac---
	to Bloom							
CDC Golden	63	16	1,776	23.2	61.1	6.0	23.2	41.0
CDC Mozart	62	16	1,680	21.8	61.1	6.8	22.2	41.8
CDC Striker	62	14	1,690	23.4	62.4	6.0	23.2	34.4
Cruiser	62	16	2,099	23.0	61.2	7.0	21.9	30.0
DS Admiral	62	16	1,830	24.1	62.0	6.3	21.8	34.6
Majoret	64	14	1,868	21.1	60.3	6.3	21.8	38.1
Trial Mean	62	15.3	1,824	22.8	61.3	6.4	22.3	36.7
CV %	0.5	3.7	5.0	7.6	1.0	7.9	0.5	7.1
LSD 0.05	0.4	0.9	136	NS	0.9	NS	0.3	3.9

Planting Date: April 22, 2009 Harvest Date: August 11, 2009

Lodging: 0=No lodging, 9=Completely flat Previous Crop: Field Pea

Seeding Rate: 325,000 live seeds/ac

Grain protein percentages reported on a 0% moisture basis

Note: Trial received hail damage

Field Pea Variety Trial - Continuously Cropped - No-till Mandan

Cooperators: USDA-ARS, Northern Great Plains Research Lab., Mandan,
Pulse USA, Bismarck, & Legume Logic, Crosby.

Variety	Brand	1000 Lodging	Test Seed wt.	Seed Weight	Yield
		0-9*	grams	lbs/bu	bu/A
Yellow Cotyledon Types					
DS Admiral	Pulse USA	7	224	61.2	51.2
SW Midas	Legume Logic	8	229	61.4	50.2
Green Cotyledon Types					
Arcadia	Legume Logic	9	276	60.7	70.4
CDC Striker	Alt. Seed. Str.	6	269	63.0	57.8
Cruiser	Pulse USA	7	197	61.5	53.6
Aragorn	Legume Logic	8	211	60.1	48.6
K2	Legume Logic	3	229	62.4	45.0
Forage Types					
Journey	Pulse USA	8	210	61.9	43.5
Trial Mean		7	240	61.6	49.4
C.V. %		18	16	1.2	5.9
LSD .05		2	63	1.2	4.8
LSD .01		3	84	1.5	6.4

* Lodging: 0 = none, 9 = lying flat on ground.

Planting Date: May 11, 2009 Harvest Date: September 1, 2009

Seeding Rate: 330,000 live seeds / acre.

Previous Crop: HRSW

2009 Organic field pea variety trial, Dickinson, ND, 2009.¹

Variety	Cotelydon Type	Plant Population 1000/acre	First Flower July	Height -in-	Yield -Bu/acre-	Test Weight Lb/bu	Seeds No./lb
CDC Golden	YELLOW	617	7	25	41	64.7	2067
CDC Mozart	YELLOW	585	6	20	43	64.5	1899
CDC Striker	GREEN	694	7	25	40	65.4	1832
Cruiser	GREEN	602	7	24	37	64.0	2272
DS Admiral	YELLOW	479	7	27	40	65.2	1866
Majoret	GREEN	536	7	21	35	63.8	2132
Mean		586	7	24	39	64.6	2,011
C.V. (%)		10	7	4	7	1	4
LSD (0.05)		84	NS	1.6	4	1	126

¹Previous crop was spring rye; field pea plots seeded on 20 May

2009 Chickpea Variety Trial – Continuously Cropped – No-till

Hettinger

Variety	Days to Bloom*	Plant Height inches	----- ascochyta ----- foliar pod seed	0 - 9**	Test Weight lbs/bu	----- Seed Yield ----- 2007 2008 2009 2 yr***	----- pounds per acre -----
Large Kaboli Types							
Sawyer	56	22	3	8	5	51.1	2115 1774 798 1944
Sierra	60	19	3	8	6	--	1726 1933 287 1830
Dylan	56	16	6	9	8	--	1576 1933 199 1754
Troy	58	16	3	9	8	--	1874 1468 172 1671
Small Kaboli Type							
CDC Frontier	59	17	0	4	3	49.1	2599 2112 1750 2356
B-90	59	22	0	6	1	52.1	2314 2024
CDC Luna	54	14	1	7	4	49.8	1281
Desi Type							
CDC Anna	56	18	1	5	1	51.1	2569 2311 1895 2440
Trial Mean	57	18	2	7	5	49.2	1984 1920 943 --
C.V. %	3.3	15	76	28	--	3.9	9.7 8.8 22 --
LSD .05	3	4	3	3	--	2.9	283 245 300 --
LSD .01	4	5	4	4	--	3.9	385 331 405 --

* Days to Bloom = the number of days from planting to 10% bloom.

** Ascochyta disease ratings: 0 = none. 9 = 100% infection.

*** Average seed yield of 2007 and 2008.

Planting Date: May 6, 2009 Harvest Date: September 1, 2009

Seeding Rate: 175,000 live seeds / acre.

Previous Crop: hrsw.

Note: The 2009 trial sustained moderate hail damage on June 22 and 24.

Variety	Days to Bloom	Plant Ht.	Lodging	1000 Seed wt.	Test Weight	---- Seed Yield ----			Average Yield	
						2007	2008	2009	2 yr	3 yr
	*	inches	0-9**	grams	lbs/bu	----- pounds per acre -----				
Large Green Types										
Pennell	59	12	2.0	44	57.3	1494	1095	1530	1312	1374
Riveland	55	13	5.0	48	56.8	1095	1098	1186	1142	1126
CDC Greenland	57	13	3.2	40	57.1		1315	1724	1520	
Medium Green Types										
CDC Richlea	57	14	1.8	38	59.9	1742	1355	1434	1394	1510
Shasta	55	14	1.8	40	57.7	1021	906	1153	1030	1027
Small Green Type										
CDC Viceroy	58	13	3.5	26	62.2	1693	1295	1822	1558	1603
Small French Green Type										
CDC LeMay	57	11	5.5	30	62.3	1319	1294	1424	1359	1346
Medium Red Types										
Cedar	54	14	3.5	36	55.7	1145	816	1015	916	992
CDC Red River	58	14	1.8	46	59.1			1782		
Small Red Types										
CDC Rouleau	58	13	2.8	30	59.9	1195	1247	1822	1534	1421
Crimson	56	12	4.0	28	62.4	1046	939	1673	1306	1219
CDC Redberry	57	14	1.2	34	60.8			1592		
Extra Small Red Type										
CDC Rosetown	56	13	2.0	24	62.3		851	1749	1300	
Trial Mean	56	13	3.4	36	59.5	1130	1056	1512	--	--
C.V. %	1.4	11.4	43	--	1.2	12.5	13.2	11.9	--	--
LSD .05	1	1	2.1	--	1.1	232	197	257	--	--
LSD .01	2	2	2.7	--	1.4	309	262	344	--	--

* Days to Bloom = the number of days from planting to 10% flowering.

** Lodging: 0 = none, 9 = lying flat on ground.

Planting Date: May 6, 2009

Harvest Date: August 26, 2009

Seeding Rate: 550,000 live seeds / acre.

Previous Crop: 2006, 2007 & 2008 = hrsw.

Note: The 2009 trial sustained moderate hail damage on June 22 and 24.

2009 Clearfield Lentil Variety Trial – Continuously Cropped - No-till Hettinger

Variety	Days to Bloom	Plant Ht.	1000 Seed wt.	Test Weight	Seed Yield			Average Yield	
					2007	2008	2009	2 yr	3 yr
	*	inches	grams	lbs/bu	----- pounds per acre -----				
Large Green Type									
CDC Improve	83	14	54	58.6	1469	985	1918	1452	1457
Medium Green Type									
CDC Impress	82	15	46	60.8		1364	2249	1806	
Small Red Types									
CDC Impact	82	12	32	61.6	1120	537	1645	1091	1101
CDC Maxim	83	12	38	61.3		1227	2234	1730	
Extra Small Red Types									
CDC Imperial	82	12	28	63.2	647	758	2035	1396	1147
CDC Impala	87	12	26	62.3		729	1939	1334	
Trial Mean	83	13	37	61.3	1130	1056	2003	--	--
C.V. %	0.8	7.3	--	0.8	12.5	13.2	9.9	--	--
LSD .05	1	1	--	0.7	232	197	299	--	--
LSD .01	1	2	--	1.0	309	262	414	--	--

* Days to Bloom = the number of days from planting to 10% flowering.

Planting Date: May 11, 2009

Harvest Date: September 1, 2009

Seeding Rate: 550,000 live seeds / acre.

Previous Crop: 2006, 2007 & 2008 = hrsw.

