North Dakota State University

Hettinger Research Extension Center

2016 Annual Report

NDSU | HETTINGER RESEARCH EXTENSION CENTER

2016 Table of Contents

NORTH DAKOTA **AGRICULTURE EXPERIMENT STATION**

Hettinger Research Extension Center

Hettinger REC Research in Brief

- Integrated crops, livestock, and range research and extension
- Variety, herbicide, and crop production research
- Lamb and beef feedlot nutrition and management
- Reproductive management of fall, winter, and spring lambing ewes
- Multiple-land use management including cropping systems, livestock, and wildlife as potential outputs
- Livestock Extension and applied calf backgrounding

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The Hettinger Research Extension Center (HREC) was established from a gift of 160 acres by the residents of Adams County and the city of Hettinger in 1909. Original work at the HREC involved converting native prairie to farm land for the purpose of agronomic research. In 1912, through cooperation with the United States Department of Agriculture, a dry land farming trial began. In 1913 a herd of Guernsey and Jersey cows and bulls was purchased to aid local producers in the production of replacement dairy cattle. Following a brief closure during the Depression, the HREC continued to grow the research programs, focusing on agronomy and sheep breeding. In 1947, an option was secured for the purchase of an extra quarter of land to continue and expand sheep and agronomy research. In the 1980's the research programs were solidified with the addition of land bringing the total owned land to 1130 acres, and the hiring of an agronomist.

The HREC is a semi-arid site located in southwest North Dakota, providing the most southerly NDSU location in the non-glaciated portion of North Dakota as a site for its agronomy research program. The HREC also is located at the center of the North Dakota sheep industry, the focus of one of its animal research programs. Furthermore, the HREC is located in an area of rapidly growing livestock feeding ventures, another focus of animal research at the HREC. Additionally, the HREC is located in a region where much of the land base is in the Conservation Reserve Program and Forest Service lands, which has resulted in additional research evaluating potential changes in the CRP program and how these changes may affect upland native and game bird populations. A new research program evaluating low-cost rangeland monitoring strategies on U.S. Forest Service lands has resulted in a significant increase in the quantity of rangeland, livestock, and wildlife interaction research conducted at the HREC throughout the western Dakotas. Research at HREC involves the disciplines of animal science, range and wildlife science agronomy, and weed science. Collaboration is with Main Station scientists, Branch Station scientists, U.S. Forest Service, grazing associations, university scientists from WY, SD, and MT, and USDA research entities in these research disciplines to improve the productivity of livestock and cropping systems and economic development of the region. Through these efforts, the center's research program has gained a national reputation for its involvement with sheep production systems as well as a strong regional and state reputation for its research in agronomy, multiple-land use, and calf backgrounding.

AGRONOMY

- Conducted crop variety and hybrid yield trials for 21 different crops at Hettinger along with off-station small grains trials at 4 locations.
- 12 preliminary yield trials/nurseries for wheat, pulse and canola breeding programs.
- Evaluation of carinata, an oilseed mustard like canola, for adaptation to western ND for use biofuel production. This crop looks promising with yields of carinata being competitive with hybrid canola and having fewer problems with seed shatter.
- 10 agronomic studies, including seed treatments, soybean & duram planting dates, spring wheat nitrogen timing, and spring wheat seeding rate.

WEED SCIENCE

- Evaluation of pre-emergence an post-emergence herbicides for weed control and crop tolerance for SW ND.
- Evaluation of fall-applied herbicides for weed control and crop tolerance.
- Options for post-harvest weed control.
- Management of noxious and troublesome weeds in pasture and rangelands.
- Cover crop tolerance to carryover of herbicides applied to spring wheat.
- Contributed to NDSU Weed Control Guide.
- Publish Crops Day report.

HREC Crops, Weeds, Livestock, and Range

RANGE and LIVESTOCK SCIENCE

- Using annual forages to provide forage for grazers and resources for pollinators and a state-wide assessment of pollinator populations.
- Evaluate the ecological effects of integrating livestock herbivory and annual forages into a winter wheat cropping system.
- Patch-burn and sheep/cattle grazing on post Conservation Reserve Program land.

- Evaluated supplementation strategies during pregnancy and their effect on embryonic death loss, fetal development, and potential feedlot and reproductive performance of offspring.
- Continued research in “Value Added Animal Production”; evaluated mineral injection during receiving of freshly weaned calves.
- Evaluation of feeding and supplementation strategies that impact ram fertility.
- Conduct the Dakota Fall Performance Ram Test; a 140 day Rambouillet Certificate of Merit program, one of three Rambouillet Ram Tests in the nation.

OUTREACH and EXTENSION

- Conduct annually the HREC Beef Day, Sheep School, Shearing School, Wool Classing School, Carcass Ultrasound School, Crops Tours, Crops Day, and Soil Health and Wildlife Workshops.
- Analyze wool samples for fiber diameter using an OFDA Fiber Analyzer
- Bi-weekly radio updates during the growing season.
- Implemented Nitrate QuikTest certification program in 41 ND County Extension Offices.
- Delivered over 30 presentation to 800 livestock producers since January 1.

HREC Research Faculty

Dr. Christopher Schauer, Director & Animal Scientist
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Weather Summary - Hettinger

Frost Free Days

	28ºF	32ºF	Normal 32ºF
Date of Last Frost	May 15	May 16	May 18
Date of First Frost	October 6	October 6	September 20
Frost Free Days	**143**	**142**	**125**

Precipitation (inches)

Month	2011-12	2012-13	2013-14	2014-15	2015-16	61 Year Average
October	0.8	0.7	4.4	0.1	2.0	1.1
November	0.0	0.1	0.2	1.0	0.0	0.5
December	0.2	0.5	0.5	0.0	0.5	0.4
January	0.4	0.2	0.1	0.1	0.2	0.4
February	0.5	0.2	0.3	0.0	0.4	0.5
March	0.2	0.2	0.6	0.2	0.2	0.7
April	3.0	0.2	1.6	1.0	3.7	1.6
May	2.2	7.9	1.6	4.0	1.0	2.7
June	2.4	3.7	5.1	5.2	0.9	3.3
July	3.9	2.0	0.9	1.0	1.5	2.1
August	2.2	1.8	5.2	1.9	1.7	1.8
September	0.0	3.4	1.3	0.9	2.3	1.4
April-Sept.	**13.7**	**15.6**	**14.3**	**13.1**	**8.9**	**11.5**
Total	**15.7**	**20.7**	**21.7**	**15.4**	**14.4**	**16.4**

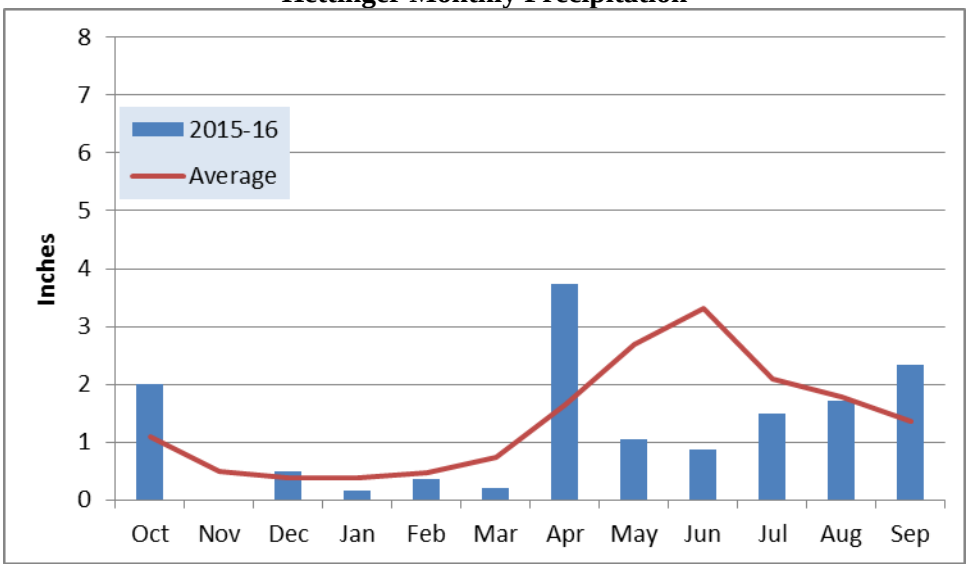
Air Temperature (ºF)

Month	2011-12	2012-13	2013-14	2014-15	2015-16	61 Year Average
October	48.2	42.1	39.7	46.6	48.5	45.5
November	30.9	32.4	28.8	21.3	32.4	29.9
December	23.9	18.5	12.9	23.4	23.9	19.7
January	24.2	18.3	16.6	21.6	20.1	15.5
February	21.8	26.7	10.1	19.1	32.0	20.0
March	44.4	27.4	26.5	38.0	38.8	29.1
April	46.9	35.5	39.1	43.2	44.2	42.5
May	53.6	53.5	52.8	50.2	54.2	53.6
June	66.5	61.7	59.5	64.6	68.7	63.1
July	75.2	68.1	66.4	70.4	72.0	70.1
August	67.8	69.5	66.0	69.3	69.0	68.7
September	59.4	62.5	56.4	64.1	60.7	58.0
Average	**46.9**	**43.0**	**39.6**	**44.3**	**47.0**	**43.0**

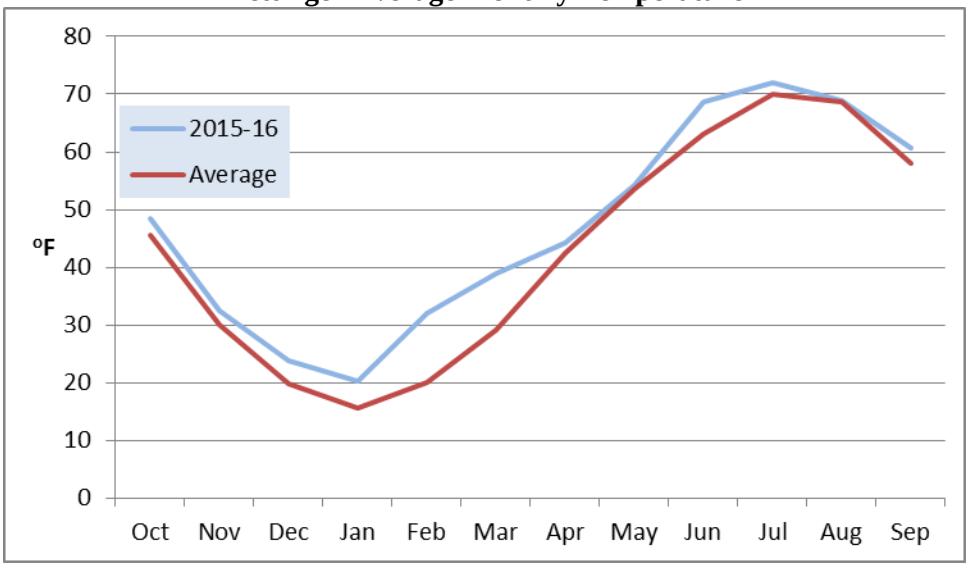
Corn Growing Degree Days (GDD)

Month	2012	2013	2014	2015	2016	44 Year Average
May	266	266	245	185	298	259
June	498	381	330	444	545	420
July	688	543	526	595	626	585
August	504	553	504	578	568	538
September	411	403	313	462	380	325
Total	**2367**	**2146**	**1918**	**2264**	**2417**	**2126**

