



Thirty-Second Annual Western Dakota Crops Day Research Report 2015



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32nd Annual Western Dakota Crops Day

December 17, 2015

Hettinger Armory

MST

9:00 am Registration

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

10:00 Early Bird Drawing and Opening Announcements

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

Dr. Caleb Dalley, Weed Scientist, NDSU Hettinger Research Extension Center.

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

Ryan Buetow, Extension Agronomist, NDSU Dickinson Research Extension Center.

John Rickertsen, Research Agronomist, NDSU Hettinger Research Extension Center.

12:00 Lunch

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

1:00 Wheat Disease Management for 2016

Dr. Andrew Friskop, Extension plant pathologist, NDSU Department of Plant Sciences.

1:45 Crop Diversity: Trends and Outcomes in the Northern Great Plains

Dr. Mark Liebig, Research Soil Scientist at the USDA-ARS Northern Great Plains Research Laboratory.

2:30 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 made this event possible. We greatly appreciate their commitment and support.

2015 Western Dakota Crops Day Sponsors

Hettinger Area Chamber of Commerce
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North Dakota Grain Growers Asso.
South Dakota Wheat Growers
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Alliance Ag Cooperative
AGT Foods
BASF
Gartner Seed Farm
Legacy Seeds
Pulse USA
Southwest Grain

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

Ryan Buetow, Dickinson Research Extension Center

Dr. Chris Graham and Bruce Swan, SDSU West River Ag Center, Rapid City

Dr. Joel Ransom, NDSU, Fargo

Todd Kautzman, New Leipzig

Neal and Justin Freitag, Scranton

August and Perry Kirschmann, Regent

Dan Christman, Hettinger

USDA – ARS Northern Great Plains Research Center, Mandan

Keith Gietzen, Glen Ullin

Pat Doll, Hannover

Ron Seidel, Bison SD

Chris and Jonas Lynch, McLaughlin, SD

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Interpreting Statistical Analysis

Field research involves the testing of one or more variables such as crop varieties, fertilizer rates, weed control methods, planting dates, etc. Field testing of such variables is conducted in order to determine which variety, fertilizer rate, herbicide, date, 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 meaningful conclusions can be drawn from the data gathered from research trials. Attempts are made to control human error and environmental conditions such as soil variability by replicating the variable in question. For example, there were four plots (replications) of the every variety grown in the Hettinger HRSW variety trial. These plots are randomly placed throughout the trial to help eliminate differences that might be a result of soil or other variations.

The coefficient of variation (C.V.%) listed at the bottom of each data column is a relative measure of the amount of variation recorded for a particular trait expressed as a percentage of the mean for that trait. It is a measure of the precision or effectiveness of the trial and the procedures used in conducting it. The numbers that you see in the tables are an average of all four replications. The C.V. for yield in the 2015 Hettinger HRSW variety trial was 4.7% meaning that there was a 4.7 percent average variation between high and low yields among replications. In summation, a trial with a C.V. of 6% is more precise and reliable than a trial with a C.V. of 18%. When looking at yield, trials with a C.V. less than 15% are generally considered reliable.

To determine if one variety, fertilizer rate, herbicide, planting date, etc. is better than another, use the least significant difference (LSD 5%) value at the bottom of each data column. The LSD 5% value is a statistical method of indicating if a trait like yield differs when comparing two hybrids. If the yield of hybrid A exceeds hybrid B by more than the LSD value, you can conclude that under like environmental conditions, hybrid A is expected to significantly out-yield hybrid B. The LSD value allows you to separate variety yields or any other variable and determine whether or not they are actually different.

For example, in the HRSW trial, the variety LCS Albany averaged 82.3 bu/ac in 2015 compared to SY-Soren at 71.9 bu/ac. Did the yield difference between these varieties differ significantly? Compare the yield difference of 10.4 bu/ac between the varieties ($82.3 - 71.9$) to the LSD 5% value of 4.7 bu/ac. Since the 10.4 bu/ac difference is more than the LSD value of 4.7 bu/a, the varieties do differ significantly in yield. If the difference between these two varieties would have been 3.5 bu/ac, their difference would have been less than 4.7 bu/ac; therefore, the yield difference between these varieties would not have been significant.

When selecting a variety or hybrid evaluate as much performance information as possible. Give more weight to information from trials close to home and look at relative performance over many locations and years. Performance averaged over many tests is called “yield stability.” Good yield stability means that, while a variety may or may not be the best yielder at all locations, it ranks high in yielding potential at many locations and years. A hybrid that ranks in the upper 20% at all locations exhibits better yield stability than one that is the top variety at one location but ranks in the lower 40% at the other locations.

Weather Summary - Hettinger

Frost Free Days

	28°F	32°F	Normal 32°F
Date of Last Frost	May 20	May 30	May 18
Date of First Frost	October 15	October 6	September 20
Frost Free Days	148	129	125

Precipitation (inches)

Month	2010 -11	2011-12	2012-13	2013-14	2014-15	60 Year Average
October	0.4	0.8	0.7	4.4	0.1	1.1
November	0.6	0.0	0.1	0.2	1.0	0.5
December	0.6	0.2	0.5	0.5	0.0	0.3
January	1.1	0.4	0.2	0.1	0.1	0.4
February	1.0	0.5	0.2	0.3	0.0	0.4
March	0.7	0.2	0.2	0.6	0.2	0.7
April	2.3	3.0	0.2	1.6	1.0	1.6
May	4.6	2.2	7.9	1.6	4.0	2.6
June	3.4	2.4	3.7	5.1	5.2	3.3
July	1.9	3.9	2.0	0.9	1.0	2.0
August	2.3	2.2	1.8	5.2	1.9	1.7
September	0.4	0.0	3.4	1.3	0.9	1.4
April-Sept.	14.5	13.7	15.6	14.3	14.1	11.3
Total	19.2	15.7	20.7	21.7	15.2	16.2

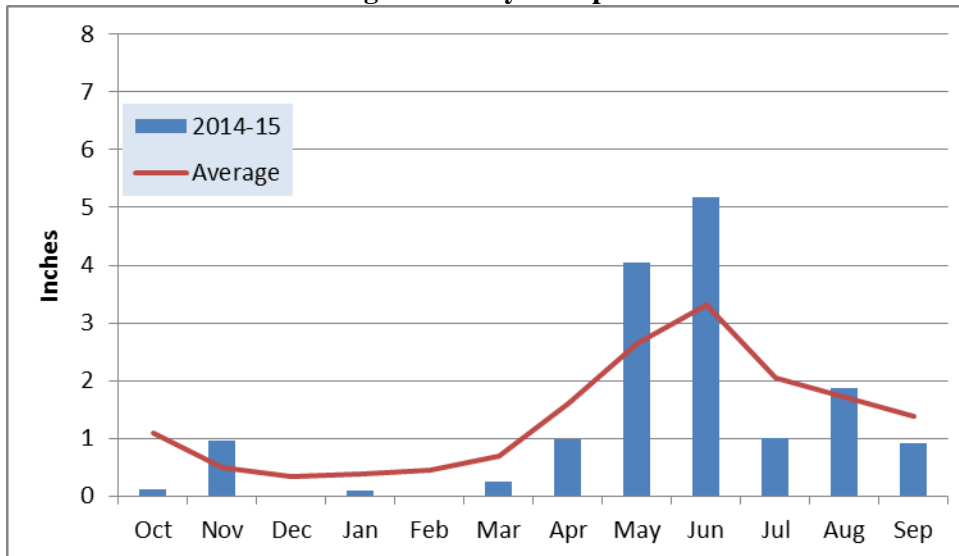
Air Temperature (°F)

Month	2010 -11	2011-12	2012-13	2013-14	2014-15	60 Year Average
October	48.5	48.2	42.1	39.7	46.6	45.6
November	28.0	30.9	32.4	28.8	21.3	30.0
December	13.4	23.9	18.5	12.9	23.4	19.7
January	12.7	24.2	18.3	16.6	21.6	15.2
February	14.7	21.8	26.7	10.1	19.1	20.0
March	22.8	44.4	27.4	26.5	38.0	28.8
April	39.4	46.9	35.5	39.1	43.2	42.6
May	50.2	53.6	53.5	52.8	50.2	53.7
June	62.0	66.5	61.7	59.5	64.6	63.1
July	71.3	75.2	68.1	66.4	70.4	70.1
August	65.3	67.8	69.5	66.0	69.3	68.7
September	56.9	59.4	62.5	56.4	64.1	57.8
Average	40.4	46.9	43.0	39.6	44.3	42.9

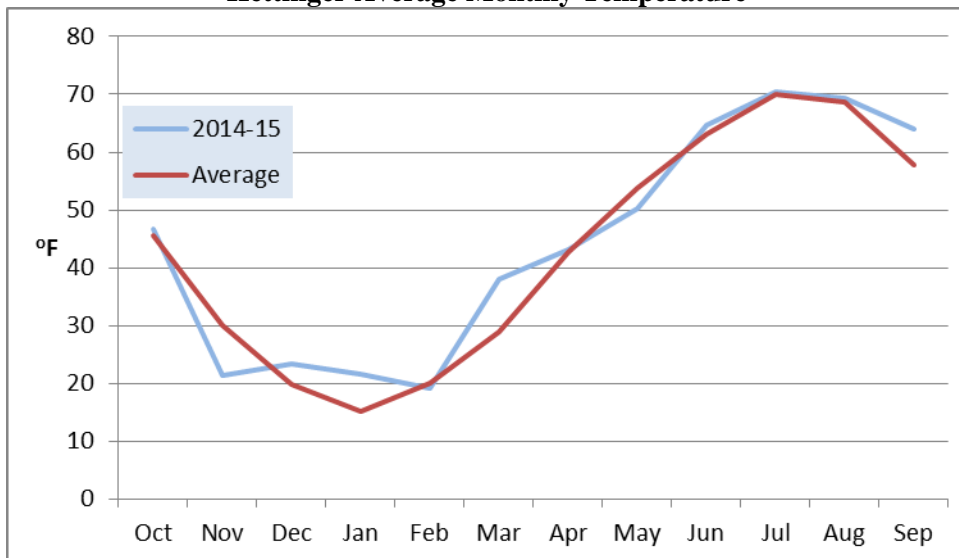
Corn Growing Degree Days (GDD)

Month	2011	2012	2013	2014	2015	43 Year Average
May	161	266	266	245	185	258
June	358	498	381	330	444	417
July	631	688	543	526	595	584
August	555	504	553	504	578	537
September	347	411	403	313	462	324
Total	2052	2367	2146	1918	2264	2120

Hettinger Monthly Precipitation



Hettinger Average Monthly Temperature



2015 Weather Summary for the Dickinson Research Extension Center Ranch Headquarters, Manning, ND.

Month	--Maximum temp.--		--Minimum temp.--		---Precipitation ---		-Small grains GDD ¹ -		---Corn GDD ² ---	
	Long		Long		Long		Long		Long	
	Term	Term	Term	Term	Term	Term	Term	Term	Term	Term
	1983 -	Current	1983 -	Current	1983 -	Current	1983 -	Current	1983 -	Current
	2015	Year	2015	Year	2015	year	2015	year	2015	year
	-----°F		-----°F		----- inches -----					
November - 14	39.3	30.6	18.5	10.2	0.57	0.35				
December - 14	26.7	30.5	7.4	13.4	0.45	1.01				
January	25.0	28.4	5.6	10.3	0.43	0.77				
February	29.0	25.6	9.2	-0.1	0.43	0.56				
March	40.1	47.6	18.9	20.4	0.79	0.44				
April	54.7	56.5	29.4	29.2	1.40	0.60	347	397		
May	66.2	64.2	40.8	37.7	2.72	1.65	666	604	252	225
June	75.6	76.2	50.5	51.9	3.25	4.68	933	962	404	433
July	83.5	83.6	55.7	56.4	2.34	2.87	1167	1177	609	596
August	82.8	83.0	54.1	52.1	1.95	1.69	1130	1097	572	532
September	71.7	75.7	43.9	47.0	1.45	1.35	774	882	326	399
October	56.5	75.7	31.4	35.8	1.23	1.96				
Mean	54.3	56.5	30.5	30.4						
Total					17.00	17.93	5016	5118	2162	2184

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

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

Source: Dickinson Research Extension Center. Data compiled by Garry Ottmar, Ranch Manager; Glenn Martin, Extension Agronomist; and Sheri Schneider, Information Processing Specialist.

North Dakota hard red spring wheat variety descriptions, agronomic traits, 2015.

Variety	Agent or Origin ¹	Year Released	Height (inches)	Straw Strength ²	Days to Head ³	Reaction to Disease ⁴					
						Stem Rust ⁵	Leaf Rust	Stripe Rust	Leaf Spot ⁶	Bact. Leaf	Head Scab
Advance	SD	2012	32	6	64	R	MR/MS	MS	M	MS	MS
Alpine ⁷	AgriPro	2008	34	6	62	MS	S	NA	MS	S	MS
Barlow	ND	2009	35	6	62	R	MS	M	MR	MS/S	M
Bolles	MN	2015	32	4	66	NA	MR	MR	NA	NA	NA
Brennan	AgriPro	2009	30	4	62	R	MR	NA	M	MS	MS
Duclair ⁸	MT	2011	31	4	65	R	NA	NA	NA	NA	NA
Elgin-ND	ND	2012	36	5	65	R	MS	M	M	MS/S	M
Faller	ND	2007	35	5	65	R	S	S	MR	MS/S	M
Focus	SD	2015	35	5	60	NA	MR/MS	MS	NA	S	MR
Forefront	SD	2012	37	5	61	R/MR	MR	MS	MR	M/MS	MR
Glenn	ND	2005	37	4	61	R	MS	M	M	M/MS	MR
HRS 3361	Croplan	2013	33	3	65	NA	MS/MR	MS	MR	NA	M
HRS 3378	Croplan	2013	32	4	64	NA	MR	MS	M	NA	M
HRS 3419	Croplan	2014	32	2	68	NA	MR	R	MR	NA	MR
HRS 3530	Croplan	2015	36	4	68	NA	NA	S	NA	NA	NA
Jenna	AgriPro	2009	32	4	66	R	MR	M	M	M/MS	M
Kelby	AgriPro	2006	30	4	62	R/MR	MR/MS	NA	M	S	M
LCS Albany	Limagrain	2008	32	5	67	NA	MR	MS	MS	M	M
LCS Breakaway	Limagrain	2011	32	5	63	R	R	MS	MS	MS	M
LCS Iguacu	Limagrain	2014	33	3	66	NA	MS	MS	M	M/MS	MR
LCS Nitro	Limagrain	2015	32	4	65	NA	NA	MR	NA	NA	NA
LCS Powerplay	Limagrain	2011	33	5	65	R	MS	M	MS	MS/S	M
LCS Pro	Limagrain	2015	32	5	66	NA	MS	NA	NA	NA	NA
Linkert	MN	2013	31	2	63	R	MR/MS	R	M	MS	M
Mott ⁷	ND	2009	36	3	66	R	MS	MS	MS	MS	MS
MS Chevelle	Meridian	2014	30	5	63	NA	R	MR	NA	NA	M
MS Stingray	Meridian	2013	35	3	67	NA	MS	S	NA	NA	NA
ND901CL Plus ⁹	ND	2010	36	4	60	MR	MS/MR	NA	NA	NA	M
Norden	MN	2012	32	3	62	R	MR/MS	NA	M	S	M
Prestige	Pulse-USA	2015	31	3	62	NA	NA	NA	NA	NA	NA
Prevail	SD	2014	31	4	64	NA	MR	MR	MS	MS	M
Prosper	ND	2011	35	5	65	R	MS	S	M	MS	M
RB07	MN	2007	32	5	62	R	MS	NA	MS	S	MR
Redstone	Pulse-USA	2014	32	3	67	NA	NA	NA	NA	NA	NA
Rollag	MN	2011	32	3	63	R	MR/MS	R	MR	M	MR
Sabin	MN	2009	33	6	65	R	MR/MS	NA	MS	NA	M
Samson	WestBred	2007	31	2	63	NA	MR/MS	M	MS	MS/S	S
Select	SD	2010	35	6	60	R	MS	S	R/MR	S	MR
SY Ingmar	Syngenta/AgriPro	2014	31	4	64	NA	MR	MR	M	M/MS	M
SY Rowyn	Syngenta/AgriPro	2013	31	4	62	R	MR	R	M	M/MS	M
SY Soren	Syngenta/AgriPro	2011	30	4	63	R	MR	R	M	S	M
SY Tyra ⁸	Syngenta/AgriPro	2011	31	5	62	R	R	R	MS	S	S
SY Valda	Syngenta/AgriPro	2015	31	4	64	NA	R	MS	NA	MS	NA
Vantage	WestBred	2007	32	2	67	MR	R	NA	MS	MS/S	MS
Velva	ND	2011	35	4	63	R	R	MS	M	S	MS
WB9507	WestBred	2013	32	5	61	NA	MR	S	R	NA	MR
WB9653	WestBred	2015	31	4	65	NA	R	S	M	NA	M
WB-Digger	WestBred	2009	34	6	63	MR	R	NA	M	NA	MS
WB-Mayville	WestBred	2011	30	4	63	R	R	MS	MS	S	S

¹Refers to agent or developer: MN = University of Minnesota; MT = Montana State University; ND = North Dakota State University; SD = South Dakota State University; **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.

²Straw 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.

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

⁴R = resistant; MR = moderately resistant; M = intermediate; MS = moderately susceptible; NA = Not adequately tested; S = susceptible.

⁵Fargo stem rust nursery inoculated with Puccinia graminis f. sp. Tritici races TPMK, TMLK, RTQQ, QFCQ and QTHJ.

⁶Leaf spot refers to the leaf fungal diseases such as tan spot and septoria. It does not include bacterial leaf streak.

⁷Hard white wheat.

⁸Solid stemmed or semisolid stem, imparting resistance to sawfly.

⁹CL = refers to a Clearfield variety, with tolerance to the Beyond™ family of herbicides.

Analytical milling and baking data from field plot variety trials at Carrington, Casselton, Dickinson, Hettinger, Langdon, Minot and Williston, 2014 (unless otherwise noted).

Variety	2015 N.D. Planted	OBS ¹	Test Weight	Protein 12% MB	Vitreous Kernels	Falling Number	Farinograph Stability	Farinograph Absorption	Loaf Volume	Mill and Bake Quality Rating
	(% area)		(lb/bu)	(%)	(%)	(seconds)	(minutes)	(%)	(cc)	(1-5) ²
Advance	--	7	61.9	13.2	42	342	9.3	59.1	989	**
Alpine ³	--	3	59.7	12.9	0	219	6.5	60.7	923	**
Barlow	12.6	7	61.7	13.4	47	324	7.9	63.5	917	***
Bolles	--	7	60.6	14.4	57	357	20.0	60.5	969	****
Brennan	2.9	7	61.2	14.0	38	352	7.4	63.1	989	*
Duclair	--	4	60.3	12.5	37	328	9.2	57.4	981	**
Elgin-ND	10.8	7	61.0	12.7	37	351	9.7	61.1	882	***
Faller	8.3	7	60.8	12.3	47	357	7.2	60.6	870	***
Focus	--	2	61.8	14.6	64	372	6.1	61.4	915	**
Forefront	--	7	61.5	13.4	40	378	9.8	60.5	1033	**
Glenn ⁴	6.5	7	63.2	13.7	56	339	9.0	62.7	915	*****
Jenna	0.9	7	60.1	13.0	35	278	6.1	60.4	973	**
Kelby	1.2	5	60.8	13.9	39	342	6.9	61.4	970	**
LCS Albany	--	5	60.3	12.1	28	312	6.4	56.0	960	**
LCS Breakaway	--	7	62.7	13.5	54	381	6.0	62.8	924	*
LCS Iguacu	--	7	60.9	12.3	29	363	9.6	58.8	842	***
LCS Powerplay	--	7	61.6	12.7	38	374	7.1	62.3	944	*
Linkert	1.0	7	61.0	13.7	42	378	15.2	61.1	945	****
Mott	1.1	5	61.3	13.7	44	310	8.7	59.6	905	***
Norden	--	7	62.3	13.4	70	368	9.1	62.4	942	**
Prevail	--	7	60.8	12.7	28	296	7.9	58.6	931	**
Prosper	10.5	7	61.1	12.4	36	340	7.5	61.0	882	***
RB07	1.9	6	61.3	13.6	57	350	11.3	60.8	964	***
Rollag	1.5	6	62.1	14.0	58	400	6.2	66.3	905	*
Samson	--	3	58.2	13.0	29	277	7.1	57.4	1012	***
Select	--	5	61.8	13.1	55	388	7.3	61.8	973	*
Steele-ND	0.9	5	62.2	14.3	67	367	8.9	63.4	984	***
SY Ingmar	--	5	61.9	14.0	62	393	9.0	61.1	1001	***
SY Rowyn	1.9	6	61.6	12.9	44	407	12.5	59.8	948	****
SY Soren	12.1	6	62.4	13.6	42	380	7.6	62.6	1005	***
SY Tyra	--	5	60.5	12.6	42	313	7.0	61.1	903	***
Vantage	1.3	6	63.1	14.9	79	298	9.7	63.1	972	***
Velva	1.2	6	60.7	12.8	57	366	8.8	61.7	943	**
WB-Digger	--	4	60.5	12.9	49	314	7.3	61.0	986	**
WB-Gunnison	--	3	60.5	13.2	33	321	9.5	60.5	945	***
WB-Mayville	4.6	6	61.0	13.5	48	328	8.9	62.4	949	***

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

¹Observations

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

³Alpine is a hard white wheat, so this sample is not graded on vitreous.