Note: The 2008 trial sustained severe late season heat and moisture stress. The 2009 trial sustained moderate hail damage on June 22 and 24.

2009 Faba Bean Variety Trial Hettinger

Variety	Days to Bloom	Plant Height	1000 Seed wt.	Test Weight	Grain Yield
	*	inches	grams	lbs/bu	lbs/A
Florent	54	26	600	48.7	2319
Taboar	55	31	480	47.9	2167
Whity	54	26	450	47.3	1909
Trial Mean	54	27	484	47.8	2155
C.V. %	1.1	12	--	7.7	9.3
LSD .05	NS	5	--	NS	NS

* Days to Bloom = the number of days from planting until 10% bloom.
NS = no statistical difference between varieties.

Planting Date: May 6, 2009

Harvest Date: September 16, 2009

Previous Crop: HRSW

Note: The trial sustained moderate hail damage.

2009 Conventional Soybean Variety Trial – Continuously Cropped, No-till, Hettinger

Brand	Variety	Maturity Group	Test	Oil	Protein	-- Seed Yield --		
			Weight	Content	Content	2008	2009	2yr
			lbs/bu	%	%	----- bu/A -----		
NDSU	Sheyenne	0.8	54.2	22.2	30.9	24.1	28.1	26.1
	Cavalier	00.7	54.6	21.3	34.7	15.5	21.9	18.7
	Ashtabula	0.4	53.7	22.6	32.7	23.2		
	Traill	00.0	55.1	21.6	34.6	21.5		
	ProSoy	0.8	53.4	22.2	34.1	19.1		
Trial Mean			54.2	22.0	33.4	20.8	22.8	--
C.V. %			0.8	--	--	7.8	9.6	--
LSD .05			0.7	--	--	0.6	3.4	--
LSD .01			0.9	--	--	0.8	4.7	--

Planting Date: May 19, 2009 Harvest Date: October 18, 2009
 Seeding Rate: 250,000 pls/A (approx. 1.5 bu/A)
 Row Spacing: 7"
 Previous Crop: 2007 & 2008 = HRSW
 Note: The 2009 trial sustained moderate hail damage.

2009 Roundup Ready Soybean Variety Trial – Continuously Cropped, No-till, Hettinger

Brand	Variety	Maturity Group	Test	Oil	Protein	Seed
			Weight	Content	Content	Yield
			lbs/bu	%	%	bu/A
Proseed	60-60	0.6	62.2	27.2	39.7	27.0
	61-00	1.0	57.5	25.7	39.7	20.5
Integra	79031R	0.3	56.7	25.9	39.0	22.1
Asgrow	AG0604	0.6	58.8	26.4	38.5	19.5
	AG0808	0.8	59.6	26.4	38.0	18.0
Trial Mean			59.0	26.3	39.0	21.4
C.V. %			1.9	--	--	14.7
LSD .05			1.7	--	--	4.8
LSD .01			2.4	--	--	6.8

Planting Date: May 19, 2009 Harvest Date: October 18, 2009
 Seeding Rate: 250,000 pls/A (approx. 1.5 bu/A)
 Row Spacing: 7"
 Previous Crop: 2007 & 2008 = HRSW
 Note: The 2009 trial sustained moderate hail damage.

2009 Dry Bean Variety Trial

Hettinger

Variety	100 Seed Weight	Test Weight	---- Seed Yield ----		
	grams	lbs/bu	2008	2009	2 yr
			pounds per acre		
Pinto					
Lapaz	32	50.8	628	1889	1258
Stampede	37	52.0	626	1745	1186
Maverick	35	53.5	552	1808	1180
Othello	36	45.5	696	1496	1096
GTS 900	31	54.1	539	1636	1088
Lariat	37	52.9	568	1540	1054
Buster	36	46.8	515	1566	1040
Navy					
Vista	16	61.3	544	1401	972
Avalanche	18	62.8	447	1474	960
Norstar	19	62.5	544	1257	900
Ensign	19	62.0	504	1207	856
Navigator	--	61.3	428	1131	780
Seahawk	18	62.6	453	1067	760
Black					
Eclipse	18	62.4	449	1343	896
T-39	17	61.8	391	1334	862
Jaguar	18	61.1	377	1341	859
Zoro	19	62.8		1413	
Great Northern					
Matterhorn	30	57.3	548	1459	1004
Small Red					
Merlot	29	60.0	525	675	600
Pink					
Sedona	35	56.9	391	803	597
Trial Mean	27	57.0	516	1378	--
C.V. %	--	2.1	23	10.6	--
LSD .05	--	1.7	165	208	--
LSD .01	--	2.3	NS	276	--

NS = no statistical difference between varieties.

Planting Date: May 27, 2009

Harvest Date: October 18, 2009

Seeding Rate: 100,000 live seeds / acre (approx. 60 lbs/A).

Previous Crop: 2007 & 2008 = hrsw.

Note: The 2008 trial sustained severe heat & moisture stress.

The 2009 trial sustained moderate hail damage.

2009 Roundup Ready Corn Trial - Continuously Cropped - No-till

Regent

Cooperators: August and Perry Kirschmann, Regent

Brand	Hybrid	GDU's	Relative Maturity	Ear Height	Test Weight	Grain Yield
		*	days	inches	lbs/bu	bu/A
Proseed	781 RRBt	1900	81	31	39.3	97.8
	581 VT3	1970	83	32	39.5	85.4
	884 VT3	1980	84	30	41.5	82.3
	787 VT3	2030	87	30	40.0	99.9
Integra	9332-R	2040	83	31	38.1	107.2
Fortified	6385-R	2060	85	30	39.9	90.5
Seed	6385-VT3	2060	85	29	40.2	91.5
	6361 R	2185	86	29	40.3	109.9
Dekalb	DKC35-19	2260	85	30	42.2	89.1
Trial Mean				30	40.1	94.9
C.V. %				2.9	3.5	11.9
LSD 5%				NS	NS	NS

*Growing Degree Units to Black Layer.

NS = no statistical difference between varieties.

Planting Date: May 19, 2009

Harvest Date: see notes

Seeding Rate: 24,000 seeds / acre

Row Spacing: 30", 2x1 Skip-row configuration

Soil Type: Silty Clay Loam

Previous Crop: HRSW

Growing Degree Days: 1849 (norm = 2115)

Note: Ears were hand picked on Oct. 26 and dried with heat prior to threshing.

SDSU Warm Season Forage Trial - Harding County (Ralph), 2009.

Crop (Variety)	Harvest Date – Yield Ton/Ac @ 13%					Average
	Aug 11, 2009	Aug 18, 2009	Aug 25, 2009	Sept, 1 2009	Sept 8, 2009	
Teff Grass (Tiffany)	0.8	1.6	2.1	2.9	1.9	1.9
Foxtail Millet (Manta)	1.5	2.5	2.8	3.2	3.6	2.7
Foxtail Millet (Golden German)	1.4	2.1	2.9	3.2	3.6	2.6
Foxtail Millet (White Wonder)	1.3	2.0	2.4	3.0	3.1	2.4
Proso Millet (Sunup)	1.4	2.0	2.6	3.3	2.8	2.4
Pearl Millet (Producers Pro Millet)	1.3	1.7	2.2	3.1	2.7	2.2
Sorghum Sudan (Honey Sweet)	1.0	1.6	2.2	2.7	3.1	2.1
Sorghum Sudan (Honey Sweet 2)	1.1	1.6	1.7	2.3	2.2	1.8
Sorghum Sudan (Honey Sweet BMR)	1.0	1.6	2.3	2.6	2.6	2.0
Cowpea (Red Ripper)	0.7	0.9	1.0	1.2	0.8	0.9
Mean	1.1	1.8	2.2	2.8	2.7	2.1
LSD (.05)	0.3	0.4	0.6	0.6	0.9	--
CV	15.4	16.5	18.4	14.8	23.7	--

Planted: June 22, 2009 Herbicide: Glyphosate burn down
Harvested: Five Dates Additional Nitrogen: 65 Lb/A
Previous crop: Conventional Fallow

SDSU Cool Season Annual Forage Trial - Harding County (Ralph), 2009.

