

*Twenty-Ninth Annual*

# **Western Dakota Crops Day Research Report 2012**

**Eric Eriksmoen, Agronomist**  
email: [eric.eriksmoen@ndsu.edu](mailto:eric.eriksmoen@ndsu.edu)

**Rick Olson, Ag. Technician**  
**Samantha Obrigewitch, Summer Tech**  
**Mariah Miller, Summer Tech**

**NDSU**

HETTINGER  
RESEARCH EXTENSION CENTER

# 29<sup>th</sup> Annual Western Dakota Crops Day

December 13, 2012

Hettinger Armory

MST

**9:00 am Registration**

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

**10:00 Early-bird 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

Roger Ashley, NDSU Area Extension Specialist/Cropping Systems, Dickinson

John Rickertsen, Extension Agronomist, SDSU West River Research Center, Rapid City

- Future Research Agronomist at the HREC

**12:00 Lunch**

Provided by Program Sponsors. Free time visit with sponsors.

**1:00 Ag Industry Update**

**1:30 Soil Salinity in Southwest North Dakota**

Dr. Abbey Wick, Extension Soil Health Assistant Professor, NDSU Soils Science Department

**2:15 Herbicide Resistant Weeds**

Greg Endres, Area Extension Specialist for Cropping Systems, NDSU Carrington REC

**3:00 Conclusion**

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

# Acknowledgments

The Hettinger Research Extension Center gratefully acknowledges and thanks 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.

## 2012 Western Dakota Crops Day Sponsors

Hettinger Area Chamber of Commerce	MinnDak Growers Ltd.
Seeds 2000 Inc.	Stone Mill Inc.
Farm Credit Services of Mandan	Southwest Grain
United Pulse Trading	Northern Pulse Growers Assoc.
North Dakota Soybean Council	Gartner Seed Farm
Dow AgroSciences	Howe Seeds Inc.
Proseed	SD Wheat Growers
North Dakota Barley Council	Alliance Ag Cooperative
Pulse USA, Inc.	

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.

Dr. Pat Carr and Glenn Martin, Dickinson Research Extension Center  
Roger Ashley, Dickinson Research Extension Center  
John Rickertsen, SDSU West River Ag Center, Rapid City  
Dr. Joel Ransom, NDSU, Fargo  
Justin Freitag, Scranton  
August and Perry Kirschmann, Regent  
Nick Vollmuth, Selfridge  
USDA – ARS Northern Great Plains Research Center, Mandan  
Lennis Erikson, Ralph, SD  
Keith Gietzen, Glen Ullin  
Pat Doll, Hannover  
Eric Eriksmoen, North Central Research Extension Center

# Table of Contents

Interpreting Statistical Analysis ..... 1

## Growing Conditions

Hettinger Weather Summary ..... 2  
Dickinson Weather Summary ..... 3

## Spring Wheat

ND Hard Red Spring Wheat Preliminary Variety Trial Results for 2012 and Selection Guide ..... 4  
Hettinger Hard Red Spring Wheat Variety Trial ..... 12  
Scranton Hard Red Spring Wheat Variety Trial ..... 13  
Regent Hard Red Spring Wheat Variety Trial ..... 14  
Dickinson Hard Red Spring Wheat Variety Trial ..... 15  
Hannover Hard Red Spring Wheat Variety Trail ..... 16  
Glen Ullin Hard Red Spring Wheat Variety Trail ..... 17  
Ralph, SD Hard Red Spring Wheat Variety Trial ..... 18  
Mandan Hard Red Spring Wheat Variety Trial ..... 19

## Winter Wheat

ND Hard Winter Wheat Variety Description ..... 20  
Hettinger Winter Wheat Variety Trial ..... 21  
Dickinson Winter Wheat Variety Trial ..... 22  
Mandan Winter Wheat Variety Trial ..... 23

## Durum

ND Durum Wheat Variety Trial Results for 2012 and Selection Guide ..... 24  
Hettinger Durum Variety Trial ..... 28  
Scranton Durum Variety Trial ..... 29

Regent Durum Variety Trial . . . . .	30
Dickinson Durum Variety Trial . . . . .	31
Hannover Durum Variety Trial . . . . .	32
Glen Ullin Durum Variety Trail . . . . .	33
Ralph, SD Durum Wheat Variety Trial . . . . .	34
Mandan Durum Variety Trial . . . . .	35

**Barley**

ND Barley Variety Descriptions . . . . .	36
Hettinger Barley Variety Trial . . . . .	37
Scranton Barley Variety Trial . . . . .	38
Regent Barley Variety Trial . . . . .	39
Dickinson Barley Variety Trial . . . . .	40
Hannover Barley Variety Trial . . . . .	41
Glen Ullin Barley Variety Trial . . . . .	42
Ralph, SD Spring Barley Variety Trial . . . . .	43
Mandan Barley Variety Trial . . . . .	44

**Oat**

ND Oat Variety Descriptions . . . . .	45
Hettinger Oat Variety Trial . . . . .	46
Dickinson Oat Variety Trail . . . . .	47
Mandan Oat Variety Trial . . . . .	48

**Winter Rye**

ND Winter Rye Variety Descriptions . . . . .	49
Hettinger Winter Rye Variety Trial . . . . .	50

**Oilseeds**

Safflower Variety Descriptions . . . . . 51  
Hettinger Safflower Variety Trial . . . . . 52  
ND Flax Variety Descriptions . . . . . 53  
Hettinger Flax Variety Trial . . . . . 54  
Hettinger Canola Variety Trial . . . . . 55

**Grain Legumes**

Hettinger Chickpea Variety Trial . . . . . 56  
Hettinger Lentil Variety Trial . . . . . 57  
Hettinger Clearfield Lentil Variety Trial . . . . . 58  
Dickinson Lentil Variety Trial . . . . . 59  
Hettinger Field Pea Variety Trial . . . . . 60  
Dickinson Field Pea Variety Trial . . . . . 61  
Hettinger Conventional Soybean Variety Trial . . . . . 62

**Weed Control & Fungicide Trial**

Grassy Weed Control with Spring Herbicide Applications in Winter Wheat . . . . . 63  
Prickly Lettuce Control in Pulse Crops with Lorox Applied in the Fall and Spring . . . . . 64  
Starane Flex and Tank Mixes Compared to Huskie in HRSW, Bowman, ND . . . . . 66  
2012 Foliar Fungicide Application on Hard Red Spring Wheat, Bowman, ND . . . . . 67

**Special Reports**

Nitrogen Rate Recalibration for Corn in North Dakota . . . . . 68  
Impact of Previous Crop on Barley Variety Performance, Dickinson Research Extension Center . . . . . 69  
Southwest North Dakota Cover Crop Demonstrations . . . . . 72

# 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 Briggs 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 2008 Hettinger HRSW variety trial was 8.7 meaning that there was an 8.7 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.

## Weather Data Summary - Hettinger

	<b>30°F</b>	<b>Normal 32°F</b>
Date of Last Frost	May 11	May 18
Date of First Frost	September 12	September 20
<b>Frost Free Days</b>	<b>125</b>	<b>125</b>

### Precipitation

Precipitation (inches)	2007 – 08	2008 - 09	2009 – 10	2010 – 11	2011-12	57 Year Average
Sept. – Dec.	1.26	6.23	4.66	4.80	0.69	3.31
Jan. – March	0.87	5.16	1.16	2.84	1.07	1.49
April	0.98	1.10	1.76	2.31	2.95	1.63
May	4.01	1.38	3.73	4.61	2.20	2.63
June	4.08	3.53	2.93	3.39	2.35	3.30
July	1.23	2.20	3.68	1.85	3.95	2.07
August	1.75	3.47	2.41	2.30	2.22	1.72
<b>Total</b>	<b>14.18</b>	<b>23.07</b>	<b>20.27</b>	<b>22.10</b>	<b>15.43</b>	<b>16.18</b>

### Air Temperature

Average Temp. F°	2008	2009	2010	2011	2012	57 Year Average
April	40.1	38.2	44.8	39.4	46.9	42.8
May	52.0	52.0	50.0	50.2	53.6	53.8
June	59.7	58.8	62.0	62.0	66.6	63.2
July	71.1	64.6	67.6	71.3	75.3	70.2
August	70.0	63.0	68.6	65.3	67.9	68.8
September	56.6	62.6	56.3	56.9	59.4	57.8



Table . 2012 Weather Summary for the Dickinson Research Extension Center, Dickinson, ND<sup>1</sup>.

Month	-----Maximum temp.-----		-----Minimum temp.-----		-----Precipitation -----		---Small grains GDD <sup>2</sup> ---		-----Corn GDD <sup>3</sup> -----	
	Long Term 1897 - 2011	Current Year	Long Term 1897 - 2011	Current Year	Long Term 1897 - 2011	Current year	Long Term 1897 - 2011	Current year	Long Term 1897 - 2011	Current year
	°F		°F		inches					
November - 11	40.0	45.3	16.9	18.4	0.50	0.02				
December - 11	27.7	35.1	5.7	16.1	0.41	0.27				
January	22.9	36.6	0.1	11.9	0.50	0.07				
February	27.0	34.3	3.8	12.2	0.41	0.17				
March	37.9	59.7	15.0	30.2	0.75	0.04				
April	54.6	60.5	28.4	33.9	1.32	1.69	342	486	252	283
May	66.1	67.8	39.2	41.1	2.34	1.93	644	698	382	487
June	75.0	79.4	49.0	52.6	3.56	2.20	900	1019	589	731
July	83.5	89.9	54.3	62.4	2.21	1.52	1147	1359	531	565
August	82.4	83.3	51.6	54.4	1.72	1.25	1086	1136	321	407
September	71.3	76.9	41.1	44.1	1.38	0.12	728	854		
October	57.6	52.2	30.0	31.6	0.96	1.63				
Mean	53.8	60.1	27.9	34.1						
Total					16.07	10.91	4848	5551	2075	2472
April -October Total					13.49	10.34				

<sup>1</sup>Current precipitation and long term precipitation values since 2010, Nov - Mar courtesy of Gary Ottmar, DREC Ranch, Manning, precipitation values April - October provided by North Dakota Agricultural Weather Network (NDAWN) station at Dickinson. Temperature values since 2010 are generated by the NDAWN station at Dickinson. Data compiled by Roger Ashley Area Extension Agronomist and Sheri Schneider, Information Processing Specialist.

<sup>2</sup> Small grains GDD, is growing degree days calculated with 95°F as the maximum temperature and 32°F as the base temperature.

<sup>3</sup> Corn GDD, is growing degree days calculated with 86°F as the maximum temperature and 50°F as the base temperature.

# North Dakota

## Hard Red Spring Wheat

### Preliminary Variety Trial Results for 2012 and Selection Guide

Joel Ransom, Mohamed Mergoum, Senay Simsek, Maricelis Acevedo, Tim Friesen, Marcia McMullen and Shaobin Zhong (NDSU Main Station); Rick Olson (Hettinger Research Extension Center) Eric Eriksmoen (North Central Research Extension Center, Minot); Bryan Hanson (Langdon Research Extension Center); Glenn Martin (Dickinson Research Extension Center); Gordon Bradbury (Williston Research Extension Center); Blaine Schatz (Carrington Research Extension Center)

Hard red spring (HRS) wheat was grown on 5.5 million acres in 2012, the same as 2011. The estimated average yield of spring wheat is 43 bushels/acre up significantly from the yield of 31.5 bu per acre recorded last year.

Barlow was the most popular HRS wheat variety in 2012, occupying 17.2 percent of the planted acreage, followed by Glenn (14.4 percent), Faller (13.1 percent), Vantage (5.5 percent), Brennan (4.9 percent), and RB07 (4.1 percent). Brennan was released by AgriPro; Vantage by WestBred; and RB07 by the University of Minnesota. All other varieties are NDSU releases.

Spring wheat was planted earlier this year than in the past several years due to a dry spring. Temperatures were above average in June and July which resulted in an early harvest. Though the growing season was dry, yields were relatively high, perhaps in part due to high levels of stored soil moisture and low disease pressure. Of the diseases only stripe rust in a few locations on varieties that were susceptible, was problematic.

Successful wheat production depends on numerous factors, including selecting the right variety for a particular area. The information included in this publication is meant to aid in selecting that variety or group of varieties. Characteristics to consider in selecting a variety may include yield potential, protein content when grown with proper fertility, straw strength, plant height, reaction to problematic pests (diseases, insects, etc.) and maturity. Every growing season differs; therefore, when selecting a variety, we recommend using data that summarize several years and locations. Choose the variety that, on average, performs the best at multiple locations near your farm during several years.

Selecting varieties with good milling and baking quality also is important to maintain market recognition and avoid discounts. Hard red spring wheat from the northern Great Plains is known around the world for its excellent end-use quality. Millers and bakers consider many factors in determining the quality and value of wheat they purchase. Several key parameters are: high test weight (for optimum milling yield and flour color), high falling number (greater than 300 seconds indicates minimal sprout damage), high protein content (the majority of HRS wheat export markets want at least 14 percent protein) and excellent protein quality (for superior bread-making quality as indicated by traditional strong gluten proteins, high baking absorption and large bread loaf volume).

Gluten strength, and milling and baking quality ratings, are provided for individual varieties in Tables 2 and 3, based on the results from the NDSU field plot variety trials. These ratings are applied to varieties grown for multiple years at seven NDSU Research Extension Centers across the state to provide producers and end users with end-use performance data. The wheat protein data often are higher than obtained in actual production fields but can be used to compare differences among varieties.

The agronomic data presented in this publication are from replicated research plots using experimental designs that enable the use of statistical analysis. These analyses enable the reader to determine, at a predetermined level of confidence, if the differences observed among varieties are reliable or if they might be due to error inherent in the experimental process.

The LSD (Least Significant Difference) values beneath the columns in the tables are derived from these statistical analyses and apply only to the numbers in the column in which they appear. If the difference between two varieties exceeds the LSD value, it means that with 90 percent confidence (LSD probability 0.10), the higher-yielding variety has a significant yield advantage. When the difference between two varieties is less than the LSD value, there is no significant difference between those two varieties under those growing conditions.

NS is used to indicate no significant difference for that trait among any of the varieties at the 90 percent level of confidence. The CV stands for coefficient of variation and is expressed as a percentage. The CV is a measure of variability in the trial. Large CVs mean a large amount of variation that could not be attributed to differences in the varieties.

Presentation of data for the entries tested does not imply approval or endorsement by the authors or agencies conducting the test. North Dakota State University approves the reproduction of any table in the publication only if no portion is deleted, appropriate footnotes are given and the order of the data is not rearranged. Additional data from county sites are available from each Research Extension Center at [www.ag.ndsu.edu/varietytrials/spring-wheat](http://www.ag.ndsu.edu/varietytrials/spring-wheat).

### **List of Tables**

- Table 1. North Dakota hard red spring wheat variety descriptions, agronomic traits, 2012.
- Table 2. Analytical milling and baking data from field plot variety trials at Carrington, Casselton, Dickinson, Hettinger, Langdon, Minot and Williston, 2010 and 2011 (unless otherwise noted).
- Table 3. Analytical milling and baking data from field plot variety trials at Dickinson, Hettinger, Langdon, Minot and Williston, 2011 (unless otherwise noted).
- Table 4. Yield of hard red spring wheat varieties grown at four locations in eastern North Dakota, 2010-2012.
- Table 5. Yield of hard red spring wheat varieties grown at four locations in western North Dakota, 2010-2012.
- Table 6. Protein at 12 percent moisture of hard red spring wheat varieties grown at eight locations in North Dakota, 2012.
- Table 7. Test weight of hard red spring wheat varieties grown at eight locations in North Dakota, 2012.

**Table 1. North Dakota hard red spring wheat variety descriptions, agronomic traits, 2012.**

Variety	Agent or Origin <sup>1</sup>	Year Released	Height (in)	Straw Strength <sup>2</sup>	Days to Head <sup>3</sup>	Reaction to Disease <sup>4</sup>			
						Stem Rust	Leaf Rust	Leaf Spot <sup>5</sup>	Head Scab
<b>Advance</b>	<b>SD</b>	<b>2012</b>	<b>32</b>	<b>6</b>	<b>64</b>	<b>MR</b>	<b>MR</b>	<b>NA</b>	<b>MS</b>
Agawam <sup>6</sup>	WestBred	2008	30	7	58	NA	MR/MS	NA	MS
Alpine <sup>7</sup>	AgriPro	2008	34	6	62	NA	S	MS	MS
Alsen	ND	2000	34	3	63	R	MR/MS	S	MR
Barlow	ND	2009	35	6	62	R	MR/MS <sup>9</sup>	MR	M
Blade	WestBred/Sabre	2007	33	4	64	R	MS <sup>9</sup>	MS	M
Breaker	WestBred	2007	34	3	64	R	MR/MS <sup>9</sup>	MS	M
Brennan	AgriPro	2009	30	4	62	R	MR	M	MS
Brick	SD	2009	35	5	60	R/MR	MR/MS	MS/S	MR
Briggs	SD	2002	35	7	61	R/MR	MR/MS	MS	S
Brogan	WestBred	2009	32	3	64	MR	MR/MS	MS	S
Choteau <sup>6</sup>	MT	2004	32	7	66	NA	MR/MS	NA	NA
Edge	WestBred/Sabre	2008	33	5	62	NA	S	MS	MS
<b>Elgin</b>	<b>ND</b>	<b>2012</b>	<b>36</b>	<b>5</b>	<b>65</b>	<b>R</b>	<b>M<sup>9</sup></b>	<b>NA</b>	<b>M</b>
Faller	ND	2007	35	5	65	R	S <sup>9</sup>	MR	M
<b>Forefront</b>	<b>SD</b>	<b>2012</b>	<b>37</b>	<b>5</b>	<b>61</b>	<b>MR</b>	<b>MR</b>	<b>NA</b>	<b>MR</b>
Freyr	AgriPro	2004	34	6	64	R	S	MS	MR
Glenn	ND	2005	37	4	61	R	MR/MS <sup>9</sup>	M	MR
LCS Hat Trick	Limagrain	2007	34	5	61	R	MR/MS	M	MS
Howard	ND	2006	36	7	63	R	MS <sup>9</sup>	M	M
Jenna	AgriPro	2009	32	4	66	R	MR/MS	M	M
Kelby	AgriPro	2006	30	4	62	MR	MR/MS <sup>9</sup>	M	M
Kuntz	AgriPro	2007	31	4	65	R	MS <sup>9</sup>	MS	M
LCS Albany	Limagrain	2008	32	5	67	MR	S	MS	M
LCS Breakaway	Limagrain	2011	32	5	63	NA	R	MS	M
LCS Powerplay	Limagrain	2011	33	5	65	NA	MR	MS	M
Mott <sup>6</sup>	ND	2009	36	3	66	MR	S <sup>9</sup>	MS	MS
ND 901CL PLUS <sup>8</sup>	ND	2010	36	4	60	R/MR	MR	NA	M
<b>Norden</b>	<b>MN</b>	<b>2012</b>	<b>32</b>	<b>3</b>	<b>6</b>	<b>R</b>	<b>R/MR</b>	<b>M</b>	<b>M</b>
Pivot	WestBred	2010	27	3	67	MS	S <sup>9</sup>	MR	S
Prosper	NDSU	2011	35	5	65	R	S <sup>9</sup>	M	M
RB07	MN	2007	32	5	62	R	R/MR <sup>9</sup>	MS	MR
Rollag	MN	2011	32	3	63	R	MS	MR	MR
Sabin	MN	2009	33	6	65	R	MR	MS	M
Samson	WestBred	2007	31	2	63	R	MR/MS	MS	S
Select	SD	2010	35	6	60	R/MR	R/MR	R/MR	MR
SY Soren	Syngenta/AgriPro	2011	30	4	63	R	MR	M	M
SY Tyra <sup>6</sup>	Syngenta/AgriPro	2011	31	5	62	R	MR	NA	S
SY605 CL <sup>8</sup>	AgriPro	2009	34	7	62	R/MR	MR/MS	MS	S
Tom	MN	2008	34	6	64	R	MR/MS	NA	M
Vantage	WestBred	2007	32	2	67	MR	MR/MS	MS	MS
Velva	NDSU	2012	35	4	63	R	MR/MS <sup>9</sup>	M	MS
WB Digger	WestBred	2009	34	6	63	MR	MR/MS	NA	MS
WB Mayville	Monsanto/WB	2011	30	4	63	R	MR/MS	MS	S

<sup>1</sup> Refers to agent or developer: MN = University of Minnesota; MT = Montana State University; ND = North Dakota State University; SD = South Dakota State University; Can. = varieties developed in Canada. **Bold** varieties are those recently released, so data is limited and rating values may change. NA indicates insufficient information is available to make an accurate assessment.

<sup>2</sup> Straw Strength = 1 to 9 scale, with 1 the strongest and 9 the weakest. These values are based on recent data and may change as more data become available.

<sup>3</sup> Days to Head = the number of days from planting to head emergence from the boot averaged from several locations in 2010 and 2011.

<sup>4</sup> R = resistant; MR = moderately resistant; M = intermediate; MS = moderately susceptible; S = susceptible; VS = very susceptible.

<sup>5</sup> Leaf spot refers to the leaf fungal diseases such as tan spot and septoria. It does not include bacterial leaf streak.

<sup>6</sup> Solid stemmed or semisolid stem, imparting resistance to sawfly.

<sup>7</sup> Hard white wheat.

<sup>8</sup> CL = refers to a Clearfield variety, with tolerance to Beyond™ family of herbicide.

<sup>9</sup> These lines were resistant to moderately resistant to races prevalent prior to 2011. Resistance may have been defeated by new races of the pathogen that was detected at low frequency in 2012 pathogen natural population.

**Table 2. Analytical milling and baking data from field plot variety trials at Carrington, Casselton, Dickinson, Hettinger, Langdon, Minot and Williston, 2010 and 2011 (unless otherwise noted).**

Variety	2012 Planted	Test Weight	Protein 12% MB	Vitreous Kernels	Falling Number	Farinograph Classification	Farinograph Stability	Farinograph Absorption	Loaf Volume	Gluten Strength	Mill & Bake Quality
	(% area)	(lb/bu)	(%)	(%)	(seconds)	(1-8) <sup>1</sup>	(minutes)	(%)	(cc)	Description	(1-5 Stars) <sup>2</sup>
Alsen	1.5	60.4	15.8	85	371	4.8	10.5	64.6	1040	Mellow	3
Barlow	17.2	61.0	14.8	80	376	4.6	10.1	66.4	996	Mellow	3
Brennan	4.9	60.3	14.6	68	390	4.1	8.4	64.4	982	Mellow	2
Brick	1.2	61.4	14.2	78	393	5.5	13.3	61.7	981	Trad. Strong	3
Briggs <sup>3</sup>	3.1	60.4	14.6	76	424	4.6	9.8	63.3	950	Mellow	2
Elgin	0.0	59.6	15.6	83	386	5.2	11.5	65.7	1009	Trad. Strong	3
Faller	13.1	59.1	14.3	69	382	4.6	10.3	63.2	994	Mellow	3
Freyr	2.2	59.2	14.7	74	416	4.9	11.4	64.3	999	Mellow	3
Glenn <sup>4</sup>	14.4	62.9	15.7	92	346	5.3	12.8	65.5	1057	Trad. Strong	5
Howard	1.7	60.5	15.1	77	376	4.6	9.6	64.7	1034	Mellow	4
Jenna	3.0	59.5	14.6	70	412	4.6	10.1	63.2	1018	Mellow	3
Kelby	2.6	60.5	15.2	64	400	4.3	8.8	64.1	982	Mellow	3
Mott <sup>3</sup>	3.1	60.5	15.0	80	349	4.9	10.7	63.2	976	Mellow	3
ND901CL+ <sup>3</sup>	0.0	59.9	16.1	81	354	5.4	13.1	64.9	1111	Trad. Strong	5
Prosper <sup>3</sup>	2.0	59.8	14.4	73	374	4.6	9.8	62.6	1006	Mellow	3
Select <sup>3</sup>	0.7	61.1	13.9	68	405	4.1	8.9	62.8	985	Mellow	3
Steele-ND	2.2	60.3	15.4	78	386	4.5	9.4	64.9	1065	Mellow	4
Velva	0.0	58.9	14.8	84	397	4.8	11.0	63.6	965	Mellow	2

Analyses conducted at the NDSU Hard Red Spring Wheat Quality Laboratory in Fargo, N.D.

For footnotes, see bottom of Table 3.