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

NDSU Hettinger Research Extension Center

Hard Red Spring Wheat - 2015	Hettinger, ND
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Variety	Days to	Plant	Plant	Test	Grain	----- Grain Yield -----			Average Yield	
	Head	Height	Lodge	Weight	Protein	2013	2014	2015	2 yr	3 yr
	*	inches	0-9**	lbs/bu	%	----- Bushels per acre -----				
LCS Albany	78	35	1	61.1	13.0	75.7	95.4	82.3	88.9	84.5
MS Stingray	80	38	0	60.0	10.9	70.9	95.9	73.8	84.9	80.2
Advance	78	36	2	62.5	13.3	67.8	89.0	79.1	84.1	78.6
SY Soren	77	33	0	62.3	15.1	72.2	86.2	71.9	79.1	76.8
LCS Iguacu	77	35	0	61.8	12.2	69.1	88.2	72.9	80.6	76.7
Elgin-ND	77	39	1	61.8	14.6	66.7	88.5	74.5	81.5	76.6
Prevail	75	38	2	61.1	14.0	66.4	87.2	75.2	81.2	76.3
SY Rowyn	76	35	0	61.3	14.0	69.5	85.0	74.3	79.7	76.3
Faller	79	38	1	61.6	12.4	54.4	94.1	79.5	86.8	76.0
SY 605CL	75	40	1	62.2	14.5	71.8	83.1	71.5	77.3	75.5
LCS Powerplay	77	34	1	61.9	13.4	69.8	82.9	68.6	75.8	73.8
LCS Breakaway	75	35	0	62.3	14.7	69.6	86.4	64.1	75.3	73.4
Rollag	76	33	0	62.3	14.7	63.9	84.2	71.8	78.0	73.3
Prosper	79	38	1	61.2	12.8	63.0	86.3	70.4	78.4	73.2
Norden	78	35	0	62.6	14.4	65.8	83.5	70.0	76.8	73.1
SY Tyra	78	31	0	60.8	13.3	66.0	85.7	66.5	76.1	72.7
ND 821	77	40	1	62.1	14.5	66.5	83.8	67.2	75.5	72.5
RB07	75	34	1	60.4	14.6	62.7	84.1	70.2	77.2	72.3
Bolles	79	36	0	60.8	15.3	65.0	79.8	70.5	75.2	71.8
Velva	78	38	0	60.0	13.6	68.0	85.7	61.5	73.6	71.7
Forefront	73	44	2	61.6	14.5	64.9	85.2	64.8	75.0	71.6
Barlow	77	39	1	63.1	15.2	68.2	80.1	65.2	72.7	71.2
Mott	80	41	0	61.5	14.3	65.0	78.9	66.4	72.7	70.1
Linkert	77	31	0	61.5	15.6	61.0	80.5	63.7	72.1	68.4
WB Mayville	76	32	0	60.7	14.7	62.6	79.7	60.1	69.9	67.5
Glenn	76	40	2	63.5	15.6	60.2	77.1	63.1	70.1	66.8
ND 901CL Plus	78	41	1	60.8	15.3	55.7	73.5	59.2	66.4	62.8

Table continued on next page

NDSU Hettinger Research Extension Center

Hard Red Spring Wheat - 2015	Hettinger, ND
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Variety	Days to	Plant	Plant	Test	Grain	----- Grain Yield -----			Average Yield	
	Head	Height	Lodge	Weight	Protein	2013	2014	2015	2 yr	3 yr
	*	inches	0-9**	lbs/bu	%	----- Bushels per acre -----				
<i>Table continued from previous page</i>										
LCS Nitro	77	34	1	60.8	12.6	--	94.4	82.6	88.5	--
MS Chevelle	76	35	2	61.4	12.8	--	91.3	76.1	83.7	--
Croplan HRS 3378	78	36	0	63.1	13.3	--	89.6	73.1	81.4	--
WB9507	76	37	3	59.1	12.4	--	92.8	65.6	79.2	--
Croplan HRS 3361	77	36	0	60.7	14.0	--	88.2	65.5	76.9	--
Focus	73	43	1	62.3	14.9	--	83.6	66.3	75.0	--
SY Ingmar	78	36	0	62.5	15.3	--	82.1	67.0	74.6	--
WB9879CLP	78	35	0	60.6	14.1	--	83.4	65.5	74.5	--
SD4299	79	38	1	61.1	14.2	--	77.1	70.5	73.8	--
LCS Pro	77	40	1	62.6	15.3	--	83.6	60.4	72.0	--
Croplan HRS 3419	79	35	0	60.9	13.3	--	97.9	86.8	--	--
LNR12-0311	76	38	2	62.5	12.7	--	--	80.4	--	--
Redstone	79	36	0	61.0	13.9	--	--	80.2	--	--
Croplan HRS 3530	79	40	2	61.8	14.3	--	--	79.6	--	--
WB9653	78	33	0	61.9	13.1	--	--	77.9	--	--
Prestige	74	34	2	60.1	14.1	--	--	72.6	--	--
SY Valdo	77	35	1	62.3	13.5	--	--	71.5	--	--
Duclair	75	36	1	59.6	14.0	--	--	64.5	--	--
Trial Mean	77	37	1	61.4	14.1	75.9	84.8	70.1	--	--
C.V. %	0.8	3.8	58.9	0.7	3.9	4.6	5.2	4.8	--	--
LSD 5%	0.8	2.0	0.7	0.6	0.8	4.8	6.2	4.7	--	--
LSD 10%	0.7	1.6	0.6	0.5	0.6	4.1	5.2	4.0	--	--

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

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

Planting Date: April 10

Harvest Date: August 12

Previous Crop: Spring Wheat Green Fallow

NDSU Hettinger Research Extension Center

Hard Red Spring Wheat - 2015	Scranton, ND
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Variety	Plant Height	Plant Lodge	Test Weight	Grain Protein	----- Grain Yield -----			Average Yield	
	inches	0-9*	lbs/bu	%	2013	2014	2015	2 yr	3 yr
					----- Bushels per acre -----				
Advance	33	0	59.9	11.7	54.3	58.1	57.9	58.0	56.8
Barlow	39	0	60.6	12.7	61.9	61.9	59.5	60.7	61.1
Bolles	33	0	58.6	13.1	--	--	53.5	--	--
Croplan HRS 3361	36	0	58.8	11.6	--	--	59.2	--	--
Croplan HRS 3419	34	0	58.4	10.4	--	--	68.5	--	--
Elgin-ND	39	0	59.5	12.1	61.6	60.2	59.5	59.9	60.4
Glenn	39	0	61.3	13.0	55.2	54.6	55.2	54.9	55.0
LCS Albany	34	0	58.8	10.7	--	63.2	66.1	64.7	--
LCS Iguacu	35	0	59.6	11.3	--	--	66.2	--	--
LCS Nitro	34	0	58.6	11.2	--	--	63.8	--	--
LCS Powerplay	36	0	59.8	11.5	--	57.7	59.5	58.6	--
Mott	40	0	59.1	12.9	63.7	62.2	56.2	59.2	60.7
MS Stingray	37	0	58.4	9.9	--	--	66.5	--	--
Prevail	36	0	59.8	12.0	--	66.4	59.5	63.0	--
RB07	32	0	59.7	12.4	57.1	55.8	60.1	58.0	57.7
SY Rowyn	31	0	59.2	11.6	--	56.8	59.5	58.2	--
SY Soren	31	0	60.6	12.2	55.7	62.6	62.6	62.6	60.3
Velva	36	0	57.0	12.3	66.4	59.7	55.5	57.6	60.5
WB9507	36	0	57.9	11.0	--	--	62.9	--	--
SY 605CL	38	0	61.6	12.6	--	65.7	61.1	63.4	--
Trial Mean	35	0	59.4	11.8	57.8	60.5	60.6	--	--
C.V. %	3.3	0.0	1.0	5.2	8.0	7.6	5.8	--	--
LSD 5%	2	0	0.8	0.9	5.5	6.3	5.0	--	--

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

Planting Date: April 13

Harvest Date: August 20

Previous Crop: Spring Wheat

NDSU Hettinger Research Extension Center

Hard Red Spring Wheat - 2015	Regent, ND
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Variety	Plant Height	Plant Lodge	Test Weight	Grain Protein	----- Grain Yield -----			Average Yield	
	inches	0-9*	lbs/bu	%	2013	2014	2015	2 yr	3 yr
					----- Bushels per acre -----				
Advance	38	0	57.6	13.4	65.1	61.8	81.4	71.6	69.4
Barlow	40	1	57.9	14.6	67.4	60.2	82.4	71.3	70.0
Bolles	36	2	56.6	15.9	--	--	75.4	--	--
Croplan HRS 3361	37	0	56.8	13.7	--	--	84.1	--	--
Croplan HRS 3419	36	1	56.9	13.5	--	--	98.8	--	--
Elgin-ND	40	2	56.5	14.9	73.8	64.4	82.4	73.4	73.5
Glenn	41	1	60.2	15.1	62.5	56.0	74.0	65.0	64.2
LCS Albany	36	1	57.4	13.5	--	63.3	105.1	84.2	--
LCS Iguacu	38	1	57.2	12.6	--	--	93.2	--	--
LCS Nitro	36	3	57.1	12.8	--	--	103.4	--	--
LCS Powerplay	36	3	58.3	13.7	--	57.5	83.6	70.6	--
Mott	43	0	57.0	15.1	69.9	57.8	84.3	71.1	70.7
MS Stingray	40	4	55.5	12.2	--	--	97.4	--	--
Prevail	38	0	57.8	13.7	--	62.6	83.8	73.2	--
RB07	35	0	56.6	14.2	69.0	55.2	83.1	69.2	69.1
SY Rowyn	35	0	57.6	13.7	--	54.5	92.0	73.3	--
SY Soren	35	0	57.7	14.6	72.6	60.8	82.5	71.7	72.0
Velva	38	0	54.3	14.3	73.3	61.1	80.6	70.9	71.7
WB9507	39	3	56.3	14.2	--	--	95.1	--	--
SY 605CL	39	0	59.5	15.2	--	65.9	82.3	74.1	--
Trial Mean	38	1	57.2	14.0	69.8	60.7	87.2	--	--
C.V. %	3.8	88.7	1.0	2.2	5.7	8.0	4.7	--	--
LSD 5%	2	1	0.7	0.4	4.8	5.7	4.9	--	--

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

Planting Date: April 13

Harvest Date: August 20

Previous Crop: Prevent Plant

NDSU Hettinger Research Extension Center

Hard Red Spring Wheat - 2015	New Leipzig, ND
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Variety	Plant Height	Plant Lodge	Test Weight	Grain Protein	----- Grain Yield -----			Average Yield	
	inches	0-9*	lbs/bu	%	2013	2014	2015	2 yr	3 yr
					----- Bushels per acre -----				
Advance	35	5	57.4	13.5	55.5	62.0	48.4	55.2	55.3
Barlow	38	5	58.6	14.4	57.7	64.0	51.4	57.7	57.7
Bolles	36	6	55.3	16.3	--	--	42.9	--	--
Croplan HRS 3361	34	3	55.6	13.8	--	--	50.9	--	--
Croplan HRS 3419	35	3	55.2	13.5	--	--	49.4	--	--
Elgin-ND	38	5	55.6	14.5	59.2	65.6	47.8	56.7	57.5
Glenn	39	3	60.6	14.8	57.6	53.3	45.4	49.4	52.1
LCS Albany	35	3	56.0	13.3	--	64.4	55.4	59.9	--
LCS Iguacu	34	6	57.6	12.6	--	--	52.5	--	--
LCS Nitro	35	5	54.9	13.3	--	--	47.3	--	--
LCS Powerplay	34	7	56.7	13.8	--	62.6	46.4	54.5	--
Mott	38	1	56.2	14.7	64.4	55.7	44.5	50.1	54.9
MS Stingray	36	5	54.7	12.4	--	--	49.3	--	--
Prevail	37	3	57.8	13.2	--	66.4	50.1	58.3	--
RB07	33	3	57.0	14.1	56.2	60.4	51.3	55.9	56.0
SY Rowyn	34	4	56.9	13.8	--	58.3	52.4	55.4	--
SY Soren	32	6	57.3	14.3	59.4	65.2	51.8	58.5	58.8
Velva	35	4	54.8	14.1	65.9	67.9	41.7	54.8	58.5
WB9507	37	6	54.2	14.1	--	--	45.9	--	--
SY 605CL	37	2	60.6	14.3	--	65.6	57.5	61.6	--
Trial Mean	36	4	56.7	13.9	58.8	62.7	49.1	--	--
C.V. %	3.7	27.5	0.8	2.3	7.9	7.4	6.7	--	--
LSD 5%	2	2	0.7	0.4	5.5	5.5	4.6	--	--

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

Planting Date: April 14

Harvest Date: August 19

Previous Crop: Sunflower

NDSU Hettinger Research Extension Center

Hard Red Spring Wheat - 2015	Mandan, ND
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Variety	Plant Height	Plant Lodge	Test Weight	Grain Protein	----- Grain Yield -----			Average Yield	
	inches	0-9*	lbs/bu	%	2013	2014	2015	2 yr	3 yr
					----- Bushels per acre -----				
Advance	34	0	57.9	11.1	70.3	76.8	35.5	56.2	60.9
Barlow	36	0	57.8	11.9	72.4	73.4	31.9	52.7	59.2
Bolles	34	0	55.6	12.2	--	--	27.0	--	--
Croplan HRS 3361	34	0	55.9	11.3	--	--	35.1	--	--
Croplan HRS 3419	34	0	55.6	10.1	--	--	39.4	--	--
Elgin-ND	38	0	56.7	11.0	78.1	76.9	30.1	53.5	61.7
Glenn	39	2	60.9	11.5	70.8	69.7	26.1	47.9	55.5
LCS Albany	34	0	56.2	10.4	--	80.9	38.5	59.7	--
LCS Iguacu	34	0	57.8	10.6	--	--	38.6	--	--
LCS Nitro	32	0	54.9	10.4	--	--	33.2	--	--
LCS Powerplay	34	0	57.8	10.5	--	71.1	29.9	50.5	--
Mott	38	0	57.0	11.4	75.0	76.0	31.0	53.5	60.7
MS Stingray	36	0	56.0	9.7	--	--	36.7	--	--
Prevail	35	2	58.1	10.8	--	73.9	35.3	54.6	--
RB07	33	1	54.7	12.0	72.3	72.2	24.3	48.3	56.3
SY Rowyn	33	1	56.5	11.2	--	74.7	34.7	54.7	--
SY Soren	29	0	57.8	11.8	76.9	72.5	32.6	52.6	60.7
Velva	34	0	55.3	11.9	71.9	72.9	24.4	48.7	56.4
WB9507	36	1	55.8	10.4	--	--	34.7	--	--
SY 605CL	38	1	60.4	10.9	--	72.8	37.1	55.0	--
Trial Mean	35	1	56.9	11.1	70.0	74.3	32.8	--	--
C.V. %	3.4	98.7	0.8	3.0	3.1	7.3	8.9	--	--
LSD 5%	2	1	0.7	0.5	2.6	6.5	4.2	--	--

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

Planting Date: April 14

Harvest Date: August 19

Previous Crop: Spring Wheat

NDSU Dickinson Research Extension Center

2015 Hard Red Spring Wheat - Recrop Dickinson, ND

Variety	Days to Head	Seeds per Pound	Plant Height in	Test Weight lbs/bu	Protein %	----- Grain Yield-----				----- Average Yield -----	
						2013	2014	2015	Returns ¹ \$/ac	2 Year	3 Year
						-----bu/ac-----			----bu/ac----		
Advance	74	14,401	33	57.0	14.9	43.1	88.1	66.8	109.43	77.4	66.0
Barlow	73	14,448	38	58.4	16.0	38.2	91.1	69.1	143.42	80.1	66.1
Bolles	76	14,493	33	55.5	17.7	45.5	88.8	68.9	151.14	78.9	67.7
Croplan 3361	75	15,780	32	55.7	15.4	--	83.9	64.1	105.67	74.0	--
Croplan 3378	74	13,605	34	60.1	14.8	--	92.7	74.6	140.88	83.7	--
Croplan 3419	75	16,588	34	56.1	15.1	--	69.8	76.6	162.92	73.2	--
Croplan 3530	75	16,439	38	53.1	16.3	--	--	72.2	143.11	--	--
Duclair	73	14,423	35	54.1	15.8	42.9	88.5	63.9	104.27	76.2	65.1
Elgin-ND	74	13,463	37	55.4	16.0	48.5	88.9	71.4	147.96	80.2	69.6
Faller	75	14,941	36	52.8	14.8	48.0	95.1	68.1	87.39	81.6	70.4
Forefront	71	14,316	40	54.5	16.0	44.0	80.0	52.3	47.45	66.1	58.8
Glenn	73	13,113	37	57.3	16.2	39.9	86.0	67.8	140.26	76.9	64.5
Howard	73	14,964	37	55.3	15.9	43.4	91.2	68.1	129.67	79.7	67.6
LCS Breakaway	71	12,458	33	59.6	16.1	40.8	88.9	77.6	189.02	83.3	69.1
LCS Iguacu	75	15,098	34	60.0	13.4	45.9	78.2	80.9	102.23	79.6	68.3
LCS Nitro	74	14,351	33	56.8	14.3	--	80.9	85.2	166.33	83.1	--
LCS Powerplay	72	13,850	33	58.3	15.4	50.0	92.2	73.2	157.46	82.7	71.8
LCS Pro	72	11,091	40	59.7	16.0	--	92.2	77.7	187.18	85.0	--
Linkert	73	13,179	29	58.6	16.9	41.2	87.2	71.2	131.24	79.2	66.5
MS Chevelle	72	16,159	32	57.1	14.6	--	--	75.9	42.23	--	--
MS Stingray	77	16,646	35	51.7	13.6	--	87.4	68.8	111.34	78.1	--
Mott	76	17,333	39	55.9	16.0	46.4	87.0	64.1	145.28	75.6	65.8
ND901CL Plus	75	14,509	41	59.2	16.8	42.3	79.5	67.1	143.30	73.3	63.0
Norden	74	14,885	32	58.9	15.3	45.0	87.4	70.5	141.54	79.0	67.6
Prestige	68	13,766	33	56.5	15.0	--	--	77.1	165.56	--	--
Prevail	70	14,201	36	55.3	15.5	42.5	85.3	53.4	52.09	69.4	60.4
Prosper	75	13,913	36	54.7	14.4	46.6	88.7	71.1	104.51	79.9	68.8
RB07	70	15,260	32	57.7	15.7	39.6	61.1	73.7	163.96	67.4	58.1
Redstone	77	16,862	33	57.1	15.4	--	--	71.0	142.20	--	--
Rolag	73	13,545	30	59.4	16.4	42.1	86.5	75.4	183.93	81.0	68.0
Select	70	12,943	38	61.1	16.3	44.3	82.4	74.5	190.14	78.5	67.1
Steele-ND	71	13,663	38	59.1	16.6	40.7	79.9	64.1	176.13	72.0	61.6
Sy 605 CL	71	14,762	37	59.5	16.8	35.5	89.8	72.0	127.78	80.9	65.8
Sy Ingmar	76	14,710	32	59.2	16.3	--	88.3	75.7	169.10	82.0	--
Sy Rowyn	74	15,723	32	55.9	15.1	39.2	87.0	72.4	182.18	79.7	66.2
Sy Soren	75	15,973	32	58.6	16.1	44.7	86.9	70.6	140.77	78.7	67.4

Table continued on next page

NDSU Dickinson Research Extension Center

2015 Hard Red Spring Wheat - Recrop Dickinson, ND

Variety	Days to Head	Seeds per Pound	Plant Height in	Test Weight lbs/bu	Protein %	----- Grain Yield-----				----- Average Yield -----	
						2013	2014	2015	Returns ¹ \$/ac	2 Year	3 Year
						-----bu/ac-----				----bu/ac----	
<i>Table continued from previous page</i>											
Sy Tyra	76	15,667	31	57.5	15.1	45.0	90.8	73.1	153.10	81.9	69.6
Sy Valda	74	13,885	33	58.1	15.9	--	--	78.3	149.87	--	--
Vantage	77	15,481	34	60.2	17.4	39.2	83.1	62.7	125.40	72.9	61.7
Velva	75	15,387	35	54.0	15.2	45.7	96.0	67.0	110.58	81.5	69.6
WB-Digger	72	13,657	34	57.0	15.6	48.4	96.0	71.8	122.53	83.9	72.1
WB-Mayville	72	12,496	30	58.1	15.5	39.1	93.2	73.5	163.16	83.4	68.6
WB9507	73	14,134	36	54.6	15.2	--	89.0	71.3	151.31	80.2	--
WB9653	73	14,702	30	54.6	15.2	--	--	69.5	159.09	--	--
WB9879CLP	74	16,241	34	55.9	16.1	46.1	90.8	74.0	133.95	82.4	70.3
Trial Mean	73	14,370	35	57.2	15.7	43.5	86.1	71.3	143.19	--	--
CV %	1.2	5.8	3.8	2.4	1.7	12.9	5.4	5.9	--	--	--
LSD 0.05	1	1,666	2	1.9	0.5	--	--	5.9	--	--	--
LSD 0.10	1	1,392	2	1.6	0.5	6.6	5.5	4.9	--	--	--

Planting Date: April 16, 2015

Harvest Date: August 11, 2015

Previous Crop: Oat hay

Seeding Rate: 1.2 million live seeds/ac

¹Returns were calculated by multiplying the 2015 yield by protein premium or discount paid at the Southwest Grain Terminal located at Gladstone on August 21. The price paid on this date was \$4.31/bu, for a grain protein concentration of 14%. An additional \$0.12/bu was paid for each additional 0.2% increase in grain protein up to 15%. An Additional \$.04/bu was paid for each additional 0.2% increase in protein up to 17% above which an additional premium was not paid. Grain was discounted \$0.12/bu for each 0.2% reduction in grain protein from 14% to 12%, and \$.04/bu for each 0.2% reduction in grain protein down to 11, 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; -\$0.03/bu for 0.5 lb/bu between 57 and 55 lb/bu; -\$0.04/bu for 0.5 lb/bu between 55 and 54 lb/bu; and -\$0.05/bu for 0.5 lb/bu between 54 and 52 lb/bu]. Returns also deduct \$207.65, the sum of all listed costs from the December 2014 Farm Management Planning Guide Projected 2015 Crop Budgets South West North Dakota for spring wheat.