Crop (Variety)	Harvest Date – Yield Ton/Ac @ 13%					Average
	July 7, 2009	July 14, 2009	July 21, 2009	July 28, 2009	August 4, 2009	
Pea (Arvika)	0.8	1.7	2.4	2.4	2.2	1.9
Pea (Mozart)	0.9	1.3	2.3	1.9	1.4	1.6
Hairy Vetch (Common)	0.2	0.7	1.3	1.1	1.6	1.0
Oat (Troy)	1.5	2.1	2.7	2.7	2.9	2.4
Oat/Pea (60% Troy / 40%Arvika)	1.5	2.1	2.5	2.7	2.4	2.2
Barley (Haybet)	1.4	2.0	2.6	3.1	2.6	2.3
Barley/Pea (60% Haybet / 40% Arvika)	1.2	1.9	2.5	2.4	2.2	2.0
Spring Triticale (Common)	1.0	1.5	2.1	2.4	3.1	2.0
Spring Triticale / Pea (60% s.Trit/40%Arvika)	0.9	1.6	2.1	2.4	2.9	2.0
Spring Wheat (Traverse)	1.1	1.5	1.8	2.2	2.6	1.8
Mean	1.0	1.6	2.2	2.3	2.4	1.9
LSD (.05)	0.2	0.4	0.5	0.6	0.6	--
CV	14.1	17.7	14.9	17.1	15.9	--

Planted: May 10, 2009 Herbicide: Glyphosate burn down
 Harvested: Five Dates Additional Nitrogen: 65 Lb/A
 Previous crop: Conventional Fallow

Variety	Plant Height inches	Harvest Moisture %	Crude Protein %	ADF %	NDF %	TDN %	RFV	Yield				
								2007	2008	2009	2 yr	3yr
								----- Tons / acre* -----				
Haybet	29	45	14.7	32	50	66	119	1.60	4.01	3.81	3.91	3.14
Rawson	27	48	12.3	23	46	77	142	1.74	4.71	2.93	3.82	3.13
Tetonia	25	44	14.7	27	44	72	144			4.71		
Lenetah	25	48	12.9	22	48	77	139			4.01		
Trial Mean	26	46	13.6	26	47	73	136	1.67	4.36	3.87	--	--
C.V. %	3.7	14.3	--	--	--	--	--	13.5	12.2	13.2	--	--
LSD .05	1	NS	--	--	--	--	--	NS	NS	0.82	--	--
LSD .01	2	NS	--	--	--	--	--	NS	NS	1.18	--	--

* Forage yields and quality reported on a dry weight basis.

ADF = Acid Detergent Fiber

NDF = Neutral Detergent Fiber

TDN = Total Digestible nutrients

RFV = Relative Feed Value using NFTA guidelines

NS = no statistical difference between varieties

Planting Date: May 6, 2009

Harvest Date: July 21, 2009 (early soft dough)

Seeding Rate: 750,000 live seeds/acre.

Previous Crop: 2006 = hrsw, 2007 = barley, 2008 = oat.

Note: The 2009 trial sustained moderate hail damage.

2009 Spring Wheat Variety Tolerance to Foliar Diseases and Sawfly at Hettinger

Dixie Dennis, IPM Crops Scout, Dickinson Res. Ext. Center

Variety	Tan Spot	Septoria	Leaf Rust	Bacterial Blight	Sawfly
----- Percent of Flag Leaf Infection -----					% Lodg.
AC Lillian	12	1	1	2	1
Agawam	15	2	7	0	5
Alpine	2	2	0	3	8
Alsen	1	2	2	0	4
AP605CL	2	3	0	1	8
Barlow	2	2	0	0	11
Blade	5	2	0	0	4
Breaker	3	2	0	2	5
Brennan	1	3	0	2	8
Brick	3	3	0	1	10
Briggs	2	4	0	0	12
Brogan	5	2	0	3	10
Choteau	3	3	0	0	1
Conan	6	2	0	2	4
Corbin	5	1	4	2	4
Cromwell	3	3	0	0	4
Faller	2	3	0	0	11
Freyr	2	2	0	1	9
Glenn	9	3	0	0	10
Granite	1	2	2	0	3
Howard	5	1	0	0	9
Jenna	2	3	0	0	8
Kelby	1	2	1	1	6
Knudson	2	4	0	0	6
Knutz	3	3	0	1	8
Mott	4	2	1	0	1
RB07	3	1	0	2	8
Reeder	4	2	4	0	11
Sabin	4	1	1	0	6
Samson	3	1	1	0	11
Steele-ND	11	1	0	0	12
Tom	2	3	1	0	14
Traverse	3	1	1	0	5
Vantage	4	3	1	0	4

Date of observations: Foliar = July 28 – soft dough stage
Sawfly = August 29

Planting Date: May 5

Previous Crop: field pea

2009 Durum Wheat Variety Tolerance to Foliar Diseases and Sawfly at Hettinger

Dixie Dennis, IPM Crops Scout, Dickinson Res. Ext. Center

Variety	Tan Spot	Septoria	Bacterial Blight	Sawfly
	----- Percent of Flag Leaf Infection -----			% Lodg.
AC Commander	12	2	2	2
AC Napoleon	8	2	0	6
AC Navigator	9	1	0	2
Alkabo	6	3	1	5
Alzada	11	1	2	5
Ben	11	4	0	10
DG Max	9	2	0	8
DG Star	8	2	1	1
Dilse	3	1	0	9
Divide	10	4	0	1
Grande Doro	7	1	0	2
Grenora	5	3	0	4
Lebsock	11	1	0	3
Maier	3	2	0	10
Mountrail	7	2	0	1
Pierce	11	1	0	8
Rugby	3	2	0	2
Strongfield	7	1	0	4
Wales	10	1	0	3
Westhope	12	4	0	3

Date of observations: Foliar = July 28 – soft dough stage

Sawfly = August 29

Planting Date: May 5

Previous Crop: field pea

2009 Winter Wheat Variety Tolerance to Foliar Diseases at Hettinger

Dixie Dennis, IPM Crops Scout, Dickinson Res. Ext. Center

Variety	Tan Spot	Septoria	Leaf Rust	Bacterial Blight
----- Percent of Flag Leaf Infection -----				
Alice	15	1	15	0
Art	10	5	0	4
CDC Accipiter	17	2	2	3
CDC Buteo	10	3	4	0
CDC Falcon	11	2	1	0
CDC Peregrine	8	4	1	0
Darrel	9	1	35	0
Expedition	14	3	18	0
Hawken	8	4	3	0
Jagalene	12	4	38	4
Jerry	16	7	1	0
Lyman	13	4	10	0
Mace	21	3	10	0
Millennium	18	4	2	3
Overland	8	3	7	0
Radiant	13	2	14	0
Wesley	11	3	37	2
Yellowstone	12	2	9	0

Date of observations: July 28 – hard dough stage

Previous Crop: hrsw

2009 Winter Wheat Variety Tolerance to Foliar Diseases at Mandan
 Roger Ashley, Dickinson Res. Ext. Center

Variety	Tan Spot	Septoria	Leaf Rust
---- % of Flag Leaf Infection ----			
Alice	5	10	50
Art	25	15	30
CDC Accipiter	5	10	30
CDC Buteo	5	20	30
CDC Falcon	15	--	90
CDC Peregrine	5	2	50
Darrel	15	70	40
Expedition	30	--	70
Hawken	15	15	40
Jagalene	20	2	80
Jerry	15	5	70
Lyman	40	20	20
Mace	20	10	50
Millennium	40	10	40
Overland	20	1	5
Radiant	40	20	50
Wesley	20	10	15
Yellowstone	40	5	80

Date of observations: Tan Spot & Septoria = July 16 – soft dough stage.
 Leaf Rust = July 26 – hard dough stage.

Previous Crop: hrsw

2009 Sharpen Herbicide in Summer Fallow

Eric Eriksmoen, Hettinger, ND

Treatments were applied on June 17 to 4 inch tall kochia (kocz), 4 inch tall Russian thistle (ruth) and to 8 inch long wild buckwheat with 73° F, 62% RH, partly cloudy sky and southwest wind at 4 mph. Treatments were applied with a tractor mounted CO₂ propelled plot sprayer delivering 10 gpa at 30 psi through PK-01E80 nozzles to a 5 foot wide area the length of 10 by 28 foot plots. The soil is classified as a silt-loam with a pH of 6.2 and OM of 3.2%. The trial was a randomized complete block design with three replications. Kochia, Russian thistle and wild buckwheat populations averaged 28, 11 and 3 plants per square foot, respectively. Plots were evaluated for weed control on June 26, July 21 and on August 11.