**Table 3. Analytical milling and baking data from field plot variety trials at Dickinson, Hettinger, Langdon, Minot and Williston, 2011 (unless otherwise noted).**

Variety	2012 N.D. Planted	Test Weight	Protein 12% MB	Vitreous Kernels	Falling Number	Farinograph Classification	Farinograph Stability	Farinograph Absorption	Loaf Volume	Gluten Strength	Mill & Bake Quality
	(% area)	(lb/bu)	(%)	(%)	(seconds)	(1-8) <sup>1</sup>	(minutes)	(%)	(cc)	Description	(1-5) <sup>2</sup>
Alsen	1.5	59.7	16.7	87	366	5.0	11.1	65.0	1083	Mellow	3
Barlow	17.2	60.0	16.0	88	375	5.2	11.2	67.5	1045	Mellow	3
Brennan	4.9	59.3	15.8	72	373	4.4	9.1	64.2	1023	Mellow	2
Brick	1.2	60.5	15.1	81	383	6.0	16.1	61.2	1028	Trad. Strong	3
Briggs <sup>3</sup>	3.1	59.1	15.6	79	405	4.8	10.6	63.3	980	Mellow	2
Choteau <sup>3</sup>	0.0	56.2	16.6	83	404	5.5	12.1	63.1	1051	Mellow	2
Elgin	0.0	58.2	16.6	85	391	5.2	12.1	67.0	1003	Mellow	3
Faller	13.1	58.3	15.4	73	396	5.4	11.7	64.6	1039	Mellow	3
Freyr	2.2	57.9	16.0	75	405	5.2	12.3	64.4	1060	Mellow	3
Glenn <sup>4</sup>	14.4	62.3	16.5	92	342	5.6	14.3	66.8	1125	Trad. Strong	5
Howard	1.7	59.4	16.0	79	377	5.0	10.2	65.4	1097	Mellow	3
Jenna	3.0	58.2	16.1	75	374	5.0	11.4	63.6	1057	Mellow	3
Kelby	2.6	59.2	16.2	68	379	4.4	9.5	64.0	1024	Mellow	2
Mott <sup>3</sup>	3.1	59.4	17.1	89	354	5.5	12.4	65.2	1015	Mellow	2
ND901CL+ <sup>3</sup>	0.0	58.5	17.3	91	350	6.3	15.9	66.1	1186	Trad. Strong	4
Prosper <sup>3</sup>	2.0	59.0	15.3	82	379	5.3	11.0	62.8	1104	Mellow	3
RB 07	4.1	58.7	15.8	71	376	5.6	16.9	62.0	1111	Trad. Strong	4
Sabin <sup>3</sup>	0.0	59.5	15.7	81	407	4.8	10.8	64.0	1010	Mellow	3
Select	0.7	60.3	14.9	74	404	4.4	10.1	62.4	1027	Mellow	3
Steele-ND	2.2	59.6	16.0	80	394	4.6	9.7	65.3	1104	Mellow	3
SY Soren <sup>3</sup>	2.0	59.1	16.5	81	365	5.8	14.5	64.0	1101	Trad. Strong	3
Vantage <sup>3</sup>	5.5	60.9	17.0	84	317	6.5	22.4	64.3	1090	Trad. Strong	3
Velva	0.0	58.1	15.8	89	368	5.8	13.9	65.1	1022	Trad. Strong	2
WB Mayville <sup>3</sup>	0.7	58.1	16.2	82	377	4.8	10.0	65.7	1044	Mellow	2

Analyses conducted at the NDSU Hard Red Spring Wheat Quality Laboratory in Fargo, N.D.

<sup>1</sup> Scale 1 to 8, where 1 = weak and 8 = very strong dough-mixing properties. Farinograph properties affected by growing conditions, so compare varieties.

<sup>2</sup> Mill and Bake Quality Rating scale 1 to 5, with 1 being low and 5 being superior.

<sup>3</sup> Varieties were not tested at all locations.

<sup>4</sup> Glenn is the current Wheat Quality Council check variety for comparing new experimental lines and newly released varieties.

**Table 4. Yield of hard red spring wheat varieties grown at four locations in eastern North Dakota, 2010-2012.**

Variety	<u>Carrington</u>		<u>Casselton</u>		<u>Prosper</u>		<u>Langdon</u>		<u>Avg. eastern N.D.</u>	
	2012	2 Yr.	2012	2 Yr.	2012	2 Yr.	2012	3 Yr.	2012	2/3 Yr.
	------(bu/a)-----									
Advance	41.5	--	66.8	--	55.0	--	81.0	--	61.1	--
Alpine	45.4	63.2	73.2	74.1	57.0	57.3	79.1	72.8	63.7	66.9
Alsen	45.1	62.3	60.4	58.2	48.6	52.1	67.7	66.6	55.5	59.8
Barlow	50.2	69.6	63.0	67.1	47.6	56.9	72.0	74.2	58.2	67.0
Breaker	44.7	62.0	64.6	66.9	53.4	59.1	75.2	76.8	59.5	66.2
Brennan	52.1	69.9	61.9	62.6	50.2	54.6	69.6	68.5	58.5	63.9
Brick	51.5	68.4	58.8	68.0	49.1	56.1	75.8	75.7	58.8	67.1
Briggs	50.4	68.1	66.9	68.5	51.0	57.1	71.0	73.6	59.8	66.8
Choteau	38.7	--	54.2	--	41.7	--	--	--	--	--
Edge	41.0	--	69.1	73.3	52.8	55.2	72.2	--	58.8	--
Elgin	51.8	--	66.3	72.7	55.9	--	76.4	78.9	62.6	--
Faller	48.8	67.9	65.2	--	54.6	65.6	85.1	85.4	63.4	--
Forefront	53.6	--	62.8	--	59.5	--	77.5	--	63.4	--
Freyr	44.5	64.4	63.2	66.0	52.0	54.0	76.7	73.3	59.1	64.4
Glenn	45.9	64.8	47.8	53.3	58.1	60.8	68.3	67.6	55.0	61.6
Howard	52.7	67.8	64.6	65.2	50.6	57.6	73.6	75.8	60.4	66.6
Jenna	51.3	68.6	70.0	73.5	56.8	58.3	74.2	76.3	63.1	69.2
Kelby	44.1	64.7	61.5	58.9	56.9	55.1	68.9	68.6	57.9	61.8
Knudson	41.0	62.0	63.4	61.2	48.7	56.6	--	--	--	--
LCS Albany	43.0	--	--	--	--	--	78.6	80.4	--	--
LCS Breakaway	41.2	--	--	--	--	--	75.7	--	--	--
LCS Powerplay	42.1	--	--	--	--	--	75.4	71.0	--	--
Mott	44.5	62.4	60.8	67.8	45.9	51.7	--	--	--	--
ND 901CL	45.6	62.1	52.8	60.2	51.3	53.6	--	--	--	--
Norden	45.2	--	68.3	--	49.5	--	72.6	72.3	58.9	--
Prosper	45.4	--	65.0	--	58.8	--	83.7	85.0	63.2	--
RB07	48.2	64.6	62.0	68.4	55.9	58.9	73.6	74.2	59.9	66.5
Reeder	45.0	62.5	66.5	67.9	51.9	53.5	--	--	--	--
Rollag	50.2	--	59.6	--	52.0	--	70.2	69.9	58.0	--
Sabin	53.6	68.8	66.4	69.8	54.3	56.0	--	--	--	--
Samson	45.3	65.0	75.9	76.4	51.2	60.6	71.5	71.6	61.0	68.4
Select	50.8	70.1	66.3	69.9	40.4	51.5	78.2	75.7	58.9	66.8
Steele-ND	50.0	65.9	63.9	64.0	52.8	56.7	73.0	75.5	59.9	65.5
SY605 CL	38.3	61.7	59.9	66.1	55.3	58.6	--	--	--	--
SY Soren	48.2	--	71.8	--	56.1	--	71.2	--	61.8	--
SY Tyra	32.8	--	63.8	--	44.7	--	--	--	--	--
Vantage	45.1	61.5	59.7	67.5	38.8	47.6	66.6	67.6	52.6	61.1
Velva	37.7	--	64.5	--	47.1	--	72.2	71.8	55.4	--
WB Digger	48.0	65.5	70.5	73.8	55.0	57.5	79.6	75.3	63.3	68.0
WB Gunnison	34.0	--	54.7	--	40.5	--	--	--	--	--
WB Mayville	39.7	--	59.3	--	47.9	--	70.2	--	54.3	--
Mean	45.7	65.3	62.2	67.0	50.1	56.4	75.2	74.0	59.5	65.4
CV%	10.6	--	7.9	--	12.7	--	3.8	--	--	--
LSD 0.10	5.7	--	5.8	--	7.4	--	3.3	--	--	--

**Table 5. Yield of hard red spring wheat varieties grown at four locations in western North Dakota, 2010-2012.**

Variety	<u>Dickinson</u>		<u>Hettinger</u>		<u>Minot</u>		<u>Williston</u>		<u>Avg. western N.D.</u>	
	2012	3 Yr.	2012	3 Yr.	2012	3 Yr.	2012	3 Yr.	2012	3 Yr.
	------(bu/a)-----									
Advance	71.1	--	84.9	--	55.5	--	32.6	--	61.0	--
Alpine	71.8	--	84.4	--	36.4	--	36.3	37.6	57.2	--
Alsen	68.1	58.4	--	--	50.7	43.7	34.4	32.9	--	--
Barlow	78.6	66.1	71.5	62.0	50.8	47.7	36.8	37.9	59.4	53.4
Breaker	68.3	61.2	76.2	65.6	52.1	46.3	34.6	33.7	57.8	51.7
Brennan	72.8	62.7	79.9	68.2	48.1	45.4	38.1	37.5	59.7	53.5
Brick	--	--	--	--	32.2	43.0	32.4	31.5	--	--
Briggs	--	--	75.3	59.0	27.0	38.3	33.6	33.4	--	--
Choteau	78.0	62.5	--	--	46.5	42.4	32.1	32.3	--	--
Edge	69.5	60.6	74.5	66.6	50.0	41.1	34.5	35.9	57.1	51.1
Elgin	69.5	62.4	77.0	66.8	38.2	46.8	34.9	--	54.9	--
Faller	76.5	58.4	68.8	58.5	47.4	47.5	30.5	32.7	55.8	49.3
Forefront	68.8	--	75.7	--	43.4	--	39.2	--	56.8	--
Glenn	77.8	62.0	71.4	57.8	46.3	--	34.5	33.6	57.5	--
Howard	73.4	61.1	73.0	63.8	51.1	--	31.8	32.8	57.3	--
Jenna	76.9	66.0	72.0	64.8	36.2	43.0	34.9	36.5	55.0	52.6
Kelby	65.5	58.4	78.4	65.2	48.7	--	37.3	37.4	57.5	--
LCS Albany	72.6	--	--	--	46.9	50.2	33.3	33.7	--	--
LCS Breakaway	70.1	--	--	--	51.3	--	33.5	--	--	--
LCS Powerplay	75.2	--	--	--	52.6	--	35.1	--	--	--
Mott	67.3	53.7	73.2	60.8	47.4	41.7	29.3	30.9	54.3	46.8
ND 901CL	69.8	55.4	69.0	61.5	43.1	42.3	32.6	33.6	53.6	48.2
Norden	69.9	62.6	76.5	--	57.8	49.5	34.9	--	59.8	--
Prosper	68.0	58.4	76.6	64.9	44.2	--	30.7	31.5	54.9	--
RB07	75.3	61.3	79.5	59.6	46.4	44.7	39.0	38.0	60.1	50.9
Reeder	--	--	73.0	69.5	45.9	--	36.9	38.8	--	--
Rollag	68.2	--	80.4	--	51.0	--	36.0	36.0	58.9	--
Sabin	67.0	61.6	82.7	74.3	--	--	--	--	--	--
Samson	71.9	62.0	79.2	65.5	40.7	--	37.1	--	57.2	--
Select	63.6	57.8	73.1	64.2	58.7	51.1	34.7	35.1	57.5	52.1
Steele-ND	71.1	59.8	72.2	63.2	50.0	--	32.4	34.5	56.4	--
SY605 CL	78.0	--	80.3	67.4	37.8	--	33.9	--	57.5	--
SY Soren	68.0	--	82.2	--	36.4	--	37.7	--	56.1	--
SY Tyra	70.2	--	82.5	--	47.4	--	34.7	--	58.7	--
Vantage	63.3	54.5	67.6	57.6	44.9	43.0	31.1	31.5	51.7	46.7
Velva	78.3	60.6	79.1	68.5	50.6	48.8	35.2	36.6	60.8	53.6
WB Digger	73.7	62.9	83.5	67.5	34.5	37.5	37.7	37.8	57.4	51.4
WB Gunnison	66.7	--	70.3	--	37.6	--	34.5	--	57.2	--
WB Mayville	71.4	--	76.6	--	42.8	--	36.1	--	56.7	--
Mean	71.3	60.4	76.4	64.3	45.7	44.7	34.6	34.8	57.0	51.0
CV %	8.4	--	4.6	--	8.2	--	6.5	--	--	--
LSD 0.10	6.9	--	4.1	--	4.5	--	2.6	--	--	--

**Table 6. Protein at 12 percent moisture of hard red spring wheat varieties grown at eight locations in North Dakota, 2012.**

Variety	Carrington	Casselton	Prosper	Dickinson	Hettinger	Langdon	Minot	Williston	State Avg.
	------(%)-----								
Advance	14.2	14.4	15.1	15.2	14.2	12.1	14.4	15.3	14.4
Alpine	14.5	13.5	15.4	--	15.3	11.6	15.2	14.3	--
Alsen	16.2	15.2	15.8	16.0	--	12.4	16.3	14.9	--
Barlow	15.4	14.4	16.0	16.3	16.4	12.7	16.0	14.3	15.2
Breaker	15.3	14.2	15.4	16.3	16.3	12.1	15.6	15.3	15.1
Brennan	14.7	16.1	16.4	16.0	15.9	12.5	15.5	15.5	15.3
Brick	14.3	15.6	15.6	--	--	11.2	15.1	14.7	--
Briggs	14.7	15.0	15.8	--	15.8	12.5	15.3	15.5	--
Choteau	15.0	14.7	15.7	15.7	--	--	16.4	15.5	--
Edge	15.2	15.6	15.6	16.5	16.8	11.9	15.3	15.3	15.3
Elgin	15.4	14.1	15.8	16.8	16.3	12.0	15.5	15.0	15.1
Faller	14.4	13.8	15.2	15.5	15.7	11.3	14.5	14.9	14.4
Forefront	15.0	15.0	15.5	15.9	15.7	11.4	15.4	14.6	14.8
Freyr	15.5	14.4	15.8	--	--	12.0	15.7	15.9	--
Glenn	15.5	15.3	15.8	16.3	16.7	13.1	16.0	15.0	15.5
Howard	14.9	14.8	15.5	16.1	15.0	12.5	15.7	14.9	14.9
Jenna	15.4	14.4	15.8	15.7	16.5	12.3	15.5	15.2	15.1
Kelby	15.2	16.2	16.1	16.0	16.0	12.6	16.2	15.2	15.4
Knudson	14.4	14.5	15.1	--	--	--	--	15.5	--
LCS Albany	14.5	--	--	15.0	--	--	15.7	15.6	--
LCS Breakaway	15.8	--	--	15.7	--	--	16.0	15.7	--
LCS Powerplay	14.9	--	--	14.9	--	--	15.4	14.6	--
Mott	15.6	14.7	16.1	16.6	16.5	--	15.7	16.5	--
ND 901CL	16.8	16.1	16.2	17.5	17.2	--	17.3	15.7	--
Norden	15.0	--	15.4	15.9	15.3	12.1	15.3	14.5	--
Prosper	14.6	13.9	14.9	15.7	15.6	11.2	14.8	15.1	14.5
RB07	14.8	14.6	15.1	15.3	16.0	12.3	15.4	14.4	14.7
Reeder	15.4	14.9	15.7	--	16.6	--	15.7	15.3	--
Rollag	16.7	16.5	16.0	16.1	16.5	12.6	16.7	15.7	15.9
Sabin	14.9	14.5	16.0	15.8	15.1	--	--	--	--
Samson	15.5	14.0	15.2	16.2	16.0	12.6	15.8	15.1	15.1
Select	14.6	16.0	15.3	15.8	15.3	11.7	15.6	15.3	15.0
Steele-ND	15.5	14.8	15.9	17.0	16.7	12.4	16.4	15.4	15.5
SY605 CL	14.7	15.5	15.9	16.0	16.2	--	16.0	15.6	--
SY Soren	15.8	15.7	15.7	16.1	15.8	12.4	--	15.1	--
SY Tyra	15.6	13.5	15.0	15.3	15.1	--	--	15.3	--
Vantage	17.1	16.3	17.2	18.2	17.7	13.0	17.3	16.7	16.7
Velva	15.1	13.6	15.7	14.9	15.7	12.1	15.0	15.0	14.6
WB Digger	14.7	14.1	15.0	15.4	15.7	11.8	15.1	14.7	14.6
WB Gunnison	14.5	14.9	15.6	15.1	15.0	--	15.3	15.2	--
WB Mayville	16.3	16.2	16.1	16.3	16.2	12.9	15.8	15.3	15.6
Mean	15.2	14.9	15.7	16.0	16.0	12.2	15.7	15.2	15.1
CV %	3.1	4.1	3.2	2.4	1.9	3.5	3.5	3.6	--
LSD 0.10	0.6	0.7	0.6	0.7	0.4	0.5	1.7	0.9	--



**Table 7. Test weight of hard red spring wheat varieties grown at eight locations in North Dakota, 2012.**

Variety	Carrington	Casselton	Prosper	Dickinson	Hettinger	Langdon	Minot	Williston	State Avg.
------(lb/bu)-----									
Advance	58.4	64.0	60.9	61.3	62.0	60.1	58.1	56.0	60.1
Alpine	57.2	62.6	59.8	60.0	58.4	59.0	58.1	56.1	58.9
Alsen	58.3	63.0	60.4	61.8	--	60.1	57.9	56.3	--
Barlow	58.9	63.6	60.2	60.8	59.8	60.3	58.2	57.4	59.9
Breaker	59.7	64.8	61.5	62.3	60.6	61.3	57.9	58.1	60.8
Brennan	59.3	62.8	60.5	61.3	61.0	59.6	58.1	58.1	60.1
Brick	60.9	63.9	62.0	--	--	60.6	58.1	58.0	--
Briggs	59.9	62.4	59.5	--	59.8	59.3	58.0	56.0	--
Choteau	57.5	61.7	59.1	60.8	--	--	58.1	55.4	--
Cromwell	--	--	--	--	--	60.7	--	--	--
Edge	55.9	62.2	59.6	59.3	58.8	57.8	58.0	55.5	58.4
Elgin	57.1	61.6	59.0	59.0	58.8	59.2	58.3	54.8	58.5
Faller	55.6	61.9	58.8	59.0	58.2	59.4	57.9	52.8	58.0
Forefront	60.4	62.1	61.2	61.5	60.0	60.6	57.9	57.6	60.2
Freyr	56.9	62.7	59.6	--	--	59.5	58.0	55.5	--
Glenn	61.8	64.9	61.5	60.3	61.6	62.6	58.3	59.0	61.3
Howard	57.7	62.7	59.7	59.5	61.2	59.2	58.1	54.2	59.0
Jenna	57.6	61.8	58.9	60.3	58.5	58.4	58.2	54.0	58.5
Kelby	58.6	62.7	60.5	61.3	61.2	59.8	57.9	58.7	60.1
Knudson	57.1	62.1	60.0	--	--	--	--	55.7	--
LCS Albany	57.2	--	--	58.5	--	58.8	58.1	54.5	--
LCS Breakaway	59.5	--	--	62.0	--	61.4	58.0	57.1	--
LCS Powerplay	56.8	--	--	61.0	--	59.6	58.0	55.1	--
Mott	59.1	62.1	60.0	60.0	59.7	--	58.0	55.5	--
ND 901CL	59.9	62.0	60.2	61.0	60.3	--	58.0	57.4	--
Norden	58.6	63.4	61.1	61.3	60.5	61.3	58.1	56.5	60.1
Prosper	55.6	62.2	59.5	58.5	59.8	59.7	58.1	53.7	58.4
RB07	58.6	61.6	60.1	60.5	59.9	58.8	58.0	57.7	59.4
Reeder	57.4	62.2	59.6	--	58.2	--	57.9	56.0	--
Rollag	58.4	62.9	60.9	61.0	61.1	60.0	57.9	55.1	59.7
Sabin	59.2	61.7	59.7	60.0	60.9	--	--	--	--
Samson	57.2	61.5	58.9	60.5	59.1	60.1	57.9	56.2	58.9
Select	60.0	63.9	60.6	61.5	60.6	60.4	58.2	56.8	60.3
Steele-ND	58.4	63.0	60.0	62.0	59.2	59.4	57.8	54.5	59.3
SY605 CL	55.3	63.3	60.3	62.0	61.1	--	57.9	55.8	--
SY Soren	56.7	62.6	59.9	59.5	60.2	59.9	57.9	56.0	59.1
SY Tyra	53.4	64.3	59.2	59.8	56.0	--	58.0	56.8	--
Vantage	59.5	63.4	60.4	61.5	60.4	61.4	58.1	58.6	60.4
Velva	52.8	62.5	56.7	58.5	57.6	59.2	58.2	54.8	57.5
WB Digger	57.3	62.6	58.4	59.0	59.3	59.8	57.8	54.9	58.6
WB Gunnison	55.8	63.1	59.5	60.0	59.7	--	58.2	55.6	--
WB Mayville	56.3	63.3	60.4	59.8	59.3	59.9	58.1	56.5	59.2
Mean	57.8	62.8	60.0	60.5	59.8	59.9	58.0	56.1	59.4
CV %	1.7	0.6	1.1	1.0	1.3	0.6	0.9	0.7	--
LSD 0.10	1.2	0.4	0.8	1.0	0.9	0.4	0.6	0.7	--

**2012 Hard Red Spring Wheat Variety Trial at Hettinger**

Variety	Days to	Plant	Test	Grain	----- Grain Yield -----			Average Yield	
	Head	Height	Weight	Protein	2010	2011	2012	2 yr	3 yr
	*	inches	lbs/bu	%	----- Bushels per acre -----				
Sabin	78	33	60.9	15.1	92.7	47.5	82.7	65.1	74.3
Reeder	78	37	58.2	16.6	86.1	49.4	73.0	61.2	69.5
Velva	78	37	57.6	15.7	77.4	49.0	79.1	64.0	68.5
Brennan	75	32	61.0	15.9	74.7	49.9	79.9	64.9	68.2
WB Digger	76	37	59.3	15.7	80.3	38.6	83.5	61.0	67.5
SY 605 CL	75	36	61.1	16.2	70.2	51.7	80.3	66.0	67.4
Elgin	77	39	58.8	16.3	73.2	50.1	77.0	63.6	66.8
Edge	77	34	58.8	16.8	76.9	48.5	74.5	61.5	66.6
Breaker	78	37	60.6	16.3	76.3	44.2	76.2	60.2	65.6
Samson	76	31	59.1	16.0	64.0	53.2	79.2	66.2	65.5
Kelby	76	33	61.2	16.0	67.2	49.9	78.4	64.2	65.2
Prosper	82	37	59.8	15.6	78.2	40.0	76.6	58.3	64.9
Jenna	76	38	58.5	16.5	73.4	48.9	72.0	60.4	64.8
Select	75	34	60.6	15.3	74.9	44.7	73.1	58.9	64.2
Howard	75	35	61.2	15.0	72.2	46.1	73.0	59.6	63.8
Steele-ND	77	38	59.2	16.7	78.9	38.6	72.2	55.4	63.2
Barlow	76	38	59.8	16.4	68.9	45.5	71.5	58.5	62.0
ND 901CL	78	37	60.3	17.2	76.5	38.9	69.0	54.0	61.5
Mott	82	38	59.7	16.5	70.0	39.3	73.2	56.2	60.8
RB07	75	34	59.9	16.0	63.6	35.8	79.5	57.6	59.6
Briggs	82	35	59.8	15.8	58.4	43.3	75.3	59.3	59.0
Faller	81	35	58.2	15.7	68.8	38.0	68.8	53.4	58.5
Glenn	75	38	61.6	16.7	62.5	39.5	71.4	55.4	57.8
Vantage	82	35	60.4	17.7	67.4	37.8	67.6	52.7	57.6
SY Soren	77	33	60.2	15.8		48.8	82.2	65.5	
Advance	77	34	62.0	14.2		44.0	84.9	64.4	
Forefront	75	38	60.0	15.7		46.0	75.7	60.8	
SY Tyra	78	32	56.0	15.1		37.0	82.5	60.8	
WB Mayville	77	33	59.3	16.2		41.6	76.6	59.1	
Rollag	76	35	61.1	16.5		35.2	80.4	57.8	
WB Gunnison	75	34	59.7	15.0		30.3	70.3	50.3	
Alpine	78	36	58.4	15.3			84.4		
Duclair	75	36	57.8	15.3			77.0		
Norden	78	34	60.5	15.3			76.5		
Trial Mean	77	36	59.7	16.0	75.4	42.1	75.9	--	--
C.V. %	0.9	3.6	1.3	1.9	6.6	6.6	4.6	--	--
LSD 10%	1	2	0.9	0.4	5.4	3.5	4.1	--	--

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

Planting Date: March 28

Harvest Date: July 25

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

Previous Crop: 2009 & 2011 = field pea, 2010 = HRSW.