NDSU Dickinson Research Extension Center

2015 Spring Wheat - Recrop

Hannover, ND

Variety	Seeds per Pound	Test Weight lbs/bu	Protein %	----- Grain Yield-----				----- Average Yield-----	
				2013	2014	2015	Returns ¹ \$/ac	2 Year bu/ac	3 Year bu/ac
Advance	16,397	58.9	14.7	60.6	76.4	61.3	78.76	68.9	66.1
Barlow	16,677	58.6	15.3	53.4	69.3	61.1	94.82	65.2	61.3
Elgin-ND	17,571	57.9	15.8	61.8	73.5	63.2	112.56	83.1	66.2
Glenn	17,031	57.9	15.5	47.5	64.9	52.2	52.98	58.5	54.9
LCS Pro	14,735	58.8	14.8	--	--	58.7	73.29	--	--
Mott	17,064	59.1	14.9	64.1	74.1	65.0	103.72	69.5	67.7
Prevail	16,894	57.6	14.4	--	72.6	58.7	52.49	61.3	--
Sy Soren	16,776	58.5	15.2	52.1	68.3	62.6	38.24	65.5	61.0
Velva	15,873	56.9	15.0	60.0	77.4	59.2	102.09	68.3	65.5
WB9879CPL	19,943	55.0	15.0	--	--	51.8	80.71	--	--
Trial Mean	16,896	57.9	15.1	58.4	72.3	59.4	78.97	--	--
CV %	4.1	1.1	2.2	5.4	4.0	5.5	--	--	--
LSD 0.05	1,555	0.9	0.8	--	--	4.7	--	--	--
LSD 0.10	1,260	0.8	0.6	3.8	3.5	3.9	--	--	--

Planting Date: April 23, 2015

Harvest Date: August 25, 2015

Previous Crop: Wheat

Seeding Rate: 1.2 million live seeds/ac

¹Returns were calculated by multiplying the 2015 yield by protein premium or discount paid at the Southwest Grain Terminal located at Gladstone on August 21. The price paid on this date was \$4.31/bu, for a grain protein concentration of 14%. An additional \$0.12/bu was paid for each additional 0.2% increase in grain protein up to 15%. An Additional \$.04/bu was paid for each additional 0.2% increase in protein up to 17% above which an additional premium was not paid. Grain was discounted \$0.12/bu for each 0.2% reduction in grain protein from 14% to 12%, and \$.04/bu for each 0.2% reduction in grain protein down to 11, 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 \$207.65, the sum of all listed costs from the December 2014 Farm Management Planning Guide Projected 2015 Crop Budgets South West North Dakota for spring wheat.

NDSU Dickinson Research Extension Center

2015 Spring Wheat - Recrop

Glen Ullin, ND

Variety	Seeds per Pound	Test Weight lbs/bu	Protein %	----- Grain Yield-----				----- Average Yield-----	
				2013	2014	2015	Returns ¹ \$/ac	2 Year bu/ac	3 Year Year
Advance	14,778	60.3	13.5	89.8	72.3	67.5	58.88	69.9	76.5
Barlow	14,287	60.8	13.9	88.1	71.5	68.6	79.60	70.0	76.0
Elgin-ND	15,299	60.3	13.4	94.4	73.3	71.8	76.04	72.6	79.8
Glenn	15,146	60.8	13.2	85.6	68.8	61.0	18.82	64.9	71.8
LCS Pro	14,488	60.6	12.4	--	--	67.5	18.60	--	--
Mott	25,247	60.6	13.9	95.1	77.2	79.5	125.53	78.4	83.9
Prevail	14,729	58.4	13.6	--	75.0	63.9	52.29	--	69.4
Sy Soren	15,508	60.5	13.7	86.4	70.2	69.0	73.19	69.6	75.2
Velva	14,314	59.1	13.2	97.4	70.8	71.5	66.02	71.1	79.9
WB9879CPL	16,114	59.3	13.1	--	--	68.2	45.46	--	--
Trial Mean	14,991	60.1	13.4	91.8	72.4	68.8	61.44	--	--
CV %	2.7	0.9	4.1	4.6	6.8	9.1	--	--	--
LSD 0.05	912	0.8	1.2	--	--	9.1	--	--	--
LSD 0.10	739	0.7	1.0	5.1	NS	7.5	--	--	--

Planting Date: April 23, 2015

Harvest Date: August 25, 2015

Previous Crop: Wheat

Seeding Rate: 1.2 million live seeds/ac

¹Returns were calculated by multiplying the 2015 yield by protein premium or discount paid at the Southwest Grain Terminal located at Gladstone on August 21. The price paid on this date was \$4.31/bu, for a grain protein concentration of 14%. An additional \$0.12/bu was paid for each additional 0.2% increase in grain protein up to 15%. An Additional \$.04/bu was paid for each additional 0.2% increase in protein up to 17% above which an additional premium was not paid. Grain was discounted \$0.12/bu for each 0.2% reduction in grain protein from 14% to 12%, and \$.04/bu for each 0.2% reduction in grain protein down to 11, 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; -\$0.03/bu for 0.5 lb/bu between 57 and 55 lb/bu; -\$0.04/bu for 0.5 lb/bu between 55 and 54 lb/bu; and -\$0.05/bu for 0.5 lb/bu between 54 and 52 lb/bu]. Returns also deduct \$207.65, the sum of all listed costs from the December 2014 Farm Management Planning Guide Projected 2015 Crop Budgets South West North Dakota for spring wheat.

2015 North Dakota hard winter wheat variety description and agronomic traits.

Variety	Agent or Origin ²	Year	Reaction to Disease ¹				Maturity ³	Straw ⁴ Strength	Height ⁵ (inches)	Winter ⁶ Hardiness
			Stripe Rust	Leaf Rust	Stem Rust	Scab				
AAC Gateway	A.Can.	2012	R/MR	MR/MS	R	MS	0	3	30	3
Accipiter	CDC	2008	R/MR	MS	R	S	0	4	36	2
Art	Agripro	2008	R	R	R	MS	-6	4	33	8
Boomer	WB	2009	MS	MR	R	S	-2	4	34	3
Broadview	A.Can.	2008	MR/MS	R	R	S/VS	-2	5	32	4
Carter	WB	2010	S	NA	NA	S	-2	4	32	6
CDC Chase	CDC	2013	R	R	R	MS	-2	6	37	4
CDC Falcon	WB	2000	R	MS	NA	S	-2	5	34	4
Colter	MT	2013	MR	S	R	S	-1	3	36	5
Darrell	SD	2006	NA	S	R	MS	-4	4	35	6
Decade	MT/ND	2010	S	VS	R	VS	-4	4	35	2
Emerson	A.Can.	2011	R	MS	R	MR	-2	4	33	3
Flourish	A.Can.	2010	R/MR	MS	MS	S	-4	5	35	2
Hawken	Agripro	2007	S	MR	MR	S	-5	4	28	7
Ideal	SD	2011	MR/MS	R	MR	S	-3	5	33	5
Jerry	ND	2001	S	MR	R	S	0	4	37	3
Lyman	SD	2008	MR/MS	R	R	MR	-4	7	35	5
McGill	ARS-NE	2010	MS	MS	MR	MS	-5	4	36	4
Moats	A.Can.	2010	R	R	R	MR	0	5	38	2
Northern	MT	2015	R	S	R	S	+1	NA	35	6
Overland	NE	2006	MR	MR/R	MR	S	-4	4	35	5
Peregrine	CDC	2008	R	MR	R	MS	+1	4	39	2
Radiant ⁷	A.Can.	2001	R	S	S	S	+1	2	36	2
Redfield	SDSU	2013	MR/MS	MS	S	MR	-3	R	33	5
Smoky Hill	WB	2007	S	R	R	S	0	5	35	7
Striker	WB	2009	MS	MR	R	S	-4	4	32	5
SY Wolf	Agripro	2010	MR	MR	R	MS	-4	4	33	6
WB-Grainfield	WB	2013	MS	MS	NA	S	-5	6	33	6
WB-Matlock	WB	2010	MS	MS	R	MS	+1	4	36	2
WB4614	WB	2013	R	NA	NA	S	0	5	35	3
Wesley	NE/SD/WY	2000	MR	MS	R	S	-5	5	32	6
Yellowstone	MT	2005	R	S	S	VS	+2	6	33	5

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

²A.Can. = Agriculture and Agri-Food Canada; CDC = Crop Development Centre, University of Saskatchewan; WB = WestBred; SD = South Dakota State University; MT = Montana State University; ND = North Dakota State University; ARS = USDA Agricultural Research Service; NE = University of Nebraska; WY = Wyoming.

³Days to heading relative to Jerry.

⁴Straw strength = 1 to 9 scale, with 1 strongest and 9 weakest. These ratings may change as additional data become available.

⁵Based on the average of several environments, and should be used for comparing varieties. The environment can impact the height of varieties.

⁶Relative winter hardiness rating: 1 = excellent, 10 = very poor. These values are subject to change as additional information becomes available.

⁷Curl mite resistant.

NDSU Hettinger Research Extension Center

Winter Rye - 2015

Hettinger, ND

Variety	Spring	Heading	Plant	Plant	Test	----- Grain Yield -----			Average Yield	
	Stand	Date	Height	Lodge	Weight	2010	2012	2015	2 yr	3 yr
	%		inches	0-9*	lbs/bu	----- Bushels per acre -----				
Aroostok	90	5/30	55	5.8	55.3	66.3	46.0	54.3	50.2	55.5
Dacold	90	6/4	51	6.5	54.6	105.1	71.1	87.8	79.5	88.0
Hancock	91	5/31	55	6.3	56.4	92.9	63.5	73.7	68.6	76.7
Hazlet	91	6/1	53	5.5	56.8			92.6	--	--
Musketeer	90	6/1	53	7.0	55.8			77.2	--	--
Rymin	90	6/1	55	6.0	55.6			69.8	--	--
Spooner	90	5/31	53	4.0	56.7	73.8	48.9	64.4	56.7	62.4
Wheeler	90	6/4	61	3.5	50.9	53.2	33.1	49.8	41.5	45.4
ND Dylan	90	6/2	53	7.0	55.6	110.6	74.2	84.9	79.6	89.9
Trial Mean	90	6/1	54	5.7	55.3	79.1	55.4	72.7	62.6	69.6
C.V. %	1.2	0.4	6.9	19.8	0.9	4.1	15.5	6.9	--	--
LSD 5%	1.6	0.9	5.4	1.7	0.7	4.7	10.5	7.2	--	--
LSD 10%	1.3	0.8	4.5	1.4	0.6	3.9	8.8	6.0	--	--

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

Planting Date: September 22

Harvest Date: August 3

NDSU Hettinger Research Extension Center

Hard Red Winter Wheat - 2015	Hettinger, ND
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Variety	Spring	Plant	Plant	Test	Grain	----- Grain Yield -----			----- Average Yield -----	
	Stand	Height	Lodge	Weight	Protein	2012	2014	2015	2 yr	3 yr
	%	inches	0-9*	lbs/bu	%	----- Bushels per acre -----				
SY Wolf	90	34	0.0	61.6	12.4	62.2	95.7	96.8	96.3	84.9
Decade	90	36	2.0	59.9	11.7	68.4	102.9	81.1	92.0	84.1
Overland	90	38	1.3	62.0	11.6	73.8	91.6	86.3	89.0	83.9
Lyman	90	36	2.8	62.6	12.7	73.7	91.0	80.4	85.7	81.7
Ideal	90	38	2.5	60.5	11.1	66.3	95.8	80.8	88.3	81.0
WB Matlock	90	39	1.8	61.1	12.0	67.2	86.6	75.2	80.9	76.3
Peregrine	90	44	1.5	62.1	10.9	46.9	96.2	80.6	88.4	74.6
Jerry	90	45	1.8	60.4	11.9	66.3	85.2	72.2	78.7	74.6
Accipiter	90	39	2.0	60.0	11.1	58.3	81.2	77.5	79.4	72.3
AC Emerson	90	40	0.0	62.9	12.5	--	94.9	86.9	90.9	--
AC Gateway	90	36	0.8	61.4	12.2	--	87.9	79.3	83.6	--
Redfield	90	35	5.0	60.7	12.0	--	88.0	78.4	83.2	--
Flourish	85	36	1.5	58.3	11.8	--	88.8	75.9	82.4	--
CDC Falcon	90	36	3.8	59.2	11.9	--	85.2	73.3	79.3	--
AC Broadview	90	36	5.5	59.4	11.8	--	84.9	71.7	78.3	--
Moats	90	42	1.5	61.6	12.2	--	85.6	70.6	78.1	--
Northern	90	37	1.0	59.7	11.9			84.0	--	--
CDC Chase	90	43	2.0	62.7	12.0	--	--	83.7	--	--
Colter	90	39	0.8	54.8	12.1	--	--	80.4	--	--
WB4614	90	35	0.0	57.9	12.3	--	--	78.1	--	--
Trial Mean	90	38	1.9	60.2	11.9	63.7	88.1	79.5	84.6	79.3
C.V. %	1.0	4.7	37.7	1.0	2.9	7.7	4.9	4.3	--	--
LSD 5%	1.2	3	1.0	0.9	0.5	5.8	5.9	4.8	--	--

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

Planting Date: September 22

Harvest Date: August 3

Fertilizer: 50 lbs/ac 11-52-0, 100 lbs/ac 46-0-0

Herbicide: Widematch + 2,4-D

Previous Crop: Spring Wheat Green Fallow

NDSU Dickinson Research Extension Center

2015 Winter Wheat - Recrop Dickinson, ND

Variety	Spring Stand %	Heading Date June	Seeds		Plant Height in	Test Weight lbs/bu	Protein %	----- Grain Yield-----				Average Yield	
			per Pound	Test				2013	2014	2015	Returns ¹ \$/ac	2 Year bu/ac	3 Year bu/ac
AC Broadview	85	16	17,225	32	58.3	13.2	64.8	104.1	75.1	65.01	89.6	81.3	
AC Emerson	51	19	15,744	35	59.5	13.9	75.0	93.1	79.7	91.28	86.4	82.6	
AC Gateway	49	19	14,633	31	57.0	14.4	--	91.2	71.5	58.55	73.8	--	
Accipiter	66	19	14,657	34	61.0	12.6	65.0	102.8	83.9	90.80	93.4	83.9	
CDC Chase	49	18	12,688	38	61.5	13.7	--	--	76.3	76.17	--	--	
CDC Falcon	76	16	16,282	32	59.5	12.8	66.1	99.7	73.1	52.26	86.4	79.6	
Colter	68	19	14,967	34	56.3	13.5	--	105.4	75.0	60.69	80.4	--	
Decade	66	17	15,304	33	59.0	13.2	75.6	102.2	66.2	32.13	84.2	81.3	
Flourish	70	17	14,345	33	58.3	13.4	68.0	99.5	72.1	53.65	85.8	79.9	
Ideal	58	19	16,293	32	58.8	12.3	71.1	96.2	55.5	-17.06	75.8	74.3	
Jerry	73	18	13,481	39	59.3	12.7	63.5	99.9	65.7	24.92	82.8	76.4	
Lyman	59	17	12,850	35	61.0	13.0	64.5	87.0	75.6	64.60	81.3	75.7	
Northern	66	19	15,561	33	58.8	13.4	--	--	81.0	72.74	--	--	
Moats	34	19	13,033	38	60.8	13.5	66.1	87.8	67.2	37.73	77.5	73.7	
Overland	64	16	13,844	35	60.5	12.7	63.5	94.4	77.5	69.19	85.9	78.4	
Peregrine	76	18	15,833	40	60.8	12.7	72.0	96.5	79.1	75.20	87.8	82.5	
Redfield	79	17	14,216	32	61.0	13.2	--	--	70.2	48.34	--	--	
SY Wolf	51	16	13,930	32	57.8	13.8	72.0	96.5	77.0	78.37	86.7	81.8	
WB 4614	60	20	16,557	32	57.5	14.2	--	--	67.8	45.56	--	--	
WB Matlock	53	19	13,979	36	60.8	13.3	64.3	100.6	75.3	67.96	88.0	80.1	
Trial Mean	62	18	14,876	34	59.1	13.3	64.7	94.9	72.8	55.84	--	--	
CV %	36.5	8.6	8.0	4.0	2.8	2.3	10.1	9.4	13.0	--	--	--	
LSD 0.05	32	2.2	2,474	2	3.5	0.6	--	--	13.3	--	--	--	
LSD 0.10	27	2	2,045	2	2.9	0.5	7.7	10.6	11.1	--	--	--	

Planting Date: September 22, 2014

Harvest Date: August 10, 2015

Previous Crop: Oat

Seeding Rate: 1 million live seeds/ac

¹Returns were calculated by multiplying the 2015 yield by protein premium or discount paid at the Southwest Grain Terminal located at Gladstone on August 21. The price paid on this date was \$3.63/bu for a grain protein concentration of 12%. \$.03/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 \$.07/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 \$218.94, the sum of all listed costs from the December 2014 Farm Management Planning Guide Projected 2015 Crop Budgets South West North Dakota for winter wheat.

NDSU Hettinger Research Extension Center

Winter Rye - 2015

Hettinger, ND

Variety	Spring	Heading	Plant	Plant	Test	----- Grain Yield -----			Average Yield	
	Stand	Date	Height	Lodge	Weight	2010	2012	2015	2 yr	3 yr
	%		inches	0-9*	lbs/bu	----- Bushels per acre -----				
Aroostok	90	5/30	55	5.8	55.3	66.3	46.0	54.3	50.2	55.5
Dacold	90	6/4	51	6.5	54.6	105.1	71.1	87.8	79.5	88.0
Hancock	91	5/31	55	6.3	56.4	92.9	63.5	73.7	68.6	76.7
Hazlet	91	6/1	53	5.5	56.8			92.6	--	--
Musketeer	90	6/1	53	7.0	55.8			77.2	--	--
Rymin	90	6/1	55	6.0	55.6			69.8	--	--
Spooner	90	5/31	53	4.0	56.7	73.8	48.9	64.4	56.7	62.4
Wheeler	90	6/4	61	3.5	50.9	53.2	33.1	49.8	41.5	45.4
ND Dylan	90	6/2	53	7.0	55.6	110.6	74.2	84.9	79.6	89.9
Trial Mean	90	6/1	54	5.7	55.3	79.1	55.4	72.7	62.6	69.6
C.V. %	1.2	0.4	6.9	19.8	0.9	4.1	15.5	6.9	--	--
LSD 5%	1.6	0.9	5.4	1.7	0.7	4.7	10.5	7.2	--	--
LSD 10%	1.3	0.8	4.5	1.4	0.6	3.9	8.8	6.0	--	--

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

Planting Date: September 22

Harvest Date: August 3

Descriptions and agronomic traits of durum wheat varieties grown in North Dakota, 2015.

Variety	Agent or Origin ¹	Year Released	Height (inches)	Straw Strength ²	Days to Heading ³	Reaction to Disease ⁴				
						Stem Rust	Leaf Rust	Foliar Disease	Bact. Leaf Streak	Head Scab
AC Commander	Can.	2002	32	5	68	R	R	MS	NA	NA
AC Napoleon	Can.	2001	40	5	68	R	R	S	NA	NA
AC Navigator	Can.	1999	32	5	66	R	R	M	NA	S
Alkabo	ND	2005	36	2	67	R	R	M	MS	MS
Alzada ⁵	WB	2004	30	6	63	R	R	S	NA	VS
Belzer	ND	1997	39	5	66	R	R	M	NA	MR
Ben	ND	1996	39	3	67	R	R	MR	MS	S ⁶
Carpio	ND	2012	37	5	69	R	R	M	MS/S	M
CDC Verona	Can.	2010	38	4	69	R	R	MR	NA	S
DG Max	DGP	2008	38	5	66	R	MR	MR	NA	MS
DG Star	DGP	2007	37	4	64	R	R	M	NA	NA
Dilse	ND	2002	37	5	68	R	R	M	M	MS
Divide	ND	2005	38	5	68	R	R	M	MS/S	MR
Grande D'Oro	WB/DGP	2005	37	4	68	R	R	M	NA	NA
Grenora	ND	2005	35	5	67	R	R	M	MS/S	MS
Joppa	ND	2013	39	5	68	R	R	M	MS	MS
Kyle	Can.	1984	39	7	68	R	MR	M	NA	NA
Lebsock	ND	1999	37	3	67	R	R	M	MS	MS
Maier	ND	1998	37	5	67	R	R	M	NA	S ⁶
Mountrail	ND	1998	37	5	68	R	R	M	MS	S ⁶
MS-Dart⁷	Meridian	2015	37	5	68	NA	NA	NA	NA	NA
Pierce	ND	2001	38	5	67	R	R	MS	MS	S
Plaza	ND	1999	29	7	68	R	R	M	NA	MS
Rugby	ND	1973	38	5	64	R	R	MR	NA	S ⁶
Silver	MT	2012	31	5	62	NA	NA	NA	NA	NA
Strongfield	Can.	2004	37	6	68	R	R	MS	NA	S
Tioga	ND	2010	39	4	68	R	R	M	MS	MS
VT Peak	Viterra	2010	37	6	68	NA	NA	NA	NA	NA
Wales	WB	2008	36	3	67	R	R	M	NA	S ⁶
WB-Belfield	WB	2011	30	2	62	R	R	S	NA	S
Westhope	WB	2009	36	3	67	R	R	MS	NA	S

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

²Straw 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.

³Days to Heading = the number of days from planting to head emergence from the boot. Averaged from several locations and years.

⁴R = resistant; MR = moderately resistant; M = intermediate; MS = moderately susceptible; S = susceptible; VS = very susceptible; NA = Not adequately tested. Foliar Disease = reaction to tan spot and septoria leaf spot complex.

⁵Alzada has a disease-resistance package that makes it more adapted to drier growing conditions (for example, western North Dakota).

⁶Indicates yields and/or quality often have been higher than would be expected based on visual symptoms. NA = Not adequately tested.

⁷Bold indicates newly released in 2015.

Durum wheat variety quality descriptions, milling and processing data averaged for five years (2009-2014) from drill strips (33 locations/year).

Variety	Test Weight	Vitreous Kernels	Large Kernels	Falling Number	Wheat Protein ¹	Gluten Index ²	Pasta Color ³	Spaghetti Firmness	Overall Quality ⁴
	(lb/bu)	(%)	(%)	(sec)	(%)		(1-12)	(g-cm)	
AC Commander	59.5	94	52	477	14.0	90	9.0	5.7	Good
AC Navigator	60.0	95	50	462	14.3	69	8.8	5.8	Good
Alkabo	60.8	88	51	385	13.8	51	8.9	5.1	Good
Alzada ⁵	59.1	93	62	451	14.2	90	8.5	5.7	Good
Carpio	60.9	83	58	433	13.8	92	8.9	5.5	Good
Divide	60.5	89	52	428	14.1	76	8.7	5.2	Good
Grenora	60.1	93	51	404	13.8	67	8.8	5.4	Good
Joppa	60.5	88	44	391	13.5	84	9.1	5.1	Good
Lebsock ⁶	60.3	93	42	411	14.5	42	8.5	5.5	Good
Maier	60.0	93	46	380	14.7	55	8.7	5.5	Good
Mountrail	59.7	91	42	396	14.0	22	8.2	4.7	Average
Pierce	60.7	95	42	391	14.2	63	8.7	5.4	Good
Strongfield	60.1	89	52	406	14.7	67	8.6	5.5	Good
Tioga	60.5	89	57	389	13.8	77	8.6	5.4	Good
Average	60.2	91	50	415	14.1	68	8.7	5.4	

For all numbered footnotes, refer to bottom of Table 3.