Treatment	Product rate oz/A	----- June 26 -----			----- July 21 -----			----- August 11 -----		
		kocz	ruth	wibw	kocz	ruth	wibw	kocz	ruth	wibw
1 Untreated		0	0	0	0	0	0	0	0	0
2 glyphosate + NIS + AMS	32 + 0.25% + 17 lb	96	99	57	93	99	50	92	99	40
3 Sharpen + glyph + MSO + AMS	1.0 + 32 + 1% + 17 lb	99	99	91	96	94	82	93	94	93
4 2,4-D ester + glyph + NIS + AMS	16 + 32 + 0.25% + 17 lb	98	99	87	93	99	62	91	95	27
5 Distinct + glyph + MSO + AMS	2.0 + 32 + 1% + 17 lb	99	99	92	93	98	90	93	93	92
6 Sharpen + Distinct + glyph + MSO + AMS	1.0 + 2.0 + 16 + 1% + 17 lb	96	98	88	95	95	83	93	85	78
7 Sharpen + Distinct + glyph + MSO + AMS	1.0 + 1.0 + 16 + 1% + 17 lb	95	98	96	90	90	88	63	63	63
8 Sharpen + glyph + MSO + AMS	2.0 + 32 + 1% + 17 lb	99	99	99	95	95	93	92	92	95
C.V. %		2.9	1.4	10.8	3.9	4.5	20.5	10.4	10.9	41.3
LSD 5%		4	2	14	6	7	25	14	16	44

Summary

All herbicide treatments provided excellent season long kochia and Russian thistle control except for Sharpen + Distinct + glyphosate (trt 7). That treatment provided excellent control initially but declined as the season progressed to unacceptable levels by mid-August. Both 1.0 and 2.0 oz/A Sharpen + glyphosate treatments (trt 3 & 8) and the Distinct + glyphosate treatment (trt 5) provided excellent season long wild buckwheat control.

2009 Sharpen Herbicide in Spring Wheat

Eric Eriksmoen, Hettinger, ND

Treatments were applied on May 12 to seedling common mallow (cmal) and wild buckwheat (wibw), ¼ inch tall kochia (kocz) and to ½ inch tall Russian thistle (ruth) with 68° F, 48% RH, cloudy sky and southeast wind at 6 mph. Treatments were applied with a tractor mounted CO₂ propelled plot sprayer delivering 10 gpa at 30 psi through PK-01E80 nozzles to a 5 foot wide area the length of 10 by 28 foot plots. The soil is classified as a silt-loam with a pH of 6.2 and OM of 3.2%. 'Reeder' HRSW was seeded on May 14. The trial was a randomized complete block design with four replications. Common mallow, wild buckwheat, kochia and Russian thistle populations averaged 0.8, 0.5, 14 and 26 plants per square foot, respectively. Plots were evaluated for crop injury on May 27 and June 12, and for broadleaf weed control on May 20, May 27, June 12 and on September 2. The trial was harvested on September 7.

Summary

Crop injury was not observed. All Sharpen treatments (trts 3 – 6) provided significantly higher season long kochia control than the glyphosate alone treatment (trt 2). The 1.5 oz/A Sharpen + glyphosate treatment (trt 5) provided significantly higher season long Russian thistle control than the other treatments. The Sharpen treatments appear to have good activity on common mallow. Grain yield and test weight of all herbicide treatments were significantly higher than the untreated check.

Treatment	Product rate oz/A	May 20			May 27			June 12			September 2			Test weight lbs/bu	Grain yield bu/A				
		kocz	ruth	wibw	cmal	inj	kocz	ruth	cmal	inj	kocz	ruth	cmal			inj	kocz	ruth	wibw
1 Untreated		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53.8	33.6
2 Glyphosate + NIS + AMS	32 + 0.25% + 17 lb	92	99	99	0	0	90	97	0	79	81	25	55	72	99	99	55.1	41.3	
3 Sharpen + Glyph. + MSO + AMS	1.0 + 16 + 1% + 17 lb	99	97	94	99	0	96	97	95	0	91	87	54	89	70	99	55.4	43.6	
4 Sharpen + Glyph. + MSO + AMS	1.0 + 32 + 1% + 17 lb	97	97	97	99	0	93	97	85	0	92	91	91	72	99	99	57.0	42.8	
5 Sharpen + Glyph. + MSO + AMS	1.5 + 32 + 1% + 17 lb	97	99	99	95	0	97	98	95	0	97	97	0	92	99	99	55.2	40.7	
6 Sharpen + Clarity + Glyph+ MSO + AMS	1.5 + 2.0 + 32+ 1%+ 17lb	97	97	99	99	0	93	93	95	0	92	88	27	85	62	99	56.3	38.6	
7 2,4-D + Glyph. + NIS + AMS	8.0 + 32 + 0.25% + 17 lb	92	94	99	99	0	94	98	99	0	91	90	23	80	76	99	55.7	44.4	
C.V. %		4.7	3.9	0.0	--	0	6.7	4.2	--	0	10	14	132	8.0	29	--	2.0	8.2	
LSD 5%		6	5	1	--	NS	8	5	--	NS	12	15	NS	8	28	--	1.6	4.9	

NS = no statistical difference between treatments.

2009 Evaluation of Weed Control with Axial TBC in Spring Wheat

Eric Eriksmoen, Hettinger, ND

'Reeder' HRSW was seeded on May 14. Treatments were applied on June 3 to 3 leaf wheat and to 1 inch tall kochia (kocz), 2 inch tall Russian thistle (ruth), 2 inch tall wild buckwheat (wibw), downy brome (dobr) in the boot, tillering Japanese brome (jabr) and 3 leaf wild oat (wiot) with 49° F, 80% RH, clear sky and southwest wind at 5 mph. Treatments were applied with a tractor mounted CO₂ propelled plot sprayer delivering 10 gpa at 30 psi through PK-01E80 nozzles to a 5 foot wide area the length of 10 by 28 foot plots. The soil is classified as a silt-loam with a pH of 6.2 and OM of 3.2%. The trial was a randomized complete block design with four replications. Kochia, Russian thistle, wild buckwheat, downy brome, Japanese brome and wild oat populations averaged 12, 7, 0.5, 3, 1 and 0.2 plants per square foot, respectively. Plots were evaluated for crop injury on June 15 and June 26, and for weed control on June 26 and September 4. The trial sustained moderate hail damage on June 22 and June 24, and was harvested on September 7.

Treatment	Product rate oz/A	6/15	June 26					September 4				Grain yield bu/A	
		inj	inj	kocz	ruth	wibw	dobr	kocz	ruth	jabr	wiot		
		% control											
1	Untreated	0	0	0	0	0	0	0	0	0	0	27.9	
2	Axial TBC + Adigor	8.85 + 9.6	3	0	95	96	96	0	62	28	0	99	29.6
3	Axial TBC + Adigor + MCPA ester	8.85 + 9.6 + 10.6	2	0	88	88	99	0	66	54	0	99	33.1
4	Axial TBC + Adigor + Starane	8.85 + 9.6 + 5.3	0	0	93	93	98	7	94	84	0	99	39.6
5	Axial TBC + Adigor + Starane & Sward	8.85 + 9.6 + 12	2	0	99	80	99	25	92	84	30	99	32.2
6	Axial TBC + Adigor + Starane NXT	8.85 + 9.6 + 14	2	0	98	98	96	25	99	92	0	99	36.2
7	Axial TBC + Adigor + Bronate Advanced	8.85 + 9.6 + 16	2	0	95	96	98	0	96	98	0	99	30.0
8	Axial TBC + Adigor + Widematch	8.85 + 9.6 + 10	0	0	90	70	99	0	80	52	0	99	38.1
9	Axial XL + Huskie + NIS + AMS	16.4 + 11 + 0.25%+0.5lb	1	0	92	99	99	0	96	97	0	99	28.1
10	Goldsky + NIS	16 + 0.25%	4	0	96	90	95	99	95	82	99	99	34.2
11	Wolverine + NIS	27.4+0.25%	2	0	88	94	96	0	81	98	0	99	32.1
12	Puma + Huskie + NIS + AMS	8 + 11 + 0.25%+0.5lb	2	0	95	96	93	0	91	99	0	99	38.2
13	Puma+ Widematch + MCPA ester	8 + 16 + 12	0	0	95	95	99	0	96	89	0	99	33.0
14	Everest + Bron. Adv.	0.4 + 12.8	2	0	85	99	98	99	71	96	99	99	36.6
15	Rimfire+Bron. Adv. + MSO	2.25 + 12 + 24	0	0	87	93	90	99	75	92	99	99	32.8
C.V. %			138	0	4.2	8.4	3.6	51	13.5	18.0	--	0	9.3
LSD .05			NS	NS	6	12	5	19	15	20	--	NS	4.4

NS = no statistical difference between treatments.

Summary

Crop injury was minor when observed and quickly diminished. All treatments provided good initial kochia and wild buckwheat control. All treatments provided very good initial Russian thistle control with the exception of Axial TBC + Starane & Sward (trt 5) and Axial TBC + Widematch (trt 8) which only provided marginal control. Hail damage opened up the crop canopy, allowing many noncompetitive weeds to grow and also cause some crop damage. Season long weed control and grain yield data should be interpreted with caution.