**2012 Hard Red Spring Wheat Variety Trial at Scranton**

Cooperator: Justin Freitag, Scranton

Variety	Plant	Test	Grain	----- Grain Yield -----			Average Yield		
	Height	Weight	Protein	2010	2011	2012	2 yr	3 yr	
	inches	lbs/bu	%	----- Bushels per acre -----					
RB07	33	60.0	14.7	62.6	33.0	51.3	42.2	49.0	
Velva	37	55.5	14.6	58.7	31.5	50.1	40.8	46.8	
Glenn	40	58.5	16.4	60.5	27.8	50.7	39.2	46.3	
Mott	39	56.8	16.5	61.3	34.3	43.3	38.8	46.3	
Barlow	39	56.6	16.5	54.4	34.5	48.9	41.7	45.9	
Steele-ND	37	53.9	15.1	55.6	30.1	46.0	38.0	43.9	
Faller	37	51.8	15.7	59.9	28.0	41.1	34.6	43.0	
Sabin	37	57.8	15.5		35.5	49.4	42.4		
SY Soren	33	57.2	16.1		29.7	53.1	41.4		
Select	38	57.7	13.9		29.9	51.2	40.6		
Prosper	37	53.4	14.9		28.9	44.0	36.4		
Elgin	40	57.9	13.9			58.2			
Trial Mean	37	56.6	15.4	58.2	28.7	49.3	--	--	
C.V. %	2.7	2.6	5.1	5.2	5.2	5.8	--	--	
LSD 10%	1	1.8	0.9	3.4	1.6	3.4	--	--	

Planting Date: April 4

Harvest Date: July 30

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

Previous Crop: HRSW

Note: The 2011 trial sustained moderate infections of bacterial leaf streak and barley yellow dwarf causing lower test weights and grain yields.

**2012 Hard Red Spring Wheat Variety Trial at Regent**

Cooperators: August and Perry Kirschmann, Regent

Variety	Plant	Test	Grain	----- Grain Yield -----			Average Yield		
	Height	Weight	Protein	2010	2011	2012	2 yr	3 yr	
	inches	lbs/bu	%	----- Bushels per acre -----					
RB07	33	60.0	14.7	47.6	35.2	53.6	44.4	45.5	
Velva	37	55.5	14.6	49.3	34.9	52.4	43.6	45.5	
Mott	39	56.8	17.5	51.5	33.8	45.2	39.5	43.5	
Barlow	39	56.6	16.5	47.3	30.4	51.1	40.8	42.9	
Glenn	40	58.5	16.4	48.3	27.0	53.0	40.0	42.8	
Steele-ND	37	53.9	15.1	49.2	30.8	48.1	39.4	42.7	
Faller	37	51.8	15.7	48.0	34.3	43.0	38.6	41.8	
SY Soren	33	57.2	16.1		34.8	55.5	45.2		
Select	38	57.7	13.9		35.4	53.5	44.4		
Sabin	37	57.8	15.5		32.7	51.6	42.2		
Prosper	37	53.4	14.9		30.0	46.0	38.0		
Elgin	40	57.9	13.9			60.9			
Trial Mean	37	56.6	15.4	48.2	31.2	51.5	--	--	
C.V. %	2.7	0.8	5.1	6.0	5.4	5.8	--	--	
LSD 10%	1	1.8	0.9	3.1	1.8	3.5	--	--	

Planting Date: April 4

Harvest Date: July 31

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

Previous Crop: HRSW

Note: The 2011 trial sustained moderate infections of bacterial leaf streak and barley yellow dwarf causing lower test weights and grain yields.

Variety	Days	Seeds	Plant	Test	Protein	----- Grain Yield-----			Returns <sup>1</sup>	----- Average Yield -----	
	to	per				2010	2011	2012		2	3
	Head	Pound	Height	Weight	%	-----bu/ac-----			\$/ac	Year	Year
			in	lbs/bu						bu/ac	bu/ac
Advance	75	16,391	30	61.3	15.2	--	--	71.1	407.51	--	--
Alsen	76	15,004	31	61.8	16.0	52.8	54.3	68.1	384.83	61.2	58.4
Barlow	74	15,017	33	60.8	16.3	59.2	60.7	78.6	474.83	69.6	66.1
Breaker	77	14,960	30	62.3	16.3	55.3	60.0	68.3	387.40	64.1	61.2
Brennan	74	15,805	28	61.3	16.0	59.4	55.7	72.8	425.14	64.3	62.7
Choteau	76	14,300	31	60.8	15.7	60.1	49.5	78.0	467.86	63.8	62.5
Edge	76	15,351	30	59.3	16.5	57.1	55.1	69.5	398.41	62.3	60.6
Elgin	79	15,569	33	59.0	16.8	58.5	59.4	69.5	398.61	64.4	62.4
Faller	79	13,669	32	59.0	15.5	50.2	48.6	76.5	454.29	62.6	58.4
Forefront	74	14,834	34	61.5	15.9	--	--	68.8	390.30	--	--
Glenn	76	14,067	33	60.3	16.3	47.6	60.7	77.8	468.53	69.2	62.0
Howard	77	14,441	31	59.5	16.1	57.0	53.0	73.4	429.74	63.2	61.1
Jenna	78	14,240	30	60.3	15.7	60.5	60.6	76.9	458.43	68.8	66.0
Kelby	74	16,383	28	61.3	16.0	55.8	54.0	65.5	362.45	59.7	58.4
LCS Albany	79	18,827	30	58.5	15.0	--	--	72.6	419.06	--	--
LCS Breakaway	74	15,080	28	62.0	15.7	--	--	70.1	400.64	--	--
LCS Powerplay	75	15,036	30	61.0	14.9	--	55.0	75.2	440.72	65.1	--
Mott	78	16,537	33	60.0	16.6	41.0	52.8	67.3	379.40	60.0	53.7
ND901CL	77	14,361	33	61.0	17.5	46.7	49.6	69.8	402.50	59.7	55.4
Norden	77	14,603	30	61.3	15.9	59.6	58.3	69.9	399.45	64.1	62.6
Prosper	79	13,963	31	58.5	15.7	51.4	55.8	68.0	382.22	61.9	58.4
RB07	73	15,304	30	60.5	15.3	57.4	51.3	75.3	443.06	63.3	61.3
Rolag	75	15,376	30	61.0	16.1	--	--	68.2	385.25	--	--
Sabin	76	15,870	30	60.0	15.8	61.3	56.4	67.0	374.71	61.7	61.6
Samson	76	13,170	28	60.5	16.2	51.8	62.3	71.9	417.49	67.1	62.0
Select	70	14,895	32	61.5	15.8	52.8	57.0	63.6	345.61	60.3	57.8
Steele-ND	73	13,775	33	62.0	17.0	58.1	50.3	71.1	414.04	60.7	59.8
Sy 605 CL	72	16,393	31	62.0	16.0	--	--	78.0	468.73	--	--
Sy Soren	76	17,828	30	59.5	16.1	--	54.5	68.0	383.48	61.2	--
Sy Tyra	76	15,952	28	59.8	15.3	--	50.8	70.2	400.00	60.5	--
Vantage	80	16,469	30	61.5	18.2	52.7	47.4	63.3	346.56	55.3	54.5
Velva	76	13,829	32	58.5	14.9	47.9	55.7	78.3	467.14	67.0	60.6
WB-Digger	74	15,026	31	59.0	15.4	60.5	54.5	73.7	430.40	64.1	62.9
WB-Gunnison	75	13,472	30	60.0	15.1	--	37.9	66.7	369.64	52.3	--
WB-Mayville	76	13,971	28	59.8	16.3	--	54.6	71.4	413.81	63.0	--
Alpine	77	14,829	30	60.0	14.9	--	55.1	71.8	411.93	63.5	--
Trial Mean	76	15,480	31	60.3	16.0	54.4	54.1	70.6	405.58	--	--
CV %	1.5	6.0	4.0	1.0	2.4	--	--	8.4	--	--	--
LSD 0.10	1	1,534	1	1.0	0.7	--	--	6.9	--	--	--

Planting Date: April 2, 2012

Harvest Date: July 30, 2012

Previous Crop: Field Pea

Seeding Rate: 1.2 million live seeds/ac

<sup>1</sup>Returns were calculated by multiplying the 2012 yield by protein premium or discount paid at the Southwest Grain Terminal located at Gladstone on August 10. The price paid on this date was \$8.43/bu, for a grain protein concentration of 14%. An additional \$.01/bu was paid for each additional 0.2% increase in grain protein up to 17% above which an additional premium was not paid. Grain was discounted \$0.03/bu for each 0.2% reduction in grain protein from 14% to 12%, below which no additional discount was assigned. Returns factored in discounts for grain with a test weight <58 lb/bu [-\$.02/bu for 0.5 lb/bu between 58 and 57 lb/bu; -.03/bu for 0.5 lb/bu between 57 and 55 lb/bu; -.04/bu for 0.5 lb/bu between 55 and 54 lb/bu; and -.05/bu for 0.5 lb/bu between 54 and 52 lb/bu]. Returns also deduct \$196.19, the sum of all listed costs from the December 2011 Farm Management Planning Guide Projected 2012 Crop Budgets South West North Dakota for spring wheat.

**2012 Hannover Spring Wheat - Recrop**

**Dickinson, ND**

Variety	Seeds per Pound	Test Weight lbs/bu	Protein %	----- Grain Yield-----			Returns <sup>1</sup> \$/ac	----- Average Yield-----	
				2010	2011	2012		2	3
				-----bu/ac-----				----bu/ac----	
Barlow	16,421	59.5	14.5	38.1	29.4	60.7	309.77	45.0	42.7
Elgin	16,808	57.8	14.6	--	--	65.1	354.55	--	--
Glenn	16,658	57.8	14.7	35.8	27.6	60.4	314.51	44.0	41.3
Mott	18,032	58.5	14.2	42.2	30.2	57.4	288.48	43.8	43.3
Prosper	15,773	57.0	13.2	--	27.9	55.3	261.04	41.6	--
Sabin	15,541	59.8	14.2	--	32.7	61.7	324.79	47.2	--
Select	15,693	60.3	13.5	--	--	65.1	346.74	--	--
Steele-ND	15,727	61.8	14.5	36.6	23.8	59.3	305.23	41.5	39.9
Velva	15,513	55.3	14.1	--	32.2	56.2	268.34	44.2	--
Trial Mean	16,241	58.6	14.2	38.3	28.2	60.1	308.16	--	--
CV %	5.1	1.2	2.0	--	--	6.5	--	--	--
LSD 0.10	NS	1.3	0.5	--	--	4.7	--	--	--

Planting Date: April 24, 2012

Harvest Date: August 6, 2012

Previous Crop: Spring Wheat

Seeding Rate: 1.2 million live seeds/ac

<sup>1</sup>Returns were calculated by multiplying the 2012 yield by protein premium or discount paid at the Southwest Grain Terminal located at Gladstone on August 10. The price paid on this date was \$8.43/bu, for a grain protein concentration of 14%. An additional \$.01/bu was paid for each additional 0.2% increase in grain protein up to 17% above which an additional premium was not paid. Grain was discounted \$0.03/bu for each 0.2% reduction in grain protein from 14% to 12%, below which no additional discount was assigned. Returns factored in discounts for grain with a test weight <58 lb/bu [-\$.02/bu for 0.5 lb/bu between 58 and 57 lb/bu; -\$.03/bu for 0.5 lb/bu between 57 and 55 lb/bu; -\$.04/bu for 0.5 lb/bu between 55 and 54 lb/bu; and -\$.05/bu for 0.5 lb/bu between 54 and 52 lb/bu]. Returns also deduct \$196.19, the sum of all listed costs from the December 2011 Farm Management Planning Guide Projected 2012 Crop Budgets South West North Dakota for spring wheat.

Variety	Seeds per Pound	Test Weight lbs/bu	Protein %	----- Grain Yield-----			Returns <sup>1</sup> \$/ac	----- Average Yield-----	
				2010 bu/ac	2011 bu/ac	2012 bu/ac		2 Year bu/ac	3 Year bu/ac
Barlow	13,834	60.8	14.4	49.5	30.7	61.8	326.10	46.2	47.3
Elgin	13,981	60.0	14.5	--	--	65.2	354.92	--	--
Glenn	13,642	61.0	14.0	44.3	27.1	64.4	346.87	45.8	45.3
Mott	14,338	60.5	14.0	47.9	37.1	64.6	348.14	50.9	49.9
Prosper	13,053	60.8	12.9	--	32.0	66.0	348.15	49.0	--
Sabin	14,380	60.3	13.5	--	35.0	61.3	315.14	48.2	--
Select	12,817	62.0	13.5	--	--	55.0	262.81	--	--
Steele-ND	13,545	63.3	14.5	41.7	28.8	56.7	282.67	42.8	42.4
Velva	14,446	59.5	13.7	--	33.6	67.9	372.29	50.8	--
Trial Mean	13,782	60.9	13.9	38.3	31.7	62.6	328.56	--	--
CV %	2.1	0.6	3.7	--	--	4.3	--	--	--
LSD 0.10	541	0.7	NS	--	--	3.2	--	--	--

Planting Date: April 17, 2012

Harvest Date: August 6, 2012

Previous Crop: Spring Wheat

Seeding Rate: 1.2 million live seeds/ac

<sup>1</sup>Returns were calculated by multiplying the 2012 yield by protein premium or discount paid at the Southwest Grain Terminal located at Gladstone on August 10. The price paid on this date was \$8.43/bu, for a grain protein concentration of 14%. An additional \$.01/bu was paid for each additional 0.2% increase in grain protein up to 17% above which an additional premium was not paid. Grain was discounted \$0.03/bu for each 0.2% reduction in grain protein from 14% to 12%, below which no additional discount was assigned. Returns factored in discounts for grain with a test weight <58 lb/bu [-\$.02/bu for 0.5 lb/bu between 58 and 57 lb/bu; -\$.03/bu for 0.5 lb/bu between 57 and 55 lb/bu; -\$.04/bu for 0.5 lb/bu between 55 and 54 lb/bu; and -\$.05/bu for 0.5 lb/bu between 54 and 52 lb/bu]. Returns also deduct \$196.19, the sum of all listed costs from the December 2011 Farm Management Planning Guide Projected 2012 Crop Budgets South West North Dakota for spring wheat.

SDSU Hard Red Spring Wheat Variety Trial – Harding County (Ralph), 2010 - 2012.

Variety	Height	Lodging	Test Wt.	Protein	Yield	Bu/A
	Inches	0-9*	Lb/Bu	%	2012	3-Year
ADVANCE	27	0	61.4	16.7	<b>41.2</b>	<b>34.8</b>
BARLOW	32	0	61.0	16.1	33.9	31.4
BREAKER	29	0	62.1	16.6	32.1	28.4
BRICK	31	0	61.8	14.7	<b>40.7</b>	31.3
BRIGGS	30	0	60.2	14.8	<b>40.9</b>	32.9
CHRIS	33	0	62.4	17.9	35.3	24.1
ELGIN	32	0	60.4	16.5	38.8	
FALLER	29	0	60.4	16.5	<b>41.7</b>	27.4
FOREFRONT	31	0	62.7	15.4	<b>43.8</b>	33.6
GRANGER	32	0	63.5	15.0	<b>47.1</b>	<b>35.1</b>
LCS ALBANY	27	0	61.1	15.3	<b>41.9</b>	33.7
LCS POWERP	27	0	60.8	15.0	<b>43.1</b>	
MOTT	30	0	63.0	15.8	<b>40.4</b>	30.6
NORDEN	28	0	63.5	14.6	<b>44.1</b>	
PROSPER	29	0	59.3	15.0	<b>41.6</b>	28.1
RB07	28	0	62.2	16.0	<b>43.7</b>	32.8
ROLLAG	27	0	61.8	16.8	39.2	30.3
SABIN	27	0	62.4	14.8	40.0	<b>35.8</b>
SAMSON	26	0	61.9	17.1	37.9	31.9
SELECT	32	0	62.6	13.9	47.1	<b>36.6</b>
STEELE-ND	30	0	61.7	17.1	36.4	29.3
SY SOREN	26	0	62.5	15.5	40.3	
TRAVERSE	33	0	59.7	13.3	<b>46.6</b>	<b>37.4</b>
VANTAGE	28	0	64.4	15.2	36.6	30.2
WB-DIGGER	29	0	62.2	13.3	<b>41.9</b>	30.5
WB-MAYVILL	25	0	62.8	15.0	36.9	
VELVA	28		60.8	13.0	<b>41.7</b>	31.8
LCS 11FXMN	26	0	58.8	12.8	35.4	
MN 06028	27	0	61.9	14.1	40.0	
MN 07098-6	29	0	64.4	12.6	36.6	
MT 0608-79	26	0	61.2	14.3	34.5	
SD 4112 *	29	0	62.8	12.2	<b>40.4</b>	29.7
SD 4178 *	29	0	60.5	12.3	38.6	
SD 4189 *	30	0	61.5	12.5	<b>42.2</b>	<b>36.3</b>
SD 4215 *	28	0	58.1	13.8	39.8	
SD 4218	32	0	63.2	13.7	39.8	
SD 4250	32	0	61.6	15.5	37.6	
SD 4253	33	0	63.0	13.8	<b>43.1</b>	
SD 4280	31	0	61.8	14.7	39.5	
SD 4299	29		61.7	15.0	38.9	
SD 4300	29	0	61.0	14.8	37.6	
Average	29	0.0	61.7	14.8	40.1	31.8
LSD (P=.05)	1.7	0.0	2.7	.	6.7	3.1
CV	4.3	0.0	3.1	.	12.0	12.6

\* 0=No lodging, 9 = 100% lodged.

Planted: April 11, 2012      Herbicide: Widematch (1 pt/A) + MCPA (8 oz/A) + Axial XL (1 pt/A)  
Harvested: August 1, 2012      Additional Nitrogen: 50 Lb/A  
Previous crop: Conventional Fallow.



**2012 Hard Red Spring Wheat Variety Trial at Mandan**

Cooperator: USDA-ARS, Mandan

Variety	Plant	Test	Grain	----- Grain Yield -----			Average Yield		
	Height	Weight	Protein	2009	2010	2012	2 yr	3 yr	
	inches	lbs/bu	%	----- Bushels per acre -----					
Mott	41	59.3	12.2	67.0	71.1	69.1	70.1	69.1	
Barlow	42	59.1	12.5	63.2	64.3	71.2	67.8	66.2	
Faller	38	56.7	11.8	69.2	61.4	64.5	63.0	65.0	
Steele-ND	38	58.8	12.0	54.6	64.6	66.5	65.6	61.9	
Glenn	42	61.2	12.6	54.1	60.4	65.4	62.9	60.0	
Velva	38	57.7	11.4		69.6	70.2	69.9		
RB07	35	58.3	12.5		62.9	69.0	66.0		
Sabin	38	59.9	11.9			77.4			
SY Soren	34	58.9	12.1			77.1			
Select	41	59.9	11.4			75.7			
Elgin	41	58.4	11.7			69.1			
Prosper	38	58.0	11.2			68.1			
Trial Mean	39	58.8	11.9	61.9	64.1	70.0	--	--	
C.V. %	3.5	0.8	3.8	5.0	4.4	3.1	--	--	
LSD 10%	2	0.6	0.5	3.4	3.0	2.6	--	--	

Planting Date: April 3

Harvest Date: August 1

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

Previous Crop: 2008 & 2011 = HRSW, 2009 = field pea.

**2011 North Dakota hard winter wheat variety description table, agronomic traits.**

Variety	Agent or Origin <sup>2</sup>	Year	Reaction to Disease <sup>1</sup>				Maturity <sup>3</sup>	Straw Strength	Height <sup>4</sup> (inches)	Winter <sup>5</sup> Hardness
			Stripe Rust	Leaf Rust	Stem Rust	Scab				
Accipiter	W.Ag	2008	NA	MS	R	S	0	Strong	36	2
Alice <sup>6</sup>	SD	2006	NA	S	MR	S	-3	M. strong	33	-
Art	Agripro	2008	R	R	R	MS	-4	Strong	33	8
Boomer	WB	2009	NA	MR	NA	S	0	Strong	34	3
Carter	WB	2010	S	NA	NA	S	0	Strong	32	6
CDC Buteo	WB	2004	NA	MS	NA	S	0	Med.	36	2
CDC Falcon	WB	2000	MS	MS	NA	S	0	M. strong	34	4
Darrell	SD	2006	NA	S	R	MS	-2	Strong	35	6
Decade	MT/ND	2010	S	VS	R	VS	-2	Strong	35	2
Expedition	SD	2002	MS	MS	R	S	-3	Strong	34	4
Hawken	Agripro	2007	S	MR	MR	S	-3	Strong	28	7
Ideal	SDSU	2011	NA	R	MR	S	-1	M. strong	33	5
Jagalene	Agripro	2002	MS	S	MR	VS	-2	Strong	33	6
Jerry	ND	2001	MR	MR	R	S	0	Strong	37	3
Lyman	SD	2008	MS	R	R	MR	-2	Med.	35	5
Mace	ARS-NE	2008	NA	MS	R	MS	0	Strong	33	-
Millennium	NE/SD	1999	MR	MR	MR	S	-2	Strong	37	6
Overland	NE	2006	MR	MR/R	MR	S	-2	Strong	35	5
Peregrine	W.Ag	2008	R	MR	R	MS	+1	Strong	39	2
Radiant <sup>7</sup>	Can.	2005	R	S	S	S	+1	V. strong	36	2
Ransom	ND	1998	NA	MR	MR	S	+1	Med.	37	3
Roughrider	ND	1975	NA	S	R	MS	0	M. strong	42	2
Striker	WB	2009	NA	MR	NA	S	-2	Strong	32	5
SY Wolf	Agripro	2010	MS	MR	R	MS	-2	Strong	33	6
WB-Matlock	WB	2010	MS	MS	NA	MS	+1	Strong	36	2
Wesley	NE/SD/WY	2000	MR	MS	R	S	-3	M. strong	32	6
Yellowstone	MT	2005	R	S	S	VS	+2	Med.	33	5

<sup>1</sup>R = resistant; MR = moderately resistant; MS = moderately susceptible; S = susceptible; VS = very susceptible; NA = not available.

<sup>2</sup>W.Ag = Western Ag, WB = WestBred.

<sup>3</sup>Days to heading relative to Jerry.

<sup>4</sup>Based on the average of several locations in 2011, and should be used for comparing varieties. The environment can impact the height of varieties.

<sup>5</sup>Relative winter hardiness rating: 1 = Excellent, 10 = very poor. These values are subject to change as additional information becomes available.

<sup>6</sup>White wheat.

<sup>7</sup>Curl mite resistant.

**2012 Winter Wheat Variety Trial at Hettinger**

Variety	Spg Plant	Heading	Plant	Test	Grain	----- Grain Yield -----			Average Yield	
	Stand*	Date	Height	Weight	Protein	2009	2010	2012	2 yr	3 yr
	%	June	inches	lbs/bu	%	----- Bushels per acre -----				
Radiant	84	7	35	59.0	13.5	46.5	83.1	72.9	78.0	67.5
Boomer	69	11	33	57.3	13.3	53.4	79.3	67.5	73.4	66.7
Overland	90	5	31	58.9	13.1	45.2	80.2	73.8	77.0	66.4
Decade	79	6	30	59.6	14.5	54.4	75.3	68.4	71.8	66.0
Lyman	81	6	31	59.3	14.1	49.5	72.3	73.7	73.0	65.2
Accipiter	53	11	31	57.5	13.3	51.0	84.3	58.3	71.3	64.5
Jerry	81	9	35	58.8	13.9	44.3	78.5	66.3	72.4	63.0
Hawken	83	5	27	58.3	14.1	52.4	65.3	68.6	67.0	62.1
Wesley	81	5	27	57.8	14.0	43.6	71.6	66.4	69.0	60.5
Art	73	6	29	58.6	14.4	36.2	74.5	59.7	67.1	56.8
Peregrine	45	10	35	55.0	13.7	44.5	68.5	46.9	57.7	53.3
Ideal	78	8	30	59.6	12.6		76.6	66.3	71.4	
WB Matlock	76	9	33	59.5	13.2			67.2		
Carter	79	8	28	58.6	14.0			66.2		
SY Wolf	76	6	30	58.4	14.0			62.2		
McGill	81	6	33	58.3	12.6			61.8		
Robidoux	76	5	29	57.3	13.5			61.4		
Settler CL	64	7	28	57.9	12.9			57.9		
Trial Mean	75	7	31	58.0	13.7	46.7	74.5	63.7	--	--
C.V. %	13	20	4	1.8	1.7	7.7	5.4	7.7	--	--
LSD 10%	11	2	1	1.3	0.3	4.1	4.7	5.8	--	--

\* Spring Plant Stand: Visual estimation of plant stand in the spring after green up (see note below).

Planting Date: September 26, 2011

Harvest Date: July 27, 2012

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

Previous Crop: 2008, 2009 & 2011 = HRSW.

Note: The 2012 trial had very poor fall germination and emergence (less than 1%) prior to freeze up. It is believed that most seed germination and vernalization took place during early spring.