Durum wheat variety quality descriptions, milling and processing data for 2014 at seven locations in the drill strips.

Variety	Test Weight	Vitreous Kernels	Large Kernels	Falling Number	Wheat Protein ¹	Gluten Index ²	Pasta Color ³	Spaghetti Firmness	Overall Quality ⁴
	(lb/bu)	(%)	(%)	(sec)	(%)		(1-12)	(g-cm)	
AC Commander	60.1	88	73	354	12.4	87	8.5	4.0	Good
AC Navigator	60.7	89	69	347	12.9	60	8.4	4.0	Good
Alkabo	60.9	74	68	266	12.7	38	8.4	3.4	Average
Alzada ⁵	59.5	86	81	330	12.7	82	7.9	3.7	Average
Carpio	60.9	65	72	335	12.1	91	8.4	3.6	Good
Divide	60.7	76	67	320	12.4	70	8.4	3.4	Good
Grenora	60.4	87	64	282	12.8	66	8.4	3.9	Good
Joppa	60.9	72	60	270	12.0	77	8.6	3.4	Good
Maier	60.7	85	66	253	13.0	41	8.3	3.6	Good
Mountrail	60.7	77	61	297	12.4	4	7.7	3.2	Fair
Pierce	61.2	90	59	281	12.8	51	8.2	3.5	Good
Strongfield	60.0	77	73	254	12.6	56	7.8	3.5	Average
Tioga	59.9	78	66	274	12.8	72	8.1	3.8	Good
Average	60.5	80	68	297	12.6	61	8.2	3.6	

¹Wheat protein is reported on a 12 percent moisture basis.

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

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

⁴Overall Quality is determined based on agronomic, milling and spaghetti processing performance.

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

⁶Average of 30 drill strips instead of 33 for other varieties in Table 1. Average of four locations instead of seven for other varieties in Table 2.

NDSU Hettinger Research Extension Center

Durum Wheat - 2015

Hettinger, ND

Variety	Days to	Plant	Plant	Test	Grain	----- Grain Yield -----			Average Yield	
	Head	Height	Lodge	Weight	Protein	2013	2014	2015	2 yr	3 yr
	*	inches	0-9**	lbs/bu	%	----- Bushels per acre -----				
AC Commander	80	30	0	56.3	13.7	43.7	69.7	59.7	64.7	57.7
AC Navigator	80	33	0	57.3	14.0	42.3	65.1	56.2	60.7	54.5
Alkabo	79	39	0	59.2	13.0	50.5	82.6	70.0	76.3	67.7
Alzada	79	31	2	53.9	14.1	35.0	56.8	41.7	49.3	44.5
Ben	80	42	0	58.0	13.6	53.2	73.0	60.5	66.8	62.2
Carpio	81	41	1	59.3	13.8	50.3	80.5	71.6	76.1	67.5
CDC Verona	80	41	0	57.2	14.5	55.6	79.1	66.5	72.8	67.1
Divide	79	41	1	59.5	13.2	55.1	81.6	82.6	82.1	73.1
Grenora	79	38	0	57.7	13.8	52.6	68.1	76.3	72.2	65.7
Joppa	79	40	1	58.1	12.7	51.1	85.7	78.8	82.3	71.9
Lebsock	80	38	0	58.7	14.0	49.5	71.8	60.6	66.2	60.6
Maier	82	38	0	57.6	14.7	42.3	66.3	59.3	62.8	56.0
Mountrail	80	41	0	57.4	13.1	55.3	83.3	76.6	80.0	71.7
MS Dart	79	40	4	58.9	12.4	--	--	73.5	--	--
Pierce	82	40	0	57.8	13.5	47.2	64.3	55.3	59.8	55.6
Rugby	79	43	0	57.6	13.6	51.3	74.9	59.3	67.1	61.8
Strongfield	80	40	0	59.1	14.7	52.4	75.7	70.7	73.2	66.3
Tioga	79	42	1	59.0	13.6	59.9	79.8	81.5	80.7	73.7
VT Peak	78	38	2	60.5	13.1	63.3	80.4	79.2	79.8	74.3
Trial Mean	79	40	1	58.9	13.4	64.5	56.0	73.5	--	--
C.V. %	6	11.9	65.8	0.9	3.2	4.9	7.0	6.2	--	--
LSD 5%	1.0	1.7	1.2	0.7	0.6	4.4	5.5	6.4	--	--
LSD 10%	0.8	1	1	0.6	0.5	3.7	4.6	5.3	--	--

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

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

Planting Date: April 10

Harvest Date: August 17

Previous Crop: Lentils

NDSU Hettinger Research Extension Center

Durum Wheat - 2015	Scranton, ND
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Variety	Plant Height	Plant Lodge	Test Weight	Grain Protein	----- Grain Yield -----			Average Yield		
	inches	0-9*	lbs/bu	%	2013	2014	2015	2 yr	3 yr	
					----- Bushels per acre -----					
Alkabo	40	0	58.2	11.9	57.5	64.9	58.4	61.7	60.3	
Carpio	40	0	58.3	11.3	55.3	57.8	56.5	57.2	56.5	
Divide	42	0	58.4	11.1	54.6	61.5	62.0	61.8	59.4	
Joppa	40	0	57.0	11.3	60.7	63.5	60.1	61.8	61.4	
Mountrail	41	0	57.8	11.2	52.9	67.6	63.1	65.4	61.2	
Tioga	43	0	57.8	11.1	61.2	61.1	62.1	61.6	61.5	
Trial Mean	41	0	57.9	11.3	56.5	62.7	60.4	--	--	
C.V. %	4.6	0.0	1.1	6.5	5.8	6.3	6.0	--	--	
LSD 5%	3	0	1.0	1.1	4.0	4.8	5.5	--	--	

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

Planting Date: April 13

Harvest Date: August 20

Previous Crop: Spring Wheat

Durum Wheat - 2015	Regent, ND
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Variety	Plant Height	Plant Lodge	Test Weight	Grain Protein	----- Grain Yield -----			Average Yield		
	inches	0-9*	lbs/bu	%	2013	2014	2015	2 yr	3 yr	
					----- Bushels per acre -----					
Alkabo	42	1	57.6	13.1	65.5	46.9	83.0	65.0	65.1	
Carpio	44	2	58.2	12.8	64.9	46.9	88.0	67.5	66.6	
Divide	44	2	57.9	13.8	64.5	46.9	89.0	68.0	66.8	
Joppa	43	1	57.1	13.0	67.1	49.9	88.0	69.0	68.3	
Mountrail	43	1	56.2	13.5	61.9	47.2	80.5	63.9	63.2	
Tioga	45	3	58.2	13.4	69.7	46.3	89.2	67.8	68.4	
Trial Mean	43	2	57.5	13.3	65.8	47.4	86.3	--	--	
C.V. %	3.7	18.0	1.1	2.1	5.9	9.3	2.6	--	--	
LSD 5%	2	0.4	1.0	0.4	4.8	5.5	3.4	--	--	

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

Planting Date: April 13

Harvest Date: August 20

Previous Crop: Prevent Plant

NDSU Hettinger Research Extension Center

Durum Wheat - 2015	Mandan, ND
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Variety	Plant	Plant	Test	Grain	----- Grain Yield -----			Average Yield	
	Height	Lodge	Weight	Protein	2013	2014	2015	2 yr	3 yr
	inches	0-9*	lbs/bu	%	----- Bushels per acre -----				
Alkabo	39	0	56.2	11.4	77.1	74.2	25.3	49.8	58.9
Carpio	40	1	58.2	10.9	84.6	67.6	26.7	47.2	59.6
Divide	41	1	56.7	10.8	79.8	69.3	28.9	49.1	59.3
Joppa	40	1	56.5	10.6	85.3	74.9	26.2	50.6	62.1
Mountrail	40	1	55.9	11.0	80.4	76.0	24.8	50.4	60.4
Tioga	43	2	57.4	10.7	86.4	68.7	26.9	47.8	60.7
Trial Mean	41	1	56.8	10.9	82.1	71.8	26.5	--	--
C.V. %	3.0	75.0	0.8	1.9	4.1	7.4	9.1	--	--
LSD 5%	2	2	0.7	0.7	4.1	6.6	3.6	--	--

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

Planting Date: April 14

Harvest Date: August 19

Previous Crop: Spring Wheat

NDSU Dickinson Research Extension Center

2015 Durum - Recrop **Dickinson, ND**

Variety	Days to Head	Seeds per Pound	Plant Height in	Test Weight lbs/bu	Protein %	----- Grain Yield-----				----- Average Yield -----	
						2013	2014	2015	Returns ¹ \$/ac	Year 2	Year 3
						-----bu/ac-----				----bu/ac----	
AC Commander	74	13,789	31.0	54.4	15.9	35.6	72.5	63.5	147.05	68.0	57.2
AC Navigator	73	13,723	31.8	56.1	16.1	34.5	68.4	61.4	142.49	64.9	54.8
Alkabo	74	13,189	39.6	57.0	16.0	39.9	74.3	68.2	188.25	71.3	60.8
Alzada	70	13,383	31.6	54.8	16.3	35.2	56.7	59.6	125.26	58.2	50.5
Ben	73	13,786	40.1	56.8	16.3	36.7	71.5	68.1	186.57	69.8	58.8
CDC Verona	74	14,801	38.3	53.9	17.8	39.5	70.7	59.0	117.39	64.8	56.4
Carpio	76	12,767	41.1	57.4	16.8	43.9	67.0	67.4	185.61	67.2	59.4
Divide	75	13,820	42.6	56.9	17.0	40.3	77.3	73.7	221.91	75.5	63.8
Grenora	74	13,792	38.2	57.1	16.0	35.1	78.1	75.0	229.49	76.5	62.7
Joppa	75	14,799	39.0	55.7	16.3	41.1	80.4	69.1	187.14	74.7	63.5
Lebsock	73	15,075	38.6	56.1	16.4	32.2	72.6	68.2	183.89	70.4	57.7
Maier	74	13,982	39.0	56.2	16.9	36.3	75.5	72.0	206.87	73.8	61.3
Mountrail	74	13,997	39.8	54.7	16.5	44.6	83.2	68.4	176.51	75.8	65.4
Pierce	74	14,342	39.8	57.1	16.2	31.7	74.3	71.4	209.40	72.9	59.1
Rugby	73	14,507	43.9	57.5	16.7	32.6	70.5	66.3	178.96	68.4	56.5
Strongfield	74	14,479	39.4	52.9	17.8	37.6	72.2	63.9	140.51	68.1	57.9
Tioga	73	13,610	42.6	57.4	16.2	37.5	78.3	74.7	229.41	76.5	63.5
Trial Mean	74	13,778	39	56.6	16.2	38.2	76.7	69.3	193.06	--	--
CV %	1.4	5.4	3.8	2.0	2.3	17.9	6.9	6.3	--	--	--
LSD 0.05	1	1,501	2	1.6	0.8	--	--	6.1	--	--	--
LSD 0.10	1	1,251	2	1.3	0.6	8.0	6.2	5.1	--	--	--

Planting Date: April 17, 2015
 Harvest Date: August 12, 2015
 Previous Crop: Oat hay
 Seeding Rate: 1.2 million live seeds/ac

¹Returns were calculated by multiplying the 2015 yield by the test weight discount paid at the Southwest Grain Terminal located at Gladstone on August 21. The price paid on this date was \$6.25/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 \$.05/bu per 0.5 lb/bu reduction between 54 and 50 lb/bu. Returns also deduct \$225.70, the sum of all listed costs from the December 2014 Farm Management Planning Guide Projected 2015 Crop Budgets South West North Dakota for durum.

NDSU Dickinson Research Extension Center

2015 Durum - Recrop **Hannover, ND**

Variety	Seeds per Pound	Test Weight lbs/bu	Protein %	-----Grain Yield-----			Returns ¹ \$/ac	-----Average Yield-----	
				2013	2014	2015		2	3
				-----bu/ac-----				-----bu/ac-----	
Alkabo	12,815	58.3	12.9	56.9	71.4	76.2	244.72	73.8	68.1
Alzada	15,577	52.8	13.6	--	--	49.5	57.32	--	--
Carpio	12,688	58.5	13.9	67.8	64.6	73.2	227.68	68.9	68.5
Divide	13,329	58.0	13.6	61.8	57.8	75.6	240.89	66.7	65.1
Joppa	13,247	57.6	13.9	70.6	64.5	76.3	242.67	70.4	70.5
Tioga	12,756	57.8	13.3	69.1	62.1	73.4	225.70	67.8	68.2
Trial Mean	13,402	57.1	13.5	64.8	65.3	70.7	206.50	--	--
CV %	7.0	0.8	5.4	7.2	10.3	6.2	--	--	--
LSD 0.05	2,405	0.7	NS	--	--	6.6	--	--	--
LSD 0.10	1,885	0.5	NS	6.9	8.3	5.4	--	--	--

Planting Date: April 23, 2015

Previous Crop: Wheat

Harvest Date: August 25, 2015

Seeding Rate: 1.2 million live seeds/ac

2015 Durum - Recrop **Glen Ullin , ND**

Variety	Seeds per Pound	Test Weight lbs/bu	Protein %	-----Grain Yield-----			Returns ¹ \$/ac	-----Average Yield-----	
				2013	2014	2015		2	3
				-----bu/ac-----				-----bu/ac-----	
Alkabo	11,607	60.6	11.3	83.2	73.2	72.8	229.11	73.0	76.4
Alzada	13,894	57.1	12.7	--	--	54.8	108.51	--	--
Carpio	11,350	60.3	11.5	87.5	69.3	75.1	243.18	72.2	77.3
Divide	11,603	60.8	12.2	87.0	69.6	76.8	254.37	73.2	77.8
Joppa	12,489	60.4	12.0	91.9	76.3	73.0	230.51	74.7	80.4
Tioga	11,545	60.5	11.2	88.8	66.3	74.9	242.18	70.6	76.6
Trial Mean	12,081	59.9	11.8	87.3	71.5	71.2	217.98	--	--
CV %	3.2	0.9	7.4	6.4	5.1	6.9	--	--	--
LSD 0.05	1,000	0.8	NS	--	--	7.4	--	--	--
LSD 0.10	784	0.7	NS	NS	4.5	6.1	--	--	--

Planting Date: April 23, 2015

Previous Crop: Wheat

Harvest Date: August 20, 2015

Seeding Rate: 1.2 million live seeds/ac

¹Returns were calculated by multiplying the 2015 yield by the test weight discount paid at the Southwest Grain Terminal located at Gladstone on August 21. The price paid on this date was \$6.25/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 \$.05/bu per 0.5 lb/bu reduction between 54 and 50 lb/bu. Returns also deduct \$225.70, the sum of all listed costs from the December 2014 Farm Management Planning Guide Projected 2015 Crop Budgets South West North Dakota for durum.

2015 North Dakota barley variety descriptions.

Variety	Use ¹	Origin ²	Year Released	Awn Type ³	Rachilla Hair Length ⁴	Aleurone Color	Height	Straw Strength	Relative Maturity	Reaction to Disease ⁵			
										Stem Rust	Spot-form Net Blotch	Spot Blotch	Net Blotch
Six-rowed													
Celebration	M/F	BARI	2008	S	S	White	M.short	Strg.	Med.	S	MS	MR/R	MS/S
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 ⁶	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
Two-rowed													
AC Metcalfe	M	Canada	1997	R	L	White	Med.	Med.	Late	S	MS	MS	S
CDC Copeland	M	Canada	1999	R	L	White	Tall	Med.	Late	S	MS	MS	MR
CDC Meredith	M	Canada	2008	R	L	White	Med.	Med.	Late	MR	MR	S	MS
Conlon ⁷	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 ⁸	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
ND Genesis⁹	M/F	ND	2015	S	L	White	Med.	M.strg.	M.late	S	MR	MR	MS
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
Specialty													
Wanubet	SP	MT	1990	H	L	White	Med.	Weak	Late	S	NA	S	S

¹ M = malting; MT = being tested in plant-scale tests for malting and brewing quality; F = feed; SP = special uses (hull-less).

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

³ R = rough; S = smooth; H = hull-less.

⁴ S = short; L = long.

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

⁶ Moderately resistant to Fusarium head blight.

⁷ Lower DON accumulations than other varieties tested.

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

⁹ Bold indicates newly released in 2015.

NDSU Hettinger Research Extension Center

Barley - 2015 **Hettinger, ND**

Variety	Days to	Plant	Plant		Test	Grain	----- Grain Yield -----			Average Yield	
	Head	Height	Lodge	Plump	Weight	Protein	2013	2014	2015	2 yr	3 yr
	*	inches	0-9**	%	lbs/bu	%	----- Bushels per acre -----				
TWO ROW											
ND Genesis	75	40	1	95	50.0	11.3	122.8	114.4	103.2	108.8	113.5
Pinnacle	75	38	1	95	50.4	11.0	110.5	115.1	103.5	109.3	109.7
CDC Copeland	82	43	1	95	50.8	12.4	103.5	110.0	101.0	105.5	104.8
Rawson	73	38	1	95	49.0	11.9	116.1	102.1	93.2	97.7	103.8
Conrad	82	36	2	95	50.9	12.4	102.7	109.3	93.1	101.2	101.7
Conlon	73	36	2	98	51.1	12.8	102.1	118.2	82.6	100.4	101.0
AC Metcalfe	76	38	3	89	49.8	13.1	87.4	86.9	81.6	84.3	85.3
CDC Meredith	82	38	3	93	49.8	11.7	--	--	110.0	--	--
SIX ROW											
Tradition	74	39	1	97	49.2	12.6	124.1	120.2	83.9	102.1	93.0
Lacey	76	40	1	96	49.2	13.3	116.5	114.2	84.3	99.3	91.8
Stellar-ND	74	38	1	97	48.1	13.1	107.9	122.2	86.6	104.4	95.5
Innovation	74	40	0	97	49.0	13.2	122.4	122.3	87.2	104.8	96.0
Celebration	75	38	2	95	48.7	14.3	110.7	115.3	76.4	95.9	86.1
Quest	76	41	2	91	48.3	13.2	114.0	110.4	66.2	88.3	77.3
Trial Mean	76	39	1	95	49.5	12.4	115.5	115.5	90.7	--	--
C.V. %	1.0	3.3	42.6	1.1	0.9	3.4	5.6	3.0	5.4	--	--
LSD 5%	1.1	1.8	0.8	1.5	0.6	0.6	9.0	4.9	6.9	--	--
LSD 10%	0.9	1.5	0.6	1.3	0.5	0.5	7.6	4.1	5.8	--	--

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

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

Planting Date: April 10

Harvest Date: August 7

Previous Crop: Spring Wheat Green Fallow

NDSU Hettinger Research Extension Center

Barley - 2015	Scranton, ND
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Variety	Plant	Plant	Test	Grain	----- Grain Yield -----			----- Average Yield -----	
	Height	Lodge	Weight	Protein	2013	2014	2015	2 yr	3 yr
	inches	0-9*	lbs/bu	%	----- Bushels per acre -----				
TWO ROW									
Conlon	33	4	48.9	11.9	81.0	74.0	67.6	70.8	74.2
Pinnacle	36	1	48.8	10.4	93.5	81.3	79.7	80.5	84.8
ND Genesis	36	0	47.9	10.6	--	--	85.2	--	--
SIX ROW									
Celebration	34	4	47.6	12.2	82.6	75.3	76.4	75.9	78.1
Quest	37	2	47.3	11.6	94.6	80.6	78.1	79.4	84.4
Innovation	35	2	48.3	11.3	80.3	83.0	78.6	80.8	80.6
Trial Mean	35	2	48.1	11.3	87.4	80.7	77.6	--	--
C.V. %	3.2	17.5	0.8	4.2	9.6	7.3	8.2	--	--
LSD 5%	2	2	0.6	0.7	10.4	7.3	9.6	--	--

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

Planting Date: April 13

Harvest Date: August 20

Previous Crop: Spring Wheat

Barley - 2015	Regent, ND
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Variety	Plant	Plant	Test	Grain	----- Grain Yield -----			----- Average Yield -----	
	Height	Lodge	Weight	Protein	2013	2014	2015	2 yr	3 yr
	inches	0-9*	lbs/bu	%	----- Bushels per acre -----				
TWO ROW									
Conlon	37	6	49.9	13.3	88.4	71.0	93.8	82.4	84.4
Pinnacle	41	2	48.6	12.1	106.3	73.2	106.1	89.7	95.2
ND Genesis	41	3	48.4	12.1	--	--	112.1	--	--
SIX ROW									
Celebration	39	4	47.7	16.0	98.9	87.9	78.8	83.4	88.5
Quest	41	1	47.2	14.1	95.9	84.1	83.3	83.7	87.8
Innovation	38	2	48.5	14.3	104.8	77.1	84.8	81.0	88.9
Trial Mean	39	3	48.4	13.6	100.3	79.0	93.2	--	--
C.V. %	3.6	27.9	1.3	3.5	4.5	12.5	8.0	--	--
LSD 5%	2	1	0.9	0.7	5.5	12.3	11.3	--	--