Hettinger Monthly Precipitation



Hettinger Average Monthly Temperature



NDSU Hettinger Research Extension Center

Hard Red Spring Wheat - 2016 **Hettinger, ND**

Variety	Days to Head	Plant Height	Plant Lodge	Test Weight	Grain Protein	----- Grain Yield ----- 2014	2015	2016	Average Yield 2 yr	3 yr
	DAP[1]	inches	0-9[2]	lbs/bu	%	---------- Bushels per acre ----------				
HRS3419	30	78	0	57.3	13.4	97.9	86.8	54.7	70.8	79.8
LCS Nitro	27	78	0	57.3	13.4	94.4	82.6	44.9	63.8	74.0
Faller	30	78	0	57.1	13.2	94.1	79.5	43.4	61.5	72.3
MS Stingray	30	79	0	55.7	12.6	95.9	73.8	43.2	58.5	71.0
Prevail	28	74	0	59.0	13.6	87.2	75.2	49.3	62.3	70.6
Elgin-ND	33	77	0	56.8	14.6	88.5	74.5	48.5	61.5	70.5
LCS Iguacu	30	77	0	60.2	12.3	88.2	72.9	47.5	60.2	69.5
SY Soren	27	77	0	57.9	14.5	86.2	71.9	50.1	61.0	69.4
SY Rowyn	28	76	0	58.3	13.8	85.0	74.3	48.8	61.6	69.4
SY605CL	30	75	0	59.1	14.2	83.1	71.5	49.0	60.3	67.9
Rollag	27	75	0	58.8	14.5	84.2	71.8	47.3	59.6	67.8
LCS Breakaway	29	75	0	58.8	13.6	86.4	64.1	48.4	56.3	66.3
Focus	32	73	0	59.6	13.4	83.6	66.3	48.2	57.3	66.0
SY Ingmar	28	77	0	58.8	14.3	82.1	67.0	48.1	57.6	65.7
WB9507	29	76	0	53.9	13.3	92.8	65.6	36.2	50.9	64.9
Bolles	30	77	0	58.8	15.8	79.8	70.5	44.0	57.3	64.8
Barlow	31	76	0	59.0	14.5	80.1	65.2	48.4	56.8	64.6
LCS Pro	33	76	0	58.3	14.0	83.6	60.4	49.7	55.1	64.6
Prosper	27	80	0	54.9	13.3	86.3	70.4	36.0	53.2	64.2
Mott	30	78	0	58.5	14.5	78.9	66.4	46.4	56.4	63.9
ND 825	31	75	0	60.9	15.3	78.2	64.1	48.1	56.1	63.5
Velva	29	78	0	56.2	13.7	85.7	61.5	43.0	52.3	63.4
Glenn	32	73	0	60.1	14.9	77.1	63.1	49.1	56.1	63.1
WB Mayville	25	75	0	55.8	13.9	79.7	60.1	45.9	53.0	61.9
ND901CLPlus	30	77	0	57.7	15.2	73.5	59.2	41.5	50.4	58.1
Shelly	28	78	0	56.8	13.7	--	79.9	50.9	65.4	--
LCS Prime	29	76	0	57.5	13.0	--	80.4	49.1	64.8	--
Redstone	29	78	0	56.2	13.4	--	80.2	47.0	63.6	--
Surpass	30	73	0	58.8	13.4	--	76.0	49.7	62.9	--
WB9653	27	77	0	56.8	13.2	--	77.9	45.8	61.9	--
HRS 3530	32	77	0	55.4	14.2	--	79.6	43.7	61.7	--
SY Valda	29	77	0	57.7	13.4	--	71.5	49.6	60.6	--
Prestige	28	73	0	58.3	13.4	--	72.6	45.8	59.2	--
Duclair	30	76	0	56.2	13.5	--	64.5	48.5	56.5	--

Table continued on next page

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Hard Red Spring Wheat - 2016 **Hettinger, ND**

Variety	Days to Head	Plant Height	Plant Lodge	Test Weight	Grain Protein	----- Grain Yield ----- 2014	2015	2016	Average Yield 2 yr	3 yr
	DAP[1]	inches	0-9[2]	lbs/bu	%	---------- Bushels per acre ----------				
Table continues from previous page										
LCS Trigger	28	79	0	57.3	12.4	--	--	55.7	--	--
LCS Anchor	27	74	0	59.4	13.9	--	--	52.6	--	--
TCG Spitfire	28	79	0	56.1	13.8	--	--	52.0	--	--
Egan	30	77	0	56.4	14.8	--	--	51.6	--	--
MN10261-1	29	77	0	59.6	14.4	--	--	49.9	--	--
07S0027-3	29	78	0	55.0	13.8	--	--	48.7	--	--
HRS 3616	28	76	0	57.2	14.3	--	--	48.6	--	--
HRS 3504	27	77	0	56.7	13.4	--	--	48.3	--	--
TCG Wildfire	30	76	0	58.5	13.7	--	--	45.3	--	--
TCG Cornerstone	26	78	0	57.1	14.3	--	--	43.2	--	--
WB9312	26	75	0	55.8	12.2	--	--	39.1	--	--
Trial Mean	30	76	0	57.8	14.0	84.8	70.1	47.3	58.6	67.0
C.V. %	5.0	0.9	818.3	2.3	3.7	5.2	4.8	7.1	--	--
LSD 5%	2.2	1.0	0.1	1.8	0.7	6.2	4.7	4.7	--	--
LSD 10%	1.7	0.8	0.1	1.5	0.6	5.2	4.0	4.0	--	--

[1] Days to Head = the number of days from planting to head emergence from the boot.

[2] 0 = no lodging, 9 = 100% lodged.

Planting Date: April 1

Harvest Date: July 25

Previous Crop: Chemical Fallow

NDSU Hettinger Research Extension Center

Hard Red Spring Wheat - 2016 **Scranton, ND**

Variety	Plant Height	Plant Lodge	Test Weight	Grain Protein	----- Grain Yield ----- 204	2015	2016	Average Yield 2 yr	3 yr
	inches	0-9*	lbs/bu	%	---------- Bushels per acre ----------				
Barlow	31	0	61.1	13.0	61.9	59.5	41.1	50.3	54.2
Elgin ND	30	0	59.5	12.4	60.2	59.5	41.7	50.6	53.8
Focus	29	0	62.1	12.6	--	--	38.3	--	--
Glenn	29	0	62.5	13.0	54.6	55.2	42.4	48.8	50.7
HRS 3419	27	0	57.4	11.5	--	68.5	48.5	58.5	--
HRS 3530	31	0	58.8	12.3	--	--	42.8	--	--
LCS Breakaway	26	0	60.3	13.6	--	--	38.6	--	--
LCS Iguacu	26	0	59.3	12.3	--	66.2	37.3	51.8	--
LCS Nitro	25	0	57.5	11.8	--	63.8	42.0	52.9	--
LCS Prime	28	0	59.0	11.5	--	--	41.1	--	--
Mott	28	0	58.4	13.5	62.2	56.2	36.6	46.4	51.7
MS Stingray	26	0	57.0	11.4	--	66.5	39.5	53.0	--
Prestige	27	0	59.4	11.4	--	--	46.6	--	--
Prevail	27	0	60.8	11.8	66.4	59.5	45.0	52.3	57.0
SY Ingmar	26	0	60.1	13.3	--	--	38.2	--	--
SY Rowyn	24	0	59.2	12.7	56.8	59.5	37.0	48.3	51.1
SY Soren	24	0	58.8	13.5	62.6	62.6	38.3	50.5	54.5
Velva	26	0	58.7	12.5	59.7	55.5	37.9	46.7	51.0
WB9507	28	0	55.4	12.1	--	62.9	40.2	51.6	--
WB9653	25	0	58.4	12.2	--	--	41.2	--	--
SY605CL	28	0	61.2	12.4	65.7	61.1	40.3	50.7	55.7
Trial Mean	27	0	59.3	12.4	60.5	60.6	40.7	50.9	53.3
C.V. %	4.4	--	2.0	6.4	7.6	5.8	9.7	--	--
LSD 5%	1.7	NS	1.7	1.1	6.3	5.0	5.6	--	--
LSD 10%	1.4	NS	1.4	0.9	5.2	4.1	4.6	--	--

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

Planting Date: April 4

Harvest Date: August 9

Previous Crop: Spring Wheat

NDSU Hettinger Research Extension Center

Hard Red Spring Wheat - 2016 **Regent, ND**

Variety	Plant Height	Plant Lodge	Test Weight	Grain Protein	----- Grain Yield ----- 2014	2015	2016	Average Yield 2 yr	3 yr
	inches	0-9*	lbs/bu	%	---------- Bushels per acre ----------				
Barlow	27	0	57.8	16.4	60.2	82.4	31.5	57.0	58.0
Elgin ND	28	0	56.4	16.4	64.4	82.4	35.3	58.9	60.7
Focus	27	0	58.1	15.5	--	--	30.9	--	--
Glenn	27	0	59.3	16.0	56.0	74.0	29.0	51.5	53.0
HRS 3419	25	0	56.9	15.7	--	98.8	24.2	61.5	--
HRS 3530	28	0	57.1	15.9	--	--	36.9	--	--
LCS Breakaway	25	0	58.2	16.2	--	--	31.1	--	--
LCS Iguacu	25	0	58.3	15.1	--	93.2	26.3	59.8	--
LCS Nitro	23	0	56.3	16.2	--	103.4	25.2	64.3	--
LCS Prime	26	0	58.2	13.6	--	--	36.0	--	--
Mott	25	0	56.9	16.3	57.8	84.3	32.7	58.5	58.3
MS Stingray	25	0	55.8	13.4	--	97.4	31.8	64.6	--
Prestige	25	0	57.1	14.9	--	--	36.1	--	--
Prevail	25	0	57.7	14.7	62.6	83.8	35.1	59.5	60.5
SY Ingmar	23	0	57.3	16.2	--	--	35.2	--	--
SY Rowyn	23	0	56.8	14.9	54.5	92.0	31.2	61.6	59.2
SY Soren	23	0	56.2	16.5	60.8	82.5	32.9	57.7	58.7
Velva	25	0	53.5	15.4	61.1	80.6	32.5	56.6	58.1
WB9507	26	0	54.7	15.2	--	95.1	31.8	63.5	--
WB9653	23	0	56.8	15.8	--	--	38.1	--	--
SY605CL	26	0	57.5	16.1	65.9	82.3	33.3	57.8	60.5
Trial Mean	25	0	57.0	15.5	60.7	87.2	32.3	59.5	58.6
C.V. %	4.6	--	2.1	4.0	8.0	4.7	7.6	--	--
LSD 5%	1.6	NS	1.7	0.9	5.7	4.9	3.5	--	--
LSD 10%	1	NS	1.4	0.7	4.7	4.1	2.9	--	--