2009 Pulsar Herbicide in Spring Wheat

Eric Eriksmoen, Hettinger, ND

'Reeder' HRSW was seeded on May 14. Treatments were applied on June 3 to 3 leaf wheat and to 1 inch tall kochia (kocz) and to 2 inch tall Russian thistle (ruth) with 50° F, 80% RH, clear sky and southwest wind at 5 mph. Treatments were applied with a tractor mounted CO₂ propelled plot sprayer delivering 10 gpa at 30 psi through PK-01E80 nozzles to a 5 foot wide area the length of 10 by 28 foot plots. The soil is classified as a silt-loam with a pH of 6.2 and OM of 3.2%. The trial was a randomized complete block design with four replications. Kochia and Russian thistle populations averaged 23 and 10 plants per square foot, respectively. Plots were evaluated for crop injury on June 15 and on June 30, and for broadleaf weed control on June 30 and on September 4. The trial sustained moderate hail damage on June 22. The trial was harvested on September 7.

Treatment	Product rate oz/A	June 15	June 30		Sept. 4		Grain yield bu/A		
		inj.	inj	kocz	ruth	kocz		ruth	
		----- % control -----							
1	Untreated	0	0	0	0	0	0	26.9	
2	Axial TBC + Adigor	8.85 + 9.6	1.5	0	45	35	18	25	33.5
3	Pulsar + MCPA + NIS	8.3 + 8.6 + 0.25%	0.2	0	90	38	82	12	27.3
4	Pulsar + NIS	12.5 + 0.25%	0.2	0	95	65	84	50	30.5
5	Pulsar + MCPA + NIS	12.5 + 8.6 + 0.25%	0.5	0	94	80	95	80	26.7
6	Pulsar + Affinity TM + NIS	12.5 + 0.6 + 0.25%	0.5	0	92	94	95	96	29.8
7	Pulsar+WideMatch+Affinity TM+NIS	12.5+16+0.2+0.25%	0.8	0	95	94	99	99	26.6
8	Orion	17	1.2	0	52	60	32	18	28.2
9	Orion + WideMatch	17 + 16	0.5	0	94	91	94	20	24.3
10	Orion + Starane	17 + 5.33	1.5	0	82	68	92	25	29.7
11	Orion + Buctril	17 + 16	0.5	0	65	70	65	58	27.4
12	Bronate Advance	12.8	1.2	0	70	65	68	41	28.8
13	Huskie + NIS + AMS	11 + 0.25% + 0.5 lb	0.2	0	79	90	95	82	28.1
14	WideMatch + MCPA	16 + 8	0.2	0	89	91	94	97	28.4
15	Affinity TM + MCPA	0.6 + 8	0.2	0	25	36	50	28	26.7
C.V. %			213	0	12.6	26.1	20.3	47.5	13.3
LSD 5%			NS	NS	13	24	21	33	NS

NS = no statistical difference between treatments.

Summary

Crop injury was minor and diminished quickly. Axial TBC (trt 2), Orion alone (trt 8) and Affinity TM + MCPA (trt 15) provided relatively poor season long kochia and Russian thistle control. Pulsar + Affinity TM (trt 6), Pulsar + WideMatch + Affinity TM (trt 7) and WideMatch + MCPA (trt 14) provided excellent season long kochia and Russian thistle control. Pulsar + MCPA (trt 5), Orion + WideMatch (trt 9), Orion + Starane (trt 10) and Huskie (trt 13) provided excellent season long kochia control but only fair to poor season long Russian thistle control. There were no statistically significant differences between treatments for grain yield.

Residual Weed Control from Lentil Treated with Valor Herbicide

Eric Eriksmoen, Hettinger, ND

'CDC Richlea' lentil was seeded on May 14, 2008. Treatments were applied on August 3 to lentils that were at physiologic maturity with 83° F, 34% RH, clear sky and NW wind at 6 mph. Treatments were applied with a tractor mounted CO₂ propelled plot sprayer delivering 20 gpa at 30 psi through PK-01E80 nozzles to the length of 5 by 28 foot plots. 'Reeder' HRSW was seeded on May 14, 2009. No herbicide was applied during the 2009 growing season. The trial was not harvested.

Treatment	Product Rate oz/A	- May 20 -		- June 12 -	
		inj.	kocz	inj.	kocz
Untreated		0	0	0	0
Valor + Superb + AMS	2.0 + 32 + 2.5 lbs	0	83	0	60
Gramoxone + NIS	20.8 + 0.25%	0	80	0	23
Valor + glyphosate + Superb + AMS	2.0 + 22 + 32 + 2.5 lbs	0	90	0	60
Glyphosate + Superb + AMS	22 + 32 + 2.5 lbs	0	67	0	23
C.V. %		0	11	0	51
LSD .05		NS	13	NS	32

NS = no statistical difference between treatments

Summary

Crop injury was not observed. All herbicide treatments showed significant early season suppression of kochia. The Valor + glyphosate treatment expressed excellent early season control. This control diminished as the season progressed, however, both Valor alone and Valor + glyphosate treatments had significantly higher season long kochia control than the other treatments. This trial demonstrates the crop safety and short term benefits of Valor Herbicide applied in a pre or post harvest scenario.

2008 NDSU Broadleaf Herbicide Trial at Hettinger (WHTB0803), Eric Eriksmoen.

'Howard' HRSW was seeded on April 30. Treatments were applied on May 31 to 4 leaf wheat and to 2" kochia (kocz) and 2" Russian thistle (ruth) with 65° F, 55% RH, clear sky and west wind at 2 mph. Treatments were applied with a tractor mounted CO₂ propelled plot sprayer delivering 10 gpa at 30 psi through PK-01E80 nozzles to a 5 foot wide area the length of 10 by 28 foot plots. The trial was a randomized complete block design with three replications. HRSW, kochia and Russian thistle populations were 8, 17 and 3 plants per square foot, respectively. The trial was sprayed with 16 oz/A Axial XL on June 16 to control wild oats. Plots were evaluated for crop injury on June 18 and for weed control on July 2 and August 1. The trial was harvested on August 8.

Treatment	Product Rate	6/18 inj	7/2 kocz % control	7/2 kocz	-- Aug. 1-- ruth	Test Weight lbs/bu	Grain Yield bu/A
1 Starane + Sward	18	0	98	99	99	52.1	20.5
2 Widematch	16	0	95	98	93	51.8	23.9
3 Widematch + Harmony SG + Express SG	10.7+ 0.32 + 0.08	0	27	50	99	48.8	15.9
4 Harmony SG + Express SG + Sword + NIS	0.32 + 0.08 + 6.15 + 0.25%	0	57	40	99	55.0	26.3
5 Harmony SG + Express SG + Salvo + NIS	0.2 + 0.2 + 6.4 + 0.25%	2	90	92	99	51.6	21.9
6 Rage D-Tech + NIS	8 + 0.25%	0	95	93	99	50.8	18.1
7 ET + Salvo + NIS	0.52 + 6.4 + 0.25%	0	70	83	99	51.6	17.1
8 Bronate Advance	12.8	0	98	93	99	51.5	19.1
9 Bromoxynil & 2,4-D	18	0	98	93	99	49.8	16.1
10 Huskie	9.5	0	99	99	99	49.5	16.5
11 Huskie + AMS	9.5 + 8	0	97	98	99	51.6	18.5
12 Starane NXT	13.8	0	96	96	95	53.9	21.5
13 Florasulam & MCPA	17.1	2	82	47	96	51.5	16.7
14 Untreated		0	0	0	0	48.6	13.9
C.V.%		369	11.8	11.6	3.0	2.0	13.3
LSD .05		NS	16	15	5	1.4	8.8

Summary

Crop injury was very minor when observed. All herbicide treatments provided excellent season long Kochia control with the exception of Widematch + Harmony SG + Express SG (trt 3), Harmony SG + Express SG + Sword + NIS (trt 4), ET + Salvo + NIS (trt 7) and Florasulam & MCPA (trt 13) which were all quite weak on kochia. Despite poor kochia control, treatment 4 had the highest test weight and grain yield. All herbicide treatments provided excellent season long Russian thistle control. All herbicide treatments had grain yields higher than the untreated check, however, only the Widematch alone (trt 2) and Harmony SG + Express SG + Sword + NIS (trt 4) had statistically higher yields.

Field Bindweed Control at Hettinger, ND

Eric Eriksmoen

Herbicide treatments were applied on September 11, 2007 to fully mature field bindweed (fibw) which had been cut to a 4 to 6 inch height during small grain harvest (post harvest) with 54° F, 56% RH, partly cloudy sky and east wind at 6 mph. 'Howard' HRSW was seeded on April 30. Treatments were applied with a tractor mounted CO₂ propelled plot sprayer delivering 10 gpa at 30 psi through PK-01E80 nozzles to a 10 foot wide area the length of 15 by 28 foot plots. The trial was a randomized complete block design with three replications. Plots were evaluated for crop injury and weed control on May 27 and on June 18. The trial was harvested on August 8.