**2012 Winter Wheat - Recrop**

**Dickinson, ND**

Variety	Heading Date	Seeds per Pound	Plant Height	Test Weight	Protein %	----- Grain Yield-----				Average Yield	
						2009	2011	2012	Returns <sup>1</sup>	2 Year	3 Year
	June		in	lbs/bu		-----bu/ac-----		\$/ac	bu/ac	bu/ac	
Accipiter	9	18,439	31	54.8	14.8	68.5	40.6	60.3	263.26	50.5	56.5
Art	5	17,829	28	57.3	14.4	55.8	65.4	60.3	270.54	62.8	60.5
Boomer	8	17,129	33	54.8	14.1	70.9	37.0	66.4	309.12	51.7	58.1
AC Broadview	7	16,258	30	56.0	13.8	--	--	70.3	342.85	--	--
CDC Falcon	7	17,726	29	55.0	14.4	70.4	48.6	68.3	325.06	58.5	62.4
Carter	7	18,275	27	55.8	14.6	--	46.8	63.2	289.20	55.0	--
Darrell	6	13,979	32	57.5	13.5	71.8	54.2	67.7	326.64	60.9	64.6
Decade	5	15,104	30	57.8	14.4	70.4	48.6	70.1	350.34	59.4	63.0
Hawken	4	13,135	27	56.8	14.0	61.7	41.1	62.0	281.13	51.5	54.9
Ideal	7	16,897	29	57.5	13.9	73.2	46.7	62.7	288.56	54.7	60.9
Jerry	8	14,202	34	56.5	14.1	58.9	39.1	66.0	311.87	52.5	54.7
Lyman	6	12,221	31	57.8	14.0	61.4	55.6	67.9	332.39	61.8	61.7
McGill	5	16,023	31	55.5	13.3	--	--	60.0	258.39	--	--
Overland	6	14,071	31	57.5	13.5	72.1	50.5	75.4	388.62	62.9	66.0
Peregrine	9	16,555	37	56.8	14.5	68.2	42.7	54.9	226.21	48.8	55.3
Robidoux	4	15,863	29	57.0	13.7	--	--	66.4	315.54	--	--
SY Wolf	5	15,120	28	57.0	13.7	--	61.8	65.8	311.03	63.8	--
WB-Matlock	8	15,406	33	57.8	14.2	--	28.8	70.6	354.25	49.7	--
Wesley	4	14,521	26	56.5	14.6	57.3	47.8	51.8	200.07	49.8	52.3
Trial Mean	6	15,557	30	56.6	14.1	65.0	46.7	64.6	301.4	--	--
CV %	12.5	5.3	5.2	1.3	1.9	--	--	9.5	--	--	--
LSD 0.10	1	1,409	2	1.3	0.5	--	--	7.3	--	--	--

Planting Date: September 26, 2011

Harvest Date: July 26, 2012

Previous Crop: Pea

Seeding Rate: 1 million live seeds/ac

<sup>1</sup>Returns were calculated by multiplying the 2012 yield by protein premium or discount paid at the Southwest Grain Terminal located at Gladstone on August 10. The price paid on this date was \$7.99/bu for a grain protein concentration of 12%. \$.01/bu was paid for each additional 0.2% increase in grain protein up to 15%, above which an additional premium was not paid. Grain was discounted \$0.04/bu for each 0.2% reduction in grain protein from 12% to 9%, below which no additional discount was assigned. Returns factored in discounts for grain with a test weight < 60 lb/bu [-\$.01/bu for 0.5 lb/bu between 60 and 58 lb/bu; -\$.02/bu for 0.5 lb/bu between 58 and 57 lb/bu; -\$.03/bu for 0.5 lb/bu between 57 and 55 lb/bu; -\$.04/bu for 0.5 lb/bu between 55 and 54 lb/bu; and -\$.05/bu for 0.5 lb/bu between 54 and 52 lb/bu]. Returns also deduct \$214.61, the sum of all listed costs from the December 2011 Farm Management Planning Guide Projected 2012 Crop Budgets South West North Dakota for winter wheat.

**2012 Winter Wheat Variety Trial at Mandan**

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

Variety	Winter	Test	Grain	----- Grain Yield -----			Average Yield		
	Survival	Weight	Protein	2010	2011	2012	2 yr	3 yr	
	%	lbs/bu	%	----- Bushels per acre -----					
Overland	95	58.9	11.6	51.4	34.0	90.0	62.0	58.5	
Art	90	57.3	12.2	44.7	31.9	77.9	54.9	51.5	
Decade	94	56.0	11.6	49.6	30.0	69.2	49.6	49.6	
Wesley	93	56.7	12.0	50.1	19.6	73.3	46.4	47.7	
Jerry	91	56.5	11.1	47.0	19.7	73.7	46.7	46.8	
Lyman	89	57.8	12.3	47.3	25.8	67.1	46.4	46.7	
Boomer	90	55.6	11.5	48.3	22.1	66.2	44.2	45.5	
Hawken	93	57.3	12.5	45.9	20.1	64.0	42.0	43.3	
Accipiter	83	56.1	10.8	44.4	19.2	60.7	40.0	41.4	
Peregrine	73	57.6	11.6	44.5	22.7	55.3	39.0	40.8	
Carter	93	54.1	12.1	40.0	19.5	55.7	37.6	38.4	
Radiant	94	54.3	11.4	38.4	20.6	45.8	33.2	34.9	
SY Wolf	89	58.3	10.9		32.2	87.7	60.0		
WB Matlock	90	58.1	11.2		21.4	77.9	49.6		
McGill	93	57.2	11.2			76.5			
Settler CL	89	58.3	10.6			74.8			
Robidoux	89	56.5	10.8			73.2			
Ideal	90	57.3	11.2			70.8			
Trial Mean	89	56.6	11.5	45.1	23.5	69.5	--	--	
C.V. %	6.9	2.4	4.7	15.4	24.2	17.3	--	--	
LSD 10%	7	1.6	0.6	8.1	6.7	14.2	--	--	

Planting Date: September 27, 2011

Harvest Date: August 1, 2012

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

Previous Crop: 2009 & 2010 = HRSW, 2011 = field pea.

Note: The 2011 trial sustained severe foliar and head disease infestations.

# North Dakota Durum Wheat

## Variety Trial Results for 2012 and Selection Guide

Joel Ransom, Elias Elias, Maricelis Acevedo, Tim Friesen, Frank Manthey and Marcia McMullen (NDSU Main Station); Eric Eriksmoen (North Central Research Extension Center, Minot); Rick Olson (Hettinger Research Extension Center); Bryan Hanson (Langdon Research Extension Center); Blaine Schatz (Carrington Research Extension Center) and Gordon Bradbury (Williston Research Extension Center)

Durum was planted on 1.4 million acres in North Dakota in 2012, up from the 750,000 acres planted in 2011. Average yield is estimated at 32 bushels per acre (bu/a), up significantly from the yield of 25.5 bu per acre recorded last year. The most commonly grown varieties in 2012 and the percent of the acreage they occupied were Divide (30.4), Alkabo (14.7), Mountrail (13.3), Lebsock (10.3), Grenora (10.2), Pierce (3.4) and Tioga (2.9).

Durum varieties are tested each year at multiple sites throughout North Dakota. The relative performance of these varieties is presented in table form. Variety performance data are used to provide recommendations to producers. Some varieties may not be included in the tables due to insufficient testing or lack of seed availability, or they offer no yield or disease advantage over similar varieties.

The agronomic data presented in this publication are from replicated research plots using experimental designs that enable the use of statistical analysis. These analyses enable the reader to determine, at a predetermined level of confidence, if the differences observed among varieties are reliable or if they might be due to error inherent in the experimental process. The LSD (Least Significant Difference) numbers beneath the columns in tables are derived from these statistical analyses and only apply to the numbers in the column in which they appear. If the difference between two varieties exceeds the LSD value, it means that with 90 percent confidence (LSD probability 0.10), the higher-yielding variety has a significant yield advantage. When the difference between two varieties is less than the LSD value, no significant difference occurs between those two varieties under those growing conditions.

NS is used to indicate no significant difference for that trait among any of the varieties at the 90 percent level of confidence. The CV is a measure of variability in the trial. The CV stands for coefficient of variation and is expressed as a percentage. Large CVs mean a large amount of variation that could not be attributed to differences in the varieties.

Presentation of data for the entries tested does not imply approval or endorsement by the authors or agencies conducting the test. North Dakota State University approves the reproduction of any table in the publication only if no portion is deleted, appropriate footnotes are given and the order of the data is not rearranged. Additional data from county sites are available from each Research Extension Center at [www.ag.ndsu.edu/varietytrials/durum](http://www.ag.ndsu.edu/varietytrials/durum). Use data from multiple locations and years when selecting a variety.

## List of Tables

- Table 1. North Dakota durum wheat variety descriptions, agronomic traits, 2012.  
 Table 2. North Dakota durum wheat variety quality descriptions, milling and processing data averaged for five years (2007-2011) from drill strip trials.  
 Table 3. North Dakota durum wheat variety quality descriptions, milling and processing data for 2011 at all locations in the drill strip trials.  
 Table 4. Yield of durum varieties at six locations in North Dakota, 2010-2012.  
 Table 5. Test weight (six locations) and protein at 12 percent moisture (four locations) of durum varieties in North Dakota, 2012.

**Table 1. North Dakota durum wheat variety descriptions, agronomic traits, 2012.**

Variety	Agent or Origin <sup>1</sup>	Year Released	Average Plant Height (in)	Straw Strength <sup>2</sup>	Days to Heading <sup>3</sup>	Reaction to Disease <sup>4</sup>			
						Stem Rust	Leaf Rust	Foliar Disease	Head Scab
AC Commander	Can.	2002	32	5	68	R	R	MS	NA
AC Napoleon	Can.	2001	40	5	68	R	R	S	NA
AC Navigator	Can.	1999	32	5	66	R	R	M	S
Alkabo	ND	2005	36	2	67	R	R	M	MS
Alzada <sup>5</sup>	WB	2004	30	6	63	R	R	S	VS
Belzer	ND	1997	39	5	66	R	R	M	MR
Ben	ND	1996	39	3	67	R	R	MR	S*
CDC Verona	Can.	2010	38	4	69	R	R	MR	S
<b>Carpio</b>	<b>ND</b>	<b>2012</b>	<b>37</b>	<b>5</b>	<b>69</b>	<b>R</b>	<b>R</b>	<b>M</b>	<b>M</b>
DG Max	DGP	2008	38	5	66	R	MR	MR	MS
DG Star	DGP	2007	37	4	64	R	R	M	NA
Dilse	ND	2002	37	5	68	R	R	M	MS
Divide	ND	2005	38	5	68	R	R	M	MR
Grande D'Oro	WB/DGP	2005	37	4	68	R	R	M	NA
Grenora	ND	2005	35	5	67	R	R	M	MS
Kyle	Can.	1984	39	7	68	R	MR	M	NA
Lebsock	ND	1999	37	3	67	R	R	M	MS
Maier	ND	1998	37	5	67	R	R	M	S*
Mountrail	ND	1998	37	5	68	R	R	M	S*
Pierce	ND	2001	38	5	67	R	R	MS	S
Plaza	ND	1999	29	7	68	R	R	M	MS
Rugby	ND	1973	38	5	64	R	R	MR	S*
Strongfield	Can.	2004	37	6	68	R	R	MS	S
Tioga	ND	2010	39	4	68	R	R	M	MS
Wales	WB	2008	36	3	67	R	R	M	S*
WB-Belfield	WB	2011	30	2	62	R	R	S	S
Westhope	WB	2009	36	3	67	R	R	MS	S

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

<sup>2</sup>Straw Strength = 1-9 scale with 1 the strongest and 9 the weakest. Based on recent data. These values may change as more data become available.

<sup>3</sup>Days to Head = the number of days from planting to head emergence from the boot. Averaged from several locations in 2010.

<sup>4</sup>R = resistant; MR = moderately resistant; M = intermediate; MS = moderately susceptible; S = susceptible; VS = very susceptible; Foliar Disease = reaction to tan spot and septoria leaf spot complex.

<sup>5</sup>Alzada has a disease-resistance package that is best suited for western North Dakota (drier growing conditions).

\* Indicates yields and/or quality often have been higher than would be expected based on visual symptoms. NA = Not adequately tested.

**Table 2. North Dakota durum wheat variety quality descriptions, milling and processing data averaged for five years (2007-2011) in drill strip trials (33 loc/env).**

Variety	Test Weight	Vitreous Kernels	Large Kernels	Falling Number	Wheat Protein <sup>1</sup>	Gluten Index <sup>2</sup>	Pasta Color <sup>3</sup>	Spaghetti Firmness	Overall Quality <sup>4</sup>
	(lb/bu)	(%)	(%)	(sec)	(%)		(1-12)	(g-cm)	
AC Commander	58.6	97	46	479	14.8	93	9.1	6.0	good
AC Navigator	59.1	98	41	466	14.9	77	8.8	6.0	good
Alkabo	60.3	90	45	397	14.3	58	8.9	5.4	good
Alzada	58.2	96	56	437	14.8	94	8.7	5.9	good <sup>5</sup>
Ben	59.4	96	49	385	15.0	61	8.4	5.4	average
Carpio	60.1	90	52	434	14.5	93	8.9	6.0	excellent
Dilse	59.8	96	40	382	15.6	59	8.8	6.1	good
Divide	59.6	92	46	437	14.8	79	8.8	5.6	good
Grenora	59.4	95	46	418	14.4	71	8.9	5.6	good
Lebsock	60.4	93	43	405	14.5	51	8.6	5.3	average
Maier	59.3	96	40	398	15.3	64	8.7	6.0	good
Mountrail	59.0	93	37	404	14.6	29	8.3	5.2	average
Pierce	60.2	97	37	414	14.8	72	8.8	5.7	good
Strongfield	59.4	94	46	404	15.5	74	8.7	5.8	good
Tioga	60.1	92	48	405	14.3	86	9.0	5.3	good
Average	59.5	94	45	418	14.8	71	8.8	5.7	

**Table 3. North Dakota durum wheat variety quality descriptions, milling and processing data for 2011 at all locations in the drill strip trials.**

Variety	Test Weight	Vitreous Kernels	Large Kernels	Falling Number	Wheat Protein <sup>1</sup>	Gluten Index <sup>2</sup>	Pasta Color <sup>3</sup>	Spaghetti Firmness	Overall Quality <sup>4</sup>
	(lb/bu)	(%)	(%)	(sec)	(%)		(1-12)	(g-cm)	
AC Commander	56.3	97	35	427	15.9	86	9	6.5	good
AC Navigator	55.9	97	28	412	16.3	64	8.5	6.1	good
Alkabo	58.8	96	32	377	15.0	44	8.7	5.2	good
Alzada	56.3	97	40	381	15.9	88	8.3	6.1	good <sup>5</sup>
Carpio	58.9	96	46	398	15.4	90	8.7	5.9	excellent
DG Max	57.3	98	31	362	16.6	63	8.4	5.6	good
Divide	57.9	96	39	420	16.0	74	8.8	5.4	good
Grenora	57.6	97	36	401	15.4	53	8.6	5.5	good
Lebsock	57.5	95	26	395	15.6	44	8.3	5.1	average
Maier	55.8	97	26	365	16.8	59	8.2	5.6	good
Mountrail	55.9	96	23	389	15.7	29	7.9	4.9	average
Pierce	57.2	97	23	384	15.9	58	8.4	5.6	good
Strongfield	57.5	96	36	398	16.9	65	8.6	5.8	good
Tioga	58.1	96	46	362	15.8	75	8.3	5.7	good
Westhope	58.0	98	32	370	15.8	62	8.7	5.4	good
Average	57.3	97	33	389	15.9	64	8.5	5.6	

<sup>1</sup>Wheat protein is reported on a 12 percent moisture basis.

<sup>2</sup>Gluten index is unitless. Numbers less than 15 = very weak and greater than 80 = very strong gluten proteins.

<sup>3</sup>Pasta Color Score: Higher number indicates better color, with 8.5+ typically considered good.

<sup>4</sup>Overall Quality is determined based on agronomic, milling and spaghetti processing performance.

<sup>5</sup>Alzada has good quality when grown in environments where it is adapted. Low test weight can affect quality in some environments.



**Table 4. Yield of durum varieties at six locations in North Dakota, 2010-2012.**

Variety	<u>Carrington</u>		<u>Langdon</u>		<u>Dickinson</u>		<u>Hettinger</u>		<u>Minot</u>		<u>Williston</u>		<u>Average</u>	
	2012	3 Yr.	2012	3 Yr.	2012	3 Yr.	2012	3 Yr.	2012	3 Yr.	2012	3 Yr.	2012	3 Yr.
	-----(bu/a)-----													
AC Commander	41.9	55.8	71.2	65.9	61.2	72.2	72.9	62.7	33.6	45.7	38.8	--	53.3	--
AC Navigator	37.9	53.1	63.8	57.8	52.0	62.5	73.2	59.2	23.9	41.1	35.3	33.2	47.7	51.2
Alkabo	50.1	63.3	75.4	76.4	52.8	59.5	64.9	58.4	45.4	51.5	35.3	34.4	54.0	57.3
Alzada	38.2	50.6	60.7	56.3	49.3	57.3	69.6	57.7	27.3	--	38.3	33.3	47.2	--
Ben	42.1	58.1	74.3	76.2	59.7	61.8	62.5	58.6	39.2	47.6	32.5	32.7	51.7	55.8
CDC Verona	45.4	--	69.5	69.2	52.2	65.3	60.5	58.7	37.7	--	29.8	29.4	49.2	--
Carpio	47.2	61.5	78.7	80.6	56.4	67.7	59.6	58.5	47.8	--	32.1	--	53.6	--
DG Max	43.2	58.9	69.3	70.4	57.1	66.5	69.9	62.0	43.8	46.0	37.0	34.7	53.4	56.4
DG Star	46.6	55.4	72.7	73.8	53.5	61.8	65.0	57.6	40.2	47.4	32.5	32.1	51.8	54.7
Dilse	45.5	59.1	70.1	71.9	59.3	67.3	61.5	58.5	46.0	49.9	34.6	32.3	52.8	56.5
Divide	47.1	58.7	74.9	76.5	59.1	66.0	56.7	54.9	44.1	47.9	34.0	32.1	52.7	56.0
Grand D'Oro	--	--	--	--	56.3	--	62.7	58.6	--	--	--	--	--	--
Grenora	47.5	57.0	76.4	78.3	61.2	69.0	58.3	56.8	43.8	52.0	33.1	33.8	53.4	57.8
Lebsock	43.9	59.9	79.4	78.5	64.8	65.2	63.4	58.2	42.4	46.9	31.1	30.8	54.2	56.6
Maier	46.5	59.6	72.6	72.5	60.3	67.6	64.8	59.9	49.4	49.6	38.5	35.2	55.4	57.4
Mountrail	42.7	60.5	76.7	74.8	59.1	69.8	53.6	56.5	41.1	54.6	32.0	31.0	50.9	57.9
Pierce	46.4	55.6	77.2	76.7	58.5	66.9	62.9	58.1	52.6	52.1	32.6	32.5	55.0	57.0
Rugby	46.7	55.4	66.6	--	54.1	--	60.3	57.4	41.6	--	34.0	32.9	50.6	--
Strongfield	45.1	56.9	72.8	72.3	55.1	63.5	66.4	58.0	40.8	48.6	34.8	33.5	52.5	55.5
Tioga	47.9	61.7	77.6	77.7	56.0	64.8	64.2	55.7	44.4	49.2	31.0	33.3	53.5	57.1
Wales	44.7	58.6	78.9	76.9	54.5	69.1	64.0	62.8	45.8	48.2	34.5	34.7	53.7	58.4
WB Belfield	31.1	--	--	--	38.9	--	66.9	--	29.0	--	33.8	--	39.9	--
Westhope	47.3	57.4	74.9	78.3	56.8	--	67.4	63.4	40.1	48.6	34.8	33.2	53.6	--
Mean	44.3	57.9	73.0	73.1	56.0	65.5	64.0	58.7	40.9	48.6	34.1	32.9	52.1	56.4
CV %	8.3	--	4.5	--	8.1	--	4.9	--	8.2	--	6.7	--	--	--
LSD 0.10	4.4	--	3.8	--	5.3	--	3.7	--	1.6	--	2.7	--	--	--

**Table 5. Test weight and protein at 12 percent moisture of durum varieties at six locations in North Dakota, 2012.**

Variety	<u>Carrington</u>		<u>Langdon</u>		<u>Dickinson</u>		<u>Hettinger</u>		<u>Minot</u>		<u>Williston</u>		<u>Average</u>	
	Test Wt.	Protein	Test Wt.	Test Wt.	Protein	Test Wt.	Protein	Test Wt.	Protein	Test Wt.	Test Wt.	Protein	Test Wt.	Protein
	(lb/bu) (%)													
AC Commander	55.8	15.0	58.0	59.3	16.3	57.8	14.1	60.0	16.7	55.9	57.8	15.5	57.8	15.5
AC Navigator	57.1	15.6	58.3	60.0	16.4	57.5	13.5	60.1	16.6	56.2	58.2	15.5	58.2	15.5
Alkabo	59.2	14.0	60.0	60.5	15.8	57.6	14.0	58.6	16.4	56.8	58.8	15.4	58.8	15.4
Alzada	57.2	15.3	56.7	59.3	15.6	57.6	14.1	60.6	16.9	55.6	57.8	15.5	57.8	15.5
Ben	59.0	15.3	60.2	59.8	16.1	57.9	14.2	58.7	16.4	55.9	58.6	15.5	58.6	15.5
CDC Verona	57.5	16.3	--	59.5	17.2	57.0	15.7	59.0	17.1	--	--	16.6	--	16.6
Carpio	58.2	15.3	60.3	59.5	15.8	54.0	14.2	57.9	17.1	55.1	57.5	15.6	57.5	15.6
DG Max	58.9	15.1	59.7	61.0	15.9	59.3	14.4	58.3	17.1	57.6	59.1	15.6	59.1	15.6
DG Star	58.0	15.0	59.0	59.0	15.9	58.0	14.0	57.7	16.8	56.8	58.1	15.4	58.1	15.4
Dilse	58.2	16.0	59.4	59.8	16.4	57.4	15.3	59.1	17.6	56.1	58.3	16.3	58.3	16.3
Divide	58.3	15.6	60.0	60.5	15.3	57.9	14.6	58.2	16.7	56.4	58.6	15.6	58.6	15.6
Grand D'Oro	--	--	--	60.5	15.8	58.7	14.1	--	--	--	--	--	--	--
Grenora	57.3	15.2	58.7	59.5	15.2	56.5	14.5	59.3	16.9	54.6	57.7	15.5	57.7	15.5
Lebsock	58.8	14.6	60.2	60.5	15.2	58.7	13.8	57.5	16.7	56.6	58.7	15.1	58.7	15.1
Maier	58.9	14.3	59.1	60.0	15.4	58.5	14.8	58.1	17.4	56.3	58.5	15.5	58.5	15.5
Mountrail	57.0	14.9	59.0	58.0	16.1	55.9	13.9	59.2	18.4	54.7	57.3	15.8	57.3	15.8
Pierce	59.4	14.6	60.3	60.3	15.8	58.2	13.6	58.2	16.4	56.8	58.9	15.1	58.9	15.1
Rugby	58.8	14.9	59.4	59.8	16.2	57.8	14.9	58.3	16.3	56.1	58.4	15.6	58.4	15.6
Strongfield	57.9	16.7	59.5	58.5	17.2	58.3	14.7	59.1	18.3	55.5	58.1	16.7	58.1	16.7
Tioga	58.0	14.9	59.4	60.0	16.1	57.4	15.6	58.4	16.1	55.1	58.1	15.7	58.1	15.7
Wales	58.3	15.4	60.3	60.0	16.3	58.3	14.4	58.8	17.1	57.8	58.9	15.8	58.9	15.8
WB Belfield	56.0	15.0	--	59.8	15.7	58.8	13.8	60.7	16.9	55.9	--	15.4	--	15.4
Westhope	58.3	15.4	60.1	59.5	16.6	58.9	14.1	58.9	18.2	58.1	59.0	16.1	59.0	16.1
Mean	58.0	15.3	59.5	59.8	16.0	58.2	14.4	58.7	17.0	56.1	58.3	15.7	58.3	15.7
CV %	0.9	3.7	0.9	0.9	2.6	1.5	4.2	1.1	2.7	0.7	--	--	--	--
LSD 0.10	0.6	0.7	0.7	0.9	0.7	1.0	0.7	0.3	0.2	0.7	--	--	--	--

**2012 Durum Variety Trial at Hettinger**

Variety	Days to Head	Plant Height	Test Weight	Grain Protein	----- Grain Yield -----			Average Yield	
					2010	2011	2012	2 yr	3 yr
	*	inches	lbs/bu	%	----- Bushels per acre -----				
Westhope	79	39	58.9	14.1	79.8	43.1	67.4	55.2	63.4
Wales	82	40	58.3	14.4	85.4	39.0	64.0	51.5	62.8
AC Commander	81	36	57.8	14.1	81.7	33.5	72.9	53.2	62.7
DG Max	79	40	59.3	14.4	77.2	39.0	69.9	54.4	62.0
Maier	82	38	58.5	14.8	80.4	34.4	64.8	49.6	59.9
AC Navigator	81	36	57.5	13.5	77.9	26.4	73.2	49.8	59.2
CDC Verona	82	39	57.0	15.7	80.5	35.2	60.5	47.8	58.7
Grande D'oro	81	41	58.7	14.1	77.0	36.2	62.7	49.4	58.6
Ben	79	43	57.9	14.2	76.2	37.2	62.5	49.8	58.6
Carpio	82	39	54.0	14.2	80.8	35.0	59.6	47.3	58.5
Dilse	82	41	57.4	15.3	79.3	34.7	61.5	48.1	58.5
Alkabo	81	39	57.6	14.0	75.5	34.8	64.9	49.8	58.4
Lebsock	78	38	58.7	13.8	77.4	33.7	63.4	48.6	58.2
Pierce	81	40	58.2	13.6	75.6	35.9	62.9	49.4	58.1
Strongfield	82	39	58.3	14.7	79.5	28.0	66.4	47.2	58.0
Alzada	75	36	57.6	14.1	74.6	28.9	69.6	49.2	57.7
DG Star	78	41	58.0	14.0	74.9	32.8	65.0	48.9	57.6
Rugby	77	43	57.8	14.9	71.8	40.1	60.3	50.2	57.4
Grenora	79	38	56.5	14.5	77.6	34.6	58.3	46.4	56.8
Mountrail	82	39	55.9	13.9	81.4	34.5	53.6	44.0	56.5
Tioga	80	40	57.4	15.6	74.8	28.1	64.2	46.2	55.7
Divide	79	39	57.9	14.6	77.5	30.5	56.7	43.6	54.9
WB-Belfield	75	33	58.8	13.8		32.7	66.9	49.8	
Trial Mean	80	40	58.2	14.2	79.8	37.7	64.5	--	--
C.V. %	1.4	4.1	1.5	4.2	4.4	5.7	4.9	--	--
LSD 10%	1	2	1.0	0.7	3.8	2.3	3.7	--	--

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

Planting Date: March 29

Harvest Date: July 23

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

Previous Crop: 2009 = canola, 2010 = field pea, 2011 = hrsw.