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

Planting Date: April 4

Harvest Date: August 9

Previous Crop: Spring Wheat

NDSU Hettinger Research Extension Center

Hard Red Spring Wheat - 2016 **New Leipzig, ND**

Variety	Plant Height	Plant Lodge	Test Weight	Grain Protein	----- Grain Yield ----- 2014	2015	2016	Average Yield 2 yr	3 yr
	inches	0-9*	lbs/bu	%	---------- Bushels per acre ----------				
Barlow	26	0	56.9	16.1	64.0	51.4	33.7	42.6	49.7
Elgin ND	26	0	55.2	16.5	65.6	47.8	33.4	40.6	48.9
Focus	26	0	57.3	15.6	--	--	35.7	--	--
Glenn	27	0	57.5	16.0	53.3	45.4	37.9	41.7	45.5
HRS 3419	23	0	53.5	15.1	--	49.4	17.1	33.3	--
HRS 3530	26	0	54.9	16.3	--	--	41.7	--	--
LCS Breakaway	24	0	54.1	16.3	--	--	31.8	--	--
LCS Iguacu	23	0	54.1	15.0	--	52.5	25.8	39.2	--
LCS Nitro	25	0	50.6	14.7	--	47.3	27.9	37.6	--
LCS Prime	26	0	56.8	14.2	--	--	44.9	--	--
Mott	23	0	55.1	16.2	55.7	44.5	32.8	38.7	44.3
MS Stingray	23	0	55.0	13.8	--	49.3	32.4	40.9	--
Prestige	24	0	52.4	16.1	--	--	36.9	--	--
Prevail	25	0	53.9	15.3	66.4	50.1	34.2	42.2	50.2
SY Ingmar	23	0	54.2	16.1	--	--	36.0	--	--
SY Rowyn	23	0	52.8	15.2	58.3	52.4	37.1	44.8	49.3
SY Soren	22	0	54.9	15.9	65.2	51.8	32.2	42.0	49.7
Velva	22	0	55.5	16.2	67.9	41.7	35.3	38.5	48.3
WB9507	24	0	50.6	15.6	--	45.9	31.4	38.7	--
WB9653	21	0	53.9	15.3	--	--	39.0	--	--
SY605CL	23	0	57.1	15.6	65.6	57.5	35.9	46.7	53.0
Trial Mean	24	0	54.6	15.6	62.7	49.1	34.0	40.5	48.8
C.V. %	6	--	3.5	3.7	7.4	6.7	14.6	--	--
LSD 5%	2.0	NS	2.7	0.8	5.5	4.6	7.0	--	--
LSD 10%	1.7	NS	2.3	0.7	4.6	3.8	5.8	--	--

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

Planting Date: April 5

Harvest Date: August 15

Previous Crop: Flax

NDSU Hettinger Research Extension Center

Hard Red Spring Wheat - 2016 **Mandan, ND**

Variety	Plant Height	Plant Lodge	Test Weight	Grain Protein	----- Grain Yield ----- 2014	2015	2016	Average Yield 2 yr	3 yr
	inches	0-9*	lbs/bu	%	---------- Bushels per acre ----------				
Barlow	32	2	55.1	12.4	73.4	31.9	60.9	46.4	55.4
Elgin ND	32	0	54.1	11.4	76.9	30.1	65.3	47.7	57.4
Focus	32	2	56.6	11.2	--	--	65.5	--	--
Glenn	33	1	57.4	11.9	69.7	26.1	62.6	44.4	52.8
HRS 3419	30	0	53.4	10.4	--	39.4	73.5	56.5	--
HRS 3530	32	0	55.2	11.4	--	--	70.6	--	--
LCS Breakaway	28	0	55.0	11.6	--	--	56.3	--	--
LCS Iguacu	29	0	53.8	10.6	--	38.6	60.9	49.8	--
LCS Nitro	28	0	53.7	11.4	--	33.2	67.6	50.4	--
LCS Prime	30	0	55.5	10.6	--	--	70.0	--	--
Mott	34	0	54.9	12.1	76.0	31.0	61.3	46.2	56.1
MS Stingray	33	0	51.3	9.8	--	36.7	63.9	50.3	--
Prestige	30	0	53.0	11.5	--	--	64.3	--	--
Prevail	30	0	53.9	11.8	73.9	35.3	66.2	50.8	58.5
SY Ingmar	28	0	54.3	12.3	--	--	58.8	--	--
SY Rowyn	28	0	53.3	11.3	74.7	34.7	61.5	48.1	57.0
SY Soren	27	0	53.7	12.0	72.5	32.6	59.4	46.0	54.8
Velva	29	0	52.9	11.5	72.9	24.4	62.6	43.5	53.3
WB9507	30	0	50.7	10.8	--	34.7	59.8	47.3	--
WB9653	27	0	53.0	10.8	--	--	70.1	--	--
SY605CL	30	1	55.7	11.3	72.8	37.1	66.8	52.0	58.9
Trial Mean	30	0	54.1	11.3	74.3	32.8	64.2	48.6	56.3
C.V. %	4.1	108.3	2.2	4.6	7.3	8.9	7.6	--	--
LSD 5%	1.8	0.6	1.7	0.9	6.5	4.2	6.9	--	--
LSD 10%	1.5	0.5	1.4	0.7	5.4	3.5	5.7	--	--

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

Planting Date: April 5

Harvest Date: August 15

Previous Crop: Spring Wheat

Hard Red Winter Wheat - 2016 **Hettinger, ND**

Variety	Fall Growth	Fall Stand	Spring Stand	Heading Date	Plant Height	Plant Lodge	Test Weight	Grain Protein	---- Grain Yield ---- 2014	2015	2016	Average Yield 2 yr	3 yr
	1-5[1]	%	%		inches	0-9[2]	lbs/bu	%	---------- Bushels per acre ----------				
SY Wolf	5	90	90	6/9	32	0	59.7	13.8	95.7	96.8	69.0	82.9	87.2
Overland	4	90	90	6/7	35	1	59.9	12.8	91.6	86.3	72.4	79.4	83.4
AC Emerson	3	90	90	6/10	32	0	59.7	14.3	94.9	86.9	63.0	75.0	81.6
Decade	3	90	90	6/10	32	4	56.9	13.8	102.9	81.1	58.0	69.6	80.7
Peregrine	3	90	90	6/11	38	1	59.7	13.9	96.2	80.6	63.1	71.9	80.0
Lyman	3	90	90	6/8	33	2	59.4	13.9	91.0	80.4	64.9	72.7	78.8
Ideal	3	90	90	6/9	32	0	57.6	13.2	95.8	80.8	57.3	69.1	78.0
Flourish	3	90	90	6/9	35	1	56.0	14.4	88.8	75.9	68.4	72.2	77.7
AC Gateway	4	90	90	6/10	31	0	59.4	14.7	87.9	79.3	64.1	71.7	77.1
Redfield	3	90	90	6/8	30	0	57.8	14.2	88.0	78.4	60.2	69.3	75.5
WB Matlock	4	90	90	6/9	35	0	58.9	13.5	86.6	75.2	55.7	65.5	72.5
Moats	3	90	90	6/9	37	1	58.9	14.6	85.6	70.6	60.7	65.7	72.3
AC Broadview	4	90	90	6/9	34	2	56.1	13.7	84.9	71.7	58.4	65.1	71.7
Accipiter	2	90	90	6/11	33	1	56.3	13.9	81.2	77.5	56.1	66.8	71.6
Jerry	3	90	90	6/10	36	0	57.3	13.7	85.2	72.2	51.9	62.1	69.8
Northern	4	90	90	6/10	31	0	55.5	15.0	--	84.0	68.3	76.2	--
WB4614	5	90	90	6/9	30	0	55.7	14.0	--	78.1	71.8	75.0	--
Colter	2	76	75	6/10	32	0	55.5	14.3	--	80.4	69.2	74.8	--
CDC Chase	5	90	90	6/10	38	0	59.9	14.6	--	83.7	56.3	70.0	--
SY Sunrise	4	90	90	6/7	31	0	59.4	13.1	--	--	80.2	--	--
SY Monument	5	90	90	6/8	33	0	57.7	14.4	--	--	69.1	--	--
Loma	3	90	90	6/11	30	0	55.4	13.1	--	--	69.7	--	--
Ruth	4	90	90	6/7	32	0	58.4	13.7	--	--	63.2	--	--
Trial Mean	3	90	90	6/9	34	0.5	58.2	14.1	88.1	79.5	61.2	71.3	77.2
C.V. %	11.6	0.5	0.1	0.4	3.9	146.4	1.6	3.3	4.9	4.3	7.7	--	--
LSD 0.05	0.5	0.6	0.1	0.9	1.9	1.1	1.3	0.7	6.9	4.8	6.7	--	--
LSD 0.10	0.5	0.5	0.1	0.7	1.6	1.0	1.1	0.5	5.9	4.0	5.6	--	--

[1] 1 = least growth, 5 = most growth.

[2] 0 = no lodging, 9 = 100% lodged.

Planting Date: September 21

Harvest Date: July 19

Previous Crop: Chemical Fallow

Winter Rye - 2016 **Hettinger, ND**

Variety	Spring Stand	Heading Date	Plant Height	Plant Lodge	Test Weight	----- Grain Yield ----- 2012	2015	2016	Average Yield 2 yr	3 yr
	%		inches	0-9[1]	lbs/bu	---------- Bushels per acre ----------				
Dacold	90	6/1	60	6	52.6	71.1	87.8	72.9	80.4	77.3
DR02	90	5/31	54	3	54.1	74.2	84.9	64.6	74.8	74.6
Hancock	90	5/27	54	3	54.2	63.5	73.7	59.9	66.8	65.7
Spooner	90	5/27	51	2	55.5	48.9	64.4	57.3	60.9	56.9
Aroostok	90	5/25	52	3	55.4	46.0	54.3	45.6	50.0	48.6
Musketeer	90	5/27	53	5	54.3	--	77.2	70.7	74.0	--
Rymin	90	5/27	53	4	54.2	--	69.8	62.1	66.0	--
DREB15	90	5/24	54	3	54.5	--	--	50.7	--	--
Trial Mean	90	5/27	54	4	54.4	55.4	72.7	60.5	67.5	64.6
C.V. %	0	0.3	3.4	25.8	1.0	15.5	6.9	9.0	--	--
LSD 0.05	0.0	0.7	2.7	1.3	0.8	10.5	7.3	8.0	--	--
LSD 0.10	0.0	0.5	2.2	1.1	0.7	8.6	6.0	6.7	--	--

[1] 0 = no lodging, 9 = 100% lodged.

Planting Date: September 21

Harvest Date: July 19

Previous Crop: Chemical Fallow

Durum Wheat - 2016 **Hettinger, ND**

Variety	Days to Head	Plant Height	Plant Lodge	Test Weight	Grain Protein	----- Grain Yield ----- 2014	2015	2016	Average Yield 2 yr	3 yr
	DAP[1]	inches	0-9[2]	lbs/bu	%	---------- Bushels per acre ----------				
Joppa	77	30	0	58.3	11.8	85.7	78.8	41.1	60.0	68.5
Divide	77	26	0	58.4	12.6	81.6	82.6	33.4	58.0	65.9
Tioga	76	28	0	58.4	13.0	79.8	81.5	34.3	57.9	65.2
VT Peak	76	29	0	60.3	12.1	80.4	79.2	35.1	57.2	64.9
Mountrail	77	27	0	57.1	12.1	83.3	76.6	31.8	54.2	63.9
Alkabo	78	27	0	58.7	12.4	82.6	70.0	33.3	51.7	62.0
Carpio	78	26	0	56.2	12.6	80.5	71.6	32.2	51.9	61.4
Strongfield	78	27	0	57.1	13.3	75.7	70.7	35.5	53.1	60.6
CDC Verona	77	27	0	57.9	12.7	79.1	66.5	33.7	50.1	59.8
Grenora	77	26	0	57.6	12.5	68.1	76.3	33.4	54.9	59.3
Lebsock	77	29	0	59.3	11.6	71.8	60.6	35.6	48.1	56.0
Ben	77	29	0	58.6	12.3	73.0	60.5	31.6	46.1	55.0
AC Commander	78	24	0	57.6	13.4	69.7	59.7	35.0	47.4	54.8
Rugby	76	27	0	57.6	12.7	74.9	59.3	25.5	42.4	53.2
AC Navigator	77	26	0	59.6	12.8	65.1	56.2	36.3	46.3	52.5
Maier	80	26	0	63.3	12.7	66.3	59.3	30.4	44.9	52.0
Pierce	77	28	0	59.1	12.2	64.3	55.3	35.1	45.2	51.6
Alzada	77	27	0	58.0	12.3	56.8	41.7	34.4	38.1	44.3
Trial Mean	77	28	0	59.4	12.4	78.2	73.5	35.1	53.1	60.3
C.V. %	0.9	5.4	--	2.2	8.6	4.5	6.2	17.2	--	--
LSD 5%	1.0	2.1	NS	1.8	1.5	5.0	6.4	8.4	--	--
LSD 10%	0.8	1.8	NS	1.5	1.3	4.1	5.3	7.1	--	--

[1] Days to Head = the number of days from planting to head emergence from the boot.