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

Planting Date: April 13

Harvest Date: August 20

Previous Crop: Prevent Plant

NDSU Hettinger Research Extension Center

Barley - 2015 **New Leipzig, ND**

Variety	Plant	Plant	Test	Grain	----- Grain Yield -----			----- Average Yield -----	
	Height	Lodge	Weight	Protein	2013	2014	2015	2 yr	3 yr
	inches	0-9*	lbs/bu	%	----- Bushels per acre -----				
TWO ROW									
Conlon	38	6	50.5	13.5	76.0	69.3	53.5	61.4	66.3
Pinnacle	38	4	50.1	11.8	81.9	81.8	51.5	66.7	71.7
ND Genesis	38	4	49.1	11.9	--	--	51.3	--	--
SIX ROW									
Celebration	37	8	47.8	14.5	90.1	81.6	55.6	68.6	75.8
Quest	38	7	48.3	14.0	92.4	83.8	49.5	66.7	75.2
Innovation	37	8	49.4	13.5	93.0	78.5	51.2	64.9	74.2
Trial Mean	37	6	49.2	13.1	87.3	79.8	52.1	--	--
C.V. %	3.6	15.0	1.1	3.1	7.9	7.6	6.1	--	--
LSD 5%	2	1	0.8	0.6	8.5	7.5	5.7	--	--

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

Planting Date: April 14

Harvest Date: August 19

Previous Crop: Spring Wheat

NDSU Dickinson Research Extension Center

2015 Barley - Recrop Dickinson, ND

Variety	Days	Seeds	Plant	Test	Protein	%	----- Grain Yield-----				Average Yield	
	to	per					Height	Weight	Plump	2013	2014	2015
	Head	Pound	in	lbs/bu	%	>6/64	-----bu/ac-----			\$/ac	---bu/ac---	
Six Row												
Celebration	74	14,348	36	46.9	18.3	87.5	78.6	124.1	102.3	8.01	113.2	101.7
Innovation	73	13,232	37	48.8	18.3	93.7	76.3	135.7	97.9	-1.24	116.8	103.3
Lacey	73	13,238	37	49.5	17.7	93.7	82.3	133.9	110.3	24.64	122.1	108.8
Quest	76	14,843	38	47.0	19.0	76.9	84.9	133.2	91.7	-17.24	112.4	103.3
Stellar-ND	73	12,386	35	48.2	16.9	94.9	79.0	142.6	107.9	19.62	125.2	109.8
Tradition	72	11,866	38	48.7	17.3	94.2	74.4	140.6	81.3	-36.06	111.0	98.8
Two Row												
ND Genesis	75	10,455	37	52.4	14.8	97.0	79.6	126.5	124.5	54.60	125.5	110.2
AC Metcalfe	75	11,419	37	49.5	17.5	90.9	70.9	122.8	110.1	24.41	116.5	101.3
CDC Copeland	76	12,432	36	47.2	17.6	81.9	87.0	130.7	107.9	17.17	119.3	108.6
CDC Meredith	77	12,588	34	46.3	18.1	83.4	--	--	126.2	55.33	--	--
Conlon	68	9,480	36	51.8	16.8	98.1	62.8	106.8	103.4	10.17	105.1	91.0
Conrad	77	12,759	32	48.3	18.8	87.9	84.4	144.0	114.3	33.12	129.1	114.2
Pinnacle	71	9,506	36	51.3	15.9	95.6	76.3	130.3	126.2	58.06	128.2	110.9
Rawson	70	9,363	35	51.2	15.1	98.1	83.5	120.4	124.5	54.46	122.4	109.5
Trial Mean	73	12,043	36	49.2	17.1	91.5	81.4	133.1	110.4	24.55	--	--
CV %	1.1	6.7	3.9	3.6	3.15	3.9	10.7	9.5	9.9	--	--	--
LSD 0.05	1	1,684	2	2.5	1.1	7.4	--	--	15.5	--	--	--
LSD 0.10	1	1,391	2	2.1	0.9	6.1	10.3	14.9	12.9	--	--	--

Planting Date: April 16, 2015

Harvest Date: August 3, 2015

Previous Crop: oat hay

Seeding Rate: 1.2 million live seeds/ac

¹Returns were calculated by multiplying the 2015 yields by the price paid for feed barley minus the test weight discount paid at the Southwest Grain Terminal located at Gladstone on August 21. The price paid on this date was \$2.10/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 \$206.89, the sum of all listed costs from the December 2014 Farm Management Planning Guide Projected 2015 Crop Budgets South West North Dakota for barley.

NDSU Dickinson Research Extension Center

2015 Barley - Recrop Hannover , ND

Variety	Seeds per Pound	Test Weight lbs/bu	% Plump >6/64	Protein %	-----Grain Yield-----			Returns ¹ \$/ac	Average Yield	
					2013	2014	2015		2	3
					-----bu/ac-----				----bu/ac----	
Six Row										
Innovation	12,963	45.4	96	15.9	82.7	111.4	105.0	12.01	108.2	99.7
Quest	13,701	44.3	89	16.4	74.3	97.0	89.4	-22.01	93.2	86.9
Two Row										
ND Genesis	11,089	45.4	96	14.9	--	95.5	92.1	-14.83	93.8	--
Pinnacle	10,267	46.4	95	14.9	78.7	111.2	100.9	5.09	106.1	97.0
Rawson	9,922	46.6	97	15.6	76.2	91.1	90.8	-16.19	91.0	86.0
Trial Mean	11,693	45.6	95	15.5	69.8	104.3	95.9	-6.60	--	--
CV %	5.6	1.7	2.4	1.8	15.2	5.3	4.4	--	--	--
LSD 0.05	1,686	1.1	6	0.7	--	--	6.3	--	--	--
LSD 0.10	1,322	0.9	5	0.6	21.4	8.2	5.2	--	--	--

Planting Date: April 23, 2015 Previous Crop: wheat
 Harvest Date: August 25, 2015 Seeding Rate: 1.2 million live seeds/ac

2015 Barley - Recrop Glen Ullin, ND

Variety	Seeds per Pound	Test Weight lbs/bu	% Plump >6/64	Protein %	-----Grain Yield-----			Returns ¹ \$/ac	Average Yield	
					2013	2014	2015		2	3
					-----bu/ac-----				----bu/ac----	
Six Row										
Innovation	10,448	46.8	99	13.6	105.8	125.4	86.4	-25.53	105.9	105.9
Quest	12,584	46.1	97	14.2	107.0	127.1	91.8	-14.15	109.4	108.6
Two Row										
ND Genesis	9,650	47.5	98	13.7	--	125.6	93.0	-11.54	109.3	--
Pinnacle	10,483	48.1	97	13.5	106.5	123.3	94.0	-9.55	108.6	107.9
Rawson	9,235	46.9	97	13.8	104.7	98.3	80.4	-37.96	89.4	94.5
Trial Mean	10,538	47.0	98	13.8	99.5	123.0	90.1	-17.77	--	--
CV %	8.9	1.1	0.6	3.8	6.5	4.8	6.9	--	--	--
LSD 0.05	2,399	0.8	1	NS	--	--	9.4	--	--	--
LSD 0.10	1,881	0.6	1	NS	8.0	7.3	7.7	--	--	--

Planting Date: April 23, 2015 Previous Crop: Spring Wheat
 Harvest Date: August 20, 2015 Seeding Rate: 1.2 million live seeds/ac

¹Returns were calculated by multiplying the 2015 yields by the price paid for feed barley minus the test weight discount paid at the Southwest Grain Terminal located at Gladstone on September 21. The price paid on this date was \$2.10/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 \$206.89, the sum of all listed costs from the December 2014 Farm Management Planning Guide Projected 2015 Crop Budgets South West North Dakota for barley.

2015 North Dakota oat variety descriptions.

Variety	Origin ¹	Year Released	Grain Color	Height	Straw Strength	Maturity ²	Reaction to Diseases			Bu/Wt.	Protein ⁵
							Stem Rust ³	Crown Rust ³	Barley Y.Dwf ⁴		
AAC Justice	AAFC/MN	2015	White	Tall	Strong	L	S	R	NA	Good	NA
AC Assiniboia	AAFC	1997	Red	Med.	Strong	L	S	S	T	Good	M/L
AC Kaufman	AAFC	2000	Yellow	Tall	Strong	L	S	S	MT	V.good	M/L
AC Pinnacle	AAFC	1999	White	Tall	Med.	L	S	S	S	V.good	L
Beach	ND	2004	White	Tall	M.strg.	M/L	S	MR/MS	MS	V.good	M
Buff	SD	2002	Hull-less	Med.	M.strg.	L	S	MR/MS	MT	Good	H
CDC Dancer	Sask.	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 Weaver	Sask.	2005	Yellow	Med.	M.strg.	L	S	S	S	Good	M
Deon	MN	2013	Yellow	Tall	Strong	L	S	R	T	V.good	
Furlong	AAFC	2003	Red	Tall	M.strg.	L	S	S	T	V.good	M
Goliath	SD	2013	White	Tall	Med.	L	NA	MR/MS	NA	Good	M
Hayden	SD	2015	White	Med	Med	M	S	MR/MS	MT	V Good	M
HiFi	ND	2001	White	Tall	Strong	L	MR/MS	S	T	Good	M
Horsepower	SD	2012	White	Short	Strong	E/M	MS	S	MT	V.good	M/H
Hyttest	SD	1986	White	Tall	M.strg.	E	S	MS	S	V.good	H
Jury	ND	2012	White	Tall	M.strg.	M	R	S	MT	V.good	M
Killdeer	ND	2000	White	Med.	Strong	M	S	MS	MT	Good	M
Leggett	AAFC	2005	White	Tall	Strong	L	MR	R	S	Good	M
Loyal	SD	2000	Ivory	Tall	M.strg.	L	S	MR	T	Good	M/H
Maida	ND	2005	Yellow	Med.	Strong	M	R	S	MS	V.good	M/H
Morton	ND	2001	White	Tall	V.strg.	L	S	S	MT	V.good	M
Newburg	ND	2011	White	Tall	Med.	L	R	S	MT	Good	M
Otana	MT	1977	White	M.tall	M.weak	L	S	S	S	V.good	M/L
Paul	ND	1994	Hull-less	V.tall	Strong	L	R	MR/MS	T	Good	H
Rockford	ND	2008	White	Tall	Strong	L	S	S	MT	V.good	M
Sesqui	MN	2001	Yellow	M.tall	Strong	L	S	S	T	Good	M
Shelby 427	SD	2008	White	Med.	Strong	E	S	S	NA	V.good	NA
Souris	ND	2006	White	Med.	Strong	M	MS	S	MS	V.good	M
Stallion	SD	2006	White	Tall	Med.	L	S	MR	NA	V.good	M
Stark	ND	2004	Hull-less	Tall	M.strg.	L	R	MR/MS	T	V.good	M
Streaker	SD	2008	Hull-less	Tall	M.weak	M	S	R/MR	NA	V.good	M/H
Summit	AAFC	2008	White	Med.	Strong	L	S	S	MT	Good	M

¹ AAFC = Agriculture & Agri-Food Canada; MN = University of Minnesota; ND = North Dakota State University; SD = South Dakota State University; Sask. = University of Saskatchewan; MT = Montana State University.

²E = early; M = medium; L = late.

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

⁴Barley Yellow Dwarf Virus; S = susceptible; MS = moderately susceptible; MT = moderately tolerant; T = tolerant; NA = not available. Varieties rated MT or T have a relatively good degree of protection against barley yellow dwarf virus.

⁵H = high; M = medium; L = low.

NDSU Hettinger Research Extension Center

Oat - 2015	Hettinger, ND
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Variety	Days to	Plant	Plant	Test	----- Grain Yield -----			Average Yield	
	Head	Height	Lodge	Weight	2013	2014	2015	2 yr	3 yr
	*	inches	0-9**	lbs/bu	----- Bushels per acre -----				
Beach	84	52	1	37.7	152.2	171.0	164.8	167.9	162.7
CDC Dancer	83	52	4	33.7	151.5	165.2	177.4	171.3	164.7
Deon	84	49	3	36.8	--	200.9	173.0	187.0	--
Furlong	84	48	1	31.8	162.2	192.8	194.6	193.7	183.2
Goliath	83	58	6	36.8	161.0	195.8	177.5	186.7	178.1
HiFi	82	53	5	37.1	135.6	130.1	180.7	155.4	148.8
Horsepower	79	42	1	36.8	159.5	192.0	171.5	181.8	174.3
Hyttest	80	50	4	38.0	130.2	109.0	144.7	126.9	128.0
Jury	81	53	5	35.9	163.1	196.0	175.8	185.9	178.3
Killdeer	81	44	1	36.2	164.0	185.5	186.8	186.2	178.8
Leggett	85	50	2	35.8	162.4	193.2	174.5	183.9	176.7
CDC Minstrel	84	48	2	33.7	167.9	191.5	186.3	188.9	181.9
Newburg	81	53	4	34.4	172.5	192.7	181.6	187.2	182.3
Otana	83	51	4	34.8	167.6	181.3	156.2	168.8	168.4
AC Pinnacle	85	51	8	33.4	148.8	173.5	180.4	177.0	167.6
Rockford	82	53	2	37.8	156.1	199.8	186.3	193.1	180.7
Souris	81	47	2	34.5	136.7	128.9	169.5	149.2	145.0
Stallion	81	51	7	37.2	150.8	157.1	160.5	158.8	156.1
Paul (hull-less)	85	56	3	41.0	--	131.7	149.4	140.6	--
Trial Mean	82	50	3	35.7	157.0	175.8	176.5	--	--
C.V. %	0.9	3.2	46.0	3.3	5.0	6.3	5.6	--	--
LSD 5%	0.8	2.3	2.2	1.6	11.1	15.6	13.8	--	--
LSD 10%	0.6	1.9	1.8	1.4	9.3	13.0	11.6	--	--

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

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

Planting Date: April 10

Harvest Date: August 7

Previous Crop: Spring Wheat Green Fallow

NDSU Dickinson Research Extension Center

2015 Oat - Recrop Dickinson, ND

Variety	Days to Head	Seeds per Pound	Plant Height in	Test Weight lbs/bu	----- Grain Yield-----			Returns ¹ \$/ac	Average Yield	
					2013	2014	2015		2	3
					-----bu/ac-----			----bu/ac----		
AC Pinnacle	76	15,446	41	34.8	150.7	216.2	161.6	90.16	188.9	176.2
Beach	73	17,263	42	38.5	142.4	169.9	115.6	22.20	142.7	142.6
CDC Dancer	76	21,963	41	35.3	132.5	170.9	141.3	57.17	156.1	148.2
CDC Minstrel	74	14,514	38	34.3	112.7	193.7	149.9	66.96	171.8	152.1
Deon	76	14,075	41	36.1	--	175.4	150.5	77.32	163.0	--
Furlong	76	11,833	40	33.6	131.0	165.7	163.3	83.51	164.5	153.3
Goliath	74	16,499	44	37.3	116.3	160.3	128.8	44.78	144.5	135.1
HiFi	74	15,563	40	36.6	117.3	162.9	140.7	63.07	151.8	140.3
Horsepower	69	17,601	33	35.8	111.7	141.2	133.7	48.10	137.4	128.9
Hytest	71	17,617	42	39.5	124.0	178.8	108.8	11.11	143.8	137.2
Jury	71	15,908	42	36.1	124.1	151.2	134.0	48.57	142.6	136.4
Killdeer	73	13,917	37	35.9	135.1	152.0	149.8	75.99	150.9	145.7
Leggett	76	15,255	38	36.3	118.7	197.1	150.1	78.19	173.6	155.3
Newburg	72	19,957	42	36.0	143.9	178.0	143.0	61.31	160.5	155.0
Otana	75	18,652	42	35.9	139.5	178.5	127.3	37.40	152.9	148.5
Paul*	77	18,324	44	42.9	--	132.3	105.0	4.25	118.6	--
Rockford	74	16,172	42	36.8	136.2	174.4	144.1	70.40	159.3	151.6
Souris	74	18,504	37	37.1	131.2	173.5	145.0	67.20	159.2	149.9
Stallion	74	17,369	43	36.2	129.5	176.1	134.6	50.79	155.3	146.7
Trial Mean	74	16,187	40	36.3	126.5	168.6	140.5	58.81	--	--
CV %	1.3	11.2	3.1	4.0	10.4	7.7	8.4	--	--	--
LSD 0.05	1	3,684	1.8	2.0	--	--	16.6	--	--	--
LSD 0.10	1	3,065	1	1.7	15.4	15.2	13.9	--	--	--

Planting Date: April 15, 2015

Harvest Date: July 31, 2015

* Hullless

Previous Crop: oat hay

Seeding Rate: 1 million live seeds/ac

¹Returns were calculated by multiplying the 2015 yield by the test weight discount paid at the Southwest Grain Terminal located in Gladstone on August 21. The price paid was \$1.80/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 \$184.70, the sum of all listed costs from the December 2014 Farm Management Planning Guide Projected 2015 Crop Budgets South West North Dakota for oats.

NDSU Hettinger Research Extension Center

Safflower - 2015 **Hettinger, ND**

Variety	Oil Type	Days to Flower	Plant Height	Test Weight	Oil Content	-----Grain Yield-----			-----Average Yield-----	
						2013	2014	2015	2-Yr	3-Yr
		DAP*	inches	lbs/bu	%	----- lbs per acre -----				
Cardinal	Linoleic	98	39	41.1	32.3	2394	1043	2497	1770	1978
Finch	Linoleic	96	35	43.3	33.6	2272	897	2672	1785	1947
MonDak	Oleic	97	35	41.0	34.8	2303	1070	3050	2060	2141
Montola 2003	Oleic	98	32	39.9	36.7	2186	991	3346	2169	2174
Nutrasaff	Linoleic	98	36	34.0	41.8	2124	867	2162	1515	1718
Hybrid 9049	Oleic	96	36	40.7	29.9	2978	1063	3082	2073	2374
Hybrid 1601	Oleic	98	36	38.7	34.7	2182	1195	3750	2473	2376
Hybrid 200	Oleic	97	34	41.4	31.1	--	--	3412	--	--
Hybrid 446	Oleic	97	32	41.1	31.3	--	--	3302	--	--
Hybrid 621	Oleic	98	36	34.7	37.6	--	--	2860	--	--
Trial Mean		97	35	39.6	34.4	2277	983	3011	1978	2101
C.V. %		0.8	3.6	1.9	2.5	8.8	21.7	7.7	--	--
LSD 5%		0.9	1.9	1.1	0.8	290	NS	337	--	--
LSD 10%		0.7	1.5	0.9	0.6	244	NS	279	--	--

* Days after planting.

Planting Date: April 22

Harvest Date: September 24

Previous Crop: Spring Wheat Green Fallow

NDSU Hettinger Research Extension Center

Oil Type Sunflower - 2015

Hettinger, ND

Company/Brand	Hybrid	Oil Type & Traits	Days to Bloom	Plant Height inches	Lodging %	Test Weight lbs/bu	Oil Content %	Grain Yield		
								2015	2-Year	3-Year
AgVenture - Scherr Seed	AF3H68IES	HO, EX, DM	105	62	10	25.7	34.5	2280	1567	--
AgVenture - Scherr Seed	AF3N692ES	NS, EX, DM	106	61	8	26.0	35.9	3329	1962	--
Prosun - Scherr Seed	3N94DM	NS, CL, DM	104	62	14	28.4	37.6	3195	--	--
Prosun - Scherr Seed	4H95DM	HO, CL, DM	106	65	3	27.4	39.4	3757	--	--
Croplan	432 E	NS, EX, DM	102	57	13	23.5	32.8	1916	1453	1628
Croplan	458 E HO	HO, EX, DM	104	60	2	23.8	35.6	2517	--	--
Croplan	545 CL	NS, CL, DM	106	59	3	25.6	36.4	3082	2309	--
Croplan	549 CL HO	HO, CL, DM	101	67	3	26.5	36.5	2896	--	--
Croplan	553 CL HO	HO, CL, DM	107	62	1	26.0	36.4	3413	--	--
Genosys	12G04	HO	106	54	5	24.4	36.6	2648	--	--
Genosys	12G20	HO, CL	104	59	8	27.3	37.1	3247	2479	2370
Genosys	12G25	HO, CL	104	58	1	27.0	38.5	3757	2629	--
Genosys	12G28	HO	106	60	0	27.3	36.3	3394	--	--
Mycogen Seeds	8D310CL	TR, CL	104	65	1	22.5	32.2	2885	2157	1983
Mycogen Seeds	8H456CL	HO, CL, DM	106	62	0	26.3	42.0	4134	--	--
Mycogen Seeds	8H449CLDM	HO, CL, DM	105	58	2	28.7	41.3	3407	2470	2289
Nuseed	Badger DMR	NS, CL, DM	102	59	6	22.5	30.4	2352	1727	--
Nuseed	Camaro II	NS, CL, DM	104	62	5	26.9	36.9	3103	2204	2152
Nuseed	Cobalt II	HO, CL, DM	101	60	0	26.7	36.5	2577	1735	1694
Nuseed	Daytona	HO, CL	105	55	0	24.7	34.9	2996	--	--
Nuseed	Falcon	NS, EX	104	49	1	28.0	37.1	2995	2109	2203
Nuseed	Hornet	HO, CL, DM	106	61	2	26.8	37.5	3687	2699	--
Nuseed	NHK12M054	HO, CL, DM	102	57	5	26.3	36.7	2392	--	--
Nuseed	NHK12M055	HO, CL, DM	102	55	2	25.7	36.1	2117	--	--
Nuseed	NSK12M507	NS, CL, DM	101	56	5	21.5	34.1	1508	--	--
Nuseed	Talon	NS, EX	102	56	4	24.7	36.6	2893	1966	--
NuTech	68H7	HO, EX	106	65	11	26.0	34.6	2666	--	--
NuTech	69M2	NS, EX	106	61	6	25.7	35.4	3219	--	--
Proseed	E-85 CL	HO, CL	103	65	4	25.2	35.7	2939	2025	1899
Proseed	E-31 CL	HO, CL	106	65	15	24.4	32.5	2111	1568	1681
Proseed	E-21 CL	HO, CL	104	67	0	24.6	33.5	2040	1347	1446
Proseed	E-362436	HO	104	67	1	27.3	36.5	2578	1847	1880
Proseed	E-31051 CL	HO, CL	104	67	4	24.8	33.4	1765	--	--
Proseed	E-1041 CL	HO, CL	104	63	23	25.4	34.0	2039	--	--

Table continued on next page.