**2012 Durum Variety Trial at Scranton**

Cooperator: Justin Freitag, Scranton

Variety	Plant	Test	Grain	----- Grain Yield -----			Average Yield		
	Height	Weight	Protein	2010	2011	2012	2 yr	3 yr	
	inches	lbs/bu	%	----- Bushels per acre -----					
Carpio	40	57.0	15.8	51.2	32.9	50.2	41.6	44.8	
Tioga	42	59.1	13.9	50.5	32.9	50.4	41.6	44.6	
Alkabo	39	59.3	14.4	49.9	31.4	50.4	40.9	43.9	
Grenora	36	57.4	14.7	54.0	31.9	44.1	38.0	43.3	
Divide	40	58.4	14.3	44.9	32.1	49.5	40.8	42.2	
Mountrail	39	55.2	15.1	51.1	33.5	39.6	36.6	41.4	
Maier	38	58.5	14.4		32.1	49.7	40.9		
Trial Mean	39	57.7	14.5	50.3	32.3	48.2	--	--	
C.V. %	3.8	1.4	5.8	4.0	4.1	4.7	--	--	
LSD 10%	2	1.0	1.0	2.3	NS	2.7	--	--	

NS = no statistical difference between varieties.

Planting Date: April 4

Harvest Date: July 30

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

Previous Crop: HRSW

Note: The 2011 trial sustained moderate infections of bacterial leaf streak and barley yellow dwarf causing lower test weights and grain yields.

**2012 Durum Variety Trial at Regent**

Cooperators: August and Perry Kirschmann, Regent

Variety	Plant	Test	Grain	----- Grain Yield -----			Average Yield		
	Height	Weight	Protein	2010	2011	2012	2 yr	3 yr	
	inches	lbs/bu	%	----- Bushels per acre -----					
Tioga	41	58.0	17.3	48.7	23.7	40.6	32.2	37.7	
Grenora	37	57.3	15.5	48.7	25.6	38.1	31.8	37.5	
Alkabo	36	58.2	16.2	45.9	26.9	37.1	32.0	36.6	
Carpio	38	56.1	16.0	47.8	30.9	30.1	30.5	36.3	
Divide	38	57.8	16.4	45.8	26.9	33.5	30.2	35.4	
Mountrail	38	56.6	15.5	47.6	26.3	28.8	27.6	34.2	
Maier	37	58.1	16.3		25.6	39.2	32.4		
Trial Mean	38	57.6	16.0	47.4	27.3	36.0	--	--	
C.V. %	3.8	0.8	2.4	4.8	6.9	5.4	--	--	
LSD 10%	2	0.5	0.5	NS	2.1	2.4	--	--	

NS = no statistical difference between varieties.

Planting Date: April 4

Harvest Date: July 31

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

Previous Crop: HRSW

Note: The 2011 trial sustained moderate infections of bacterial leaf streak and barley yellow dwarf causing lower test weights and grain yields.

Variety	Days	Seeds	Plant	Test	Protein	----- Grain Yield-----				Average Yield	
	to	per				Height	Weight	2009	2010	2012	Returns <sup>1</sup>
	Head	Pound	in	lbs/bu	%	-----bu/ac-----			\$/ac	----bu/ac----	
AC Commander	76	13,480	30	59.3	16.3	93.3	62.0	61.2	213.25	61.6	72.2
AC Navigator	77	13,533	31	60.0	16.4	83.9	51.8	52.0	150.54	51.9	62.5
Alkabo	76	12,946	33	60.5	15.8	75.0	50.7	52.8	156.40	51.8	59.5
Alzada	69	12,797	28	59.3	15.6	69.4	53.2	49.3	131.41	51.3	57.3
Ben	77	12,703	35	59.8	16.1	75.6	50.0	59.7	204.10	54.9	61.8
CDC Verona	77	13,111	34	59.5	17.2	87.0	56.8	52.2	151.37	54.5	65.3
Carpio	78	12,803	32	59.5	15.8	87.7	59.0	56.4	179.82	57.7	67.7
DG Max	76	11,999	35	61.0	15.9	87.2	55.1	57.1	186.18	56.1	66.5
DG Star	74	12,999	33	59.0	15.9	80.4	51.5	53.5	160.07	52.5	61.8
Dilse	78	13,041	34	59.8	16.4	84.4	58.0	59.3	201.43	58.7	67.3
Divide	77	12,417	33	60.5	15.3	87.1	51.8	59.1	200.08	55.5	66.0
Grande D'oro	76	12,600	32	60.5	15.8	--	53.4	56.3	180.67	54.9	--
Grenora	76	12,979	32	59.5	15.2	89.6	56.0	61.2	213.19	58.6	69.0
Lebsock	76	13,549	34	60.5	15.2	77.9	52.8	64.8	239.08	58.8	65.2
Maier	76	13,541	34	60.0	15.4	85.3	57.3	60.3	207.80	58.8	67.6
Mountrail	76	14,762	33	58.0	16.1	92.2	58.1	59.1	195.86	58.6	69.8
Pierce	76	13,707	34	60.3	15.8	87.7	54.3	58.5	195.78	56.4	66.9
Rugby	76	13,349	36	59.8	16.2	--	44.7	54.1	165.19	49.4	--
Strongfield	77	13,449	33	58.5	17.2	78.0	57.3	55.1	169.66	56.2	63.5
Tioga	76	11,997	35	60.0	16.1	82.3	56.0	56.0	178.13	56.0	64.8
WB-Belfield	69	13,999	28	59.8	15.7	--	--	38.9	60.70	--	--
Wales	77	12,498	32	60.0	16.3	92.7	60.1	54.5	168.24	57.3	69.1
Westhope	76	13,111	32	59.5	16.6	--	57.4	56.8	182.47	57.1	--
Trial Mean	76	13,300	33	59.9	16.0	85.2	56.7	56.5	181.53	--	--
CV %	1.1	4.9	4.8	0.9	2.6	--	--	8.1	--	--	--
LSD 0.10	1	1,102	2	0.9	0.7	--	--	5.3	--	--	--

Planting Date: April 3, 2012

Harvest Date: July 30, 2012

Previous Crop: Field Pea

Seeding Rate: 1.2 million live seeds/ac

<sup>1</sup>Returns were calculated by multiplying the 2012 yield by the test weight discount paid at the Southwest Grain Terminal located at Gladstone on August 10. The price paid on this date was \$6.90/bu for grain with a minimum test weight of 60 lb/bu. Grain was discounted \$.02/bu for each 0.5 lb reduction in test weight between 60 and 58 lb/bu, \$.04/bu per 0.5 lb reduction between 58 and 54 lb/bu, and \$0.05/bu per 0.5 lb/bu reduction between 54 and 50 lb/bu. Returns also deduct \$208.05, the sum of all listed costs from the December 2011 Farm Management Planning Guide Projected 2012 Crop Budgets South West North Dakota for durum.

Variety	Seeds per Pound	Test Weight lbs/bu	Protein %	-----Grain Yield-----			Returns <sup>1</sup> \$/ac	Average Yield	
				2010 -----bu/ac-----	2011	2012		2 Year	3 Year
Alkabo	13,055	59.3	13.1	48.4	25.5	53.0	155.26	39.2	42.3
Carpio	12,293	55.5	14.1	47.7	29.3	53.1	143.27	41.2	43.4
Divide	12,394	59.3	13.7	44.1	30.8	54.8	167.60	42.8	43.2
Grenora	13,442	57.8	13.8	49.3	30.4	53.7	155.71	42.0	44.4
Tioga	12,743	59.0	13.1	46.1	34.6	52.7	153.27	43.6	44.5
Trial Mean	12,955	57.9	13.5	48.4	30.5	53.7	156.00	--	--
CV %	2.4	0.8	3.0	--	--	4.5	--	--	--
LSD 0.10	634	1.0	NS	--	--	NS	--	--	--

Planting Date: April 24, 2012

Harvest Date: August 6, 2012

Previous Crop: Spring Wheat

Seeding Rate: 1.2 million live seeds/ac

<sup>1</sup>Returns were calculated by multiplying the 2012 yield by the test weight discount paid at the Southwest Grain Terminal located at Gladstone on August 10. The price paid on this date was \$6.90/bu for grain with a minimum test weight of 60 lb/bu. Grain was discounted \$.02/bu for each 0.5 lb reduction in test weight between 60 and 58 lb/bu, \$.04/bu per 0.5 lb reduction between 58 and 54 lb/bu, and \$0.05/bu per 0.5 lb/bu reduction between 54 and 50 lb/bu. Returns also deduct \$208.05, the sum of all listed costs from the December 2011 Farm Management Planning Guide Projected 2012 Crop Budgets South West North Dakota for durum.

Variety	Seeds per Pound	Test Weight lbs/bu	Protein %	-----Grain Yield-----			Returns <sup>1</sup> \$/ac	Average Yield	
				2010 -----bu/ac-----	2011 -----bu/ac-----	2012 -----bu/ac-----		2 Year ----bu/ac----	3 Year
Alkabo	11,706	60.8	13.0	52.4	43.9	65.9	246.78	54.9	54.1
Carpio	12,278	59.5	13.6	56.1	45.0	64.7	236.81	54.8	--
Divide	11,549	60.0	13.3	56.9	49.1	63.6	230.87	56.4	56.6
Grenora	11,242	59.3	13.2	57.2	44.8	63.5	227.58	54.1	55.2
Tioga	11,104	60.5	13.6	60.6	49.3	66.2	248.84	57.7	58.7
Trial Mean	11,628	60.0	13.2	56.9	47.1	65.6	243.60	--	--
CV %	1.9	0.5	1.4	--	--	4.0	--	--	--
LSD 0.10	441	0.6	0.4	--	--	NS	--	--	--

Planting Date: April 17, 2012

Harvest Date: August 6, 2012

Previous Crop: Spring Wheat

Seeding Rate: 1.2 million live seeds/ac

<sup>1</sup>Returns were calculated by multiplying the 2012 yield by the test weight discount paid at the Southwest Grain Terminal located at Gladstone on August 10. The price paid on this date was \$6.90/bu for grain with a minimum test weight of 60 lb/bu. Grain was discounted \$.02/bu for each 0.5 lb reduction in test weight between 60 and 58 lb/bu, \$.04/bu per 0.5 lb reduction between 58 and 54 lb/bu, and \$0.05/bu per 0.5 lb/bu reduction between 54 and 50 lb/bu. Returns also deduct \$208.05, the sum of all listed costs from the December 2011 Farm Management Planning Guide Projected 2012 Crop Budgets South West North Dakota for durum.

SDSU Durum Wheat Variety Trial - Harding County (Ralph), 2010 - 2012.

Variety	Height	Lodging	Test Wt	Protein	Yield	Bu/Ac
	Inches	0-9*	Lb/Bu	%	2012	3-year
ALKABO	31	0	62.4	13.6	<b>41.3</b>	37.8
CARPIO	31	0	61.5	13.6	<b>42.5</b>	.
DIVIDE	31	0	61.9	13.8	38.5	<b>41.4</b>
GRENORA	28	0	61.1	14.6	<b>44.4</b>	<b>40.7</b>
MOUNTRAIL	30	0	62.2	16.3	36.7	.
TIOGA	31	0	62.9	15.6	<b>45.9</b>	<b>43.2</b>
Average	30.1	0.0	62.0	14.6	41.6	40.8
LSD (P=.05)	2.1	0.0	1.8	.	5.5	2.7
CV	4.5	0.0	1.9	.	8.8	7.9

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

Planted: April 11, 2012

Herbicide: Widematch (1 pt/A) + MCPA (8 oz/A)  
+ Axial XL (1 pt/A)

Harvested: August 1, 2012

Additional Nitrogen: 50 Lb/A

Previous crop: Conventional Fallow.



**2012 Durum Variety Trial at Mandan**

Cooperators: USDA-ARS, Mandan

Variety	Plant	Test	Grain	----- Grain Yield -----			Average Yield		
	Height	Weight	Protein	2009	2010	2012	2 yr	3 yr	
	inches	lbs/bu	%	----- Bushels per acre -----					
Divide	46	59.6	10.4	69.6	69.2	76.9	73.0	71.9	
Alkabo	46	58.7	11.1	70.2	67.1	78.2	72.6	71.8	
Tioga	49	60.4	11.7	66.8	65.6	82.4	74.0	71.6	
Grenora	44	58.1	13.1	68.1	71.7	72.5	72.1	70.8	
Mountrail	45	56.8	11.5	63.0	70.0	57.1	63.6	63.4	
Carpio	47	58.2	13.2		69.0	80.2	74.6		
Maier	46	59.3	12.1			73.7			
Trial Mean	46	58.5	11.8	67.1	68.8	75.4	--	--	
C.V. %	2.4	1.0	3.4	4.2	4.1	3.3	--	--	
LSD 10%	1	0.7	0.5	3.2	NS	3.0	--	--	

Planting Date: April 3

Harvest Date: August 1

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

Previous Crop: 2008 = HRSW, 2009 & 2011 = field pea.

## 2011 North Dakota barley variety descriptions.

Variety	Use <sup>1</sup>	Origin <sup>2</sup>	Year Released	Awn Type <sup>3</sup>	Rachilla Hair Length <sup>4</sup>	Aleurone Color	Height	Straw Strength	Relative Maturity	Reaction to Disease <sup>5</sup>			
										Stem Rust	Spot-form Net Blotch	Spot Blotch	Net Blotch
<b>Six-rowed</b>													
Celebration	M/F	BARI	2008	S	S	White	M.short	Strg.	Med.	S	MS	MR/R	MS/MS
Drummond	M/F	ND	2000	S	L	White	M.short	V.strg.	Med.	S	MR	MR/R	MS/S
Innovation	MT	BARI	2009	S	L	White	M.short	Strg.	Med.	S	MS	MR/R	MS/S
Lacey	M/F	MN	1999	S	S	White	M.short	Strg.	Med.	S	MR	MR/R	MS/S
Legacy	M/F	BARI	2000	S	L	White	Med.	Strg.	M.late	S	MS	MR/R	MS/S
Quest <sup>6</sup>	M/F	MN	2010	S	L	White	M.short	V.strg.	Med.	S	MR	MR/R	MS/S
Rasmusson	M/F	MN	2008	S	S	White	M.short	Strg.	Med.	S	MS	MR/R	MS/S
Robust	M/F	MN	1983	S	S	White	Med.	M.strg.	Med.	S	MS/S	MR/R	MS/S
Stellar-ND	M/F	ND	2005	S	L	White	M.short	V.strg.	Med.	S	MS	MR/R	MS/S
Tradition	M/F	BARI	2003	S	L	White	M.short	V.strg.	Med.	S	MS	MR/R	MS/S
<b>Two-rowed</b>													
AC Metcalfe	M	Canada	1997	R	L	White	Med.	Med.	Late	S	MS	MS	MS
CDC Copeland	M	Canada	1999	R	L	White	Tall	Med.	Late	S	MS	MS	MR
Champion	F	WestBred	2007	NA <sup>7</sup>	L	White	Tall	NA	M.late	NA	NA	NA	NA
Conlon <sup>8</sup>	M/F	ND	1996	S	L	White	M.short	Med.	M.early	S	MR	MS	MR/R
Conrad	M	BARI	2007	R	L	White	Tall	M.weak	Late	S	MS	NA	NA
Eslick	F	MT	2003	R	L	White	Med.	M.weak	M.late	S	NA	MS	NA
Harrington <sup>9</sup>	F	Canada	1981	R	L	White	Med.	M.weak	Late	S	S	S	MS
Haxby	F	MT	2003	R	L	White	Med.	Med.	Med.	S	MS	MS	NA
Hockett	M/F	MT	2008	R	L	White	Med.	Med.	Med.	S	NA	NA	NA
Lilly	F	Germany	NA	R	L	White	Short	M.strg.	Late	S	MS/S	S	MR/R
Pinnacle	M/F	ND	2006	S	L	White	Med.	Strg.	M.late	S	S	MR	MS
Rawson	F	ND	2005	R	L	White	Med.	Med.	Med.	S	MS	MR	MS
Scarlett	M	Germany	1995	R	L	White	Short	Med.	Late	S	NA	S	MR
Sunshine	F	Germany	NA	R	L	White	Short	M.strg.	Late	S	S	S	MS
<b>Specialty</b>													
Enduro	SP	WestBred	2007	H	L	White	Med.	NA	M.late	NA	NA	NA	NA
Wanubet	SP	MT	1990	H	L	White	Med.	Weak	Late	S	NA	S	S

<sup>1</sup> M = malting; MT = Being tested in plant scale tests for malting and brewing quality; F = feed; SP = special uses (hulless).

<sup>2</sup> BARI = Busch Agricultural Resources Inc.; MN = University of Minnesota; MT = Montana State University; ND = North Dakota State University.

<sup>3</sup> R = rough; S = smooth; H = hulless.

<sup>4</sup> S = short; L = long.

<sup>5</sup> R = resistant; MR = moderately resistant; MS = moderately susceptible; S = susceptible; NA = not available.

<sup>6</sup> Moderately resistant to Fusarium head blight.

<sup>7</sup> NA = Not available.

<sup>8</sup> Lower DON accumulations than other varieties tested.

<sup>9</sup> Recommended as a malting barley in western USA.

**2012 Barley Variety Trial at Hettinger**

Variety	Plant	%	Test	Grain	----- Grain Yield -----			Average Yield	
	Height	Plump	Weight	Protein	2010	2011	2012	2 yr	3 yr
	inches	>6/64	lbs/bu	%	----- Bushels per acre -----				
<b>2 Row Varieties</b>									
Haxby	34	87	47.4	13.0	115.5	82.1	85.6	83.8	94.4
Conlon	34	94	45.3	12.7	106.4	80.9	80.2	80.6	89.2
Rawson	35	94	44.6	11.7	106.7	66.7	87.3	77.0	86.9
CDC Copeland	38	79	44.8	13.6	107.3	63.4	79.0	71.2	83.2
Pinnacle	36	91	44.2	12.0	113.3	59.4	71.7	65.6	81.5
AC Metcalfe	36	83	39.6	13.9	102.6	56.8	54.7	55.8	71.4
Conrad	35	84	43.6	13.4		71.1	91.0	81.0	
<b>6 Row Varieties</b>									
Innovation	35	87	41.8	13.5	110.8	89.4	102.5	96.0	100.9
Tradition	35	83	42.9	12.9	117.4	91.1	93.5	92.3	100.7
Lacey	37	82	44.9	13.1	111.9	84.1	91.0	87.6	95.7
Celebration	37	81	41.8	13.8	106.1	70.2	99.5	84.8	91.9
Quest	37	82	41.3	13.4	109.1	72.3	90.6	81.4	90.7
Stellar-ND	36	81	42.0	12.9	113.5	61.7	94.3	78.0	89.8
Trial Mean	36	85	43.3	12.8	113.8	76.6	91.0	--	--
C.V. %	3.9	5.2	9.8	4.2	4.7	6.8	5.1	--	--
LSD 10%	2	2	5.0	1.7	5.8	5.4	5.5	--	--

Planting Date: March 29

Harvest Date: July 25

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

Previous Crop: 2008, 2009 & 2010 = field pea.

**2012 Barley Variety Trial at Scranton**

Cooperator: Justin Freitag, Scranton

Variety	Plant	Test	%	Grain	----- Grain Yield -----			Average Yield	
	Height	Weight	Plump	Protein	2010	2011	2012	2 yr	3 yr
	inches	lbs/bu	>6/64	%	----- Bushels per acre -----				
<b>2 Row Types</b>									
Rawson	38	47.4	92	11.1	87.8	54.4	80.4	67.4	74.2
Pinnacle	38	46.0	84	11.3	72.9	30.0	81.1	55.6	61.3
Conlon	37	46.5	93	11.3			86.7		
<b>6 Row Types</b>									
Innovation	36	47.7	83	10.5		56.7	88.4	72.6	
Quest	40	45.9	73	12.4		54.6	72.5	63.6	
Celebration	37	46.4	63	11.7	78.6		85.1		
Trial Mean	38	46.6	81	11.4	84.8	50.3	82.4	--	--
C.V. %	4.6	1.3	9.9	3.7	5.1	3.1	5.0	--	--
LSD 10%	2	0.8	10	0.5	3.6	1.8	5.1	--	--

Planting Date: April 4

Harvest Date: July 30

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

Previous Crop: HRSW.

Note: The 2011 trial sustained moderate infections of barley yellow dwarf causing lower test weights and grain yields.

**2012 Barley Variety Trial at Regent**

Cooperators: August and Perry Kirschmann, Regent

Variety	Plant	Test	%	Grain	----- Grain Yield -----			Average Yield	
	Height	Weight	Plump	Protein	2010	2011	2012	2 yr	3 yr
	inches	lbs/bu	>6/64	%	----- Bushels per acre -----				
<b>2 Row Types</b>									
Rawson	34	47.9	93	12.3	76.9	43.6	65.3	54.4	61.9
Conlon	37	48.4	95	13.4	76.4	33.5	69.1	51.3	59.7
Pinnacle	38	47.7	88	13.5	83.8	39.5	48.8	44.2	57.4
<b>6 Row Types</b>									
Innovation	35	46.8	84	13.8		42.4	67.2	54.8	
Quest	39	47.7	84	14.0		42.2	50.9	46.6	
Celebration	36	46.6	83	13.7	84.8		52.4		
Trial Mean	36	47.5	88	13.4	77.8	40.1	58.9	--	--
C.V. %	5.7	1.8	5.0	5.3	3.9	6.6	6.2	--	--
LSD 10%	NS	1.0	5	0.9	3.4	3.0	4.5	--	--

NS = no statistical difference between varieties.

Planting Date: April 4

Harvest Date: July 31

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

Previous Crop: HRSW.

Note: The 2011 trial sustained moderate infections of barley yellow dwarf causing lower test weights and grain yields.

Variety	Days to Head	Seeds per Pound	Plant Height in	Test Weight lbs/bu	Protein %	Plump % >6/64	----- Grain Yield-----			Returns <sup>1</sup> \$/ac	Average Yield	
							2009*	2011	2012		2	3
							-----bu/ac-----			----bu/ac----		
<b>Six Row</b>												
Celebration	65	16,063	31	42.5	13.7	87	74.6	77.9	95.7	301.15	86.8	82.7
Innovation	65	13,610	30	44.8	13.1	90	--	84.0	97.2	323.99	90.6	--
Lacey	64	13,444	30	44.8	13.5	89	74.9	77.0	93.9	304.54	85.5	82.0
Quest	64	13,634	31	44.3	13.1	84	71.0	73.2	91.4	283.94	82.3	78.5
Stellar-ND	64	13,207	31	43.5	13.1	91	72.0	78.0	101.7	335.43	89.8	83.9
Tradition	65	14,658	30	44.3	13.3	86	72.5	85.7	78.5	216.03	82.1	78.9
<b>Two Row</b>												
AC Metcalfe	68	13,367	30	43.8	12.7	87	107.2	60.5	71.9	178.84	66.2	79.9
CDC Copeland	71	12,537	33	44.0	12.6	88	110.0	61.3	81.0	230.84	71.2	84.1
Conlon	62	11,832	27	44.8	12.5	92	74.5	65.4	72.8	186.98	69.1	70.9
Conrad	70	12,945	28	45.5	12.6	91	105.6	50.2	86.6	272.26	68.4	80.8
Haxby	67	11,341	28	46.8	11.8	90	105.0	82.4	86.6	270.98	84.5	91.3
Pinnacle	66	10,633	30	44.5	11.5	95	89.3	76.8	89.1	277.48	83.0	85.1
Rawson	65	9,298	30	45.3	12.0	97	81.4	60.9	93.2	316.47	77.1	78.5
Trial Mean	65	12,802	30	44.2	12.7	89	83.5	73.2	89.5	278.45	--	--
CV %	0.9	6.3	4.8	1.7	2.82	2.5	--	--	5.7	--	--	--
LSD 0.10	1	1,391	2	1.3	0.6	4	--	--	6.0	--	--	--

Planting Date: April 11, 2012

Harvest Date: July 23, 2012

Previous Crop: F Field Pea

Seeding Rate: 1.2 million live seeds/ac

\* Note: 2009 trial received hail

<sup>1</sup>Returns were calculated by multiplying the 2012 yields by the price paid for feed barley minus the test weight discount paid at the Southwest Grain Terminal located at Gladstone on August 10. The price paid on this date was \$5.60/bu for grain with test weights heavier than 45 lb/bu. Grain with a test weight of 45 lb/bu was discounted \$.03/bu, with an additional discount of \$.04/bu per pound down to 42 lb/bu. Below 42 lb/bu, an additional discount of \$.05/bu occurred per pound. Returns also deduct \$201.02, the sum of all listed costs from the December 2011 Farm Management Planning Guide Projected 2012 Crop Budgets South West North Dakota for barley.