Treatment	Product	Approx.	- May 27 -		- June 18 -		Test Weight	Grain Yield
	Rate	trt cost	inj	fibw	inj	fibw		
	oz/A	\$/A	----- % control -----				lbs/bu	bu/A
1 Untreated	--	0	0	0	0	0	52.2	13.8
2 Roundup (RT3)	96	21.00	0	98	0	99	53.4	22.1
3 Roundup + AMS	44 + 1%	13.12	0	99	0	99	52.8	18.3
4 R'up + 2,4-D ester + AMS	11 + 24 + 1%	8.72	0	99	0	99	54.4	22.5
5 2,4-D amine (4 lb/gal)	48	4.50	0	96	0	99	53.4	16.1
6 2,4-D ester (4 lb/gal)	48	5.62	0	96	0	98	55.9	21.1
7 Banvel + NIS	32 + 0.5%	23.50	0	99	2	99	54.9	16.5
8 Paramount + MSO + UAN	5.28 + 32 + 128	25.40	0	99	0	99	56.8	19.2
C.V.%			0	3.1	490	0.9	4.0	7.8
LSD .05			NS	5	NS	1	NS	2.5

Summary

Crop injury was very minor when observed. The trial sustained severe late season heat and moisture stress causing light test weights and lower yields. All herbicide treatments provided excellent season long control of field bindweed. All herbicide treatments except for 2,4-D amine alone (trt 5) had significantly higher grain yields than the untreated check.

2009 Evaluation of Weed Control with Rimfire Max in Spring Wheat

Eric Eriksmoen, Hettinger, ND

'Reeder' HRSW was seeded on May 14. Treatments were applied on June 2 to 3 leaf wheat and to downy brome (dobr) in the boot stage, tillering Japanese brome (jabr), 3 leaf wild oat (wiot) and 2 leaf Persian darnel (peda) with 56° F, 42% RH, mostly cloudy sky and East wind at 2 mph. Treatments were applied with a tractor mounted CO₂ propelled plot sprayer delivering 10 gpa at 30 psi through PK-01E80 nozzles to a 5 foot wide area the length of 10 by 28 foot plots. The soil is classified as a silt-loam with a pH of 6.2 and OM of 3.2%. The trial was a randomized complete block design with four replications. Grassy weed populations were only present in the 4th rep. Weed populations for downy brome, Japanese brome, wild oat and Persian darnel were 5, 3, 0.2 and 0.25 plants per square foot, respectively. Plots were evaluated for crop injury on June 12 and June 27, and for weed control on June 27 and August 11. The trial was harvested on Sept 7.

Treatment	Product rate oz / Acre	Grain 6/12		June 27			August 11				
		Yield bu/A	inj	inj	dobr	jabr	peda	dobr	jabr	wiot	peda
1 Untreated		30.7	0	0	0	0	0	0	0	0	0
2 Rimfire Max + Huskie + MSO*	3.0 + 11 + 24	40.7	2.5	0	99	99	99	99	99	99	99
3 Rimfire Max + Huskie + BB*	3.0 + 11 + 1%	38.5	3.8	0	99	99	99	99	99	99	99
4 Rimfire Max + Huskie + HC*	3.0 + 11 + 12	39.5	1.2	0	99	99	99	99	99	99	99
5 Rimfire Max + Bro. Adv. + BB	3.0 + 12.8 + 1%	36.2	1.2	0	95	99	99	50	99	99	99
6 Rimfire Max+Affinity TM+Starane Ultra+BB	3.0+0.6+2.72+1%	34.8	1.2	0	95	99	99	90	99	99	99
7 Rimfire + Huskie + MSO	2.0 + 11 + 24	30.1	2.5	0	50	80	20	50	95	99	0
8 Silverado + Huskie + MSO	2.0 + 11 + 24	37.3	3.8	0	5	5	50	0	0	99	80
C.V. %		8.5	122	0	--	--	--	--	--	--	--
LSD .05		4.5	NS	NS	--	--	--	--	--	--	--

* MSO = methylated seed oil, BB = basic blend, HC = high surfactant oil concentrate

NS = no statistical difference between treatments

Summary

Crop injury was observed as slight leaf chlorosis and quickly diminished. All Rimfire Max treatments provided excellent season long Japanese brome, wild oat and Persian darnel control. All Rimfire Max treatments also provided excellent season long downy brome control except for Rimfire Max + Bronate Advance (trt 5). Rimfire + Huskie (trt 7) provided excellent season long control of Japanese brome and wild oats, marginal control of downy brome and no Persian darnel control. Silverado (trt 8) was not effective on either brome species but provided excellent season long control of wild oats and fair control of Persian darnel. All treatments had significantly higher grain yields than the untreated check except for Rimfire Max + Affinity TM + Starane Ultra (trt 6) and Rimfire + Huskie (trt 7).

2009 Prepare Herbicide + Glyphosate on Winter Wheat

Eric Eriksmoen, Hettinger, ND

'Wesley' HRWW was seeded on October 6, 2008 into dry soil. Pre-emergence treatments (PRE) were applied on October 7 to 2 leaf downy brome (dobr) with 62° F, 32% RH, clear sky and south wind at 5 mph. Fall post-emergence treatments (FPOST) were applied on November 1 to 2 leaf winter wheat and to 3 leaf downy brome with 57° F, 44% RH, partly cloudy sky and northwest wind at 7 mph. Winter crop survival was fairly good. Early spring post-emergence treatments (EPOST) were applied on April 20 to 3 1/2 leaf winter wheat and to tillering downy brome and 2 leaf Japanese brome (jabr) with 61° F, 29% RH, partly cloudy sky and north wind at 4 mph. Treatments were applied with a tractor mounted CO₂ propelled plot sprayer delivering 10 gpa at 30 psi through PK-01E80 nozzles to a 5 foot wide area the length of 10 by 28 foot plots. The trial was a randomized complete block design with four replications. The soil is classified as a silt-loam with a pH of 6.2 and OM of 3.2%. Downy brome populations averaged 5 / ft² at PRE, 32 / ft² at FPOST and 50+ /ft² at EPOST. Plots were evaluated for crop injury on May 12 and May 27 and for weed control on April 21, May 12, May 27 and on September 2. Plant height was measured on June 29, shortly after heading. The trial sustained moderate hail damage on June 22 and 24 and therefore was not harvested.

Summary

Crop injury consisted of slight leaf chlorosis when observed. Pre-emergence treatments alone (trts 2 – 5) provided very little brome control. This was probably due to the lack of emerged weeds at this application timing. With the exception of Prepare / PowerFlex (trt 8), PRE / FPOST treatments (trts 6 – 9) provided excellent season long downy brome and Japanese brome control. PRE / EPOST treatments (trts 10 – 13) provided only marginal brome control. Fall POST applied treatments alone (trts 14 – 17) provided excellent season long Japanese brome control and with the exception of PowerFlex (trt 16), excellent season long downy brome control.