Company/Brand	Hybrid	Oil Type & Traits	Days to Bloom	Plant Height	Lodging	Test Weight	Oil Content	2015	2-Year	3-Year
Table continued from previous page.										
Proseed	E-53051 CL	HO, CL	102	66	2	24.1	32.8	2076	--	--
Proseed	E-79051 CL	HO, CL	106	66	18	23.5	32.5	2211	--	--
Syngenta	3495 NS/CL/DM	NS, CL, DM	105	60	2	28.4	37.3	2635	2015	--
Syngenta	3845 HO	HO	105	57	5	28.3	41.2	3165	--	--
Syngenta	7111 HO/CL/DM	HO, CL, DM	99	54	1	24.9	31.7	1739	1351	1380
Syngenta	SY7717	HO, CL	101	57	0	27.3	36.1	2797	2327	2187
Thunder Seed	11N94	NS, CL, DM	105	62	9	28.3	36.0	2883	--	--
Thunder Seed	35H92	HO, CL, DM	102	54	0	26.7	36.5	2613	--	--
Thunder Seed	42H94	HO, CL, DM	106	61	5	27.1	37.2	3778	--	--
AAFC/USDA (Check)	Honeycomb NS	NS	97	52	4	24.0	34.2	1432	--	--
USDA (Check)	894	TR	103	59	5	26.3	36.7	2829	1961	--
Mycogen Seeds (Check)	8N270CLDM	NS, CL, DM	101	53	3	25.5	36.5	2246	--	--
Trial Mean			104	60	5	25.8	35.9	2744	--	--
C.V. %			1.0	6.6	92.0	4.3	3.4	11.4	--	--
LSD 5%			1.6	5.6	7.0	1.6	1.7	510	--	--
LSD 10%			1.3	4.7	5.9	1.3	1.4	427	--	--

* Type: TR=Traditional, NS=NuSun, HO=High Oleic, CL=Clearfield, EX=ExpressSun, DM=Downy Mildew Resistant

** Days after planting.

Planting Date: May 19

Harvest Date: October 20

Previous Crop: Wheat

NDSU Hettinger Reserach Extension Center

Canola - Liberty Link, SU and Clearfield - 2015

Hettinger, ND

Brand	Variety	Type	Days to Bloom	Bloom Duration	Days to Mature	Plant Height	Lodging	Test Weight	Oil Content	Seed Yield	
			Bloom	Duration	Mature	Height	0 - 9***	lbs/bu	%	2015	2-Yr. Avg.
			*	**	days	**	inches			-----lbs/a-----	
Bayer CropScience	InVigor L140P	LL, TR	51	21	91	52	6	51.8	48.5	1779	--
Bayer CropScience	InVigor L130	LL, TR	51	22	91	53	5	52.1	47.8	1856	--
Bayer CropScience	InVigor L120	LL, TR	52	21	91	48	5	50.9	47.2	1961	--
Bayer CropScience	InVigor 5440	LL, TR	51	22	91	54	2	52.5	48.1	2146	--
Cibus	C1511	SU, TR	53	22	93	51	4	51.1	44.4	1941	--
Cibus	C1516	SU, TR	55	24	95	52	4	51.3	45.4	1729	--
Mycogen	Nexera 2020 CL	CL, HO	54	23	95	52	3	52.1	48.9	2282	1895
Mycogen	CL2562966H	CL, HO	53	22	92	53	3	52.3	49.4	2232	--
Trial Mean			52	22	92	52	4	51.8	47.5	1991	--
C.V. %			1.0	2.1	0.5	5.5	14.7	0.9	1.3	8.4	--
LSD 5%			0.8	0.7	0.7	4.2	0.9	0.7	0.9	246	--
LSD 10%			0.7	0.6	0.6	3.5	0.7	0.6	0.8	203	--

* Type: LL-Liberty Link, SU-SU Tolerant, CL-Clearfield, TR-Traditional Oil Type, HO-High Oleic Oil Type.

** Days after planting.

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

Planting Date: April 30

Harvest Date: August 13

NDSU Hettinger Reserch Extension Center

Canola - Roundup Ready - 2015

Hettinger, ND

Brand	Variety	Oil Type	Days to Bloom	Bloom Duration	Days to Mature	Plant Height	Lodging	Test Weight	Oil Content	Seed Yield	
										2015	2-Yr. Avg.
		*	**	days	**	inches	0 - 9***	lbs/bu	%	-----lbs/a-----	
Brett Young	6074 RR	TR	52	23	92	54	7	49.3	48.9	2209	--
Brett Young	BY15-975	TR	51	21	90	52	7	50.1	49.7	2107	--
Brett Young	6064 RR	TR	51	23	92	57	3	47.9	49.4	2178	--
Cargill	V12-1	HO	52	21	91	52	4	49.8	47.8	2266	2132
Cargill	V22-1	HO	53	21	92	54	3	48.4	48.1	2232	--
Mycogen Seeds	Nexera 1012 RR	HO	54	23	95	57	3	47.7	47.0	2048	--
Mycogen Seeds	Nexera 1020 RR	HO	53	23	94	56	3	47.2	47.2	2374	--
Mycogen Seeds	Nexera 1022 RR	HO	54	22	94	54	1	48.4	47.3	1992	--
Proseed	44 Mag	TR	51	22	91	50	8	49.6	49.6	1947	1826
Proseed	300 Mag	TR	50	22	90	52	6	50.4	48.9	1971	1818
Proseed	PS 5000	TR	52	21	91	48	6	50.0	47.6	2085	--
Star Seed	Star 402	TR	50	23	91	51	6	50.5	51.7	1975	1931
P3 Hybrids	P3H13005	TR	50	23	91	52	6	51.5	46.7	2074	--
Trial Mean			52	22	92	53	5	49.3	48.5	2105	--
C.V. %			0.9	3.3	0.7	4.2	23.0	1.4	1.2	8.7	--
LSD 5%			0.7	1.0	1.0	3.2	1.6	1.0	0.8	261	--
LSD 10%			0.6	0.9	0.8	2.7	1.3	0.8	0.7	218	--

* Type: TR-Traditional Oil Type, HO-High Oleic Oil Type.

** Days after planting.

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

Planting Date: May 1

Harvest Date: August 11

NDSU Hettinger Research Extension Center

Flax - 2015 **Hettinger, ND**

Variety	Days to	Plant	Test	Oil	-----Grain Yield-----			-----Average Yield-----	
	Bloom	Height	Weight	Content	2012	2014	2015	2-Yr	3-Yr
	**	inches	lbs/bu	%	----- bu per acre -----				
Carter*	57	32	56.4	45.5	14.4	29.5	35.5	32.5	26.5
CDC Arras	56	34	56.0	44.7	16.4	30.3	31.4	30.9	26.0
CDC Bethume	56	34	56.2	44.9	20.4	30.4	32.5	31.5	27.8
CDC Glas	57	32	54.9	46.5	--	35.2	35.4	35.3	--
CDC Sanctuary	57	32	54.9	45.9	--	35.6	35.1	35.4	--
CDC Sorel	56	34	55.5	45.3	--	32.8	32.8	32.8	--
Gold ND*	58	33	56.2	46.7		32.8	33.1	33.0	--
Hanley	55	34	55.7	44.9	14.3	32.0	32.1	32.1	26.1
Lighting	56	33	56.0	45.1	12.8	31.8	33.0	32.4	25.9
Neché	56	35	55.9	45.1	--	30.3	29.7	30.0	--
Neela	55	32	55.5	46.3	--	37.6	36.2	36.9	--
Nekoma	56	33	55.7	45.6	16.8	32.8	32.8	32.8	27.5
Omega*	59	30	56.7	46.1	--	31.2	27.2	29.2	--
Pembina	56	33	55.5	45.9	18.4	31.5	30.5	31.0	26.8
Prairie Blue	57	33	55.6	46.4	17.8	34.4	33.8	34.1	28.7
Prairie Grande	55	33	55.4	46.5	16.9	32.8	33.2	33.0	27.6
Prairie Sapphire	58	33	54.5	46.7	--	33.7	30.5	32.1	--
Prairie Thunder	58	35	56.2	43.8	18.4	33.1	28.2	30.7	26.6
Rahab 94	56	34	55.1	46.0	--	34.4	33.1	33.8	--
Shape	56	33	55.2	46.7	--	33.2	31.4	32.3	--
Webster	57	34	55.9	45.5	15.4	31.7	30.8	31.3	26.0
York	55	33	55.5	45.5	22.0	31.7	33.8	32.8	29.2
Trial Mean	56	33	55.6	45.7	17.0	32.2	32.4	32.9	26.6
C.V. %	0.8	3.8	0.6	1.3	11.8	10.0	6.9	--	--
LSD 5%	0.7	1.8	0.4	0.8	2.9	4.5	3.2	--	--
LSD 10%	0.6	1.5	0.4	0.7	2.4	3.8	2.6	--	--

* Yellow seed type.

** Days after planting.

Lodging notes were taken at harvest, however no lodging was observed.

Planting Date: April 30

Harvest Date: August 12

Previous Crop: Barley

NDSU Hettinger Research Extension Center

Dry Bean - 2015	Hettinger, ND
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Variety	Type	Plant Height inches	Plant Lodge 0-9*	Test Weight lbs/bu	----- Grain Yield -----			----- Average Yield -----	
					2013	2014	2015	2 yr	3 yr
					----- lbs per acre -----				
LaPaz	Pinto	22	0	57.2	2779	2140	2024	2082	2314
Lariat	Pinto	21	3	54.9	2571	2081	2021	2051	2224
Maverick	Pinto	27	5	54.8	2152	1824	1714	1769	1897
ND-307	Pinto	24	2	52.9	2813	1892	1735	1814	2147
SF103-8	Pinto	25	2	53.9	--	1727	1809	1768	--
Stampede	Pinto	24	2	54.3	2552	1922	2028	1975	2167
Windbreaker	Pinto	26	3	53.1	2216	1833	1699	1766	1916
23ST27	Pinto	24	5	56.7	--	2003	1923	1963	--
Avalanche	Navy	24	0	56.3	2571	1583	1614	1599	1923
Ensign	Navy	24	3	56.9	2780	1682	1710	1696	2057
HMS Medalist	Navy	23	0	57.3	2562	1658	1597	1628	1939
Vista	Navy	23	0	57.0	1994	1809	1619	1714	1807
T9905	Navy	22	1	55.9	3082	1913	1744	1829	2246
Merlot	Sm Red	25	2	56.9	1961	1752	1802	1777	1838
Rio Rojo	Sm Red	26	1	59.3	2548	2075	1823	1949	2149
Zorro	Black	22	0	59.9	--	--	1986	--	--
Eclipse	Black	24	0	60.0	2246	2098	1791	1945	2045
Loreto	Black	23	0	57.5	2190	1855	1618	1737	1888
Montcalm	Dk Red Kidney	21	3	51.4	--	--	1404	--	--
Talon	Dk Red Kidney	23	3	51.1	--	--	1505	--	--
Pink Panther	Lt Red Kidney	23	1	51.2	--	--	1705	--	--
Rosie	Lt Red Kidney	22	2	52.8	--	--	1586	--	--
Trial Mean		23	2	55.4	2402	1867	1746	--	--
C.V. %		8.9	48.0	1.7	7.7	8.2	7.3	--	--
LSD 5%		2.9	1.1	1.3	260	216	181	--	--
LSD 10%		2.5	0.9	1.1	217	180	151	--	--

* 0 = no lodging, 9 = lying flat on ground.

Planting Date: May 19

Harvest Date: August 31

Previous Crop: Oat

NDSU Hettinger Research Extension Center

Chickpea - 2015 **Hettinger, ND**

Variety	Days to	Height	Lodging	-----Seed Size (mm)-----				Test	----- Grain Yield -----			-----Average Yield		
	Flower			<8	8-9	9-10	>10	Weight	2013	2014	2015	2 yr	3 yr	
	DAP*	inches	0 - 9**	-----%-----				lb/bu	-----lb/a-----					
Kabuli Type														
CDC Alma	70	23	1	11	62	25	2	51.4	2131	3386	4646	4016	3388	
CDC Frontier	71	28	3	8	67	23	1	53.7	2380	4719	4952	4836	4017	
CDC Luna	70	25	1	9	59	29	3	53.0	1976	3844	4787	4316	3536	
CDC Orion	69	26	2	4	30	48	17	53.2	2202	3998	5091	4545	3764	
CDC Xena	71	0	1	5	16	34	45	0.0	--	--	982	--	--	
Sawyer	70	28	5	5	38	37	20	55.7	1781	3223	3954	3589	2986	
Sierra	70	27	2	3	12	35	50	52.2	610	1936	3845	2891	2130	
Small Kabuli Type														
B-90	71	25	4	85	14	1	0	50.9	1914	4204	4345	4275	3488	
Desi Type														
CDC Anna	70	24	0	94	6	0	0	49.4	2281	4718	4299	4509	3766	
Mean	70	25	2	12	22	31	35	49.5	1924	3369	3858	--	--	
C.V. %	0.6	7.1	43.5	19.3	20.4	16.6	15.6	3.0	11.4	11.1	8.2	--	--	
LSD 5%	1	3	2	3	6	7	8	2.1	315	531	448	--	--	
LSD 10%	1	2	1	3	5	6	7	1.8	262	443	374	--	--	

* Days after planting.

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

Planting Date: April 15

Harvest Date: August 26

Previous Crop: Winter Wheat

NDSU Dickinson Research Extension Center

2015 Chickpea - Recrop

Dickinson, ND

Variety	Days	Days	Plant Height in	1000 seed weight gm	Seeds per Pound	Test Weight lbs/bu	-----Seed Size (mm)-----				Yield lbs/ac
	to Flower	to Mature					<8	8-9	9-10	>10	
<i>Kabuli type</i>											
CDC Frontier	65	121	16	302	1,502	60.9	14	56	29	0	2,305
CDC Luna	62	120	12	309	1,469	60.5	13	47	39	1	2,009
CDC Orion	62	120	15	337	1,348	59.6	9	30	60	2	2,183
Sawyer	62	119	15	334	1,357	60.4	10	38	50	2	1,827
Sierra	62	121	17	355	1,288	59.8	6	13	72	8	1,570
<i>Desi Type</i>											
CDC Anna	64	117	16	162	2,810	60.0	93	6	1	0	2,119
Trial Mean	63	120	15	300	1,629	60.2	24	32	42	2	2,002
CV %	0.5	0.8	8.4	5.0	4.7	0.5	7.46	8.7	6.2	28.0	7.9
LSD 0.05	0	2	2	23	116	0.5	3	4	4	1	239
LSD 0.10	0	1	2	19	95	0.4	2	3	3	1	196

Planting Date: April 24, 2015

Harvest Date: September 2, 2015

Previous Crop: Wheat

NDSU Hettinger Research Extension Center

Field Pea - 2015

Hettinger, ND

Variety	Days to Flower		Days to Mature	Vine Length ¹ inches	Canopy Height ² inches	Height Index ³ %	Lodging 0 - 9 ⁵	Seed Protein %	1,000 Seed Wt. gm	Seeds Lb	Test Weight lb/bu	Seed Yield	
	Duration days	DAP ⁴										2015	3-Yr. Avg.
Yellow Cotyledon Type													
AAC Carver	70	17	100	41	21	52	6	23.9	236	1922	62.5	61.6	--
Agassiz	70	22	106	36	20	55	6	25.7	219	2068	60.5	50.9	52.1
Bridger	68	18	100	38	22	59	7	25.9	217	2097	61.6	49.2	54.0
CDC Amarillo	71	20	105	40	22	56	6	25.5	237	1917	62.1	57.7	--
CDC Meadow	69	20	104	39	16	41	7	25.1	213	2139	62.3	51.5	52.1
CDC Saffron	70	16	100	37	17	47	7	25.9	254	1785	61.7	58.1	--
CM3404	71	17	102	40	20	50	6	26.0	286	1588	63.1	53.7	--
DS Admiral	68	19	100	41	19	48	7	25.6	229	1985	60.1	57.9	55.8
Earllystar	68	21	102	40	18	45	7	24.0	210	2159	60.2	57.0	--
Gunner	70	19	103	41	20	48	7	25.8	215	2116	60.8	45.5	50.0
Hyline	69	20	103	38	15	39	7	24.7	243	1871	62.6	49.3	--
Jetset	70	21	105	37	18	49	7	25.7	224	2025	59.8	52.8	--
LGPN4243	67	19	100	38	21	54	7	25.8	267	1698	61.9	57.0	--
LGPN4244	69	17	100	38	17	46	7	26.6	244	1866	60.1	57.4	--
LGPN4901	70	20	104	44	18	41	7	25.8	221	2064	61.7	48.2	--
LGPN4902	70	20	104	39	20	51	7	27.0	227	2002	61.5	48.5	--
LGPN4903	71	19	104	45	19	42	7	24.8	216	2099	61.8	54.4	--
LN4228	68	19	100	37	19	51	7	25.0	271	1673	62.2	57.9	--
LN4236	71	17	102	38	20	52	7	25.9	257	1768	61.0	53.6	--
Nette	68	18	100	37	22	60	6	24.9	241	1886	61.8	57.9	54.4
Salamanca	69	18	101	42	20	46	6	26.8	241	1884	62.5	49.0	--
Spider	68	22	104	40	16	39	8	26.2	251	1808	60.0	53.9	--
SW Midas	70	18	102	34	16	46	7	25.3	199	2282	60.1	55.0	52.3
Vegas	70	17	100	39	20	52	7	27.4	224	2027	61.7	50.6	--

Table continued on next page.

NDSU Hettinger Research Extension Center

Field Pea - 2015 Hettinger, ND

Variety	Days to Flower		Days to Mature	Vine Length ¹ inches	Canopy Height ² inches	Height Index ³ %	Lodging 0 - 9 ⁵	Seed Protein %	1,000 Seed Wt. gm	Seeds Lb	Test Weight lb/bu	Seed Yield	
	Duration days	Mature DAP ⁴										2015	3-Yr. Avg.
Green Cotyledon Type													
Bluemoon	67	19	99	40	17	43	7	26.3	230	1971	59.7	56.4	--
CDC Striker	68	18	100	30	14	47	8	25.2	209	2175	60.9	51.4	52.5
Cruiser	70	20	104	37	17	45	7	25.7	202	2242	60.5	47.9	46.4
Daytona	69	16	100	37	17	45	7	25.3	247	1837	59.8	49.3	--
LGPNI902	68	18	100	35	15	42	7	26.9	242	1879	61.7	48.3	--
Majoret	69	17	100	37	17	44	8	26.7	221	2052	61.5	49.2	49.3
Mean	69	19	102	38	18	48	7	25.7	233	1963	61.2	52.9	--
C.V. %	0.7	5.2	0.8	4.5	15.2	15.7	9.4	1.7	3.3	3.3	1.6	8.2	--
LSD 5%	1	1	1	2	4	11	1	0.6	11	92	1.4	6.1	--
LSD 10%	1	1	1	2	3	9	1	0.5	9	77	1.1	5.1	--

¹ Plant height at end of flowering.

² Height to the top of the canopy at harvest.

³ Harvest Index: Calculated as the ratio of canopy height/plant height.

⁴ Days after planting.

⁵ Lodging: 0 = none, 9 = lying flat on ground.

Planting Date: April 15

Harvest Date: August 3

Previous Crop: Durum Wheat

NDSU Dickinson Research Extension Center

2015 Field Pea - Recrop

Dickinson, ND

Variety	Days to Flower	Days to Mature	1000 Seed Weight gm	Seeds per Pound	Plant Height in	Lodging 0-9	Vine Length in	Height Index %	Test Weight lbs/bu	Protein %	--Grain Yield--			Average Yield	
											2013	2014	2015	Year	Year
Yellow Types															
Agassiz	60	97	242	1,879	29	1	33	90	63.9	26.2	37.6	56.0	59.9	58.0	51.2
DS Admiral	60	95	269	1,689	24	4	32	77	64.6	25.8	40.9	50.0	57.0	53.5	49.3
CDC Amarillo	61	96	276	1,643	32	1	34	94	64.8	25.8	--	--	58.8	--	--
CDC Meadow	60	95	219	2,070	40	2	33	91	65.1	25.7	38.0	49.1	62.3	55.7	49.8
CDC Saffron	60	95	289	1,578	30	2	31	95	64.9	26.4	--	--	62.2	--	--
Green Types															
Cruiser	60	97	231	1,969	28	3	35	81	63.8	26.2	29.9	45.5	54.2	49.8	43.2
CDC Striker	60	95	241	1,880	22	5	27	83	64.5	25.3	27.2	48.0	56.4	52.2	43.9
Majoret	60	97	250	1,818	26	3	31	82	64.4	27.2	34.8	44.6	53.9	49.3	44.4
-----bu/ac-----															
Trial Mean	60	96	252	1,816	28	3	32	87	64.5	26.1	35.5	48.9	58.1	--	--
CV %	0.5	0.8	4.3	4.1	10.6	44.5	6.1	7.8	0.5	2.1	11.4	6.0	7.5	--	--
LSD 0.05	0	1	16	111	4	2	3	10	0.5	0.8	--	--	6.4	--	--
LSD 0.10	0	1	13	92	4	1	2	8	0.4	0.7	4.9	3.6	5.3	--	--

Planting Date: April 24, 2015

Harvest Date: August 4, 2015

Previous Crop: Wheat

Seeding Rate: 325,000 live seeds/ac

Grain protein percentages reported on a 0% moisture basis

NDSU Hettinger Reserach Extension Center

Lentil - 2015 **Hettinger, ND**

Variety	Days to	Height	Lodging	Seed	1,000	Seeds	Test	----- Grain Yield -----			----- Average Yield -----	
	Flower			Protein	Seed Wt.	Lb	Weight	2013	2014	2015	2 yr	3 yr
	DAP*	inches	0 - 9**	%	gm	seeds	lb/bu	-----lbs/acre-----				
Large Green Type												
CDC Greenland	69	10	7	24.9	50	9003	60.2	1789	2182	2823	2503	2265
Pennell	69	12	7	25.7	51	8965	59.7	1457	2269	2527	2398	2084
Riveland	68	12	7	24.9	57	8019	58.1	1580	2075	2374	2225	2010
Medium Green Type												
Avondale	68	12	7	23.4	44	10318	60.9	2171	2700	2844	2772	2572
CDC Richlea	69	11	7	24.8	44	10452	59.9	1890	2084	2804	2444	2259
Merrit	68	10	7	26.7	58	7797	58.5	--	2244	2407	2326	--
Small Green Type												
CDC Viceroy	69	11	7	27.0	31	14553	62.4	3046	2388	2951	2670	2795
Essex	68	14	7	24.6	41	11128	59.2	2171	2031	2388	2210	2197
Eston	69	11	7	26.3	32	14366	62.8	2273	2601	2823	2712	2566
French Green Type												
CDC Lemay	69	12	7	24.6	32	14035	62.7	2393	2603	3005	2804	2667
Small Red Type												
CDC Red Rider	69	12	7	24.5	42	10817	61.0	3133	2475	2974	2725	2861
CDC Redberry	68	11	6	26.6	39	11641	62.0	2919	2731	3295	3013	2982
CDC Redcoat	69	12	7	24.5	38	11938	62.1	--	2846	3057	2952	--
CDC Rosetown	69	12	7	25.5	27	16936	62.8	2942	2319	2768	2544	2676
CDC Rouleau	69	12	7	23.7	35	12988	61.3	1926	2842	3154	2998	2641
Crimson	68	10	8	25.2	34	13358	63.0	--	2465	2534	2500	--
Spanish Brown Type												
Morena	69	10	7	25.2	38	11898	61.6	2478	1929	2786	2358	2398
Pardina	69	11	8	23.6	36	12714	61.3	--	2602	3266	2934	--
Mean	68	11	7	25	43	11081	60.5	2283	2394	2687	--	--
C.V. %	0.5	10.7	7.0	1.8	4.7	4.4	4.4	12.3	10.2	7.0	--	--
LSD 5%	0.5	1.7	0.7	0.6	2.9	686	1.1	395	344	264	--	--
LSD 10%	0.4	1.4	0.6	0.5	2.4	574	0.9	332	289	221	--	--

* Days after planting.