Variety	Seeds per Pound	Test Weight lbs/bu	% Plump >6/64	Protein %	-----Grain Yield-----			Returns <sup>1</sup> \$/ac	Average Yield	
					2010	2011	2012		2	3
					-----bu/ac-----			----bu/ac----		
<b>Six Row</b>										
Celebration	15,172	47.3	97	13.2	--	--	86.7	275.06	--	--
Innovation	13,463	47.8	97	12.2	--	59.1	90.2	297.45	74.6	--
Quest	13,851	48.0	94	12.7	--	58.7	78.7	234.68	68.7	--
<b>Two Row</b>										
Conlon	10,274	48.5	95	12.5	26.0	39.3	76.9	227.82	58.1	47.4
Pinnacle	10,839	48.8	97	11.6	41.8	49.5	88.1	288.66	68.8	59.8
Rawson	9,482	47.5	98	11.8	41.0	55.2	79.8	244.50	67.5	58.6
Trial Mean	12,180	48.0	96	12.3	41.6	48.6	83.4	261.36	--	--
CV %	2.6	0.6	0.6	1.8	--	--	5.5	--	--	--
LSD 0.10	635	0.5	1	0.5	--	--	5.7	--	--	--

Planting Date: April 24, 2012

Harvest Date: August 6, 2012

Previous Crop: Spring Wheat

Seeding Rate: 1.2 million live seeds/ac

<sup>1</sup>Returns were calculated by multiplying the 2012 yields by the price paid for feed barley minus the test weight discount paid at the Southwest Grain Terminal located at Gladstone on August 10. The price paid on this date was \$5.60/bu for grain with test weights heavier than 45 lb/bu. Grain with a test weight of 45 lb/bu was discounted \$.03/bu, with an additional discount of \$.04/bu per pound down to 42 lb/bu. Below 42 lb/bu, an additional discount of \$.05/bu occurred per pound. Returns also deduct \$201.02, the sum of all listed costs from the December 2011 Farm Management Planning Guide Projected 2012 Crop Budgets South West North Dakota for barley.

Variety	Seeds per Pound	Test Weight lbs/bu	% Plump >6/64	Protein %	-----Grain Yield-----			Returns <sup>1</sup> \$/ac	Average Yield	
					2010	2011	2012		2	3
					-----bu/ac-----				----bu/ac----	
<b>Six Row</b>										
Celebration	13,440	46.0	96	13.2			72.2	201.93	--	--
Innovation	12,563	47.0	95	12.9	--	58.4	69.1	186.17	63.7	--
Quest	12,871	46.8	92	12.7	--	56.6	67.1	173.49	61.8	--
<b>Two Row</b>										
Conlon	11,499	47.0	98	12.2	51.7	38.1	58.7	126.67	48.4	49.5
Pinnacle	10,525	47.8	98	11.4	56.4	47.4	68.1	180.07	57.7	57.3
Rawson	9,566	46.5	98	11.5	53.3	49.0	58.0	123.41	53.5	53.4
Trial Mean	11,744	46.8	96	12.3	54.3	50.2	65.5	165.29	--	--
CV %	5.0	0.8	0.5	2.0	--	--	6.0	--	--	--
LSD 0.10	1,087	0.7	1	0.5	--	--	4.9	--	--	--

Planting Date: April 17, 2012

Harvest Date: August 6, 2012

Previous Crop: Spring Wheat

Seeding Rate: 1.2 million live seeds/ac

<sup>1</sup>Returns were calculated by multiplying the 2012 yields by the price paid for feed barley minus the test weight discount paid at the Southwest Grain Terminal located at Gladstone on August 10. The price paid on this date was \$5.60/bu for grain with test weights heavier than 45 lb/bu. Grain with a test weight of 45 lb/bu was discounted \$.03/bu, with an additional discount of \$.04/bu per pound down to 42 lb/bu. Below 42 lb/bu, an additional discount of \$.05/bu occurred per pound. Returns also deduct \$201.02, the sum of all listed costs from the December 2011 Farm Management Planning Guide Projected 2012 Crop Budgets South West North Dakota for barley.



SDSU Spring Barley Variety Trial - Harding County (Ralph), 2010 - 2012.

Variety	Height Inches	Lodging 0-9*	Test Wt Lb/Bu	Protein Percent	Yield 2012	Bu/Ac 3-year
<b>TWO ROW</b>						
HAYS	26	0	41.7	11.5	<b>45.9</b>	.
CONLON +	27	0	41.5	10.4	22.1+	<b>+</b>
ESLICK	25	0	38.4	11.2	<b>45.4</b>	<b>54.6</b>
PINNACLE	27	0	43.1	11.5	<b>43.1</b>	44.7
<b>SIX ROW</b>						
CELEBRATION	29	0	42.4	12.0	<b>40.8</b>	40.5
INNOVATION	27	0	43.9	10.9	<b>40.3</b>	.
STELLAR-ND	29	0	39.4	11.7	<b>40.1</b>	44.4
QUEST	27	0	41.3	.	<b>36.5</b>	.
Average	27	0.0	41.4	11.3	39.3	39.5
LSD (P=.05)	2.5	0.0	2.2	.	11.4	4.5
CV	6.2	0.0	3.6	.	16.6	14.6

+ Colon yields were adversely affected by wildlife damage.

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

Planted: April 11, 2012

Herbicide: Widematch (1 pt/A) + MCPA (8 oz/A)  
+ Axial XL (1 pt/A)

Harvested: August 1, 2012

Additional Nitrogen: 50 Lb/A

Previous crop: Conventional Fallow.

**2012 Barley Variety Trial at Mandan**

Cooperator: USDA-ARS, Mandan

Variety	Plant	Test	%	Grain	----- Grain Yield -----			Average Yield	
	Height	Weight	Plump	Protein	2009	2010	2012	2 yr	3 yr
	inches	lbs/bu	>6/64	%	----- Bushels per acre -----				
<b>2 Row Types</b>									
Pinnacle	41	40.6	91	11.1	79.4	89.4	43.1	66.2	70.6
Rawson	39	41.1	92	11.1	73.3	86.5	45.9	66.2	68.6
Conlon	39	40.1	88	11.7	72.2	79.5	41.9	60.7	64.5
<b>6 Row Types</b>									
Celebration	40	41.1	84	12.1	83.7	90.1	36.6	63.4	70.1
Innovation	41	42.4	88	11.1			51.4		
Quest	41	41.6	82	11.0			49.8		
Trial Mean	40	41.1	88	11.4	81.1	87.5	44.8	--	--
C.V. %	3.0	3.2	2.8	3.5	3.9	2.7	5.6	--	--
LSD 10%	2	NS	3	0.5	3.6	2.6	3.1	--	--

NS = no statistical difference between varieties.

Planting Date: April 3

Harvest Date: August 1

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

Previous Crop: HRSW.

2011 North Dakota oat variety descriptions.

Variety	Origin <sup>1</sup>	Year Released	Grain Color	Height	Straw Strength	Maturity <sup>2</sup>	Reaction to Diseases			Bu/Wt.	Protein <sup>5</sup>
							Stem Rust <sup>3</sup>	Crown Rust <sup>3</sup>	Barley Y.Dwf <sup>4</sup>		
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 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 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 Weaver	Can.	2005	Yellow	Med.	M.strg.	L	S	S	S	Good	M
Drumlin	WI	2003	Yellow	Med.	Strong	M	S	MR	VT	Good	M
Excel	IN	2006	White	Med.	Strong	M	S	MS	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
Hytest	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	Strong	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
Minstrel	Sask.	2008	White	M.tall	Strong	L	MR/MS	S	S	Good	M
Monida	MT/ID	1985	White	M.tall	Strong	L	S	S	S	Fair	ML
Morton	ND	2001	White	Tall	V.strg.	L	S	S	MT	V.good	M
Newburg	ND	2011	White	Tall	Med.	L	R	R	MT	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
Rockford	ND	2008	White	Tall	Strong	L	S	R	MT	V.good	M
Sesqui	MN	2001	Yellow	M.tall	Strong	L	S	S	T	Good	M
Shelby427	SD	2008	White	Med.	Strong	E	S	R	NA	V.good	NA
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
Streaker	SD	2008	Hulless	Tall	M.weak	M	S	R/MR	NA	V.good	MH
Summit	AAFC Winnipeg	2008	White	Med.	Strong	L	S	R	MT	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

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

<sup>2</sup> E = early; M = medium; L = late; V = very late.

<sup>3</sup> R = resistant; MR = moderately resistant; MS = moderately susceptible; S = susceptible.

<sup>4</sup> 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.

<sup>5</sup> H = high; M = medium; L = low.

**2012 Oat Variety Trial at Hettinger**

Variety	Days to	Plant	Test	----- Grain Yield -----			Average Yield		
	Head	Height	Weight	2010	2011	2012	2 yr	3 yr	
	*	inches	lbs/bu	----- Bushels per acre -----					
Jury	77.0	43.3	33.2	162.8	116.1	135.3	125.7	138.1	
Stallion	80.0	42.3	33.0	151.2	120.6	139.0	129.8	136.9	
AC Pinnacle	81.5	38.2	29.9	159.6	117.5	133.0	125.2	136.7	
Furlong	81.3	38.4	29.4	154.7	122.7	131.1	126.9	136.2	
CDC Minstrel	81.0	37.8	30.8	154.9	112.1	140.4	126.2	135.8	
Newburg	78.0	42.3	32.0	152.7	122.9	126.2	124.6	133.9	
Shelby 427	74.0	38.5	35.4	142.2	127.5	127.1	127.3	132.3	
Killdeer	79.3	36.1	30.1	151.0	113.7	131.0	122.4	131.9	
Souris	81.0	35.7	32.1	155.9	113.5	118.3	115.9	129.2	
Rockford	81.0	41.7	33.4	145.8	113.5	126.9	120.2	128.7	
Beach	78.8	42.4	32.2	149.0	113.9	120.3	117.1	127.7	
Leggett	81.0	36.8	31.7	154.4	95.4	124.6	110.0	124.8	
Morton	81.0	43.4	31.5	135.7	112.1	115.5	113.8	121.1	
HiFi	81.3	40.4	31.4	140.1	103.8	111.5	107.6	118.5	
Otana	81.0	44.3	31.6	139.6	67.2	141.6	104.4	116.1	
CDC Dancer	81.3	41.0	31.4	145.9	67.7	118.9	93.3	110.8	
Hyttest	78.0	41.5	36.3	121.9	70.2	120.5	95.4	104.2	
Horsepower	74.0	33.8	33.9			132.9			
<b><i>Naked (hulless) Varieties</i></b>									
Buff	74.0	32.2	35.2	103.2	114.5	88.2	101.4	102.0	
Stark	82.3	38.9	31.9	95.8	90.9	94.8	92.8	93.8	
Trial Mean	80	40	32.3	143.8	104.1	124.3	--	--	
C.V. %	1.0	4.1	3.4	5.8	4.1	3.8	--	--	
LSD 10%	1	2	1.3	9.1	4.6	5.6	--	--	

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

Planting Date: March 29

Harvest Date: July 23

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

Previous Crop: 2009 = mustard, 2010 & 2011 = field pea.

Variety	Days to Head	Seeds per Pound	Plant Height in	Test Weight lbs/bu	----- Grain Yield-----			Returns <sup>1</sup> \$/ac	----- Average Yield -----	
					2010 -----bu/ac-----	2011	2012		2 Year	3 Year
AC Pinnacle	78	14,407	34	35.0	189.2	154.1	111.9	143.01	133.0	151.7
Beach	78	14,680	36	37.8	174.9	129.0	118.0	167.05	123.5	140.6
Buff*	76	16,755	34	38.5	149.9	106.9	107.6	135.47	107.3	121.5
CDC Dancer	78	15,778	36	36.5	158.9	118.8	114.2	147.27	116.5	130.6
CDC Minstrel	78	13,093	31	35.0	183.5	120.5	133.3	203.91	126.9	145.7
Furlong	78	10,946	34	35.5	184.3	139.2	130.3	193.02	134.7	151.3
HiFi	76	15,837	34	35.5	185.4	114.9	117.5	152.71	116.2	139.2
Horsepower	73	16,075	30	37.0	--	--	93.0	85.88	--	--
Hyttest	76	15,648	38	35.0	161.7	105.9	132.8	197.57	119.3	133.4
Jury	75	13,522	39	36.0	174.5	124.9	131.9	199.27	128.4	143.8
Killdeer	76	16,031	32	33.0	176.5	138.5	124.8	166.63	131.6	146.6
Leggett	78	13,872	32	36.3	177.2	139.5	117.8	162.56	128.6	144.8
Morton	76	14,497	37	37.5	159.1	126.9	130.5	199.34	128.7	138.8
Newburg	75	13,129	36	35.5	177.7	128.2	139.8	214.41	134.0	148.6
Otana	78	16,865	39	35.5	164.3	110.7	133.4	199.45	122.1	136.2
Rockford	77	15,798	37	37.8	188.2	139.4	129.7	196.90	134.6	152.5
Shelby 427	72	15,242	36	38.3	153.0	117.9	125.2	190.09	121.6	132.0
Souris	76	15,973	33	36.0	168.6	115.4	127.7	186.14	121.6	137.2
Stallion	76	15,656	36	35.8	156.3	141.0	147.5	237.25	144.2	148.2
Stark*	78	15,339	36	39.3	161.7	111.0	108.0	140.77	109.5	126.9
Trial Mean	76	14,809	35	36.4	169.7	123.0	122.9	173.37	--	--
CV %	1.1	4.7	4.6	2.5	--	--	8.8	--	--	--
LSD 0.10	1	1,182	2	1.6	--	--	12.8	--	--	--

Planting Date: April 3, 2012

Harvest Date: July 25, 2012

\* Hulless

Previous Crop: Field Pea

Seeding Rate: 1 million live seeds/ac

<sup>1</sup>Returns were calculated by multiplying the 2012 yield by the test weight discount paid at the Southwest Grain Terminal located in Gladstone on August 10. The price paid was \$2.95/bu for grain with a test weight greater than 37 lb/bu. Grain with a test weight of 37 lb/bu was discounted \$.04/bu, with an additional discount of \$.04/bu per pound to 30 lb/bu. Below 30 lb/bu, an additional discount of \$.07/bu occurred per pound. Returns also deduct \$175.80, the sum of all listed costs from the December 2011 Farm Management Planning Guide Projected 2012 Crop Budgets South West North Dakota for oats.

**2012 Oat Variety Trial at Mandan**

Cooperator: USDA-ARS, Mandan

Variety	Plant	Test	----- Grain Yield -----			Average Yield		
	Height	Weight	2009	2010	2012	2 yr	3 yr	
	inches	lbs/bu	----- Bushels per acre -----					
Rockford	44	36.4	172.4	142.7	136.4	139.6	150.5	
Killdeer	41	34.8	166.7	142.2	140.4	141.3	149.8	
Souris	41	32.6	159.0	139.7	105.1	122.4	134.6	
Morton	49	32.2	154.1	133.2	107.9	120.6	131.7	
Newburg	49	33.2			144.4			
Jury	50	35.3			127.6			
Trial Mean	46	34.1	157.8	137.1	127.0	--	--	
C.V. %	2.8	2.3	4.1	3.1	3.0	--	--	
LSD 10%	2	1.0	7.1	4.7	4.7	--	--	

Planting Date: April 3

Harvest Date: August 1

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

Previous Crop: HRSW.

**2011 North Dakota winter rye variety descriptions.**

Variety	Origin <sup>1</sup>	Year Released	Height	Straw Strength	Maturity	Seed Color	Seed Size	Test Weight	Winter Hardines
AC Rifle	Canada	1994	Short	V.good	Med.	Blue	Med.	Med.	V.good
AC Remington	Canada	1998	Short	V.good	Med.	NA	Med.	Good	Good
Aroostok	USDA	1999	Tall	Fair	Early	NA	Small	High	V.good
<b>Ensi</b>	Finland	1933	Tall	Fair	Late	NA	Small	Low	NA
Dacold	ND	1989	Med.	Good <sup>2</sup>	V.late	Bl-grn.	Med.	Low	Good
Frederick	SD	1984	Tall	Fair	Late	Tan	Med.	High	Good
Hancock	WI	1979	Tall	Good	Med.	Tan	Large	High	Fair <sup>3</sup>
Musketeers	Canada	1980	Tall	Good	M.early	Blue	Large	Med.	V.good
Prima	Canada	1984	Tall	Good	Med.	Blue	Large	Med.	V.good
Rymin	MN	1973	Tall	V.good	Late	Grn-gray	Large	High	Fair <sup>3</sup>
Spooner	WI	1993	Tall	V.good	Med.	Tan	Large	High	Good
Wheeler	MI	1971	Tall	Fair	Med.	NA	Large	Low	Good
Wrens Abruzzi	GA	1953	Tall	Fair	Early	NA	Small	High	Good

<sup>1</sup>ND = North Dakota State University; SD = South Dakota State University; WI = University of Wisconsin; MN = University of Minnesota; MI = Michigan State University.

<sup>2</sup>Under certain environments lodging has been observed.

<sup>3</sup>Varieties with fair winter hardiness should not be seeded on bare soil.

**2012 Winter Rye Variety Trial at Hettinger**

Variety	Heading Date	Plant Height	Test Weight	Grain Yield			Average Yield	
				2010	2011	2012	2 year	3 year
		inches	lbs/bu	bushels per acre				
Dacold	June 6	38	49.5	105.1	103.2	71.1	87.2	93.1
Hancock	June 1	44	51.0	92.9	93.1	63.5	78.3	83.2
Spooner	June 2	44	48.2	73.8	82.5	48.9	65.7	68.4
Aroostok	May 22	46	48.2	66.3	73.6	46.0	59.8	62
Wheeler	June 4	47	44.0	53.2	43.9	33.1	38.5	43.4
Ensi	June 5	48	50.5			51.0		
Trial Mean		44	49.0	79.1	73.5	55.4	--	--
C.V. %		4.9	2.5	4.1	4.2	15.4	--	--
LSD 10%		3	1.5	3.5	3.4	10.5	--	--

Planting Date: September 26, 2011

Harvest Date: July 26, 2012

Seeding Rate: 1 million live seeds / acre

Previous Crop: 2009 = hrsw, 2010 & 2011 = field pea.

Note: The 2012 trial was seeded into dry soil and had less than 5% seedling emergence on November 30.



## SAFFLOWER VARIETY DESCRIPTIONS

Variety	Origin <sup>1</sup>	PVP <sup>6</sup>	Hull Type <sup>2</sup>	Oil Type <sup>3</sup>	Irrigated Yield <sup>4</sup>	Dryland Yield <sup>4</sup>	TWT <sup>4</sup>	Oil <sup>3</sup>	Maturity	Tolerance <sup>5</sup>	
										Alt.	BB
Cardinal	MT/ND	yes	N	high lino	v good	v good	high	fair	med	T	MT
Centennial	MT/ND	yes	STP	linoleic	m good	good	med	v good	m late	MT	MT
Finch	MT/ND	no	N	linoeic	good	v good	v high	fair	m early	MS	T
MonDak	MT/ND	yes	N	high oleic	good	v good	high	fair	m early	T	MT
Morlin	MT/ND	yes	STP	high linoleic	v good	good	med	good	m late	T	T
Nutrasaff	MT/ND	yes	RED	linoeic	good	good	med	high	med	T	MT
S-541	ST	no	STP	linoeic	fair	v good	m high	v good	m late	MS	MS
Montola 2000	MT/ND	yes	N	high oleic	m good	good	med	good	early	MS	MS
Montola 2001	MT/ND	yes	STP	high oleic	good	fair	med	good	med	MT	MT
Montola 2003	MT/ND	yes	N	high oleic	v good	v good	m high	good	m early	MT	MT
Montola 2004	MT/ND	yes	N	high oleic	good	good	m high	good	m early	MS	MT

<sup>1</sup> ST -= SeedTec International, MT = Montana, ND = North Dakota

<sup>2</sup> STP = striped, N = normal, RED = reduced

<sup>3</sup> Lino - linoleic

<sup>4</sup> Relative ratings of yield, test weight, and oil will vary under conditions of moderate-severe disease infestation

<sup>5</sup> Alt = Alternaria leaf spot disease, BB = bacterial blight, S = susceptible, MS = moderately susceptible, MT = moderately tolerant, T = tolerant

<sup>6</sup> "yes" indicates the variety is protected and the seed may be sold for planting purposes only as a class of certified seed (Title V option)

**2012 Safflower Variety Trial at Hettinger**

Variety	Plant	Oil	Test	Seed Yield			Avg. Yield		
	Height	Content	Weight	2010	2011	2012	2 year	3 year	
	inches	%	lbs/bu	pounds per acre					
<b><i>Linoleic Types</i></b>									
Cardinal	28	42.0	42.3	3015	1607	2381	1994	2334	
Finch	27	42.6	42.1	2444	1785	2073	1929	2101	
NutraSaff	27	48.6	32.3	2458	938	1366	1152	1587	
00B1597-3	29	45.3	38.1		1951	2115	2033		
<b><i>Oleic Types</i></b>									
Hybrid 1601	27	44.3	39.0	3361	1791	2993	2392	2715	
Hybrid 9049	28	39.5	41.2	3184	2100	2601	2350	2628	
MonDak	26	43.6	39.0	2831	2078	2358	2218	2422	
Montola 2003	25	45.1	38.5	2898	2057	2060	2058	2338	
Trial Mean	27	43.9	39.3	2793	1777	2272	--	--	
C.V. %	3.2	3.5	1.8	5.3	8.0	10.6	--	--	
LSD 10%	1	1.9	1.0	140	140	320	--	--	

Planting Date: March 30

Harvest Date: August 16

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

Previous Crop: 2009 = oat, 2010 = barley, 2011 = hrsw.

<b>2011 North Dakota flax variety descriptions.</b>						
---	--	--	--	--	--	--

Variety <sup>1</sup>	Origin <sup>2</sup>	Year Released	Relative Maturity	Seed Color	Plant Height	Wilt <sup>3</sup>
AC Lightning	Can.	2002	Late	Brown	Med.tall	R
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 Sorrel	Can.	2007	Med.late	Brown	Med.tall	MR
Hanley	Can.	2002	Med.early	Brown	Med.	R
Linott	Can.	1966	Med.early	Brown	Med.	MS/MR
McGregor	Can.	1980	Late	Brown	Med.tall	MR
Nече	ND	1988	Med.	Brown	Med.	R
Nekoma	ND	2002	Late	Brown	Med.	MR
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
Rahab 94	SD	1994	Med.	Brown	Med.	MR
Selby	SD	2000	Late	Brown	Tall	MR
Shape	Can.	2010	Med.	Brown	Med.	R
Webster	SD	1998	Late	Brown	Tall	MR
York	ND	2002	Late	Brown	Med.	R

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

<sup>2</sup> Can. = Canada; ND = North Dakota State University; SD = South Dakota State University.

<sup>3</sup> R = resistant; MR = moderately resistant; MS = moderately susceptible; NA = not available.

**2012 Flax Variety Trial at Hettinger**

Variety	Plant	Test	----- Seed Yield -----			Average Yield		
	Height	Weight	2009	2011	2012	2 yr	3 yr	
	inches	lbs/bu	----- Bushels per acre -----					
York	20	56.3	40.8	28.8	22.0	25.4	30.5	
Prairie Thunder	19	56.4	42.0	28.2	18.4	23.3	29.5	
CDC Arra	20	55.2	42.0	26.5	16.4	21.4	28.3	
CDC Bethume	21	55.0	41.1	23.4	20.4	21.9	28.3	
Prairie Grande	21	55.5	40.1	27.5	16.9	22.2	28.2	
Prairie Blue	20	55.7	39.4	26.4	17.8	22.1	27.9	
Nekoma	21	56.2	39.1	25.1	16.8	21.0	27.0	
Pembina	22	55.6	37.9	23.4	18.4	20.9	26.6	
Carter*	20	56.0	40.6	24.1	14.4	19.2	26.4	
Hanley	21	--	40.2	24.7	14.3	19.5	26.4	
Webster	20	55.8	34.5	27.1	15.4	21.2	25.7	
Lightnin	22	55.5	39.3	23.3	12.8	18.0	25.1	
Trial Mean	21	55.7	39.2	25.6	17.0	--	--	
C.V. %	7.2	1.1	6.9	10.2	11.8	--	--	
LSD 10%	NS	NS	2.9	2.8	2.4	--	--	

\* Yellow seed type.