[2] 0 = no lodging, 9 = 100% lodged.

Planting Date: April 4

Harvest Date: July 26

Previous Crop: Soybean Green Fallow

Durum Wheat - 2016 **Scranton, ND**

Variety	Plant Height	Plant Lodge	Test Weight	Grain Protein	----- Grain Yield ----- 2014	2015	2016	Average Yield 2 yr	3 yr
	inches	0-9*	lbs/bu	%	---------- Bushels per acre ----------				
Alkabo	29	0	59.8	12.4	64.9	58.4	34.7	46.6	52.7
Carpio	29	0	59.8	13.0	57.8	56.5	38.0	47.3	50.8
Divide	29	0	60.0	12.2	61.5	62.0	38.1	50.1	53.9
Joppa	30	0	59.8	12.1	63.5	60.1	40.8	50.5	54.8
Mountrail	31	0	59.7	11.6	67.6	63.1	42.7	52.9	57.8
Tioga	31	0	61.0	12.0	61.1	62.1	42.6	52.4	55.3
Trial Mean	30	0	60.0	12.2	62.7	60.4	39.5	49.9	54.2
C.V. %	3.0	--	0.8	6.1	6.3	6.0	8.4	--	--
LSD 5%	1.3	NS	0.8	1.1	4.8	5.5	5.0	--	--
LSD 10%	1.1	NS	0.6	0.9	4.0	4.6	4.1	--	--

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

Planting Date: April 4

Harvest Date: August 9

Previous Crop: Spring Wheat

Durum Wheat - 2016 **Regent, ND**

Variety	Plant Height	Plant Lodge	Test Weight	Grain Protein	----- Grain Yield ----- 2014	2015	2016	Average Yield 2 yr	3 yr
	inches	0-9*	lbs/bu	%	---------- Bushels per acre ----------				
Alkabo	26	0	53.9	14.7	46.9	83.0	26.6	54.8	52.2
Carpio	26	0	53.1	16.4	46.9	88.0	29.3	58.7	54.7
Divide	26	0	54.4	15.0	46.9	89.0	31.3	60.2	55.7
Joppa	27	0	55.3	14.8	49.9	88.0	29.9	59.0	55.9
Mountrail	25	0	55.0	14.3	47.2	80.5	32.3	56.4	53.3
Tioga	28	0	55.3	14.4	46.3	89.2	31.1	60.2	55.5
Trial Mean	26	0	54.5	14.9	47.4	86.3	30.0	58.2	54.6
C.V. %	3.4	--	1.9	3.2	9.3	2.6	12.4	--	--
LSD 5%	1.3	NS	1.5	0.9	5.5	3.4	5.6	--	--
LSD 10%	1.1	NS	1.3	0.7	4.6	2.8	4.6	--	--

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

Planting Date: April 4

Harvest Date: August 9

Previous Crop: Spring Wheat

NDSU Hettinger Research Extension Center

Durum Wheat - 2016 **Mandan, ND**

Variety	Plant Height	Plant Lodge	Test Weight	Grain Protein	----- Grain Yield ----- 2014	2015	2016	Average Yield 2 yr	3 yr
	inches	0-9*	lbs/bu	%	---------- Bushels per acre ----------				
Alkabo	31	2	55.0	11.7	74.2	25.3	62.5	43.9	54.0
Carpio	33	4	56.7	11.7	67.6	26.7	70.2	48.5	54.8
Divide	32	3	56.7	11.7	69.3	28.9	70.7	49.8	56.3
Joppa	32	4	56.4	10.5	74.9	26.2	69.8	48.0	57.0
Mountrail	31	2	57.1	10.8	76.0	24.8	73.6	49.2	58.1
Tioga	34	4	57.0	10.9	68.7	26.9	72.9	49.9	56.2
Trial Mean	32	3	56.5	11.2	71.8	26.5	70.0	48.2	56.1
C.V. %	3.3	22.5	1.0	4.0	7.4	9.1	4.8	--	--
LSD 5%	1.6	1.1	0.9	0.7	6.6	3.6	5.1	--	--
LSD 10%	1.3	0.9	0.7	0.6	5.5	3.0	4.2	--	--

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

Planting Date: April 5

Harvest Date: August 15

Previous Crop: Spring Wheat

NDSU Hettinger Research Extension Center

Barley - 2016 **Hettinger, ND**

Variety	Days to Head	Plant Height	Plant Lodge	Plump	Test Weight	Grain Protein	----- Grain Yield ----- 2014	2015	2016	Average Yield 2 yr	3 yr
	DAP[1]	inches	0-9[2]	%	lbs/bu	%	---------- Bushels per acre ----------				
TWO ROW											
ND Genesis	81	26	0	97	45.8	11.9	114.4	103.2	69.0	86.1	95.5
Pinnacle	79	24	0	96	47.8	11.4	115.1	103.5	64.6	84.1	94.4
Rawson	77	24	0	96	45.8	12.6	102.1	93.2	66.1	79.7	87.1
Conlon	74	24	0	98	46.5	13.0	118.2	82.6	60.4	71.5	87.1
CDC Meredith	81	22	0	85	41.9	11.9	--	110.0	68.2	89.1	--
AAC Synergy	80	25	0	94	44.7	12.1	--	--	75.7	--	--
ABI Balster	81	22	0	89	43.9	11.8	--	--	73.2	--	--
SY Sirish	80	21	0	92	45.8	11.3	--	--	71.4	--	--
LCS Odyssey	80	21	0	93	43.2	10.9	--	--	70.7	--	--
ABI Growler	81	22	0	88	43.4	12.6	--	--	68.0	--	--
LCS Genie	81	21	0	93	45.9	12.6	--	--	67.0	--	--
SIX ROW											
Innovation	75	24	0	90	44.4	12.6	122.3	87.2	62.1	74.7	90.5
Stellar-ND	74	24	0	89	44.0	13.1	122.2	86.6	62.5	74.6	90.4
Tradition	74	27	0	93	46.5	12.6	120.2	83.9	63.3	73.6	89.1
Lacey	76	23	0	90	45.4	13.0	114.2	84.3	59.5	71.9	86.0
Celebration	76	24	0	89	43.3	13.4	115.3	76.4	61.4	68.9	84.4
Quest	77	24	0	86	43.7	13.5	110.4	66.2	64.4	65.3	80.3
Trial Mean	78	23	0	92	45.0	12.4	115.5	90.7	67.7	76.3	88.5
C.V. %	1.1	4.8	--	2.6	1.5	4.3	3.0	5.4	7.5	--	--
LSD 5%	1.2	1.6	NS	3.4	1.0	0.7	4.9	6.9	7.2	--	--
LSD 10%	1.0	1.3	NS	2.9	0.8	0.6	4.1	5.8	6.0	--	--

[1] Days to Head = the number of days from planting to head emergence from the boot.

[2] 0 = no lodging, 9 = 100% lodged.

Planting Date: April 4

Harvest Date: July 28

Previous Crop: Soybean Green Fallow

NDSU Hettinger Research Extension Center

Barley - 2016 **Scranton, ND**

Variety	Plant Height	Plant Lodge	Test Weight	Grain Protein	----- Grain Yield ----- 2014	2015	2016	Average Yield 2 yr	3 yr
	inches	0-9*	lbs/bu	%	---------- Bushels per acre ----------				
TWO ROW									
ND Genesis	27	0	42.3	11.9	--	85.2	66.5	75.9	--
CDC Meredith	23	0	40.0	12.2	--	--	57.5	--	--
Pinnacle	25	0	45.9	12.3	81.3	79.7	56.7	68.2	72.6
SIX ROW									
Innovation	24	0	44.4	13.0	83.0	78.6	60.8	69.7	74.1
Tradition	25	0	45.7	12.8	--	--	59.8	--	--
Trial Mean	25	0	43.7	12.4	80.7	77.6	60.3	71.3	73.4
C.V. %	2.5	--	2.8	4.6	7.3	8.2	10.2	--	--
LSD 5%	1.0	NS	1.9	0.9	7.3	9.6	9.4	--	--
LSD 10%	0.8	NS	1.5	0.7	6.1	8.0	7.7	--	--

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

Planting Date: April 4

Harvest Date: August 9

Previous Crop: Spring Wheat

NDSU Hettinger Research Extension Center

Barley - 2016 **Regent, ND**

Variety	Plant Height	Plant Lodge	Test Weight	Grain Protein	----- Grain Yield ----- 2014	2015	2016	Average Yield 2 yr	3 yr
	inches	0-9*	lbs/bu	%	---------- Bushels per acre ----------				
TWO ROW									
ND Genesis	25	0	44.7	13.5	--	112.1	39.7	75.9	--
CDC Meredith	22	0	46.6	16.0	--	--	44.1	--	--
Pinnacle	23	0	36.4	14.1	73.2	106.1	24.5	65.3	67.9
SIX ROW									
Innovation	22	0	47.3	15.1	77.1	84.8	27.4	56.1	63.1
Tradition	24	0	47.7	15.7	--	--	30.8	--	--
Trial Mean	23	0	44.5	14.9	79.0	93.2	33.3	65.8	65.5
C.V. %	6.3	--	1.3	2.5	12.5	8.0	18.8	--	--
LSD 5%	2.2	NS	1.0	0.6	12.3	11.3	9.6	--	--
LSD 10%	1.8	NS	0.8	0.5	10.2	9.4	7.9	--	--

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

Planting Date: April 4

Harvest Date: August 9

Previous Crop: Spring Wheat

NDSU Hettinger Research Extension Center

Barley - 2016 **New Leipzig, ND**

Variety	Plant Height	Plant Lodge	Test Weight	Grain Protein	----- Grain Yield ----- 2014	2015	2016	Average Yield 2 yr	3 yr
	inches	0-9*	lbs/bu	%	---------- Bushels per acre ----------				
TWO ROW									
ND Genesis	24	0	42.6	13.5	--	51.3	37.5	44.4	--
CDC Meredith	19	0	43.1	16.0	--	--	36.0	--	--
Pinnacle	22	0	45.3	14.1	81.8	51.5	44.8	48.2	59.4
SIX ROW									
Innovation	21	0	41.7	15.1	78.5	51.2	41.1	46.2	56.9
Tradition	23	0	42.6	15.7	--	--	30.3	--	--
Trial Mean	22	0	43.1	14.9	79.8	52.1	37.9	46.2	58.2
C.V. %	6.1	--	2.0	2.5	7.6	6.1	8.5	--	--
LSD 5%	2.1	NS	1.3	0.6	7.5	5.7	5.0	--	--
LSD 10%	1.7	NS	1.1	0.5	6.2	4.7	4.1	--	--

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

Planting Date: April 5

Harvest Date: August 15

Previous Crop: Flax

Mandan location was destroyed by deer.