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

Planting Date: April 15

Harvest Date: August 5

Previous Crop: Peas

NDSU Dickinson Research Extension Center

2015 Lentil - Recrop Dickinson, ND

Variety	Days	Days	1000	Seeds	Plant	Vine	Height	Test	Protein	---Grain Yield---			Average Yield	
	to	to	Seed	per						Height	Length	Index	Weight	2013
	Flower	Mature	Weight	Pound	in	in	%	lbs/bu	%	-----lbs/ac-----			---lbs/ac---	
Large Green Types														
CDC Greenland	61	105	65	7,013	16	18	89	60.0	25.0	1,743	2,259	2,155	2,207	2,052
Pennell	61	105	70	6,455	14	17	80	59.3	24.8	1,548	2,666	1,583	2,125	1,932
Riveland	60	106	67	7,096	13	18	74	61.2	24.5	1,451	2,188	1,659	1,923	1,766
Medium Green Type														
CDC Richlea	61	105	53	8,639	15	18	81	63.1	24.1	1,872	2,799	2,337	2,568	2,336
Small Green Type														
CDC Viceroy	61	105	34	13,168	15	18	83	63.3	27.2	1,920	3,047	2,544	2,795	2,504
Small French Green Type														
CDC Lemay	61	104	32	14,006	13	16	83	62.7	24.2	1,571	2,042	1,949	1,995	1,854
Medium Red Type														
CDC Red Rider	61	105	47	9,716	17	20	87	62.5	25.1	1,837	2,796	2,551	2,673	2,394
Small Red Types														
CDC Redberry	61	105	43	10,673	14	18	81	62.2	25.8	1,567	2,339	1,811	2,075	1,906
CDC Rouleau	61	105	38	11,971	15	18	84	60.8	23.6	1,755	2,679	2,241	2,460	2,225
Extra Small Red Type														
CDC Rosetown	61	104	29	15,760	15	18	80	63.7	27.0	1,725	2,577	2,124	2,351	2,142
Trial Mean	61	105	48	10,450	15	18	82	61.9	25.1	1,673	2,539	2,095	--	--
CV %	0.8	0.8	9.9	6.6	8.4	6.4	10.2	2.3	1.5	13.5	8.8	12.3	--	--
LSD 0.05	1	1	7	997	2	2	12	2.0	0.5	--	--	373	--	--
LSD 0.10	1	1	6	828	1	1	10	1.7	0.5	268	268	310	--	--

Planting Date: April 24, 2015

Harvest Date: August 24, 2015

Previous Crop: Wheat

Seeding Rate: 600,000 live seeds/ac

Grain protein percentages reported on a 0% moisture basis

NDSU Hettinger Reserch Extension Center

Clearfield Lentil - 2015

Hettinger, ND

Variety	Days to	Plant	Plant	Seed	1,000	Seeds	Test	----- Grain Yield -----			----- Average Yield -----	
	Flower	Height	Lodging	Protein	Seed Wt.	Lb	Weight	2013	2014	2015	2 yr	3 yr
	DAP*	inches	0 - 9**	%	gm	seeds	lb/bu	-----lbs/acre-----				
Medium Green Type												
CDC Imigreen CL	63	14	3	25.8	50	9029	62.4	2640	2311	3012	2662	2654
Small Green Type												
CDC Invincible CL	63	13	3	26.6	31	14573	63.2	--	--	3624	--	--
Small Red Type												
CDC Maxim CL	62	13	3	24.9	36	12714	63.4	3132	3566	4007	3787	3568
CDC Impala CL	65	14	3	26.2	29	15572	63.9	3086	2754	3428	3091	3089
Mean	63	13	3	25.9	37	12972	63.2	3029	2817	3518	--	--
C.V. %	0.7	12.1	0.0	2.1	5.5	5.6	0.7	8.2	6.6	7.6	--	--
LSD 5%	0.7	2.6	0.0	0.9	3.2	1172	0.7	383	286	428	--	--
LSD 10%	0.5	2.1	0.0	0.7	2.6	950	0.6	322	240	347	--	--

* Days after planting.

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

Planting Date: April 22

Harvest Date: August 10

Previous Crop: Field Pea

NDSU Dickinson Research Extension Center

2015 Clearfield Lentil - Recrop

Dickinson, ND

Variety	Days	Days	1000	Seeds	Plant	Vine	Height	Test	Test	---Grain Yield---			Average Yield	
	to	to	Seed	per						2013	2014	2015	2	3
	Flower	Mature	Weight	Pound	Height	Length	Index	Weight	Protein	-----lbs/ac-----			---lbs/ac---	
			gm		in	in	%	lbs/bu	%					
Large Green Type														
CDC Imigreen-CL	61	106	59	7,693	15	22	70	60.8	27.3	1,527	2,311	1,940	2,125	1,926
Small Green Type														
CDC Invincible-CL	60	104	35	13,131	14	18	77	62.7	27.9	--	--	2,754	--	--
Small Red Type														
CDC Maxim-CL	60	105	41	11,146	15	19	81	62.3	24.9	1,428	2,431	2,682	2,557	2,180
Extra Small Red Type														
CDC Impala-CL	60	104	30	14,891	14	19	77	63.2	28.6	1,912	2,802	2,762	2,782	2,492
Trial Mean	60	105	41	11,715	15	19	76	62.2	27.2	1,703	2,537	2,534	--	--
CV %	0.8	0.4	1.7	1.9	8.8	7.9	10.5	1.5	1.0	12.2	8.4	4.3	--	--
LSD 0.05	NS	1	1	350	NS	2	13	1.5	0.4	--	--	173	--	--
LSD 0.10	NS	1	1	284	NS	2	10	1.2	0.4	269	275	140	--	--

Planting Date: April 24, 2015

Harvest Date: August 24, 2015

Previous Crop: Wheat

Seeding Rate: 600,000 live seeds/ac

Grain protein percentages reported on a 0% moisture basis

NDSU Hettinger Reaserch Extension Center

Soybean - Conventional - 2015	Hettinger, ND
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Company /Brand	Variety	Maturity	Mature Date	Plant Height	Test Weight	Seed Oil	Seed Protein	Grain Yield	Average 3-Yr
				inches	lbs/bu	%	%	Bushels per acre	
NDSU	Traill	00.0	8/31	31	56.3	16.2	34.5	25.6	37.5
NDSU	ND-Henson	0.0	9/3	28	56.2	16.8	34.0	26.4	--
NDSU	Ashtbula	0.4	9/5	31	54.4	17.9	31.9	25.7	39.9
NDSU	Sheyenne	0.7	9/7	32	52.3	17.6	31.1	27.9	41.9
Trial Mean		--	9/4	31	54.8	17.1	32.9	26.4	39.8
C.V. %		--	0.1	2.4	1.1	1.2	0.9	4.1	--
LSD 5%		--	0.4	1.2	1.0	0.3	0.5	1.7	--
LSD 10%		--	0.3	1.0	0.8	0.3	0.4	1.4	--

Planting Date: May 5
 Harvest Date: September 10
 Previous Crop: Oat

NDSU Hettinger Research Extension Center

Soybean - Roundup Ready - 2015	Hettinger, ND
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Company/Brand	Variety	Maturity	Mature Date	Plant Height inches	Test Weight lbs/bu	Seed Oil %	Seed Protein %	Grain Yield Bushels per acre	Average 2-Yr
Integra	20215	0.1	9/9	35	55.0	15.7	35.1	53.7	--
Rea Hybrids	61G24	0.1	9/9	35	56.1	16.2	35.1	51.2	--
Proseed	30-20	0.2	9/10	34	54.2	17.0	35.0	52.1	52.8
AgVenture	03E3RR	0.3	9/12	36	55.2	17.3	34.9	48.2	--
Integra	20300	0.3	9/11	34	55.1	16.5	34.7	50.6	48.5
Integra	20327	0.3	9/10	36	55.6	15.9	36.0	52.4	--
Legacy Seed	LS0334	0.3	9/11	36	54.7	16.5	35.3	53.4	51.5
Thunder Seeds	3503	0.3	9/9	36	55.5	16.0	35.9	49.9	--
AgVenture	04E4RR	0.4	9/9	36	55.3	16.9	34.6	47.0	47.0
Peterson Farms Seed	15R04	0.4	9/10	35	55.1	16.6	34.9	52.2	50.3
Rea Hybrids	64G94	0.4	9/5	38	54.4	17.8	33.2	45.9	--
AgVenture	05B2RR	0.5	9/7	35	54.6	17.2	33.1	50.1	50.1
Proseed	11-50	0.5	9/11	36	55.3	16.4	34.2	52.2	51.7
Thunder Seeds	3205	0.5	9/12	35	55.4	16.2	34.2	51.2	--
Thunder Seeds	3505N	0.5	9/11	35	54.5	16.2	35.2	51.6	--
AgVenture	06K1RR	0.6	9/13	36	56.4	16.8	35.0	43.0	--
Integra	20600	0.6	9/12	35	55.2	16.4	34.0	54.4	52.4
Legacy Seed	LS0615	0.6	9/15	34	55.2	16.6	35.0	49.7	--
Legacy Seed	LS0635N	0.6	9/14	35	54.9	16.6	35.1	55.0	--
Rea Hybrids	66G14	0.6	9/11	35	54.9	16.2	34.7	51.9	--
Peterson Farms Seed	15R07	0.7	9/13	33	54.5	16.3	34.3	50.1	--
AgVenture	08E5RR	0.8	9/13	35	56.2	16.8	34.0	49.5	45.6
Rea Hybrids	R0815	0.8	9/14	32	55.0	16.4	34.3	49.0	--
Thunder Seeds	3408N	0.8	9/14	33	55.5	16.4	34.5	49.9	--
AgVenture	09E1RR	0.9	9/18	37	55.1	17.1	34.8	43.0	40.6
Rea Hybrids	69G14	0.9	9/15	35	55.5	16.4	34.0	48.6	--
Trial Mean		--	9/11	35	55.2	16.6	34.7	50.2	49.0
C.V. %		--	0.1	6.6	0.6	1.9	1.3	6.8	--
LSD 5%		--	2.0	3.2	0.5	0.5	0.6	4.8	--
LSD 10%		--	1.6	3	0.4	0.4	0.5	4.0	--

Planting Date: May 13

Harvest Date: September 27

Previous Crop: Oat

NDSU Hettinger Research Extension Center

Corn - 2015 **Hettinger, ND**

Company	Hybrid	Relative Maturity* days	Days to Silk DAP**	Plant Height inches	Ear Height inches	Stalk Lodge %	Root Lodge %	Moisture Content %	Test Weight lbs/bu	Grain Yield bu/ac
Legacy Seeds	L2314 VT2PRO RIB	83	72	84	29	0	0	17.8	53.8	108.3
Legacy Seeds	L2415 VT2PRO	84	73	86	28	0	0	20.0	53.7	111.8
Legacy Seeds	L2813 VT2PRO RIB	87	75	93	33	0	1	23.3	53.6	137.3
Legacy Seeds	L2924 VT2PRO	89	73	84	35	0	0	25.3	50.4	125.6
Legacy Seeds	L3011 VT3PRO RIB	90	75	93	35	1	0	29.1	51.1	126.4
Integra	9301	80	70	86	35	0	0	23.1	54.5	116.1
Integra	3314	83	73	82	34	1	0	25.1	53.2	124.5
Integra	3537	85	74	91	30	0	0	21.6	52.5	129.5
Integra	9352	85	74	88	29	0	0	23.5	53.6	124.8
Rea Hybrids	1B820-RIB	82	73	89	35	0	0	21.4	53.1	107.3
Rea Hybrids	2B840-RIB	84	73	89	36	0	0	18.6	52.7	126.6
Rea Hybrids	2B850-RIB	85	74	80	32	0	0	23.8	53.2	122.3
Rea Hybrids	2A871-RIB	87	73	87	27	1	0	22.8	53.1	114.0
Rea Hybrids	3B890-RIB	89	74	90	34	0	1	27.9	52.1	121.3
Peterson Farms Seed	PFS 75K85	85	73	91	40	1	0	21.9	52.8	121.3
Thunder Seed	6385VT2PRIB	85	72	91	31	1	0	22.4	54.1	129.1
Thunder Seed	4585RR	85	74	95	36	1	0	21.9	52.6	133.4
Thunder Seed	7188VT2PRIB	88	75	96	39	0	0	28.0	52.8	112.8
Thunder Seed	7993VT2PRIB	93	77	90	36	0	0	40.5	48.7	105.9
Proseed	1283 VT2P	83	70	82	29	0	0	20.9	53.6	103.5
Proseed	1384 VT2P	84	73	89	32	1	2	21.4	54.1	116.2
Proseed	PX85R VT2RIB	85	74	93	33	0	0	22.4	52.4	119.4
Proseed	1185 RR	85	75	90	28	0	0	18.2	52.7	132.1
Proseed	1286 VT2P	86	74	92	33	0	0	24.8	52.4	122.5
AgVenture	RL1742HB	78	70	88	35	0	5	16.4	53.5	115.8
AgVenture	RL2106AM	81	72	84	36	0	2	17.8	54.1	118.1
AgVenture	RL2289AM	82	73	92	35	0	11	17.2	54.1	121.9
AgVenture	R2774	82	72	84	33	0	0	22.7	50.7	80.0
AgVenture	GL2949AB	86	75	89	29	0	0	20.3	53.0	116.7
AgVenture	RL3645AM	89	76	91	35	0	2	21.0	51.1	119.8
AgVenture	RL4492AMX	92	76	89	39	1	3	37.1	50.6	99.7
AgVenture	RL4616HB	93	75	86	30	0	5	30.1	50.4	98.8
Trial Mean			74	88	33	0	1	23.4	52.6	117.6
C.V. %			1.3	5.3	12.6	287.1	232.8	10.6	2.2	18.2
LSD 5%			1.6	6.7	5.9	1.2	3.7	4.0	1.9	34.9
LSD 10%			1.3	5.5	4.9	1.0	3.1	3.4	1.6	29.2

* Relative maturity provided by the company.

** Days after planting

Planting Date: May 19

Harvest Date: October 20

Previous Crop: Wheat

Wheat Tolerance to Zidua at Different Rates and Application Timings

Caleb Dalley, HREC, Hettinger, ND, 2015

A field trial was conducted to evaluate the tolerance of spring wheat to the herbicide Zidua and experimental herbicide BAS 820ABH when applied preemergence (PRE), delayed PRE (DPRE), and early postemergence (EPOST). Spring wheat was planted on Friday April 24, 2015 at a rate of approximately 80 lbs/A at a depth of 1.5 inches using a John Deere 1590 no-till planter. Starter fertilizer (18-46-0) was applied at planting at a rate of 40 lbs/acre and granular urea fertilizer was broadcast at 100 lbs/acre on May 16 using a drop spreader. After planting, the entire trial was treated with glyphosate (26 oz/A Roundup PowerMAX) plus AMS to control emerged weeds (primarily wild buckwheat and wild mustards). PRE treatments were applied on April 30. At time of application wheat seed was imbibed and the root radicle had emerged from some of the seed. DPRE treatments were applied on May 5th. At time of application, the coleoptile had emerged from the seed, but had not yet emerged from the soil. The EPOST treatments were applied on May 13th when wheat was at the 1-leaf stage. Unfortunately, no rainfall occurred until May 6th, the day after the DPRE application was made, therefore the treatments applied at the PRE timing were not incorporated into the soil until this rainfall had occurred. Rainfall also occurred on the day of, and on the day after the EPOST timing. Weed infestation levels were low in this trial and no ratings were possible. Injury to wheat (minor stunting) was not observed until the June 8th rating when wheat had begun to elongate. Wheat was harvested on August 7th. Wheat yield, regardless of treatment rate or timing was similar to that in the weed free check. There was also no differences in test weight or seed moisture due to herbicide treatment. Currently, only DPRE and EPOST treatments of Zidua are labelled for use in wheat production. Further research needs to be conducted to verify wheat tolerance to Zidua and to determine appropriate tank-mix partners for weed control.

Treatment	Rate	Timing	Wheat		Test wt Aug 7	Yield
			May 15	Jun 8		
			injury(%)		lbs/bu	bu/A
1 Zidua	1oz/a	PRE	0a	1bc	58.2a	72.5a
2 BAS 820ABH	1.68fl oz/a	PRE	0a	2abc	58.6a	72.6a
3 Zidua	2oz/a	PRE	0a	3ab	58.8a	66.4a
4 BAS 820ABH	3.13fl oz/a	PRE	0a	4a	58.1a	76.6a
5 Zidua	1oz/a	DPRE	0a	0c	58.4a	72.2a
6 BAS 820ABH	1.68fl oz/a	DPRE	0a	1bc	58.9a	73.8a
7 Zidua	2oz/a	DPRE	0a	1bc	59.0a	74.3a
8 BAS 820ABH	3.13fl oz/a	DPRE	0a	4a	58.0a	71.1a
9 Zidua	1oz/a	EPOST	0a	0c	58.8a	73.9a
10 BAS 820ABH	1.68fl oz/a	EPOST	0a	0c	58.7a	74.1a
11 Zidua	2oz/a	EPOST	0a	1bc	58.4a	72.6a
12 BAS 820ABH	3.13fl oz/a	EPOST	0a	1bc	59.2a	72.7a
13 Check- Weed Free			0a	0c	59.4a	73.0a
LSD P=.05			NS	2.3	NS	NS
Standard Deviation			0.0	1.6	1.047	4.20
CV			0.0	124.09	1.79	5.77
Treatment F			0.000	3.568	0.662	1.220
Treatment Prob(F)			1.0000	0.0015	0.7747	0.3073

Comparison of POST and PRE/POST Combinations for Weed Control in Spring Wheat

Caleb Dalley, HREC, Hettinger, ND, 2015

A trial was conducted to evaluate preemergence (PRE) and postemergence (POST) options for weed control in spring wheat. 'Elgin' spring wheat was drilled using a John Deere 1590 no-till drill on April 24, 2015. Starter fertilizer (18-46-0) was applied at planting at 40 lbs/acre. Olympus PRE treatments were applied on April 27. Wheat emerged on approximately May 5. Granular urea fertilizer was broadcast at 100 lbs/acre on May 16 using a drop spreader. Wheat and weeds were allowed to grow together until time of treatment application. POST herbicide treatments were applied at a volume of 10 gal/A using a hand-held backpack spray system on May 28 when wheat was in the 3-4 leaf stage. Wild buckwheat and field bindweed were just beginning to vine at time of application. Wheat was evaluated for injury at 2, 9, 16, and 30 days after treatment (DAT). Mild injury, in the form of slight yellowing, was observed in nearly all herbicide treatments and diminished by the 30 DAT evaluation. Field bindweed was suppressed by all treatments at 9 DAT. Wild buckwheat was controlled by all treatments. Wheat was harvested on August 7. No differences in yield, seed moisture, or test weight were observed at harvest. Weed populations were light in this test and did not lead to significant yield losses. Further research should be conducted on different weed populations in order to determine efficacy. It appears that Varro, when applied at the 3 to 4 leaf stage in spring wheat is safe and does not lead to yield losses. Further evaluations at different growth stages of spring wheat is needed to determine safety.