NS = no statistical difference between varieties.

Planting Date: March 30

Harvest Date: August 2

Seeding Rate: 40 lbs/A

Previous Crop: 2008 = HRSW, 2010 & 2011 = Barley.

**2012 Canola Variety Trial at Hettinger**

Brand	Variety	Type *	Plant Height inches	Oil Content %	----- Seed Yield -----		
					2011	2012	2 yr Avg.
					---- pounds per acre ----		
Cargill	v1050	RR,H	36	41.0		1136	
Cargill	V12-1	RR,H	35	41.2		1119	
Cargill	v2035	RR,H	35	40.5	1825	943	1384
Cargill	v2045	RR,H	36	42.9		1066	
BrettYoung	6070 RR	RR,H	38	42.0	2417	1111	1764
BrettYoung	6040 RR	RR,H	39	39.5	1937	1156	1546
Integra	7150 R	RR,H	36	41.9	1951	1038	1494
Integra	7152 R	RR,H	35	42.9	2002	1154	1578
Mycogen	Nexera 1012 RR	RR,H	41	44.4	2130	814	1472
Mycogen	Nexera 1016 RR	RR,H	37	41.7	2084	836	1460
Mycogen	Nexera 2012 CL	CL,H	42	44.8		722	
Mycogen	Nexera 2016 CL	CL,H	37	44.7		878	
Croplan	HyCLASS 940	RR,H	35	41.6	1842	1223	1532
Croplan	HyCLASS 947	RR,H	36	41.4		943	
Croplan	HyCLASS 955	RR,H	32	42.4	2140	1019	1580
Croplan	HyCLASS 988	RR,H	40	43.5	2142	872	1507
Croplan	HyCLASS 930	RR,H	34	41.3		927	
Proseed	45 Caliber	RR,H	39	41.6		846	
Star	Star 402	RR,H	39	43.4		886	
Trial Mean			37	42.2	1858	984	--
C.V. %			6.4	4.2	7.3	10.5	--
LSD 10%			3	2.1	145	123	--

\* Type: RR = Roundup Ready, CL = Clearfield, H = hybrid.

Planting Date: April 16

Harvest Date: July 30

Previous Crop: HRSW

Note: 2012 seed yields were severely impacted by hot temperatures during flowering.

**2012 Chickpea Variety Trial at Hettinger**

Variety	Plant	Test	----- Seed Yield -----			--- Avg. Yield ---		
	Height	Weight	2009	2011	2012	2 yr	3 yr	
	inches	lbs/bu	----- Pounds per Acre -----					
<b>Large Kaboli Types</b>								
Sawyer	17	53.7	798	1090	2242	1666	1377	
Sierra	18	53.5	287	457	1457	957	734	
Dylan	15	49.2	199	145	1445	795	596	
Troy	15	50.5	172	192	1219	706	528	
<b>Small Kaboli Types</b>								
B-90	18	57.4	2024	1029	2813	1921	1955	
CDC Frontier	18	54.3	1750	1106	2855	1980	1904	
CDC Luna	16	51.1	1281	1114	3134	2124	1843	
<b>Desi Types</b>								
CDC Anna	16	54.1	1895	1692	2651	2172	2079	
Trial Mean	17	53.0	943	777	2227	--	--	
C.V. %	12.4	3.2	22.0	35.0	6.6	--	--	
LSD 10%	NS	2.1	225	98	180	--	--	

NS = no statistical difference between varieties.

Planting Date: April 12

Harvest Date: August 8

Seeding Rate: 175,000 live seeds / Acre.

Previous Crop: 2008 & 2010 = HRSW, 2011 = durum

**2012 Lentil Variety Trial at Hettinger**

Variety	Plant	1000	Test	----- Seed Yield -----			Avg. Yield		
	Height	Seed wt.	Weight	2010	2011	2012	2 year	3 year	
	inches	grams	lbs/bu	----- pounds per acre -----					
<b>Large Green Types</b>									
Pennell	12	71.4	57.0	1128	1551	1928	1740	1536	
CDC Greenland	12	62.2	58.6	872	1254	1698	1476	1275	
Riveland	11	67.8	57.6	743	1010	1388	1199	1047	
<b>Medium Green Type</b>									
CDC Richlea	11	51.8	60.4	1154	1463	1986	1724	1534	
<b>Small Green Types</b>									
CDC Viceroy	13	32.8	63.8	1446	1710	1962	1836	1706	
Essex	12	43.8	62.2		1252	1875	1564		
<b>Small French Green Type</b>									
CDC Lemay	11	32.6	63.6	1570	1140	1689	1414	1466	
<b>Medium Red Type</b>									
CDC Red Rider	13	44.6	61.9	1663	1984	2067	2026	1905	
<b>Small Red Types</b>									
CDC Rouleau	12	38.0	61.7	1749	1656	1776	1716	1727	
CDC Redberry	11	43.0	62.4	1390	1870	1876	1873	1712	
<b>Extra Small Red Type</b>									
CDC Rosetown	11	31.8	64.6	1498	1711	2130	1920	1780	
<b>Spanish Brown Type</b>									
Morena	12	37.8	64.7		1260	2094	1677		
Trial Mean	11	43.7	61.3	1321	1484	1932	--	--	
C.V. %	10.4	5.1	0.9	11.8	6.9	5.8	--	--	
LSD 10%	1	2.7	0.7	174	111	133	--	--	

Planting Date: March 29

Harvest Date: August 2

Seeding Rate: 550,000 live seeds / Acre.

Previous Crop: 2009, 2010 & 2011 = HRSW.

**2012 Clearfield Lentil Variety Trial at Hettinger**

Variety	Plant	1000	Test	Seed Yield			Avg. Yield		
	Height	Seed wt	Weight	2010	2011	2012	2 year	3 year	
	inches	grams	lbs/bu	pounds per acre					
<b>Large Green Type</b>									
CDC Imigreen-CL	13	50.8	59.7			1212			
<b>Medium Green Type</b>									
CDC Impress-CL	13	41.0	58.3	1543	1760	1795	1778	1699	
<b>Small Red Types</b>									
CDC Maxim-CL	12	33.4	62.2	2255	1874	2039	1956	1850	
CDC Impact-CL	12	28.6	63.6	1593	1841	1557	1699	1664	
<b>Extra Small Red Types</b>									
CDC Impala-CL	13	27.6	63.0	2215	1712	1807	1760	1911	
CDC Imperial-CL	12	24.0	62.4	2290	1620	1567	1594	1826	
Trial Mean	13	34.2	61.5	1888	1755	1663	--	--	
C.V. %	14.0	3.7	0.9	6.6	4.6	5.5	--	--	
LSD 10%	NS	1.6	0.7	120	77	112	--	--	

NS = no statistical difference between varieties.

Planting Date: March 29

Harvest Date: August 2

Seeding Rate: 550,000 live seeds / Acre.

Previous Crop: 2009, 2010 & 2011 = HRSW.



Variety	Days	Bloom Duration	Seeds per Pound	Plant Height	Test Weight	Protein %	----Grain Yield----		Returns <sup>1</sup> \$/ac	Average Yield ---lbs/ac---
	to Bloom						2011	2012		
<b>Large Green Types</b>										
CDC Greenland	69	21	7,251	12	58.9	24.4	2,006	1,616	75.55	1,811
Pennell	74	17	6,565	12	55.9	25.9	2,239	1,708	91.14	1,974
Riveland	65	25	6,647	13	57.0	25.3	2,043	1,430	43.94	1,737
<b>Medium Green Type</b>										
CDC Richlea	68	22	8,453	12	59.8	23.5	2,292	1,907	124.95	2,099
<b>Small Green Type</b>										
CDC Viceroy	71	19	13,893	11	63.0	25.6	2,364	1,736	95.95	2,050
Essex	67	23	10,385	12	61.3	24.9	--	1,730	94.88	--
<b>Small French Green Type</b>										
CDC Lemay	68	21	13,896	12	62.6	24.5	2,084	1,627	77.37	1,855
<b>Medium Red Type</b>										
CDC Red Rider	66	25	9,950	12	61.9	24.0	2,501	1,899	123.68	2,200
<b>Small Red Types</b>										
CDC Redberry	68	22	9,940	11	61.9	24.0	2,220	1,856	116.24	2,038
CDC Rouleau	69	21	11,426	12	61.3	24.0	2,135	1,780	103.30	1,957
<b>Extra Small Red Type</b>										
CDC Rosetown	73	18	15,039	13	62.9	25.8	2,375	1,738	96.16	2,056
<b>Spanish Brown Type</b>										
Morena	65	24	11,410	12	62.9	25.7	--	1,752	98.60	--
Trial Mean	68	22	11,004	12	61.0	25.1	2,226	1,706	90.73	--
CV %	1.8	5.6	2.5	8.7	0.8	1.8	--	10	--	--
LSD 0.10	1	1	329	NS	0.5	0.5	--	198	--	--

Planting Date: April 4, 2012

Harvest Date: July 26, 2012

Previous Crop: Oat

Seeding Rate: 600,000 live seeds/ac

Grain protein percentages reported on a 0% moisture basis

<sup>1</sup>Returns were calculated by multiplying the 2012 yield by the average price for lentils (\$.17/lb) listed on the Northern Pulse Growers Association web site (<http://northernpulse.com/>) on August 14, 2012. Returns also deduct \$199.22, the sum of all listed costs from the December 2011 Farm Management Planning Guide Projected 2012 Crop Budgets South West North Dakota for Lentil.

**2012 Field Pea Variety Trial at Hettinger**

Variety	Brand	Days to Bloom	Plant Height	1000 Seed wt	Protein Content	Test Weight	Seed Yield			Avg. Yield	
							2010	2011	2012	2 year	3 year
<b>Yellow Types</b>											
CDC Golden	Alt. Seed Str.	63	21	167	23.7	67.5	64.4	60.9	47.2	54.0	57.5
Korando	Pulse USA	58	22	214	23.4	66.3	51.5	64.4	53.0	58.7	56.3
SW Midas	Pulse USA	65	21	155	22.8	66.9	53.5	58.5	48.9	53.7	53.6
DS Admiral	Pulse USA	63	23	191	23.9	66.7	50.3	59.8	48.7	54.2	52.9
Agassiz	Meridian Seed	63	23	179	23.9	67.1	53.7	58.6	44.9	51.8	52.4
Gunner	Paulson Pre. Seed	64	28	170	25.3	67.8		60.1	47.9	54.0	
Vegas	JB Farms	63	22	166	24.6	68.2		59.5	47.5	53.5	
Bridger	Great N. Ag.	61	24	173	22.5	66.4			52.2		
Navarro	Great N. Ag.	57	20	188	22.9	65.2			50.8		
Mystique	Pulse USA	63	23	185	23.5	67.2			49.7		
<b>Green Types</b>											
SW Arcadia	Pulse USA	62	16	157	22.6	65.3	52.2	51.3	52.1	51.7	51.9
K2	Pulse USA	59	21	149	23.2	66.5	47.4	55.4	44.8	50.1	49.2
CDC Striker	Alt. Seed Str.	62	19	153	22.7	65.7	46.0	47.0	49.7	48.4	47.6
Cruiser	Pulse USA	63	23	165	24.0	65.6	48.0	44.0	44.9	44.4	45.6
Majoret	Pulse USA	66	20	168	24.7	67.8	49.3	46.3	41.3	43.8	45.6
Shamrock	Legume Matrix	67	22	183	24.9	69.5		51.0	36.9	44.0	
Aragorn	Pulse USA	62	21	155	23.4	64.4			43.8		
Viper	Pulse USA	62	25	172	23.1	65.1			43.5		
Trial Mean		61	22	171	23.5	66.5	52.1	55.5	47.2	--	--
C.V. %		2.1	6.9	8.2	3.0	1.3	6.1	4.9	5.1	--	--
LSD 10%		2	2	17	0.8	1.0	2.9	3.4	2.9	--	--

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

Planting Date: April 12

Seeding Rate: 330,000 live seeds / Acre.

Harvest Date: July 16

Previous Crop: 2009 & 2010 = hrsw, 2011 = durum.

Variety	Days to Bloom	Bloom Duration	Seeds per Pound	Plant Height in	Test Weight lbs/bu	Protein %	--Grain Yield--			Returns <sup>1</sup> \$/ac	Average Yield	
							2010 -----bu/ac-----	2011	2012		2 Year	3 Year
<b>Yellow Types</b>												
Agassiz	88	19	1,853	22	63.6	23.4	57.0	50.3	38.4	354.23	44.3	--
DS Admiral	86	17	1,762	26	64.5	25.2	55.6	45.6	39.0	362.16	42.3	46.7
CDC Golden	87	19	2,060	24	65.1	25.0	61.3	47.5	39.6	371.53	43.5	49.4
<b>Green Types</b>												
Cruiser	87	20	1,992	25	63.6	25.6	53.0	36.1	33.8	309.11	34.9	41.0
CDC Striker	85	17	2,208	21	64.4	24.1	57.6	43.0	38.2	374.81	40.6	46.3
Majoret	86	17	2,022	24	64.5	26.1	54.6	45.4	37.7	366.80	41.5	45.9
Trial Mean	86	18	1,983	24	64.3	24.9	58.2	45.5	37.8	356.44	--	--
CV %	0.3	4.0	5.0	7.6	0.9	2.7	--	--	8.7	--	--	--
LSD 0.10	0	1	123	2	0.7	0.8	--	--	NS	--	--	--

Planting Date: April 4, 2012

Harvest Date: July 19, 2012

Previous Crop: Oat

Seeding Rate: 325,000 live seeds/ac

Grain protein percentages reported on a 0% moisture basis

<sup>1</sup>Returns were calculated by multiplying the 2012 yield by the average price for yellow (\$14.38/bu) and green (\$15.00/bu) peas listed on the Northern Pulse Growers Association web site (<http://northernpulse.com/>) on August 14, 2012. Returns also deduct \$198.15, the sum of all listed costs from the December 2011 Farm Management Planning Guide Projected 2012 Crop Budgets South West North Dakota for Field Pea.

**2012 Conventional Soybean Variety Trial at Hettinger**

Variety	Maturity Group	Test Weight	Oil Content	Seed Protein	----- Seed Yield -----			Avg. Yield	
					2010	2011	2012	2 year	3 year
		lbs/bu	%	%	----- bushels per acre -----				
Sheyenne	0.8	55.0	19.3	28.9	33.1	43.9	38.5	41.2	38.5
Ashtabula	0.4	54.1	20.5	27.8	28.2	37.8	33.6	35.7	33.2
Cavalier	00.7	54.3	18.6	30.3	26.6	37.5	30.5	34.0	31.5
ProSoy	0.8	54.3	18.6	31.5	25.9	34.3	34.4	34.4	31.5
Traill	00.0	55.7	19.0	30.8	26.6	37.8	22.6	30.2	29.0
Trial Mean		54.7	19.2	30.4	26.8	37.7	31.6	--	--
C.V. %		1.8	2.2	2.0	9.2	3.4	4.9	--	--
LSD 10%		NS	0.5	0.8	3.7	1.8	1.9	--	--

NS = no statistical difference between varieties.

Planting Date: April 16

Harvest Date: September 4

Seeding Rate: 150,000 live seeds / Acre.

Row Spacing: 30"

Previous Crop: 2009 = barley, 2010 & 2011 = oat.

**2012 Grassy Weed Control with Spring Herbicide Applications in Winter Wheat**

Eric Eriksmoen, Hettinger, ND

‘Jerry’ HRWW was seeded no-till into dry soil on October 10, 2011. Persistent dry fall conditions resulted in less than 1% winter wheat emergence prior to freeze up and a very poor crop stand during the growing season. Spring post-emergence treatments were applied on April 14, 2012 to 2 ½ leaf wheat and to tillering downy brome (dobr), 2 leaf Japanese brome (jabr), 1 leaf wild oat (wiot) and 1 leaf Persian darnel (peda) with 55° F, 45% RH, cloudy sky, moist soil conditions and a south wind at 7 mph. Treatments were applied with a tractor mounted CO<sub>2</sub> 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, OM of 3.2% and had 85% fall hrsw residue ground cover (4300 lbs/A). The trial was a randomized complete block design with four replications. The trial had an application of 21 oz/A WideMatch herbicide on June 2 to control broadleaf weeds. Weed populations for downy brome, Japanese brome, wild oat and Persian darnel were 3, 6, 0.5 and 0.25 plants /ft<sup>2</sup> respectively. Plots were evaluated for crop injury on April 23, May 18, June 2 and July 7, and for weed control on June 2 and July 7. The trial was not harvested.

Treatment	Product rate oz/A	4/23	5/18	- June 2 -		----- July 7 -----					
		inj	inj	inj	dobr	inj	dobr	jabr	wiot	peda	
		----- Percent control -----									
1	PowerFlex HL+Act. 90+AMS	2 + 0.5% +1.5 lb	0	0	0	85	0	95	96	32	99
2	Olympus Flex+Act. 90+AMS	3.5 + 0.5% + 1.5 lb	0	0	0	75	0	90	97	65	0
3	Olympus + Act. 90	0.9 + 0.5%	0	0	0	90	0	97	99	62	3
4	Maverick + Act. 90	0.67 + 0.5%	0	0	0	45	0	91	94	9	33
5	Untreated		0	0	0	0	0	0	0	0	0
6	Axial XL	16.4	0	0	0	10	0	1	2	84	99
7	Osprey + Act. 90 + AMS	3.25+0.5%+64	0	0	0	67	0	21	46	1	3
C.V. %			0	0	0	26	0	27	31	39	66
LSD .05			NS	NS	NS	20	NS	23	29	21	28

NS = no statistical difference between treatments

**Summary**

Crop injury (leaf speckling) was minor when observed (less than 1%) and diminished quickly. PowerFlex HL, Olympus Flex, Olympus and Maverick treatments provided very good season long control of downy brome and Japanese brome. None of the treatments were very effective on wild oat, however, Olympus Flex, Olympus and Axial XL treatments provided significantly better control than the other treatments. PowerFlex HL and Axial XL treatments provided excellent season long control of Persian darnel.

## 2012 prickly lettuce control in pulse crops with Lorox applied in the fall and spring.

Roger Ashley, Dickinson, ND and Ashley Ueckert, Beach, ND

An experiment was conducted in four no-till fields near Beach, ND in Golden Valley County to evaluate weed control during the growing season in field pea and lentil from fall applied Lorox (linuron) singularly and in tank-mix with Valor (flumioxazin) and in the spring with Lorox singularly and in a tank-mix with Pursuit. The previous crop at all four locations was wheat. Soils at the four sites were sampled and then analyzed for the percent of sand, silt, and clay as well as organic matter content, pH and EC. All fall applied treatments were made on 28 Oct 2011 and all spring treatments were made on 10 Apr 2012. Treatments were applied to the center 6.3 feet of a 10 x 30 foot plot with a CO<sub>2</sub> hand held plot sprayer equipped with 11002 flat fan nozzles delivering 15.5 gpa at 30 psi. On 8 Jun 2012 6 fl oz/acre of Clethodim and 1 qt/acre of crop oil was applied with a field sprayer at 11.0 gpa at 40 psi through flat fan nozzles 8002 to Site #4 to control volunteer wheat. The experiment at all four sites was a randomized complete block design with four replications per treatment. An error was made in application at Site #4 in the spring in replication four and data from only three replications was used to calculate the statistics for that site.

Sites #1 and #2 did not have sufficient weed pressure to evaluate weed control during the entire growing season. Weed pressure became more evident at Site #3 in the late season. No observable crop injury occurred at any of the sites even in the plot where the application error occurred at Site#4 where 2 pounds/acre of Lorox was applied in the fall and an additional 2 pounds/acre was applied in the spring. Though sufficient weed populations were not present at two of the four sites general observation indicated little control of Russian thistle and kochia in Lorox only treatments. Fall applications appeared to be more effective than spring treatments for the control of prickly lettuce.

Crop injury was not observed in the lentil or field pea at these four locations. Nova Source provided the financial support for this trial. Thank you to Travis Hauck, Steve Zook, and Mike Zook for proving the use of the plot areas.

### Soil characteristics of four selected sites

Location	Sand	Silt	Clay	Texture	OM	pH	EC
	----- % -----				%		mmhos/cm
Site #1	18.8	33.8	47.5	Clay	3.3	7.0	0.30
Site #2	30.0	35.0	35.0	Clay Loam	1.9	8.2	0.28
Site #3	22.5	35.0	42.5	Clay	4.0	7.7	0.67
Site #4	27.5	32.5	40.0	Clay Loam	3.8	7.2	0.84

### Application information

Location	Application Time	Air Temperature	Soil Temperature
		-----°F -----	
<b>Fall Application</b>			
	October 28, 2011		
Site #1	11:00-11:45 am	48.5	37.0
Site #2	12:00-1:00 pm	49.9	37.0
Site #3	1:15-2:25 pm	50.0	42.0
Site #4	2:45-3:30 pm	47.0	43.0
<b>Spring Application</b>			
	April 10, 2012		
Site #1	10:15-11:00 am	47.0	42.0
Site #2	11:15 am -12:30 pm	48.5	45.0
Site #3	12:45-1:15 pm	51.0	46.0
Site #4	1:30-2:10 pm	49.5	47.0

Percent of weed control with Lorox applied in fall and spring at Site #3 on 20 Jul 2012.

Treatment	Rate	Kochia	Russian Thistle	Prickly Lettuce
Untreated Check		0	0	0
Lorox Fall	2lb/a	0	0	95
Lorox Spring	2lb/a	0	0	63.8
Lorox /Fall + Spring	1lb/a + 1lb/a	0	0	56.3
Lorox + Valor/ Fall	2lb/a + 1.5 floz/a	93.8	88.8	100
Lorox Fall + Pursuit Spring	2lb/a + 2.0oz/a	67.5	65.0	97.5
LSD 0.05		29.4	29.0	15.7
CV%		72.6	75.1	15.0

Percent weed control with Lorox applied in the fall and spring at Site #4.

Treatment	Rate	Kochia		Russian Thistle		Prickly Lettuce		Vol Canola	
		29-Jun	20-Jul	29-Jun	20-Jul	29-Jun	20-Jul	29-Jun	20-Jul
Untreated Check		0	0	0	0	0	0	0	0
Lorox Fall	2lb/a	0	0	0	0	93.3	85.0	56.7	65.0
Lorox Spring	2lb/a	0	0	0	0	75.0	60.0	0	0
Lorox /Fall + Spring	1lb/a + 1lb/a	0	0	0	0	75.0	75.0	65.0	56.7
Lorox + Valor/ Fall	2lb/a + 1.5 floz/a	96.7	88.3	90.0	81.7	100.0	96.3	83.3	83.3
Lorox Fall + Pursuit Spring	2lb/a + 2.0 floz/a	88.3	88.3	50.0	35.0	85.0	85.0	78.3	78.3
LSD 0.05		2.9	5.2	5.0	9.8	10.2	9.6	15.0	15.0
CV%		5.1	9.6	11.7	27.6	7.9	7.9	17.5	13.9

## 2012 Starane Flex and tank mixes compared to Huskie in HRSW, Bowman, ND.

Roger Ashley and Glenn Martin, Dickinson, ND

'Glenn' hard red spring wheat was no-till seeded on 2 Apr 2012 in a field that had grown sunflower in 2011. On 11 May the temperature fell to an estimated 19°F at this location delaying the application of herbicides. Starane Flex (florasulam + fluroxypyr), Starane Flex + MCPA Ester, Starane Flex + 2,4-D Ester, and Huskie (pyrasulfotole + bromoxynil) with ammonium sulfate were applied to assigned treatments in a randomized complete block design on 31 May. Crop stage on this date was 5 to 5 ½ leaves. Emerged kochia (koc) was 1-2 inches tall, wild buckwheat (wb) was 1 inch, volunteer sunflower was VE-V2 and Russian thistle (rt) and red root pigweed (rrpw) were emerging. Weather conditions at the time of application were air temperature = 66°F, relative humidity at 75% with a wind from the northwest at 10 mph. No crop injury was observed during the trial. Weed control was scored visually 22 and 43 days after application. Harvest occurred on 2 Aug. Volunteer sunflower and Russian thistle was controlled by all herbicide treatments used. Dow AgroSciences provided financial support for this trial. Thanks to Miles Hansen for proving the use of this plot area.