Treatment	Product rate oz/A	App. timing	4/21	- May 12 -		- May 27 -		Plant ht inches	- Sept 2 -	
			dobr	inj	dobr	inj	cheat*		dobr	jabr
			----- % control -----							
1	Untreated		0	0	0	0	0	19	0	0
2	Glyphosate + AMS	11 + 1lb PRE	0	0	0	0	0	20	18	2
3	Glyphosate + AMS + PrePare	11 + 1lb + 0.31 PRE	0	0	0	0	0	18	12	0
4	Glyphosate + AMS + PrePare + pyraflufen	11 + 1 lb + 0.31 + 1.5 PRE	25	0	18	0	18	20	45	5
5	Glyphosate + AMS + PrePare + tribenuron	11 + 1 lb + 0.31 + 0.1 PRE	22	0	5	0	0	18	28	0
6	Glyphosate + AMS + PrePare + pyraflufen / Everest + Basic Blend	11 + 1 lb + 0.31 + 1.5 / 0.31 + 1% PRE / FPOST	90	0	90	2	92	21	90	90
7	Glyphosate + AMS + PrePare + pyraflufen / Olympus Flex + Basic Bl.	11 + 1 lb + 0.31 + 1.5 / 2.98 + 1% PRE / FPOST	86	0	89	2	94	20	94	92
8	Glyphosate + AMS + PrePare + pyraflufen / PowerFlex + NIS	11 + 1 lb + 0.31 + 1.5 / 3.52 + 0.25% PRE / FPOST	74	0	78	1	82	20	65	76
9	Glyphosate + AMS + PrePare + pyraflufen / Maverick + Basic Blend	11 + 1 lb + 0.31 + 1.5 / 0.67 + 1% PRE / FPOST	90	0	88	1	93	20	90	92
10	Glyphosate + AMS + PrePare + pyraflufen / Everest + Basic Blend	11 + 1 lb + 0.31 + 1.5 / 0.31 + 1% PRE / EPOST	0	0	70	2	82	21	52	55
11	Glyphosate + AMS + PrePare + pyraflufen / Olympus Flex + Basic Bl.	11 + 1 lb + 0.31 + 1.5 / 2.98 + 1% PRE / EPOST	0	0	74	0	81	21	65	90
12	Glyphosate + AMS + PrePare + pyraflufen / PowerFlex + NIS	11 + 1 lb + 0.31 + 1.5 / 3.52 + 0.25% PRE / EPOST	25	0	82	1	92	20	65	50
13	Glyphosate + AMS + PrePare + pyraflufen / Maverick + Basic Blend	11 + 1 lb + 0.31 + 1.5 / 0.67 + 1% PRE / EPOST	2	0	86	1	89	20	65	72
14	Everest + Basic Blend	0.61 + 1% FPOST	82	0	78	2	85	20	90	92
15	Olympus Flex + Basic Bl.	2.98 + 1% FPOST	70	0	84	0	82	20	90	90
16	PowerFlex + NIS	3.52 + 0.25% FPOST	85	0	82	0	79	19	58	90
17	Maverick + Basic Blend	0.67 + 1% FPOST	90	0	95	0	98	21	96	92
C.V. %			34	0	19	308	18	9	32	15
LSD 5%			20	NS	16	NS	16	NS	27	12

* Cheat = downy brome / Japanese brome mixture.

NS = no statistical difference between treatments.

PrePare Herbicide in Spring Wheat

Eric Eriksmoen, Hettinger, ND

'Reeder' HRSW was seeded on May 14. Pre-emergence treatments (PRE) were applied on May 19 to 2" tall mixed bromus species (downy brome and Japanese brome) with 68° F, 64% RH, partly cloudy sky and southeast wind at 8 mph. Post-emergence treatments (POST) were applied on June 3 to 3 leaf wheat and to downy brome (dobr) in the boot stage, tillering Japanese brome (jabr) and to 1 1/2 leaf Persian darnel (peda) with 48° F, 82% RH, cloudy sky and southwest wind at 4 mph. Treatments were applied with a tractor mounted CO₂ propelled plot sprayer delivering 10 gpa at 30 psi through PK-01E80 nozzles to a 5 foot wide area the length of 10 by 28 foot plots. The trial was a randomized complete block design with four replications. The soil is classified as a silt-loam with a pH of 6.2 and OM of 3.2%. Downy brome, Japanese brome and Persian darnel populations averaged 5, 35 and 10 plants per square foot, respectively. Plots were evaluated for crop injury on June 3, June 12 and June 26 (data not shown), for plant height on July 17 and for weed control on June 3, June 12, June 26 (data not shown) and on September 1. The trial was harvested on September 7.

Summary

Crop injury was not observed on any treatment. All herbicide treatments provided excellent season long downy brome and Japanese brome control with the exception of glyphosate alone (trt 15) which provided excellent season long downy brome control but only fair Japanese brome control. Some Persian darnel and Japanese brome emerged after PRE applications. None of the PRE treatments were effective in providing season long control of Persian darnel. The PrePare / Goldsky treatments (trts 9 & 10) provided excellent season long control of Persian darnel. Wild oats emerged in a very late June flush resulting in relatively poor and inconsistent herbicide control. All herbicide treatments had significantly higher yields than the untreated check.

Treatment	Product rate oz/A	App. timing		June 3 --		June 12 -----		September 1 -----		Grain yield bu/A				
		inj	cheat*	inj	cheat	inj	cheat	inj	cheat					
		% control		% control		% control		% control						
		cm	cm	cm	cm	cm	cm	cm	cm					
1	Untreated	0	0	0	0	0	0	0	0	0				
2	Glyphosate + AMS + PrePare	11.4 + 1lb + 0.3	PRE	0	99	0	96	23	56	96	92	0	17	33.5
3	Glyph + AMS + Olympus	11.4 + 1lb + 0.3	PRE	0	99	0	97	5	55	96	96	0	86	30.8
4	Glyph + AMS + Rimfire	11.4 + 1lb + 1.75	PRE	0	99	0	99	33	55	98	97	10	27	33.1
5	Glyph + AMS + Olympus	11.4 + 1lb + 0.6	PRE	0	99	0	97	70	56	99	98	0	70	30.7
6	Glyph + AMS + PrePare / ARY...105 + Basic Blend	11.4 + 1lb + 0.3 / 0.346 + 1%	PRE / POST	0	99	0	98	90	50	94	97	50	47	33.4
7	Glyph + AMS + PrePare / ARY...105 + Basic Blend	11.4 + 1lb + 0.3 / 0.52 + 1%	PRE / POST	0	98	0	98	80	51	93	97	50	57	26.7
8	Glyph + AMS + PrePare / Everest + Basic Blend	11.4 + 1lb + 0.3 / 0.3 + 1%	PRE / POST	0	99	0	96	70	52	92	99	0	10	33.9
9	Glyph + AMS + PrePare / GoldSky + Basic Blend	11.4 + 1lb + 0.3 / 8 + 1%	PRE / POST	0	99	0	99	40	56	98	96	97	37	34.7
10	Glyph + AMS + PrePare / GoldSky + Basic Blend	11.4 + 1lb + 0.3 / 16 + 1%	PRE / POST	0	98	0	98	65	54	97	96	99	50	36.7
11	Glyph + AMS + PrePare / Rimfire + Basic Blend	11.4 + 1lb + 0.3 / 1.75 + 1%	PRE / POST	0	99	0	99	0	52	98	99	0	50	32.2
12	Glyph + AMS / Everest + Basic Blend	11.4 + 1lb / 0.6 + 1%	PRE / POST	0	99	0	98	35	58	95	97	0	83	34.9
13	Glyph + AMS / ARY...105 + Basic Blend	11.4 + 1lb / 1.04 + 1%	PRE / POST	0	99	0	96	33	56	94	99	0	80	38.4
14	Glyph + AMS / GoldSky + Basic Blend	11.4 + 1lb / 16 + 1%	PRE / POST	0	99	0	97	20	54	97	99	23	94	36.7
15	Glyph + AMS	11.4 + 1lb	PRE	0	98	0	95	0	54	94	82	0	0	29.9
C.V. %				0	1.0	0	2.4	48	11	4.0	4.4	77	59	6.3
LSD 5%				NS	1	NS	3	25	9	5	6	25	39	2.8

* Cheat = downy brome & Japanese brome mixture. NS = no statistical difference between treatments.

2009 Natural Products Herbicide Trial
North Dakota State University
Dickinson Research Extension Center
Dr. Patrick Carr and Glenn B. Martin

Preliminary Results

The 2009 growing season began much later than is typical. Cool temperatures prevented early emergence of summer annual weeds and delayed the onset of regrowth by winter annual weeds. Seeding was delayed much later than is recommended so that annual weeds would emerge or resume growth before treatments were applied. A decision was made to seed on 15 June, much later than is recommended, even though the weed population was lower than anticipated. Hard red spring wheat (cv. FBC Dylan) was seeded at 90 lb PLS/acre using a John Deere 750 grain drill in rows 15 cm apart.

All treatments were applied using a hooded bicycle-type sprayer with a 7.5-ft boom and 8004 nozzle tips at a rate of 150 gallons per hectare (60 gpa) on 18 June, beginning at 8:30 AM and ending at 10 AM, under partly cloudy skies and at a relative humidity of 55%. Wind speed during the application period achieved a maximum velocity of 2.7 mph. Treatments were applied in 10 by 20 ft plots that were arranged in a randomized complete block and replicated four times. An unsprayed 5-ft border separated adjacent plots within each block.

Above-ground weed biomass was collected from a 0.25-m² area in each plot on 17 June and separated into grass and broadleaf weed samples. The weed population was low and consisted predominately of common lambsquarters, kochia, Russian thistle, and dandelion for broadleaf species, and green foxtail and barnyardgrass for grass species. Weed samples were dried at 130°F until a constant weight was reached, and then weighed. Weights were reported as g/m². A second biomass sample was collected on 19 June, approximately 24 hr after the treatments were applied, following the same procedure.