Treatment	Rate	Spring wheat injury			Field bindweed	Wild buckwheat		Test wt	Yield	
		May 29	Jun 5	Jun 12	Jun 5	Jun 5	Jun 26	Aug 7	Aug 7	
		%			Control (%)		lbs/bu	bu/A		
1	UNTREATED	0b	0c	0c	0d	0b	0b	59a	70.3a	
2	VARRO Carnivore Herbicide AMS	6.85oz/a 1.0pt/a 0.5lb/a	5a	4ab	0c	59abc	94a	99a	57a	70.3a
3	VARRO Carnivore Herbicide OLYMPUS AMS	6.85oz/a 1.0pt/a 0.2oz/a 0.5lb/a	7a	4ab	1abc	53bc	95a	98a	58a	72.2a
4	OLYMPUS VARRO Carnivore Herbicide AMS	0.2oz/a 6.85oz/a 1.0pt/a 0.5lb/a	6a	5ab	3a	56abc	95a	98a	56a	70.8a
5	OLYMPUS VARRO Carnivore Herbicide OLYMPUS AMS	0.2oz/a 6.85oz/a 1.0pt/a 0.2oz/a 0.5lb/a	8a	7ab	3ab	56abc	95a	100a	57a	72.5a
6	HUSKIE COMPLETE AMS	13.7oz/a 0.5lb/a	6a	3b	1bc	58abc	95a	98a	58a	69.7a
7	HUSKIE COMPLETE OLYMPUS AMS	13.7oz/a 0.2oz/a 0.5lb/a	6a	3ab	1abc	67a	95a	100a	58a	69.5a
8	OLYMPUS HUSKIE COMPLETE AMS	0.2oz/a 13.7oz/a 0.5lb/a	5a	8a	4a	62ab	94a	100a	58a	68.7a
9	OLYMPUS HUSKIE COMPLETE OLYMPUS AMS	0.2oz/a 13.7oz/a 0.2oz/a 0.5lb/a	6a	4ab	4a	47c	94a	96a	58a	71.7a
LSD P=.05			3.7	0.3	0.4	13.5	1.8	4.4	NS	NS
Standard Deviation			2.5	0.2	0.3	9.0	1.3	3.0	1.2	4.86
CV			47.07	34.85	75.89	17.65	1.49	3.41	2.08	6.87
Treatment F			2.944	5.699	2.990	19.564	2542.778	484.074	1.883	0.286
Treatment Prob(F)			0.0192	0.0004	0.0179	0.0001	0.0001	0.0001	0.1101	0.9642

Postemergence options for weed control in Spring Wheat

Caleb Dalley, HREC, Hettinger, ND, 2015

A field trial was conducted to evaluate different postemergence options for weed control in spring wheat. 'Elgin' spring wheat (HRSW) was drilled at 80 lbs/a using a John Deere 1590 no-till drill on April 24, 2015. Starter fertilizer (18-46-0) was applied at planting at a rate of 40 lbs/acre. Wheat emerged on approximately May 5. Granular urea fertilizer was broadcast at 100 lbs/acre on May 16 using a drop spreader. Wheat and weeds were allowed to grow together until time of treatment application. Herbicide treatments were applied using a hand-held backpack spray system at a volume of 10 gal/A on May 28 when wheat was in the 3-4 leaf stage. Wild buckwheat and field bindweed were just beginning to vine at time of application. Wheat was evaluated for injury at 4, 8, 15, and 29 days after treatment (DAT). Mild injury, in the form of slight yellowing, was observed in nearly all herbicide treatments and diminished by the 29 DAT evaluation. Field bindweed was suppressed by all treatments at 8 and 15 DAT and was controlled 88% or more by all treatments except Wolverine at the 29 DAT evaluation. Wild buckwheat was controlled by all treatments containing Varro as well as Huskie Complete, and was suppressed by the Wolverine treatment at 29 DAT. Wheat was harvested on August 7. No differences in yield or test weight were observed at harvest. Weed populations were light in this test and did not lead to significant yield losses

Treatment	Product rate	—Wheat—		— Field Bindweed —			—Wild Buckwheat—			Test wt Aug 7 —lbs/bu—	Yield Aug 7 —bu/A—
		Jun 1	Jun 12	Jun 5	Jun 12	Jun 26	Jun 5	Jun 12	Jun 26		
1 UNTREATED		— Injury % —		Control %							
		0d	0e	0c	0c	0d	0d	0d	0c	60 a	58.6 a
2 VARRO	6.85 oz/a	7 a	3ab	70 ab	65 b	94 ab	94 a	96 a	100 a	59 a	58.2 a
Bronate	1.0 pt/a										
AMS	0.5 lb/a										
3 VARRO	6.85 oz/a	6 ab	2bc	68 b	66 b	88 b	70 c	92 ab	100 a	59 a	58.2 a
Weld Herbicide	1.3 pt/a										
AMS	0.5 lb/a										
4 VARRO	6.85 oz/a	6 ab	2cd	70 ab	70 ab	91 ab	89 ab	96 a	99 a	60 a	58.4 a
Carnivore Herbicide	1.0 pt/a										
AMS	0.5 lb/a										
5 VARRO	6.85 oz/a	7 a	4 a	70 ab	68 ab	96 a	75 c	96 a	100 a	60 a	59.9 a
WideMatch	1.0 pt/a										
2,4-D Ester LV6	0.35 pt/a										
AMS	0.5 lb/a										
6 VARRO	6.85 oz/a	5 ab	1de	70 ab	70 ab	95 a	70 c	93 ab	100 a	59 a	58.4 a
WideMatch	1.0 pt/a										
MCPA Ester	0.5 pt/a										
AMS	0.5 lb/a										
7 VARRO	6.85 oz/a	5 bc	2cd	69 ab	75 a	96 a	70 c	84 c	100 a	60 a	58.5 a
WideMatch	1.0 pt/a										
Affinity TankMix	0.6 oz/a										
AMS	0.5 lb/a										
8 VARRO	6.85 oz/a	5 ab	2bcd	71 a	71 ab	95 a	91 ab	97 a	100 a	59 a	56.5 a
OLYMPUS	0.2 oz/a										
Carnivore Herbicide	1.0 pt/a										
AMS	0.5 lb/a										
9 HUSKIE COMPLETE	13.7 oz/a	5 bc	2bcd	68 b	73 ab	95 a	92 ab	95 a	100 a	59 a	60.4 a
AMS	0.5 lb/a										
10 WOLVERINE	27.4 oz/a	3 c	0e	70 ab	68 ab	65 c	87 b	90 b	71 b	60 a	58.8 a
Advanced											
LSD P=.10		2.1	1.4	3.2	8.5	5.9	5.2	5.5	2.1	0.8	NS
Standard Deviation		1.7	1.2	2.7	7.0	4.9	4.3	4.6	1.7	0.7	2.82
CV		36.54	77.14	4.29	11.26	6.05	5.81	5.43	2.01	1.11	4.81
Treatment F		5.63	3.76	269.68	39.67	149.09	167.36	170.74	1329.2	0.71	0.55
Treatment Prob(F)		0.0002	0.0036	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.6992	0.8243

Postemergence Weed Control Options in Durum

Caleb Dalley, HREC, Hettinger, ND, 2015

A field trial was conducted to evaluate weed control and crop tolerance to POST herbicides. 'Carpio' durum wheat was seeded using a 1590 no-till drill on April 24, 2015. Starter fertilizer (18-46-0) was applied at planting at 40 lbs/acre. Durum emerged on May 7. Granular urea fertilizer was spread at 100 lbs/acre on May 16. Wheat and weeds were allowed to grow together until treatment application. Herbicide treatments were applied using a hand-held backpack spray system on May 28 when durum was in the 3-4 leaf stage. Wild buckwheat and field bindweed were just beginning to vine and Japanese brome was tillering at time of application. Durum was evaluated for injury at 4, 8, 15, and 28 days after treatment (DAT). Mild injury (yellowing), was observed in all herbicide treatments and diminished by 28 DAT. Field bindweed was suppressed by all treatments. Wild buckwheat was controlled by all treatments containing Varro, and was suppressed with Huskie Complete and Wolverine treatments. Japanese brome was controlled by all Varro tank-mixes. Durum was harvested on August 12. No differences in yield, seed moisture, or test weight were observed at harvest. Weed populations were light in this test and did not lead to significant yield losses, although yield in the untreated control was numerically less (4.5 to 16 bushels per acre less) than all other treatments. Further research should be conducted on different weed populations in order to determine efficacy. It appears that Varro, when applied at the 3 to 4 leaf stage in durum is safe and does not lead to yield losses. Further evaluations at different growth stages of durum is needed to ensure safety.

Treatment	Rate	Durum			Field bindweed		Wild buckwheat		Japanese Brome	Durum yield		
		Jun 1	Jun 12	Jun 26	Jun 12	Jun 26	Jun 12	Jun 26	Jun 26	Aug 12		
		Injury (%)					Control (%)				Test wt	bu/A
1	Untreated	0 d	0 c	0 a	0 e	0 d	0 f	0 d	0 c	60 a	58.6 a	
2	Varro Bronate Ams	6.85 oz/a 1.0 pt/a 0.5 lb/a	4 bc	3 ab	1 a	63 abc	78 ab	96 a	96 a	95 ab	60 a	65.5 a
3	Varro Weld Herbicide Ams	6.85 oz/a 1.3 pt/a 0.5 lb/a	6 ab	4 a	2 a	57 c	78 ab	88 bcd	96 a	90 ab	61 a	69.5 a
4	Varro Carnivore Herbicide Ams	6.85 oz/a 1.0 pt/a 0.5 lb/a	6 ab	2 ab	1 a	73 a	90 a	91 abc	97 a	95 ab	60 a	63.1 a
5	Varro Widematch 2,4-D Ester Ams	6.85 oz/a 1.0 pt/a 0.5 pt/a 0.5 lb/a	4 bc	2 ab	1 a	65 abc	80 ab	85 d	99 a	83 b	60 a	65.8 a
6	Varro Widematch Mcpa Ester Ams	6.85 oz/a 1.0 pt/a 0.5 pt/a 0.5 lb/a	5 abc	4 a	1 a	75 a	87 ab	86 bcd	100 a	90 ab	60 a	66.2 a
7	Varro Widematch Affinity Tankmix Ams	6.85 oz/a 1.0 pt/a 0.6 oz/a 0.5 lb/a	6 ab	1 bc	1 a	70 ab	80 ab	86 cd	99 a	100 a	61 a	74.6 a
8	Varro Olympus Carnivore Herbicide Ams	6.85 oz/a 0.2 oz/a 1.0 pt/a 0.5 lb/a	6 abc	3 a	0 a	68 abc	75 b	92 ab	89 b	94 ab	60 a	66.1 a
9	Huskie Complete Ams	13.7 oz/a 0.5 lb/a	7 a	4 a	2 a	60 bc	77 b	84 d	82 b	88 ab	60 a	70.2 a
10	Wolverine Advanced	27.4 oz/a	4 c	2 bc	0 a	33 d	57 c	65 e	68 c	2 c	61 a	70.9 a
LSD P=.05			2.2	1.7	2.1	11.9	13.2	6.2	6.8	15.1	NS	NS
Standard Deviation			1.5	1.1	1.4	6.9	7.7	4.3	4.7	10.4	1.0	8.41
CV			32.8	48.93	173.12	12.26	11.0	5.54	5.66	14.11	1.69	12.54
Treatment F			6.478	4.210	0.927	33.415	34.480	175.721	173.193	55.355	0.803	1.132
Treatment Prob(F)			0.0001	0.0017	0.5175	0.0001	0.0001	0.0001	0.0001	0.0001	0.6175	0.3751

Wild Oat Control and Safflower Tolerance to Pyroxasulfone

Caleb Dalley, HREC, Hettinger, ND, 2015

A field trial was conducted to evaluate PRE application of pyroxasulfone alone and in tank-mixes for weed control and safflower tolerance. Safflower was planted on May 4th at 25 lbs/A using a John Deere 1590 no-till drill. A broadcast application of glyphosate (Roundup PowerMAX) plus AMS was applied to the entire study to control weeds emerged at time of planting. Preemergence treatments were applied on May 6th using a hand-held spray boom at a spray volume of 10 gallons per acre. Rainfall (0.36 inches) fell on the same day after PRE treatments were applied. Safflower emerged on May 19th. Visual evaluations at 16 and 23 days after application (3 and 10 days after emergence) showed no injury in the way of stand losses, stunting, or discoloration (chlorosis/necrosis) for any of the treatments applied. At 33 days after emergence, visual injury, in the form of stunted growth was observed for some of the treatments containing pyroxasulfone. However, injury was minor and usually less than a 10% reduction in growth. Stand counts taken at 37 days after application verified visual evaluations in regard to stand losses in that there were no significant differences in safflower stand due to herbicide treatment, although numerically the highest rate of pyroxasulfone (120 g ai/A) had the lowest stand counts. Evaluation of wild oat control showed that the higher rates of pyroxasulfone were needed to achieve satisfactory control of this weed. However, weed populations in this trial were very light and were not competitive with safflower. Yield data from safflower harvested on September 8th showed no differences in yield due to herbicide treatment which were all equivalent to the untreated control. This trial showed that while higher rates of pyroxasulfone may result in minor injury, in the form of stunting, that the injury is short lasting and did not reduce safflower yield. Further research on the safety and efficacy of pyroxasulfone in safflower need to be conducted, especially ones dealing with tank-mixes that would provide adequate control of broadleaf weeds, such as wild buckwheat.

Treatment	Rate	Safflower		Wild oat	Safflower	Test wt	Yield
		May 22	Jun 8	Jul 21	Jun 15	Sep 8	Sep 8
		injury (%)		control (%)	stand (no./m ²)	lbs/bu	bu/A
1 Pyroxasulfone	1.24 oz/a	0a	0e	33d	76a	44a	2255a
2 Pyroxasulfone	2.5 oz/a	0a	4bcd	60c	72a	44a	2248a
3 Pyroxasulfone	3.73 oz/a	0a	6bc	97a	70a	44a	2439a
4 Pyroxasulfone	5 oz/a	0a	10a	98a	58a	44a	2336a
5 Prowl H2O	48 oz/a	0a	0e	0e	74a	44a	2108a
6 Dual	26.7 oz/a	0a	1de	0e	81a	44a	2204a
7 Pyroxasulfone Prowl H2O	1.87 oz/a 48 oz/a	0a	3cde	68c	69a	45a	2449a
8 Pyroxasulfone Prowl H2O	3.73 oz/a 48 oz/a	0a	8ab	97a	72a	44a	2384a
9 Pyroxasulfone Dual	1.87 oz/a 26.7 oz/a	0a	6bc	95a	60a	44a	2342a
10 Pyroxasulfone Dual	3.73 oz/a 26.7 oz/a	0a	11a	79b	67a	44a	2258a
11 Pyroxasulfone Dual	3.73 oz/a 13.4 oz/a	0a	5bc	100a	67a	44a	2371a
12 Pyroxasulfone Prowl H2O	3.73 oz/a 24 oz/a	0a	5bc	95a	59a	44a	2427a
13 Untreated		0a	0e	0e	69a	45a	2247a
LSD P=.05		NS	3.7	9.5	NS	NS	NS
Standard Deviation		0.0	2.6	5.6	10.9	0.5	202.28
CV		0.0	58.95	8.9	15.81	1.05	8.75
Treatment F		0.000	7.939	158.219	1.579	2.026	1.028
Treatment Prob(F)		1.0000	0.0001	0.0001	0.1421	0.0529	0.4466

Preemergence options for weed control in Clearfield Lentils

Caleb Dalley, HREC, Hettinger, ND, 2015

A field trial was conducted to compare preemergence herbicide applications for weed control and crop tolerance in Clearfield Lentils. Lentils were seeded using a John Deere 1590 no-till drill on May 4, 2015. Herbicides treatments were applied on May 8 with lentil emergence occurring on May 15. Weeds present during application were primarily wild buckwheat, prickly lettuce, and annual mustards. Beyond (imazamox) was applied to all plots on June 8th, prior to flowering, which occurred on June 30th. At 14 days after treatment (DAT), two treatments resulted in visual injury to lentils, both of which contained Spartan. At 35 DAT injury, in the form of chlorosis/necrosis, became apparent in treatments containing Sencor, which may be attributed to the high rainfall that occurred in May. Slight stunting occurred with the higher rate of pyroxasulfone. All treatments, except Spartan, were effective in controlling green foxtail. Wild buckwheat was controlled with Sharpen plus Pursuit with and without Sencor. All other treatments suppressed wild buckwheat. Prickly lettuce was controlled by all treatments except Spartan and the experimental treatment BAS96110H. Lentil yield was lowest in the untreated control due to weed interference, whereas the highest yield occurred when Sharpen plus Pursuit, BAS 820ABH (0.081 lb ai/A), Pyroxasulfone (0.081 lb ai/A), and Prowl H2O (0.95 lb ai/A). The higher rate of Pyroxasulfone (0.16 lb ai/A) and the Sharpen plus Pursuit plus Sencor treatments had lower yields than Sharpen plus Pursuit but yields were greater than the untreated control. Treatments with yields similar to the untreated control included Shapen plus Sencor, Spartan alone, and BAS96110H.

Treatment	Rate	Lentil			Green foxtail	Wild buckwheat Jun 9	Prickly lettuce	Lentil yield	
		May 22	May 29	Jun 9				Test wt	Test wt
		Injury (%)			Control (%)		Aug 7		
1	Roundup PowerMax AMS BAS 820ABH	22oz/a 7 lb/100 gal 2.5 oz/a	0b	0c	2de	96 a	84 bcd	100 a	64 a 37.3 ab
2	Roundup PowerMax AMS Pyroxasulfone	22oz/a 7 lb/100 gal 1.5 oz/a	0b	0c	0e	95 a	78 cd	98 ab	64 a 37.3 ab
3	Roundup PowerMax AMS Pyroxasulfone	22oz/a 7 lb/100 gal 3 oz/a	0b	0c	7c	98 a	83 bcd	100 a	64 a 35.7 bc
4	Roundup PowerMax AMS Sharpen Pursuit MSO	22oz/a 7 lb/100 gal 0.75 oz/a 2 oz/a 16oz/a	0b	0c	0e	93 a	92 ab	100 a	64 a 38.4 a
5	Roundup PowerMax AMS Sharpen Sencor MSO	22oz/a 7 lb/100 gal 0.75 oz/a 7.54 oz/a 16 oz/a	0b	0c	45a	95 a	85 bcd	100 a	64 a 33.8 cde
6	Roundup PowerMax AMS Sharpen Pursuit Sencor MSO	22oz/a 7 lb/100 gal 0.75 oz/a 1 oz/a 7.54 oz/a 16 oz/a	0b	0c	36a	93 a	95 a	100 a	64 a 35.2 bcd
7	Roundup PowerMax AMS Prowl H2O	22oz/a 7 lb/100 gal 32oz/a	0b	0c	0e	93 a	85 bcd	93 ab	64 a 36.2 abc
8	Roundup PowerMax AMS Spartan MSO	22oz/a 7 lb/100 gal 2.54 oz/a 16 oz/a	39a	27 a	19b	50 b	77 d	83 bc	64 a 32.6 de
9	Roundup PowerMax AMS BAS96110H MSO	22oz/a 7 lb/100 gal 29oz/a 16oz/a	34 a	15 b	6cd	95 a	87 abc	69 c	64 a 34.3 cde
10	Untreated Check		0b	0c	0e	0c	0e	0d	63 a 32.0e
LSD P=.05			5.0	7.3	9.2	26.8	9.5	16.4	NS 2.67
Standard Deviation			3.5	5.0	6.3	18.4	6.5	11.3	0.5 1.84
CV			47.85	109.1	53.63	22.87	8.54	13.4	0.84 5.22
Treatment F			78.1	16.6	27.1	11.8	70.6	30.9	1.074 5.258
Treatment Prob(F)			0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.4125 0.0004

Preemergence weed control in field pea

Caleb Dalley, HREC, Hettinger, ND, 2015

A field trial was conducted to compare herbicide burndown treatments combined with soil active preemergence herbicides. "Blue Moon" field pea were seeded at a rate of 200 lbs/A on May 4, 2015 using a John Deere 1590 no-till drill. Herbicide treatments were applied on May 8, 2015 from 2:40 to 3:15 PM using a backpack CO₂ spray system at a volume of 10 gal/A. Glyphosate (Roundup PowerMAX) was tank-mixed with all treatments to act as a burndown. At time of application, wild buckwheat was at the 2-3 leaf stage. No other weeds were present at significant densities at time of application. Rainfall (0.31 inches) occurred on May 9 which allowed for activation of soil active herbicides. Weed control and crop injury were rated on June 9 (5 weeks after herbicide application). Injury was noted following application of Broadaxe (sulfentrazone plus metolochlor) and Sharpen plus Dual II Magnum. All treatments effectively controlled green foxtail. Treatments including Sharpen controlled wild buckwheat 85 to 100%. Other treatments failed to adequately control wild buckwheat. Pea yield following herbicide treatments was equal to or better than the hand-weeded control and in most cases greater than the untreated control. The highest yield occurred with combination of Prowl H₂O plus Sharpen (1 oz/A) plus Spartan Charge.

Treatment	Product rate	Jun 9			Aug-8	
		Pea Injury (%)	Green foxtail control %	Wild buckwheat control %	Test wt lbs/A	Yield bu/A
1 Untreated Control		0 d	0 b	0 f	1755 d	29.2 d
2 Roundup PowerMax AMS Sharpen Prowl H2O MSO	22 oz/a 7 lb/100 gal 2 oz/a 3 pt/a 1 % v/v	0 d	91 a	88 abc	2518 abc	42.0 abc
3 Roundup PowerMax AMS Sharpen Dual II Magnum MSO	22 oz/a 7 lb/100 gal 2 oz/a 2 pt/a 1 % v/v	9 b	99 a	91 ab	2569 abc	42.8 abc
4 Roundup PowerMax AMS BroadAxe	22 oz/a 7 lb/100 gal 32 oz/a	16 a	94 a	70 d	2470 abc	41.2 abc
5 Roundup PowerMax AMS Metribuzin Dual II Magnum	24 oz/a 7 lb/100 gal 0.5 lb/a 2 pt/a	1 d	96 a	75 cd	2136 cd	35.6 cd
6 Roundup PowerMax AMS Prowl H2O Sharpen Spartan Charge MSO	22 oz/a 7 lb/100 gal 3 pt/a 1 oz/a 7.5 oz/a 1 % v/v	1 d	100 a	93 ab	2745 a	45.8 a
7 Roundup PowerMax AMS Prowl H2O Sharpen Spartan Charge MSO	22 oz/a 7 lb/100 gal 3 pt/a 2 oz/a 7.5 oz/a 1 % v/v	6 bc	99 a	100 a	2455 abc	40.9 abc
8 Roundup PowerMax AMS Pyroxasulfone	22 oz/a 7 lb/100 gal 1.5 oz/a	0 d	96 a	54 e	2659 ab	44.3 ab
9 Roundup PowerMax AMS Pyroxasulfone	24 oz/a 7 lb/100 gal 3 oz/a	1 d	96 a	46 e	2122 cd	35.4 cd
10 Roundup PowerMax AMS Pyroxasulfone Sharpen MSO	22 oz/a 7 lb/100 gal 1.5 oz/a 2 oz/a 1 % v/v	3 cd	93 a	85 bcd	2404 abc	40.1 abc
11 Hand weeded Roundup PowerMax AMS Prowl H2O	22 oz/a 7 lb/100 gal 3 pt/a	0 d	100 a	100 a	2215 bcd	36.9 bcd
LSD P=.10	3.2	9.0	15.1		489	8.2
Standard Deviation	2.7	6.3	10.5		407.47	6.79
CV	79.97	7.13	14.38		17.2	17.2
Treatment F	13.774	87.393	32.688		1.983	1.983
Treatment Prob(F)	0.0001	0.0001	0.0001		0.0720	0.0720

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