Oat - 2016 **Hettinger, ND**

Variety	Days to Head	Plant Height	Plant Lodge	Test Weight	----- Grain Yield ----- 2014	2015	2016	Average Yield 2 yr	3 yr
	DAP[1]	inches	0-9[2]	lbs/bu	---------- Bushels per acre ----------				
Beach	79	30	0	38.2	171.0	164.8	59.6	112.2	131.8
CDC Dancer	78	29	0	37.3	165.2	177.4	62.4	119.9	135.0
Deon	80	29	1	36.0	200.9	173.0	64.0	118.5	146.0
Furlong	82	27	0	33.5	192.8	194.6	59.0	126.8	148.8
Goliath	80	33	2	37.5	195.8	177.5	54.6	116.1	142.6
Hayden	79	28	0	37.0	--	--	68.9	--	--
HiFi	79	28	0	36.0	130.1	180.7	61.6	121.2	124.1
Hytest	76	30	2	39.7	109.0	144.7	53.7	99.2	102.5
Jury	78	31	2	36.2	196.0	175.8	55.5	115.7	142.4
Killdeer	79	26	0	36.3	185.5	186.8	61.6	124.2	144.6
Leggett	81	26	0	35.9	193.2	174.5	61.5	118.0	143.1
CDC Minstrel	82	25	0	33.7	191.5	186.3	65.9	126.1	147.9
Newburg	78	31	1	35.7	192.7	181.6	63.9	122.8	146.1
Otana	78	30	1	36.4	181.3	156.2	63.8	110.0	133.8
AC Pinnacle	81	27	0	36.9	173.5	180.4	77.4	128.9	143.8
Rockford	79	30	0	38.7	199.8	186.3	65.3	125.8	150.5
Souris	79	25	0	36.6	128.9	169.5	64.0	116.8	120.8
Stallion	79	29	1	37.4	157.1	160.5	59.6	110.1	125.7
Paul (hull-less)	84	30	0	41.1	131.7	149.4	46.2	97.8	109.1
Trial Mean	79	29	1	36.0	175.8	176.5	62.8	117.2	135.5
C.V. %	1.5	4.1	110.2	3.6	6.3	5.6	9.1	--	--
LSD 5%	1.7	1.7	0.9	1.8	15.6	13.8	8.0	--	--
LSD 10%	1.4	1.4	0.7	1.5	13.0	11.6	6.7	--	--

[1] Days to Head = the number of days from planting to head emergence from the boot.

[2] 0 = no lodging, 9 = 100% lodged.

Planting Date: April 4

Harvest Date: July 25

Previous Crop: Soybean Green Fallow

NDSU Hettinger Research Extension Center

Safflower - 2016 **Hettinger, ND**

Variety	Oil Type	Days to Flower	Plant Height	Test Weight	Oil Content	-------Grain Yield--------			Average Yield	
						2014	2015	2016	2-Yr	3-Yr
		DAP[1]	inches	lbs/bu	%	---------- lbs per acre ----------				
Cardinal	Linoleic	96	24	42.8	35.2	1043	2497	1805	2151	1782
Finch	Linoleic	91	23	43.3	37.1	897	2672	1669	2171	1746
MonDak	Oleic	92	22	40.7	36.8	1070	3050	1559	2305	1893
Montola 2003	Oleic	93	20	39.5	38.6	991	3346	1555	2451	1964
Nutrasaff	Linoleic	93	23	34.8	45.1	867	2162	1223	1693	1417
Hybrid 1601	Oleic	93	20	39.1	36.6	1195	3750	2095	2923	2347
Hybrid 200	Oleic	92	22	40.5	35.0	--	3412	1723	2568	--
Trial Mean		93	22	40.2	37.3	983	3011	1661	2323	1858
C.V. %		0.7	4.7	1.8	1.9	21.7	7.7	13.6	--	--
LSD 5%		1.0	1.5	1.0	1.0	NS	337	333	--	--
LSD 10%		0.8	1.2	0.9	0.9	NS	279	276	--	--

[1] Days after planting.
Planting Date: April 13
Harvest Date: August 30
Previous Crop: Chemical Fallow

NDSU Hettinger Research Extension Center

Oil Type Sunflower - 2016 **Hettinger, ND**

Company/Brand	Hybrid	Oil Type & Traits	Days to Bloom	Plant Height	Lodging	Test Weight	Oil Content	Grain Yield		
								2016	2-Year	3-Year
		*	**	inches	%	lbs/bu	%	--------lbs/ac--------		
AgVenture	AF3H681ES	HO, EX, DM	74	59	5	30.7	40.3	2156	2218	1784
AgVenture	AF3N680ES	HO, EX, DM	74	54	1	29.2	37.2	2293	--	--
AgVenture	AF3N692ES	NS, EX, DM	75	57	0	28.9	39.2	2838	3084	2336
AgVenture	AF3N94CD	NS, CL, DM	74	57	9	32.2	40.7	2698	--	--
AgVenture	AF4H95CD	HO, CL, DM	77	56	8	29.8	39.1	2812	--	--
AgVenture	XF2H14CD	HO, CL, DM	72	56	5	31.7	42.0	2602	--	--
Croplan	432 E	NS, EX, DM	72	51	1	30.2	37.9	2348	2132	1679
Croplan	455 E HO	HO, EX, DM	72	55	6	30.2	39.6	2651	--	--
Croplan	458 E HO	HO, EX, DM	73	57	0	28.8	39.6	2586	2552	--
Croplan	545 CL	NS, CL, DM	75	56	1	29.5	37.4	2976	3029	2549
Croplan	549 CL HO	HO, CL, DM	71	56	1	30.8	38.3	2574	2735	--
Croplan	553 CL HO	HO, CL, DM	76	53	13	30.2	41.1	3081	3247	--
Mycogen Seeds	8D310CL	TR, CL	76	59	11	27.8	33.8	2021	2453	2256
Mycogen Seeds	8H449CLDM	HO, CL, DM	74	52	3	32.9	45.0	2871	3139	2693
Mycogen Seeds	8H456CLDM	HO, CL, DM	75	59	5	28.3	42.4	2587	3361	--
Nuseed	Badger DMR	NS, CL, DM	73	54	3	29.4	34.7	2099	2226	1893
Nuseed	Camaro II	NS, CL, DM	75	53	6	31.4	39.9	2412	2758	2389
Nuseed	Cobalt II	HO, CL, DM	73	51	2	30.4	38.9	2302	2440	1970
Nuseed	Daytona	HO, CL	74	56	1	30.1	36.9	2473	2735	--
Nuseed	Falcon	NS, EX	74	51	2	31.1	37.4	2291	2643	2287
Nuseed	Hornet	HO, CL, DM	74	53	3	30.7	40.8	3268	3478	2959
Nuseed	N4HM354	HO, CL	74	53	1	30.8	40.0	2550	--	--
Nuseed	N5LM307	NS, CL	73	58	0	27.9	34.4	2212	--	--
Nuseed	Talon	NS, EX	72	50	4	28.6	37.7	2259	2576	2169
Proseed	12G04	HO	75	56	7	30.1	41.0	2566	--	--
Proseed	12G25	HO, CL	73	53	6	32.0	38.6	2802	--	--
Proseed	E-31 CL	HO, CL	74	53	5	28.6	35.5	2395	2253	1796
Proseed	E-50061CL	HO, CL, DM	74	51	0	29.5	38.7	2422	--	--
Syngenta	NX64189	HO, CL, DM	75	51	2	29.4	39.3	2382	--	--
Syngenta	NX64288	HO, CL, DM	75	48	14	32.0	46.7	2658	--	--
Syngenta	SY7717	HO, CL	71	55	7	31.1	38.6	2371	2584	2413
Syngenta	SY7919	HO, CL, DM	75	53	6	29.3	40.9	2929	--	--
AAFC/USDA(CK	Honeycomb NS	NS	67	51	0	28.9	34.4	1517	1475	--
USDA (CK)	894	TR	74	52	1	30.6	38.7	2269	2549	2157
Croplan (CK)	559CL		75	58	0	30.7	39.1	2360	--	--
Mycogen (CK)	8N270CLDM	NS, CL, DM	69	47	3	30.8	38.5	2156	2201	--
Trial Mean			74	54	4	30.1	39.0	2494	2630	2222
C.V. %			7.2	1.5	115.7	2.6	5.3	13.1	--	--
LSD 5%			5.4	1.6	7.5	1.1	2.9	458	--	--
LSD 10%			4.5	1.3	6.3	0.9	2.4	384	--	--

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

** Days after planting.

Planting Date: May 17

Harvest Date: October 26

Previous Crop: Wheat

Canola - Clearfield and Sulfonylurea - 2016 **Hettinger, ND**

Brand	Variety	Type[1]	Days to Bloom	Bloom Duration	Days to Mature	Plant Height	Lodging	Oil Content	Seed Yield	
									2016	2-Yr. Avg.
			DAP[2]	days	DAP[2]	inches	0 - 9[3]	%	--------lbs/a--------	
Mycogen	Nexera 2020 CL	CL, HO	49	17	84	30	0	46.5	685	1484
Mycogen	Nexera 2022 CL	CL, HO	48	17	83	30	0	46.8	778	--
Mycogen	CL3701975H	CL, HO	48	18	83	28	0	45.7	643	--
Cibus	C1511	SU, TR	47	22	88	32	0	41.4	610	1276
Cibus	C1516	SU, TR	47	22	87	30	0	40.6	581	1155
Cibus	C5507	SU, TR	47	23	88	30	0	44.5	522	--
Cibus	C5522	SU, TR	47	22	87	29	0	44.0	471	--
Cibus	C5513	SU, TR	48	23	88	29	0	42.7	545	--
Trial Mean			47	20	86	30	0	44.0	604	--
C.V. %			0.9	2.9	0.5	3.4	0.0	1.9	12.0	--
LSD 5%			0.8	0.9	0.7	1.5	0.0	1.3	107	--
LSD 10%			0.5	0.6	0.5	1.2	0.0	1.0	88	--

[1] Type: SU-Sulfonylurea Tolerant, CL-Clearfield, TR-Traditional Oil Type, HO-High Oleic Oil Type.

[2] Days after planting.

[3] Lodging: 0 = none, 9 = lying flat on ground.