Treatment	--- 29 Jun ---			--- 20 Jul ---			----- Grain -----		
	wbw	koc	rrpw	wbw	koc	rrpw	Yield bu/acre	Test wt lb/bu	Protein %
Untreated Check	0	0	0	0	0	0	31.5	51.7	17.9
Starane F	81	95	90	80	95	85	41.3	54.8	18.0
Starane F + MCPA	90	91	95	80	90	80	38.0	54.1	17.9
Starane F + 2,4-D	90	99	100	85	95	100	40.5	56.2	18.0
Huskie	100	100	100	100	100	100	41.8	56.7	17.1
Mean	72.3	77	77	69	76	73	38.6	54.7	17.8
CV%	3.9	5.1	3.4	4.6	3.8	3.5	13.7	2.6	2.4
LSD 0.05	4.3	6.1	4.0	4.9	4.4	4.0	NS	2.17	0.65



## 2012 foliar fungicide application on hard red spring wheat, Bowman, ND

Roger Ashley and Glenn Martin, Dickinson, ND

'Glenn' hard red spring wheat was no-till seeded on 2 Apr 2012 in a field that had grown sunflower in 2011. Prior to 2011 spring wheat was grown the previous two years. On 11 May temperatures fell to an estimated 19°F at this location delaying applications of herbicide and early season fungicide. Wolverine herbicide (fenoxaprop + bromoxynil + pyrasulfotole) was applied to all treatments on 31 May. Where an early season application of Stratego was to be applied, this product was tank mixed with the herbicide and then applied. The flag leaf application of fungicide Prosaro 421, was made on 8 Jun and the flowering application of Prosaro 421 was made on 25 Jun. A non-ionic surfactant (NIS) at the rate of 0.125% v/v was included in the fungicide applications of Prosaro 421. Weather conditions at the time of application on 31 May was air temperature = 60°F, relative humidity at 62% with a wind from the northwest at 12 mph. During the flag leaf application on 8 Jun air temperature was 70°F, relative humidity at 59% with wind from the north east at 15 mph. The flowering application was made on 25 Jun air temperature was 75°F relative humidity of 87% with a wind from the southeast at 5 mph. Crop injury was observed only after the early season application of herbicide or herbicide + fungicide. No crop injury was observed following any of the other fungicide application timings. Precipitation was 77% of normal for the season. Evaluations for crop disease occurred on 8 Jun, 26 Jun and 3 Jul. With the dry conditions along with following sunflower, a non-host crop for foliar diseases of wheat, disease pressure was very light. No lesions or disease plants were detected on the 8 Jun evaluation while a very low percentage, 5% or less, plants exhibited lesions and severity was less than 2% for the 26 Jun and 3 Jul evaluations. Scab was not detected and only traces of strip rust were found on the leaves during the 3 Jul evaluation. Harvest occurred on 2 Aug. Grain samples from the untreated check were submitted to the NDSU Diagnostic Laboratory. DON was not detected in any of these samples. No significant differences were detected among treatments. Effective crop rotation with sunflower along with dry weather kept foliar diseases of wheat in check. Bayer CropScience provided financial support for this trial. Thanks to Miles Hansen for the use of this plot area on his farm.

Treatment <sup>1</sup>	Rate fl oz/a	Timing <sup>2</sup>	4-Jun		26-Jun		3-Jul		----- Grain <sup>6</sup> -----	
			CI <sup>3</sup>	I <sup>4</sup>	S <sup>5</sup>	I <sup>4</sup>	S <sup>5</sup>	Yield bu/a	Test Wt lb/bu	Protein %
Untreated Check			0.00	2.25	1.50	1.00	1.00	31.6	55.9	16.5
Stratego	4.0	A	1.00	4.50	1.25	1.50	1.00	30.4	55.4	16.7
Prosaro 421 + NIS	5.0	B	0.25	3.50	2.00	1.00	0.50	30.4	55.9	17.0
Stratego/Prosaro 421 + NIS	4.0 / 6.5	A/C	2.00	5.00	1.00	1.75	0.75	29.3	54.9	16.7
Mean			0.81	3.81	1.44	1.31	0.81	30.4	55.5	16.7
CV%			151	52.5	43.8	113	42.3	5.5	13.9	3.6
LSD 0.05			NS	NS	NS	NS	NS	NS	NS	NS

<sup>1</sup> Treatment listed is foliar applied fungicide. In addition to fungicide, Wolverine herbicide was applied on 1 Jun. Where a foliar fungicide treatment occurred on 1 Jun (Timing = A) the fungicide and herbicide were tank mixed and applied. Other treatments only the herbicide was applied.

<sup>2</sup> Timing refers to the growth stage of wheat when the fungicide was applied. A = 5 to 6 leaf stage (31 May); B = Flag leaf (8 Jun); C = Flowering (25 Jun).

<sup>3</sup> CI = crop injury noted on 4 Jun from application of herbicide or herbicide + fungicide on 1 Jun. Crop injury was not observed after the flag leaf and flowering applications.

<sup>4</sup> I = Incidence or percent of plants infected with at least one lesion.

<sup>5</sup> S = Severity is the percentage of the leaf infected with a leaf disease

<sup>6</sup> Reported grain yield, test weight, and protein are adjusted to a 12% moisture basis.

# Nitrogen rate recalibration for corn in North Dakota

## Southwest North Dakota Update 12/2012

Roger Ashley, Area Extension Specialist/Cropping Systems  
David Franzen, NDSU Extension Soil Science Specialist

Current nitrogen fertilizer recommendations for corn in North Dakota are outdated and need to be reexamined with fresh field evaluations. Outside of land costs, fertilizer costs are the highest input for most corn farmers. Nitrogen recommendations that are relevant to today's hybrids and cultural practices are needed to remain profitable and avoid undue environmental scrutiny.

The cost of N to North Dakota growers has ranged from \$100 million to \$300 million per year over the last several years (assumes 2 million acres of corn, average N rate 160 lb N/acre). Since the data that helped develop the current N rate formula is over thirty-years old and farming practices have changed considerably, it is not known if current N rates are too high or too low, and what adjustments might be applied in more modern tillage systems. Savings due to lower N requirements or higher yields due to more efficient N rates will result in millions of dollars in profitability for the state's corn growers.

The objective is to develop a modern N-rate dataset for corn in order to reevaluate and develop more effective N recommendations and adjustments.

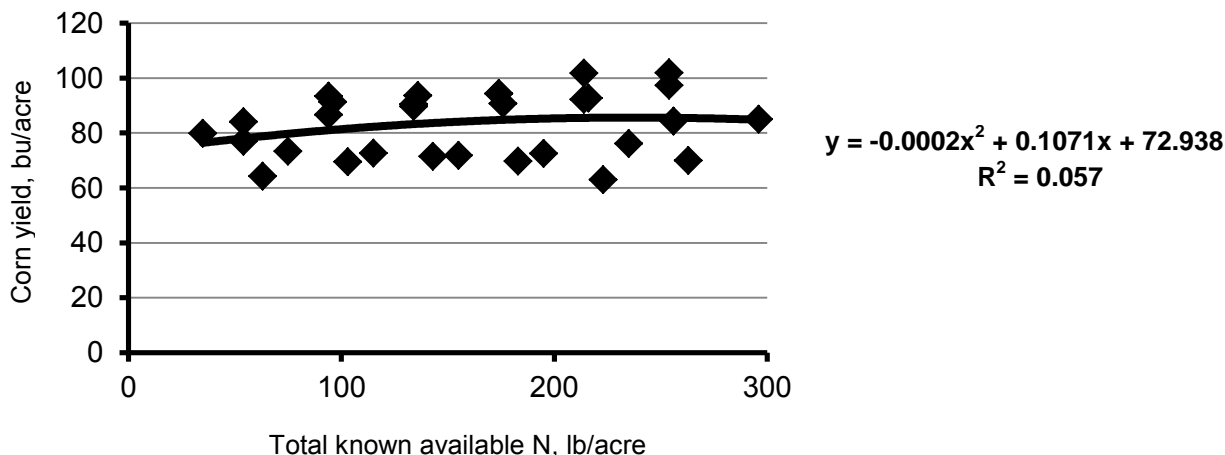
As part of the statewide effort to recalibrate nitrogen rates for corn, two sites in 2010 and four sites in 2012 were selected in southwest North Dakota. In 2010 all of the west-river sites were prevented plant as excessive rainfall at seeding kept producers out of the field. In 2013 five sites west-river will be included in the study. Other sites (over 150 site years to date) have been located in the other regions of North Dakota.

Each site is soil sampled for residual nitrate-N to a depth of 2 feet prior to fertilizer application. The study consists of a randomized complete block design with four replications and six treatments, consisting of a check, and then graduate N rates of 40 lbs N/acre, 80 lbs N/acre, 120 lbs N/acre, 160 lbs N/acre and 200 lbs N/acre applied as either ammonium nitrate, calcium nitrate, or urea broadcast.

The cooperator applies herbicide, seeds the area, and applies other normal farming operations within the plot area as with the rest of the field except nitrogen. The study is monitored throughout the growing season, and the middle two rows of each plot were hand-harvested and shelled before the cooperator harvested the field.

2013 will be the last year data is collected for this study. Late fall 2013 or early spring 2014 new nitrogen recommendations based on these data, corn grain and nitrogen prices will be available for use in the 2014 crop year. This project is partially supported by the North Dakota Corn Council.

West-river corn N Data, 2010 & 2012.



Impact of Previous Crop and Tillage on Barley Variety Performance  
NDSU Dickinson Research Extension Center

A study was established in 2009 to compare barley variety performance when preceded by canola, corn, field pea, and spring wheat. Three six-rowed (Lacey, Stellar-ND, and Tradition) and three two-rowed (Conlon, Conrad, and Pinnacle) varieties were seeded after each of the four crops in a no-till system. We were unable to detect differences in barley yield across the four different crops in 2012 at the  $P < 0.05$  level of significance, as was also the case in 2011 (Table 1). Higher barley yield was detected following field pea than following corn or spring wheat in 2010. The mean values presented in Table 1 represent a considerable range in yield across the 18 plots that were used to compute them during both 2011 and 2012, and helps explain the inability to detect statistical differences in barley yield across the previous four previous crop treatments during those years. Overall arithmetic mean rank for barley yield across all three years was field pea > canola ≈ spring wheat > corn. Barley kernel test weight was lighter following corn than following canola and spring wheat in 2012. No difference in kernel test weight was detected across the four previous crop treatments in both 2010 and 2011.

Table 1. Previous Crop by Barley Variety Trial, NDSU Dickinson Research Extension Center, 2010-2012.

Tillage system	Grain yield				Grain test weight			
	2010	2011	2012	Average	2010	2011	2012	Average
Canola	90	57	55	67	48	38	44	43
Corn	70	65	43	59	46	38	42	42
Pea	95	70	57	74	48	38	43	43
Wheat	86	59	59	68	48	38	44	43
LSD 0.05	7	NS	NS*		NS	NS	1	
Varieties								
Conlon	74	53	41	56	49	40	45	45
Conrad	90	58	58	69	47	36	43	42
Lacey	88	66	56	70	48	38	44	43
Pinnacle	86	66	58	70	48	37	42	42
Stellar-ND	89	65	51	68	46	38	43	42
Tradition	84	69	56	70	48	40	44	44
LSD 0.05	6	3	5		1	1	1	

The six-rowed cultivars Lacey and Tradition, along with the two-rowed cultivar Pinnacle, produced equal or higher yields than other barley cultivars in 2012, as well as during the previous two years (Table 1). The two-rowed cultivar Conrad produced comparable yields to those produced by Pinnacle and Tradition in both 2010 and 2012, but less grain than other cultivars in 2011, except for Conlon. Likewise, Stellar-ND produced relatively high yields in both 2010 and 2012, but lower yields than Tradition in 2011. Conlon consistently produced less grain than other cultivars throughout the study.

Conlon and Tradition produced kernel with relatively heavy test weight in each year of the study. Conversely, Conrad and Stellar-ND produced lighter kernels than Conlon or Tradition in both 2010 and 2011, and Conlon in 2012. Lacey produced kernels with a relatively heavy test weight during 2010 and 2012, but not in 2011. Pinnacle produced kernels with a relatively heavy test weight in 2010, while test weight of kernels produced by Pinnacle was relatively light in both 2011 and 2012. Results of this three-year study at Dickinson support production of Tradition in southwest North Dakota, based on grain yield and test weight data.

The six barley varieties grown following four previous crops also were grown in long-term (est. 1993) conventional-, reduced-, and no-till plots, beginning in 2010. We were unable to detect an impact of tillage system on barley yield across the six varieties at the  $P < 0.05$  level of significance in 2012, as had been the case in both 2010 and 2011 (Table 2). There was a trend ( $P = 0.09$ ) for higher grain yield following no-till than conventional-till in 2012. Overall mean arithmetic rank for grain yield across the first three years of this study was no-till  $\approx$  reduced-tillage  $>$  conventional-till. Unlike previous years, volumetric water content was similar across the three tillage systems when the study began in 2012, except at the shallowest depth, where moisture content was greater under no-till (data not provided).

Test weight of barley kernels was heavier in no-till plots than both reduced- and conventional-till plots in 2012, as had been the case in 2010 (Table 2). In contrast, differences in test weight of barley kernels was not detected across tillage systems in 2011. These results indicate that test weight of barley kernels can be increased by eliminating tillage during some years in southwestern North Dakota.

The six-rowed varieties Lacey and Stellar-ND along with the two-rowed cultivar Pinnacle produced equal or greater amounts of grain than the other four barley varieties across the three tillage systems in 2012 (Table 2). Lacey, along with Tradition, produced more grain than other barley varieties included in the study in 2011. Lacey along with Pinnacle produced equal or greater amounts of grain than other cultivars in 2010. Conlon tended to produce less grain than other cultivars during the study, although there were a few exceptions in 2010 and 2011. Conrad produced relatively high grain yields in 2010 and 2012, but not in 2011. Likewise, Tradition produced relatively high grain yields in 2010 and 2011, but

Table 2. Barley Variety Performance in Long-Term Tillage Plots, NDSU Dickinson Research Extension Center 2010-2012.

Tillage system	Grain yield			Average	Grain test weight			
	2010	2011	2012		2010	2011	2012	Average
Conventional	58	66	71	65	44	40	38	41
Reduced	67	65	74	69	45	41	38	41
No-till	63	56	87	69	47	40	41	43
LSD 0.05	NS	NS	NS*		1	NS	1	
Barley varieties								
Conlon	58	54	63	58	48	42	39	43
Conrad	62	57	78	66	45	40	40	42
Lacey	65	69	81	72	45	40	39	41
Pinnacle	67	62	83	71	45	39	39	41
Stellar-ND	60	62	83	68	44	39	38	40
Tradition	63	69	76	69	46	42	39	42
LSD 0.05	5	5	6		1	1	1	

lower yields than Pinnacle and Stellar-ND in 2012. Lacey was ranked consistently among the leaders for grain yield during the first three years of this study.

The 2-rowed variety Conlon produced grain with a test weight that was heavier than grain test weight produced by other barley varieties in 2010 (Table 2). Conlon also produced grain with a relatively heavy test weight in both 2011 and 2012. Conversely, Stellar-ND produced grain with a relatively light test weight during all three years. Tradition also tended to produce grain with a heavy test weight, except in 2010 when test weight was lighter for grain produced by Tradition than that produced by Conlon. Test weight of grain produced by Conrad, Lacey, Pinnacle was relatively heavy in 2012, but was lighter than at least one variety in 2010 and 2011.

Both the previous crop and tillage studies with barley will be continued in 2013. However, results from the first three years suggest that barley response to previous crop and tillage may be subdued compared with spring wheat for grain yield and test weight. Additional research is needed to verify these preliminary observations.

## Southwest North Dakota cover crop demonstrations

Roger Ashley, Dickinson, ND, Andrea Bowman, Dickinson, ND  
Lane Hall, Amidon, ND, Ashley Ueckert, Beach, ND

Many producers were unable to seed due to excessive precipitation during the critical spring seeding season in southwest North Dakota in 2011. Several producers chem-fallowed prevented plant acres but some producers took advantage of the opportunity to sow cover crops on these acres. The use of cover crops in southwest North Dakota is relatively new with producers asking questions such as 1) Do cover crops use more water than can be replaced with seasonal precipitation? 2) Do cover crops require more nutrients than are available in the soil? 3) What is the cost of establishing cover crops? 4) Will cover crops improve the bottom line?

Cover crop demonstrations were established in Bowman, Golden Valley and Slope Counties during the growing season in 2011 to acquaint producers with cover crop concepts and to develop local information about cover crop use.

Cooperating organizations included: Bowman County Extension Service, Bowman-Slope Conservation District, Natural Resource Conservation Service, Golden Valley Extension Service, Golden Valley County Conservation District, Slope County Extension Service, Dickinson Research Extension Center, North Dakota Sustainable Agriculture Research and education and several producers in cooperating counties.

Events and materials were planned and delivered during the “Triple C’s” (Cover Crop, Coffee, and Caramel Rolls) meetings held at the Paul White Farm near Bowman and the Ernie Holzemer Farm near Amidon in August 2011. Producers attending these events learned about soil quality from Jon Stika, NRCS soil scientist, and cover crop seeding information from Extension agents and specialists. Samples of some of the materials developed for these programs are available from Roger Ashley’s web page.

The Ernie Holzemer Farm 2011 cover crop site was followed throughout the 2011 growing season and 2012 cropping season. Establishment information can be found in the Twenty-eighth annual Western Dakota Crops Day Research Report 2011 on pages 69 - 70. It should be noted following establishment of the cover crop treatment two additional burn-down applications of herbicide were applied to the summer-fallow treatment of this demonstration. Estimated costs of these additional applications of herbicide were \$18.45 per acre. Considering seed costs in the bulk seeded cover crop demonstration of \$21.45 per acre costs were essentially similar.

The 2011-2012 winter was warmer and drier than normal followed by a warmer and drier than normal growing season. Percent water content of soil by weight was determined by extracting soil cores from similar soil mapping units adjacent to each other in the cover crop and chem-fallowed areas of the field on 23 March 2012. Soil cores were weighed wet, then oven dried, then weighed dry and percent water content calculated. Spring wheat was seeded in 2012 across the entire cover crop and chem-fallowed area of the field. The producer at planting time added an additional 30 pounds of N per acre to the cover crop area compared to the chem-fallowed portion of the field. Grain yield was 30.2 bushel per acre on the cover crop demonstration and grain yield on the chem-fallowed treatment was 31.0 bushels per acre. Less than 3% difference. The producer indicated that there was no noticeable difference between cover crop and chem-fallow treatment grain yields. Spring wheat grain test weight was 58.7 lbs/bu from the cover crop treatment compared to 56.8 lbs/bu for the grain harvested from the chem-fallow treatment, a 3% difference in test weight. Protein content of grain from the chem-fallow treatment was 17.7% while the protein content of the grain from the cover crop treatment was 17.4% or less than a 2% difference. Essentially the hard red spring wheat grain produced in this demonstration had similar yields, test weights and proteins. It would appear the soybean + millet + sunflower + turnip cover crop did not have a negative impact on grain yield and quality in the short term.

This demonstration received financial support from the ND SARE.

Seed costs per pound of dry matter produced and nutrients captured, Ernie Holzemer Farm, Amidon, ND, 2011.

Crop Species	Crop Variety Name	Planting rate	Seed Costs	Dry Weight	Seed Cost/lb dwt/acre	N+P+K	Seed <sup>1</sup>
		(percent in mix by wt)					cost/lb NPK/acre
		lb/acre (%)	\$/acre	lb/acre	\$/lb/acre	lb/acre	\$/lb/acre
Radish	Tillage	8.2 (100)	26.24	518	0.051	24.8	1.058
Radish	Graza	5 (100)	16.00	516	0.031	21.8	0.734
Winter Brassica	Winfred	5 (100)	30.00	452	0.066	21.0	1.429
Winter Brassica	Winfred	10 (100)	30.00	503	0.060	23.4	1.282
Ethiopian Cabbage <sup>2</sup>	PG584	2 (100)	10.00	516	0.019	18.3	0.546
Alfalfa	Not stated	3.5 (100)	11.38	360	0.032	24.3	0.468
Soybean	Not stated	60 (100)	51.00	427	0.119	19.8	2.576
Cowpea	Iron & Clay	70 (100)	98.00	222	0.441	10.4	9.423
Field Pea	4010 Forage Pea	86 (100)	29.41	661	0.044	35.1	0.838
Sunflower	Viper	17 (100)	13.06	628	0.021	34.6	0.377
Oat	Morton	75 (100)	24.61	692	0.036	27.7	0.888
Millet	Siberian Foxtail	20 (100)	9.20	551	0.017	16.6	0.554
Black Lentil	Indianhead	26 (100)	26.00	376	0.069	23.1	1.126
Teff Grass	Tiffany	4 (100)	14.40	554	0.026	17.8	0.809
Soybean + Sorghum Sudangrass	Not stated + Sweet Thing	60 (63 + 37)	56.85	931	0.061	46.4	1.225
Soybean + Millet	Not stated + Siberian Foxtail Millet	45 (80 + 20)	34.74	798	0.044	32.6	1.066
Cowpea + Soybean + Millet + Winter Brassica + Radish + Sunflower	Iron & Clay + not stated + Siberian Foxtail + Tillage + Viper	45 (27 + 41 + 20 + 3 + 3 + 6)	47.36	1274	0.037	59.4	0.797
Field pea + Lentil + Oat + Winter Brassica + Radish + Sunflower	4010 Forage pea + Indianhead + Morton, + Winfred + Tillage + Viper	75 (52 + 17 + 24 + 2 + 2 + 3)	43.02	1443	0.030	70.3	0.612
Soybean + Millet + Sunflower + Turnip	Not stated + Manta Siberian + Black Oil + Purple Top	28 ( 55 + 30 + 11 + 4)	21.45	1245	0.017	59.8	0.359

Planted July 22, 2011

<sup>1</sup>Seed cost per pound of nutrient (N+P+K) captured.

<sup>2</sup>Ethiopian Cabbage was noted to be severely infested with Checkered White (*Pontia protodice*) on Sept 2.

Cover crop dry matter yield and nutrient content on the Ernie Holzemer Farm, Amidon, ND, 2011.

Strip No	Species	----- Sept 23 -----							Nov 3
		Dry wt by sp.	Dry wt by mix	N	Ca	P	Mg	K	Dry wt by sp.
		----- lbs./acre -----							
1	Tillage radish	518	-	13.1	7.5	1.1	2.7	10.6	528
2	Graza radish	516	-	9.4	14.5	0.9	3.2	11.5	527
3	Winfred winter brassica	452	-	8.3	8.7	1.0	2.7	11.7	574
4	Winfred winter brassica	503	-	9.3	9.7	1.1	3.0	13.0	661
5	Ethiopian cabbage	516	-	8.6	3.8	0.8	2.2	8.9	421
6	Alfalfa	360	-	14.1	7.3	0.8	1.4	9.4	111
7	Soybean	427	-	11.6	7.8	1.2	2.9	7.0	-
8	Cowpea	222	-	4.8	4.3	0.7	1.6	4.9	-
9	Field pea	661	-	23.1	6.7	1.4	2.5	10.6	-
10	Sunflower	628	-	11.5	9.7	1.8	3.8	21.3	-
11	Oat	692	-	13.3	1.4	1.2	1.2	13.2	-
12	Millet	551	-	6.8	1.1	0.9	1.4	8.9	-
13	Black lentil	376	-	13.3	3.6	1.1	1.5	8.7	245
14	Teff grass	554	-	8.0	1.6	1.1	1.2	8.7	-
15	Soybean	370	931	20.0	6.0	1.8	4.6	24.6	-
15	Sorghum-sudan	561							-
16	Soybean	396	798	15.8	6.5	1.6	3.6	15.2	-
16	Millet	403							-
17	Cowpea	259	1274	23.6	14.8	2.7	6.4	33.1	-
17	Soybean	324							-
17	Winfred winter brassica	344							349
17	Millet	346							-
18	Field pea	323	1443	24.7	16.6	2.6	5.8	43.0	-
18	Oat	287							-
18	Lentil	264							-
18	Graza radish	257							-
18	Winfred winter brassica	312							323
18	Millet	347							-
19	Sunflower	340	1245	20.3	11.1	2.4	4.9	37.1	-
19	Purple top turnip	295							295
19	Soybean	264							-

Soil Water % by Mass

Site - 1 Rhoades-Belfield Complex

Depth	Chem-fallow	Cover crop
0-1	18%	18%
1-2	18%	11%
2-3	24%	16%
3-4	24%	23%

Site -2 Vebar-Talley fine sandy loam

Depth	Chem-fallow	Cover crop
0-1	13%	12%
1-2	14%	13%
2-3	19%	15%
3-4	23%	23%

**Water content of soil** for chem-fallow and cover crop treatments sampled on March 23, 2012 is shown on the left. Rhoades-Belfield is a silty clay loam while the Vebar-Talley is a fine sandy loam located on a ridge that bisects the plot area. Depths given are 0 to 1 ft, 1 to 2 ft, 2 to 3 ft and 3 to 4 ft. In the fine sandy loam under cover crop, soil appears to be at or very near field capacity even with the below normal winter precipitation. Fine sandy loam holds less moisture per foot of soil than silty clay loams.



# Notes

**Disclaimer:** The information given herein is for educational purposes only. Any reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement is implied by the Hettinger Research Extension Center Staff.

This publication will be made available in alternative formats for people with disabilities upon request. Contact the Hettinger Research Extension Center at 701-567-4323.

North Dakota State University does not discriminate on the basis of race, color, national origin, religion, sex, disability, age, Vietnam Era Veterans status, sexual orientation, marital status, or public assistance status. Direct inquiries to the Executive Director and Chief Diversity Officer, 205 Old Main, Fargo, ND 58108, (701) 231-7708.

1000 copies of this publication were printed at an approximate cost of \$1.50 each.