A visual efficacy rating (% control) was given by comparing the density and necrosis of weeds in the center of each plot to the 5-ft untreated area separating adjacent plots by three individuals independently at 1, 7, 14, 21, and 42 days after treatments were applied. A mean was computed from the three ratings each date by plot combination and recorded. Plot centers were marked by flags but otherwise not identified to minimize bias during the rating process. The lack of identifying plot treatments explains how the mean visual efficacy rating did not = 0 for most dates in weedy check plots (refer to Table 1).

It was observed, beginning approximately 7 days after the application of the treatments, that purslane was present at varying populations in plots; very few if any plants occurred in some plots while there appeared populations >4 plants/0.1-m² in the untreated border area separating plots, outside the study elsewhere in the field, and in at least one plot in each of the four blocks of treatments included in the study. This observation suggests varying levels of soil activity on this

weed species since no purslane was observed before or within a few days after the treatments were applied.

Above-ground crop and weed biomass samples were collected from a 0.25-m² area on 13 August. Biomass collection occurred as described earlier. Cool weather delayed grain harvest until 18 September, when grain yield was determined by harvesting the center 8.7-m² (93-ft²) area in each plot using a research harvester.

Data were analyzed using the PROC ANOVA procedure available from SAS. Results of the analyses are summarized in Tables 1 and 2.

Table 1. Pre-treatment application (PRE) and Post-treatment application (POST) weed biomass and visual weed ratings (percent visual weed control) at 1, 7, 14, 21, and 42 days after seeding (DAS) for six natural products at the North Dakota State University, Dickinson Research Extension Center in 2009.

Treatment	PRE			POST			Visual Weed Control					
	g/m ²			g/m ²			-%-					
	Grass	Broadleaf	Grass	Broadleaf	Grass	Broadleaf	1 DAS	7 DAS	14 DAS	21 DAS	42 DAS	
Green Match	70	5	65	0	39	26	39	26	40	27	39	
Matratec AG	43	3	16	3	23	29	23	29	33	27	26	
Matratec AG + Act90	38	19	13	3	28	33	28	33	37	35	38	
Racer	65	8	40	0	36	23	36	23	18	20	23	
Vinegar (20%)	30	11	8	0	49	44	49	44	59	68	52	
Weedy check	51	8	105	0	0	2	0	2	6	2	2	
Mean	42	8	35	1	25	22	25	22	28	26	26	
CV %	77	238	162	358	47	47	47	47	39	37	36	
P-value	0.68	0.48	0.32	0.6	0.003	0.006	0.003	0.006	0.0006	<0.0001	0.0002	
LSD (0.05)	NS	NS	NS	NS	21	19	21	19	19	17	16	

Table 2. Crop, grass weed (Grass), and broadleaf (Broadleaf) weed biomass, and hard red spring wheat grain yield following the application of six natural products at the North Dakota State University, Dickinson Research Extension Center in 2009.

Treatment	Rate ¹		Biomass (g/m ²)			Wheat grain yield	
	-%-	Rate	Crop	Grass	Broadleaf	kg/ha	Bu/acre
Green Match	14	487	32	65	1982	29	29
Matratec AG	8	404	83	41	1720	26	26
Matratec AG + Act90	8	397	85	43	1799	27	27
Racer	6	338	122	76	1717	26	26
Vinegar (20%)	100	464	150	29	1953	29	29
Weedy check	-	236	238	73	1238	18	18
Mean		332	101	47	1487	22	22
CV %		18	80	73	15.7	15.7	15.7
P-value		0.002	0.10	0.48	0.019	0.19	0.19
LSD (0.05)		108	NS	NS	411	6	6

¹Number indicates percent of total product (active ingredient plus inerts) in solution applied at a rate of 60 gallons per acre.

2009 Evaluation of Fall and Spring Applications of Pyroxulam for Downy Brome and Japanese Brome Control in Winter Wheat

Eric Eriksmoen, Hettinger, ND

‘Wesley’ HRWW was seeded on October 6, 2008. Fall treatments were applied on October 23 to one leaf winter wheat and to two leaf downy brome (dobr) with 45° F, 41% RH, clear sky and north wind at 7 mph. Spring treatments were applied on April 20 as the winter wheat was starting to green up and to 3 leaf downy brome and one leaf Japanese brome (jabr) with 60° F, 31% RH, partly cloudy sky and NW wind at 6 mph. Treatments were applied with a tractor mounted CO₂ propelled plot sprayer delivering 10 gpa at 30 psi through PK-01E80 nozzles to a 5 foot wide area the length of 10 by 28 foot plots. The trial was sprayed with 8 oz/A Starane + 16 oz/A Buctril to control broadleaf weeds on June 19. The trial was a randomized complete block design with four replications. Downy brome populations were greater than 50 plants per square foot and Japanese brome were inconsistently scattered throughout the trial. Plots were evaluated for crop injury on April 27 (data not shown), May 4 (data not shown), May 20 and May 27 and for brome control on April 21, May 20, May 27 and on July 21. The trial was not harvested due to hail damage on June 22 and again on June 24.

Treatment	Product rate	App. timing	4/21	-- May 20 --	-- May 27 --	-- July 21 --				
			dobr	inj. brome*	inj. brome*	dobr	jabr			
oz / acre		----- % -----								
1	GF-1274+Activator 90+AMS	3.5+0.5%+1.7kg	Fall	85	0	80	0	79	91	75
2	GF-1274+Activator 90+AMS	3.5+0.5%+1.7kg	Spg	0	0	82	0	82	91	60
3	Olympus + Activator 90	0.9 + 0.5%	Fall	89	0	82	0	88	94	72
4	Olympus + Activator 90	0.9 + 0.5%	Spg	0	10	95	5	98	97	97
5	Olympus Flex+Act. 90+AMS	3.17+0.5%+1.7kg	Fall	88	0	60	0	70	74	70
6	Olympus Flex+Act. 90+AMS	3.17+0.5%+1.7kg	Spg	0	0	88	0	90	92	92
7	Maverick + Activator 90	0.67 + 0.5%	Fall	62	0	80	0	84	82	84
8	Maverick + Activator 90	0.67 + 0.5%	Spg	0	0	64	0	66	55	68
9	Untreated	0		0	0	0	0	0	0	0
C.V. %				15	0	11	346	15	14	17
LSD 5%				8	1	11	3	16	15	17

* mixed downy and Japanese brome species.

Summary

The crop was seeded into dry soil causing delayed germination and emergence, however, winter survival and the spring stands were very good. Downy brome appeared to have more fall germination while the Japanese brome tended to have more spring germination. Crop injury was observed only on the spring applied Olympus treatment (trt 4). GF-1274 (trt 1) and Olympus (trt 3) were the only fall applied treatments to provide excellent season long downy brome control. The other fall applied treatments provided only moderate season long downy brome control. All of the fall applied treatments provided only moderate control of the spring emerging Japanese brome species. Olympus (trt 4) and Olympus Flex (trt 6) were the only spring applied treatments to provide excellent Japanese brome control.

NDSU Variable Rate Study: Procedures

The first step is to divide each field into management zones. You may make the zones yourself, or we can do it for you. If you prepare the zones, email the zoned fields to me. They can be in a shapefile, an image file or in any other proprietary format you normally use. We will add two 2-acre check plots inside each variable rate zone and return the maps to you.

If you want us to prepare the zones, email a description of the fields to me. You can send a legal description, shapefile, or other digital format of the field. We will prepare the zones using satellite imagery from previous years. We will normally use three zones. Please include what was grown on the fields in previous years so we know which time of the growing season would show the most crop growth. We will email the zoned field maps back to you.

The second step is to soil test each zone. Sample each zone separately. Have each zone analyzed separately, and have a composite sample analyzed. The composite sample analysis, a mixture of the zone samples, will be used to determine the fertilization rate for the check plots in each zone.

The third step is for you to select the crops and yield goals for each field. If you want assistance in this process please let me know. Our extension agronomists and soil scientist can provide consultation if you want it.

The fourth step is to determine the fertilizer rate for each zone, and for the check plots. I will send you NDSU's fertilizer recommendations for the crops you intend to plant. Again, if you want assistance in this step, our extension specialists are available.

Next spring after you apply the fertilizer and plant, please email the "as-applied" maps to me. I will use these maps in our analyses of the nitrogen efficiency and yield comparisons.

Harvest each field with a combine equipped with a yield monitor and GPS unit. After harvest, please email the yield maps for each field to me.

Finally, it will be useful if you would soil sample each zone after harvest so we will know the residual nitrogen after the crop growth.

These are the analyses we intend to do for each field at the end of the season:

Nitrogen Use Efficiency (for each variable rate zone and for the whole-field zone.)

1. Residual N before planting + applied N – residual N after planting = N used
2. N used / Yield = N require per bushel

Yield Comparison

1. Total bushels produced on the entire field.
2. Total bushels that would have been produced based on the whole-field check plots.

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