Planting Date: May 3

Harvest Date: August 9

NDSU Hettinger Reserch Extension Center

Canola - Roundup Ready - 2016 **Hettinger, ND**

Brand	Variety	Oil Type[1]	Days to Bloom	Bloom Duration	Days to Mature	Plant Height	Lodging	Oil Content	Seed Yield		
									2016	2-Yr. Avg.	3-Yr. Avg.
			DAP[2]	days	DAP[2]	inches	0 - 9[3]	%	lbs/a		
BrettYoung	6074 RR	TR	46	19	83	27	0	45.4	853	1531	--
BrettYoung	6080 RR	TR	46	17	81	30	0	46.7	782	--	--
Canterra Seeds	CS2000	TR	46	19	83	30	0	44.9	817	--	--
Canterra Seeds	CS2100	TR	46	16	80	31	0	46.9	910	--	--
Cargill	V12-1	HO	47	17	82	30	0	44.9	905	1586	1723
Cargill	V12-3	HO	46	17	81	31	0	45.7	903	--	--
Cargill	V22-1	HO	46	19	83	28	0	45.5	758	1495	--
Croplan	HyClass 930	TR	44	15	78	29	0	50.2	1040	--	--
Croplan	HyClass 955	TR	44	16	78	30	0	49.2	892	--	--
Croplan	HyClass 970	TR	46	17	80	31	0	48.2	828	--	--
Croplan	HyClass 972	TR	46	17	81	29	0	44.9	912	--	--
Dekalb	DKL30-20RR	TR	44	16	78	29	0	48.9	939	--	--
Dekalb	DKL38-48RR	TR	45	16	80	28	0	47.7	852	--	--
Integra	7150RR	TR	45	15	78	28	0	47.7	776	--	--
Integra	7257RR	TR	45	15	78	28	0	46.5	784	--	--
Mycogen Seeds	1020RR	HO	48	18	83	30	0	44.9	881	--	--
Mycogen Seeds	1022RR	HO	50	15	83	30	0	44.0	710	1351	--
Proseed	300 Mag	TR	45	18	81	28	0	47.0	800	1386	1478
Proseed	PS 5000	TR	46	19	83	30	0	44.6	793	1439	--
Star Seed	Star 402	TR	44	16	78	29	0	50.8	839	1407	1567
Trial Mean			46	17	81	29	0	46.4	822	--	--
C.V. %			0.9	4.3	0.8	4.0	--	2.2	10.9	--	--
LSD 5%			0.6	1.0	0.9	1.7	--	1.4	126	--	--
LSD 10%			0.5	0.8	0.7	1.4	--	1.2	106	--	--

[1] Type: TR-Traditional Oil Type, HO-High Oleic Oil Type.

[2] Days after planting.

[3] Lodging: 0 = none, 9 = lying flat on ground.

Planting Date: May 4

Harvest Date: August 5

NDSU Hettinger Research Extension Center

Flax - 2016 **Hettinger, ND**

Variety	Days to Bloom	Plant Height	Test Weight	Oil Content	-------Grain Yield-------- 2014	2015	2016	Average Yield 2-Yr	3-Yr
	**	inches	lbs/bu	%	---------- bu per acre ----------				
Bison	62	17	56.6	45.0	--	--	18.7	--	--
Carter*	63	16	54.9	45.0	29.5	35.5	18.2	26.9	27.7
CDC Bethume	62	17	56.9	44.8	30.4	32.5	19.1	25.8	27.3
CDC Glas	63	17	56.5	46.7	35.2	35.4	21.1	28.3	30.6
CDC Neela	61	16	56.0	45.9	37.6	36.2	21.6	28.9	31.8
CDC Sanctuary	63	17	56.6	45.8	35.6	35.1	22.5	28.8	31.1
CDC Sorel	63	18	56.7	45.9	32.8	32.8	21.4	27.1	29.0
Gold ND*	63	17	56.9	46.0	32.8	33.1	19.4	26.3	28.4
Nekoma	63	16	56.2	45.5	32.8	32.8	19.3	26.1	28.3
Omega*	63	16	57.5	44.8	31.2	27.2	19.4	23.3	25.9
Pembina	63	17	55.8	46.2	31.5	30.5	17.6	24.1	26.5
Prairie Blue	64	17	56.7	46.8	34.4	33.8	19.2	26.5	29.1
Prairie Grande	63	17	55.8	45.8	32.8	33.2	19.7	26.5	28.6
Prairie Sapphire	63	17	56.3	48.0	33.7	30.5	19.9	25.2	28.0
Prairie Thunder	64	16	56.5	45.7	33.1	28.2	18.9	23.6	26.7
Rahab 94	62	16	56.6	46.8	34.4	33.1	17.8	25.5	28.4
Shape	63	17	56.7	47.0	33.2	31.4	18.7	25.1	27.8
TAM201F	64	16	55.4	45.2	--	--	17.9	--	--
Webster	62	17	56.0	46.3	31.7	30.8	20.1	25.5	27.5
York	63	17	57.1	45.6	31.7	33.8	19.4	26.6	28.3
Trial Mean	63	17	56.4	45.9	32.2	32.4	19.5	27.4	29.4
C.V. %	1.1	4.8	1.1	1.7	10.0	6.9	9.6	--	--
LSD 5%	1.0	1.1	0.9	1.1	4.5	3.2	2.7	--	--
LSD 10%	0.8	0.9	0.7	0.9	3.8	2.6	2.2	--	--

* Yellow seed type.

** Days after planting.

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

Planting Date: April 13

Harvest Date: August 16

Previous Crop: Durum Wheat

Dry Bean - 2016 **Hettinger, ND**

Variety	Type	Plant Height	Plant Lodge	Test Weight	Grain Yield 2014	Grain Yield 2015	Grain Yield 2016	Average Yield 2 yr	Average Yield 3 yr
		inches	0-9*	lbs/bu	lbs per acre	lbs per acre	lbs per acre	lbs per acre	lbs per acre
LaPaz	Pinto	17	5	48.7	2140	2024	1318	1671	1827
Lariat	Pinto	16	7	48.1	2081	2021	1252	1637	1785
Maverick	Pinto	16	5	48.6	1824	1714	1070	1392	1536
ND-307	Pinto	17	5	47.0	1892	1735	1122	1429	1583
Palomino	Pinto	16	5	46.9	1727	1809	1099	1454	1545
Stampede	Pinto	18	5	47.2	1922	2028	1382	1705	1777
Windbreaker	Pinto	14	5	48.6	1833	1699	1069	1384	1534
Monterrey	Pinto	20	4	48.1	--	--	1454	--	--
Ensign	Navy	16	3	52.1	1682	1710	1360	1535	1584
HMS Medalist	Navy	16	2	52.5	1658	1597	1282	1440	1512
T9905	Navy	16	3	51.8	1913	1744	1438	1591	1698
Vista	Navy	17	3	54.1	1809	1619	1251	1435	1560
Merlot	Sm Red	17	4	48.6	1752	1802	1230	1516	1595
Rosetta	Pink	17	3	50.4	--	--	1261	--	--
Eclipse	Black	16	2	51.7	2098	1791	1429	1610	1773
Loreto	Black	16	3	53.8	1855	1618	1284	1451	1586
Zorro	Black	17	2	51.5	--	1986	1333	1660	--
Montcalm	Dk Red Kidney	16	3	47.9	--	1404	937	1171	--
Talon	Dk Red Kidney	16	3	47.2	--	1505	952	1229	--
Pink Panther	Lt Red Kidney	17	4	44.9	--	1705	1025	1365	--
Rosie	Lt Red Kidney	16	3	49.2	--	1586	1196	1391	--
Trial Mean		16	4	49.5	1867	1746	1226	1477	1635
C.V. %		8.5	18.9	1.5	8.2	7.3	9.8	--	--
LSD 5%		2.0	1.0	1.1	216	181	170	--	--
LSD 10%		1.6	0.8	0.9	180	151	142	--	--

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

Planting Date: May 23

Harvest Date: September 13

Previous Crop: Canola

NDSU Hettinger Research Extension Center

Chickpea - 2016 **Hettinger, ND**

Variety	Days to Flower	Height	Lodging	-------Seed Size (mm)-------				Test Weight	----- Grain Yield -----			Average Yield	
				<8	8-9	9-10	>10		2014	2015	2016	2 yr	3 yr
	DAP[1]	inches	0 - 9[2]	----------%----------				lb/bu	----------lbs/ac----------				
Kabuli Type													
CDC Frontier	48	24	0	16	69	13	1	54.4	4719	4952	2119	3536	3930
CDC Luna	47	20	0	18	62	18	2	53.4	3844	4787	2054	3421	3562
Sawyer	48	24	0	8	36	38	18	53.4	3223	3954	1387	2671	2855
Sierra	49	23	0	8	21	38	33	52.5	1936	3845	879	2362	2220
Small Kabuli Type													
B-90	48	22	0	85	14	1	0	55.9	4204	4345	1867	3106	3472
Desi Type													
CDC Anna	47	22	0	91	8	0	0	53.7	4718	4299	2136	3218	3718
Mean	48	22	0	32	37	23	8	53.9	3369	3858	1736	3052	3293
C.V. %	1.3	5.9	--	9.2	7.0	14.7	18.5	1.2	11.1	8.2	12.7	--	--
LSD 5%	1	2	NS	4	4	5	2	1.0	531	448	324	--	--
LSD 10%	1	2	NS	4	3	4	2	0.8	443	374	268	--	--

[1] Days after planting.

[2] Lodging: 0 = none, 9 = lying flat on ground.

Planting Date: May 3

Harvest Date: August 17

Previous Crop: Winter Wheat

Field Pea - 2016 **Hettinger, ND**

Variety	Days to Flower	Flower Duration	Days to Mature	Vine Length	Canopy Height	Height Index[1]	Lodging	Seed Protein	1,000 Seed Wt.	Seeds Lb	Test Weight	Seed Yield		
												2016	2-Yr. Avg.	3-Yr. Avg.
	DAP[2]	days	DAP[2]	inches	inches	%	0 - 9[3]	%	gm	seeds	lb/bu	bu/a		
Yellow Cotyledon Type														
Abarth	61	11	85	18	18	99	5	25.2	239	1898	59.5	18.2	--	--
Agassiz	61	12	87	20	17	89	3	26.5	215	2110	56.3	20.5	35.7	41.4
Bridger	60	12	85	20	18	91	4	26.2	208	2181	60.3	18.5	33.9	42.5
DS Admiral	60	11	86	20	15	73	4	26.3	206	2227	59.9	19.0	38.5	44.1
Durwoood	61	12	87	22	15	67	3	26.7	230	1982	58.4	22.2	--	--
Gunner	61	12	87	22	17	76	4	27.0	219	2074	58.9	24.2	34.9	42.1
Hyline	61	12	87	19	15	81	6	25.3	229	1981	58.0	17.5	33.4	--
LGPN4243	60	12	86	19	16	82	5	27.4	238	1912	58.5	18.3	37.7	--
LGPN4244	59	12	85	19	18	97	4	26.2	206	2208	59.3	22.2	39.8	--
LGPN4902	61	12	86	20	18	90	2	26.9	188	2422	59.1	17.8	--	--
LGPN4903	60	12	86	21	18	87	2	25.2	206	2203	58.7	20.5	34.5	--
LGPN4906	60	12	86	19	17	88	4	26.8	203	2242	58.3	18.6	--	--
LGPN4907	60	11	85	19	14	74	6	25.4	266	1710	58.6	19.0	--	--
Mystique	61	12	87	21	18	85	4	26.4	223	2039	59.2	20.3	--	--
Navarro	57	16	87	20	15	77	6	27.3	257	1770	57.8	20.1	--	--
Nette 2010	59	13	86	21	15	71	3	25.4	217	2091	58.4	19.7	38.8	44.8
Pulse USA 0014	60	12	86	22	17	79	3	26.6	220	2064	59.6	19.4	--	--
Pusle USA EXP115	61	11	86	20	20	96	3	27.8	222	2044	61.8	19.6	--	--
Salamanca	60	12	86	21	19	87	4	28.3	241	1883	58.8	20.8	34.9	--
Spider	62	14	90	21	16	77	6	27.5	235	1934	59.0	16.2	35.1	--
SW Midas	61	12	87	17	14	80	5	25.7	202	2247	57.9	15.6	35.3	40.5

Table continued on next page

Field Pea - 2016 **Hettinger, ND**

Variety	Days to Flower	Flower Duration	Days to Mature	Vine Length	Canopy Height	Height Index[1]	Lodging	Seed Protein	1,000 Seed Wt.	Seeds Lb	Test Weight	Seed Yield 2016	Seed Yield 2-Yr. Avg.	Seed Yield 3-Yr. Avg.
	DAP[2]	days	DAP[2]	inches	inches	%	0 - 9[3]	%	gm	seeds	lb/bu	bu/a	bu/a	bu/a
Table continues from previous page														
Green Cotyledon Type														
Arcadia	60	12	86	16	15	92	6	26.5	180	2521	58.8	17.6	--	--
CDC Striker	61	11	86	18	14	82	6	26.3	195	2336	59.2	15.9	33.7	40.2
Cruiser	60	13	87	18	15	81	7	26.3	190	2394	60.1	14.9	31.4	36.4
K2	60	12	86	18	15	87	3	25.9	206	2205	59.9	18.2	--	--
LGPN1903	62	11	87	19	16	84	4	26.9	211	2150	56.0	17.9	--	--
LGPN1904	62	11	87	21	19	92	1	26.4	219	2072	58.6	21.1	--	--
LGPN1905	60	12	86	18	14	77	3	25.7	228	1994	58.8	17.4	--	--
LN1123	62	10	86	20	16	81	3	25.7	212	2145	60.6	20.4	--	--
Pulse USA 0214	61	12	87	20	14	74	5	27.5	243	1871	59.1	18.6	--	--
Viper	60	11	85	20	18	90	5	27.7	222	2044	58.5	17.7	--	--
Marrowfat Type														
Pulse USA 1536	62	11	87	23	17	71	2	29.5	312	1457	57.9	15.7	--	--
Trial Mean	60	12	86	20	16	83	4	26.6	221	2075	58.9	18.9	35.5	41.5
C.V. %	1.1	7.7	0.9	8.1	15.0	13.7	37.2	1.3	3.8	4.0	2.1	14.8	--	--
LSD 5%	0.6	1.3	1.1	2.3	3.4	16.0	2.1	0.5	12	117	1.7	3.9	--	--
LSD 10%	0.5	1.1	1.0	1.9	2.8	13.0	1.7	0.4	10	98	1.4	3.1	--	--

[1] Harvest Index; Plant height at time of harvest relative to plant height at end of bloom.

[2] Days after planting.

[3] Lodging: 0 = none, 9 = lying flat on ground.

Planting Date: April 15

Harvest Date: July 25

Previous Crop: Durum Wheat

NDSU Hettinger Reserach Extension Center

Lentil - 2016 **Hettinger, ND**

Variety	Days to Flower	Height	Lodging	Seed Protein	1,000 Seed Wt.	Seeds Lb	Test Weight	----- Grain Yield ----- 2014	2015	2016	Average Yield 2 yr	3 yr
	DAP[1]	inches	0 - 9[2]	%	gm	seeds	lb/bu	----------lbs/acre----------				
Large Green Type												
CDC Greenland	61	12	1	24.5	66	6930	58.6	2182	2823	1219	2021	2075
Pennell	61	10	1	24.8	67	6794	58.0	2269	2527	1079	1803	1958
Riveland	61	13	1	24.2	71	6393	57.4	2075	2374	1118	1746	1856
Medium Green Type												
Avondale	61	12	1	23.2	53	8574	59.5	2700	2844	1164	2004	2236
CDC Richlea	61	11	1	23.7	51	8898	60.4	2084	2804	1299	2052	2062
Small Green Type												
CDC Viceroy	61	11	1	25.1	38	11953	62.4	2388	2951	1352	2152	2230
Eston	61	10	1	25.3	39	11788	61.8	2601	2823	867	1845	2097
ND Eagle	61	9	2	24.2	42	10812	61.7	2577	3409	890	2150	2292
French Green Type												
CDC Lemay	61	10	2	24.9	39	11788	61.4	2603	3005	598	1802	2069
Small Red Type												
CDC Red Rider	61	11	1	23.6	49	9261	61.4	2475	2974	1359	2167	2269
CDC Redberry	61	11	1	25.0	48	9553	61.5	2731	3295	902	2099	2309
CDC Rosetown	61	10	1	25.0	36	12639	63.1	2319	2768	1304	2036	2130
CDC Rouleau	61	11	1	23.1	41	11205	60.5	2842	3154	1157	2156	2384
Spanish Brown Type												
Pardina	61	9	3	23.7	44	10309	61.2	2602	3266	645	1956	2171
Trial Mean	61	10	2	24.2	49	9690	60.8	2394	2687	1043	1932	2128
C.V. %	0.6	7.4	38.6	1.3	4.0	3.8	1.0	10.2	7.0	11.8	--	--
LSD 5%	0.5	1.1	0.8	0.4	2.8	517	0.9	344	264	174	--	--
LSD 10%	0.4	0.9	0.7	0.4	2.3	432	0.7	289	221	145	--	--

[1] Days after planting.

[2] Lodging: 0 = none, 9 = lying flat on ground.

Planting Date: April 15

Harvest Date: August 1

Previous Crop: Peas

NDSU Hettinger Resarch Extension Center

Clearfield Lentil - 2016 **Hettinger, ND**

Variety	Days to Flower	Plant Height	Plant Lodging	Seed Protein	1,000 Seed Wt.	Seeds Lb	Test Weight	----- Grain Yield ----- 2014	2015	2016	Average Yield 2 yr	3 yr
	DAP[1]	inches	0 - 9[2]	%	gm	seeds	lb/bu	----------lbs/acre----------				
Medium Green Type												
CDC Imigreen CL	61	12	1	25.6	58	7825	60.0	2311	3012	1601	2307	2308
CDC Impress CL	61	11	3	23.0	52	8824	60.1	--	--	1705	--	--
Small Green Type												
CDC Imvincible CL	61	10	3	25.4	38	12119	62.1	--	3624	1925	2775	--
French Green Type												
CDC Peridot CL	61	10	1	24.3	42	10812	62.3	--	--	1483	--	--
Small Red Type												
CDC Maxim CL	61	10	0	23.1	42	10800	61.7	3566	4007	1601	2804	3058
CDC Impala CL	61	10	0	25.3	35	12971	62.8	2754	3428	1710	2569	2631
CDC Dazil CL	61	10	0	23.1	38	12103	61.2	--	--	1623	--	--
CDC Proclaim CL	61	9	1	23.3	43	10677	60.8	--	--	1741	--	--
Mean	61	10	1	24.1	43	10766	61.4	2817	3518	1655	2614	2666
C.V. %	0.6	6.0	58.1	1.0	3.4	3.3	1.1	6.6	7.6	8.6	--	--
LSD 5%	0.5	0.9	0.8	0.4	2.2	529	1.0	286	428	210	--	--
LSD 10%	0.4	0.7	0.7	0.3	1.8	438	0.8	240	347	174	--	--

[1] Days after planting.

[2] Lodging: 0 = none, 9 = lying flat on ground.

Planting Date: April 15

Harvest Date: August 1

Previous Crop: Field Pea

NDSU Hettinger Reaserch Extension Center

Soybean - Conventional - 2016 **Hettinger, ND**

Company/Brand	Variety	Maturity	Mature Date	Plant Height	Test Weight	Seed Oil	Seed Protein	Yield 2016	Average Yield 2-Yr	Average Yield 3-Yr
				inches	lbs/bu	%	%	bu/a	bu/a	bu/a
NDSU	ND-Henson	0.00	8/31	19	51.0	17.7	32.8	23.2	24.8	--
NDSU	Ashtbula	0.4	9/7	20	50.6	18.7	31.2	23.6	24.7	32.4
NDSU	Sheyenne	0.7	9/10	22	50.2	17.7	31.1	27.2	27.6	35.3
NDSU	ND Bison	0.7	9/13	21	49.9	17.5	31.4	27.2	--	--
Trial Mean			9/8	20	50.5	18.0	31.6	26.0	25.7	33.9
C.V. %			0.6	7.5	0.6	1.4	1.7	8.9	--	--
LSD 5%			1.1	2.3	1.7	0.4	0.8	3.5	--	--
LSD 10%			0.9	1.9	1.4	0.3	0.7	2.8	--	--

Planting Date: May 4
Harvest Date: September 13
Previous Crop: Wheat

NDSU Hettinger Research Extension Center

Soybean - Roundup Ready - 2016 **Hettinger, ND**

Company/Brand	Variety	Maturity	Mature Date	Plant Height	Test Weight	Seed Oil	Seed Protein	Yield 2016	Average Yield 2-Yr	Average Yield 3-Yr
				inches	lbs/bu	%	%	----------bu/a----------		
Legacy Seed	LS-0135	0.1	8/30	22	49.6	17.4	34.1	19.7	--	--
Legacy Seed	LS-0214	0.2	9/5	22	48.8	17.6	33.6	25.7	--	--
Proseed	30-20	0.2	9/4	22	49.4	17.7	33.5	26.9	39.5	44.1
Integra	20300	0.3	9/11	21	49.4	16.7	33.7	26.9	38.8	41.3
Legacy Seed	LS-0334	0.3	9/12	21	49.5	17.2	33.1	27.5	40.5	43.5
Integra	20418	0.4	9/6	24	49.5	17.3	33.2	27.0	--	--
REA Hybrids	64G94	0.4	9/5	22	49.4	18.4	31.9	26.3	36.1	--
Proseed	XT605	0.5	9/9	23	48.4	16.8	34.1	26.2	--	--
Integra	20600	0.6	9/9	24	49.2	17.4	31.7	31.0	42.7	45.3
Legacy Seed	LS-0635N	0.6	9/9	24	49.9	16.9	33.4	30.1	42.6	--
REA Hybrids	66G14	0.6	9/10	24	48.2	16.8	32.9	30.5	41.2	--
Integra	20775N	0.7	9/12	23	48.0	17.2	33.0	29.0	--	--
REA Hybrids	R0815	0.8	9/11	22	48.3	17.4	32.5	30.3	39.7	--
Trial Mean			9/8	23	49.1	17.3	33.1	27.5	40.4	45.3
C.V. %			1.0	9.3	1.5	1.5	1.6	13.2	--	--
LSD 5%			1.8	3.0	1.0	0.4	0.7	5.2	--	--
LSD 10%			1.6	2.5	0.9	0.3	0.6	4.3	--	--

Planting Date: May 4
Harvest Date: September 13
Previous Crop: Safflower

Soybean - Planting Date - 2016 **Hettinger, ND**

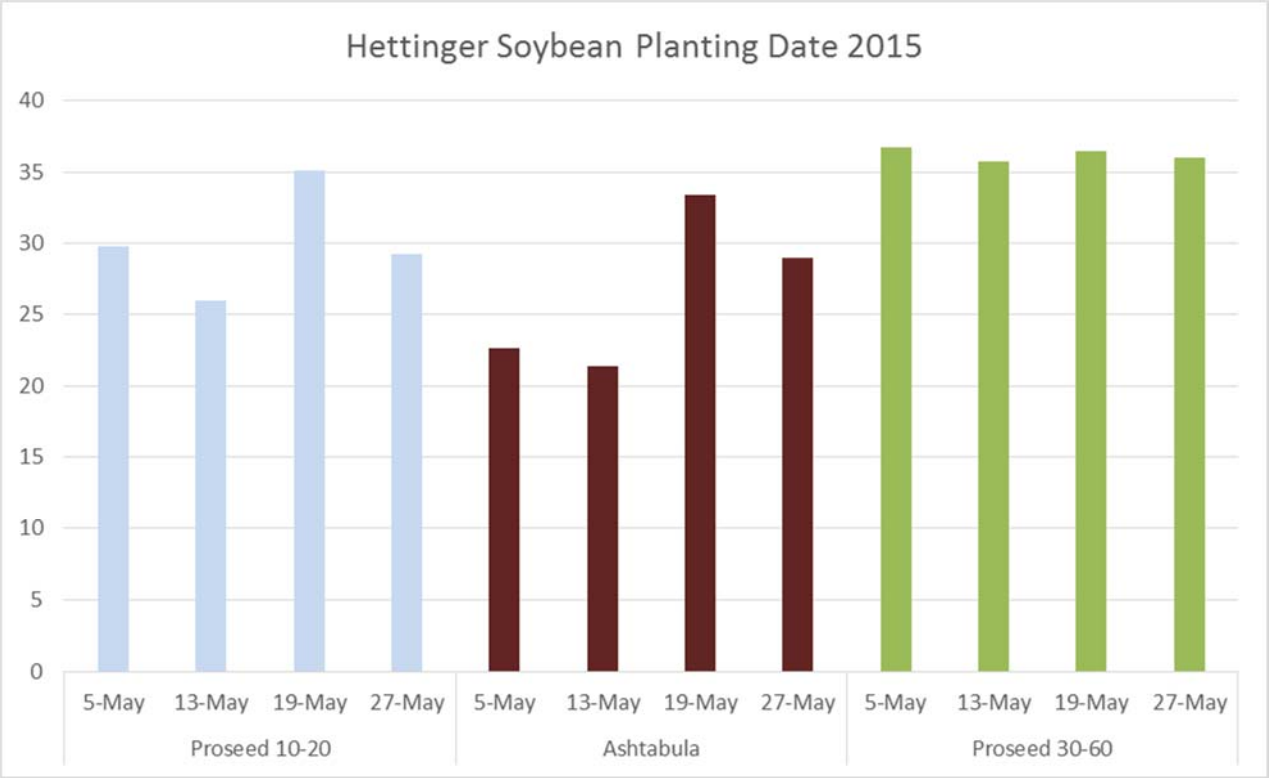
Treatment	Flower Date	Mature Date	Harvest Date	Plant Height	Test Weight	Seed Oil	Seed Protein	Grain Yield
				inches	lbs/bu	%	%	bu/ac
Planting Date								
May 4	6/28	9/5	9/12	23	51.1	17.4	33.0	24.7
May 19	7/5	9/13	9/19	25	50.5	17.5	32.9	31.7
June 2	7/13	9/18	9/25	24	48.2	17.3	32.6	25.9
LSD 5%	0	1	0	1	0.4	NS	NS	1.2
Variety								
Ashtabula (0.4)	7/1	9/7	9/19	24	50.2	18.1	32.2	23.9
Proseed 50-60 (0.6)	7/6	9/12	9/19	23	50.3	17.1	32.6	28.7
Proseed 30-80 (0.8)	7/6	9/15	9/19	24	49.1	17.5	32.1	28.2
ProSoy (0.8)	7/6	9/13	9/19	25	50.1	16.8	34.4	29.0
LSD 5%	0	1	NS	1	0.5	0.2	0.4	1.4
Population								
80,000	7/5	9/12	9/19	24	49.8	17.4	32.8	27.1
120,000	7/5	9/12	9/19	24	50.3	17.4	32.7	27.6
160,000	7/5	9/12	9/19	24	50.1	17.3	33.0	28.0
200,000	7/5	9/12	9/19	24	49.7	17.4	32.8	27.0
LSD 5%	NS	NS	NS	NS	0.5	NS	NS	NS
Date x Variety								
May 4 - Ashtabula	6/23	8/30	9/12	22	51.7	18.3	31.9	19.4
May 4 - Proseed 50-60	6/29	9/5	9/12	22	51.6	17.0	33.0	27.2
May 4 - Proseed 30-80	6/29	9/11	9/12	24	49.7	17.4	32.8	27.7
May 4 - ProSoy	6/29	9/6	9/12	24	51.5	16.8	34.3	24.3
May 19 - Ashtabula	7/1	9/8	9/19	25	50.5	18.1	32.4	29.1
May 19 - Proseed 50-60	7/6	9/13	9/19	23	51.6	17.4	32.5	32.0
May 19 - Proseed 30-80	7/6	9/15	9/19	23	50.0	17.8	31.9	30.0
May 19 - ProSoy	7/5	9/15	9/19	28	50.1	16.8	34.7	35.8
June 2 - Ashtabula	7/10	9/14	9/25	23	48.6	18.0	32.2	23.2
June 2 - Proseed 50-60	7/14	9/18	9/25	24	47.8	17.0	32.4	26.7
June 2 - Proseed 30-80	7/14	9/20	9/25	24	47.6	17.5	31.7	26.8
June 2 - ProSoy	7/13	9/18	9/25	25	48.8	16.7	34.1	26.9
LSD 5%	0	1/2	0	NS	0.8	NS	NS	2.5
Trial Mean	7/5	9/12	9/19	24	50.0	17.4	32.8	27.4
C.V. %	--	0.1	--	8.9	2.2	3.3	3.2	13.0

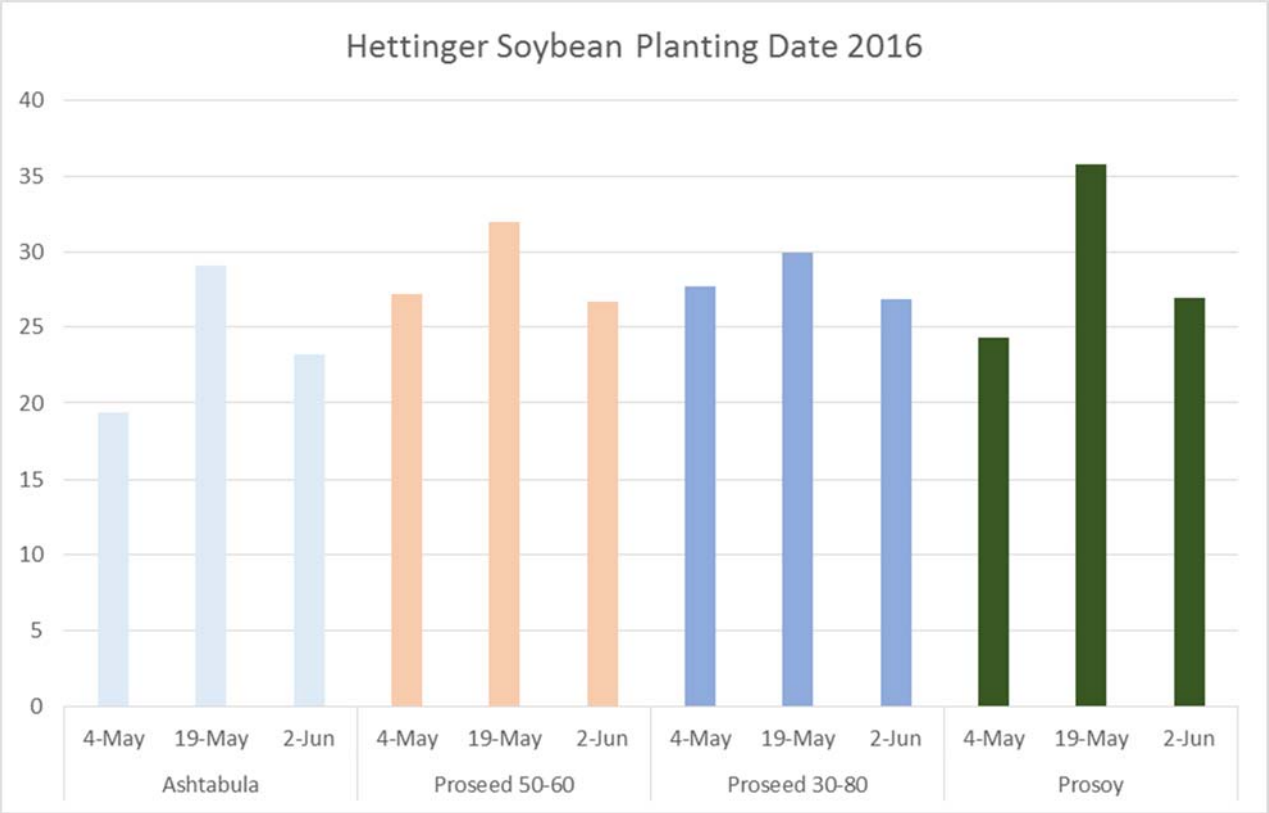
Analysis of Variance

Source	DF	Anova SS	MS	F Value	Pr > F
Rep	3	485.02	161.67	12.64	<.0001
Date	2	1808.76	904.38	70.72	<.0001
Variety	3	819.56	273.19	21.36	<.0001
Date*Variety	6	464.10	77.35	6.05	<.0001
Population	3	33.07	11.02	0.86	0.4625
Date*Population	6	64.41	10.74	0.84	0.5414
Variety*Population	9	73.26	8.14	0.64	0.7643
Date*Variety*Population	18	138.50	7.69	0.60	0.8936

Soybean - Planting Date - 2015 **Hettinger, ND**

Treatment	Flower Date	Mature Date	Harvest Date	Plant Height	Test Weight	Seed Oil	Seed Protein	Grain Yield
				inches	lbs/bu	%	%	bu/ac
Planting Date								
5/5	7/10	9/4	9/12	31	54.7	16.8	33.2	29.7
5/13	7/10	9/8	9/12	27	55.5	16.6	33.2	27.7
5/19	7/11	9/10	9/16	26	55.6	16.7	33.3	35.0
5/27	7/12	9/14	9/24	26	55.4	16.6	33.4	31.4
LSD 5%	0.5	2.0	2.0	1.1	0.4	NS	NS	1.2
Variety								
Proseed 10-20 (0.2)	7/11	9/6	9/15	28	55.3	16.0	33.2	30.0
Ashtabula (0.4)	7/11	9/8	9/15	29	55.2	17.5	32.8	26.6
Proseed 30-60 (0.6)	7/11	9/12	9/18	26	55.5	16.5	33.7	36.2
LSD 5%	0.4	0.0	2.0	0.9	NS	0.1	0.2	1.0
Date X Variety								
5/5 - Proseed 10-20	7/10	9/1	9/10	32	54.0	16.3	33.1	29.8
5/5 - Ashtabula	7/10	9/3	9/10	32	55.0	17.5	32.7	22.6
5/5 - Proseed 30-60	7/10	9/8	9/16	28	55.2	16.6	33.7	36.7
5/13 - Proseed 10-20	7/10	9/5	9/10	28	55.6	15.8	33.1	25.9
5/13 - Ashtabula	7/11	9/7	9/10	29	55.4	17.4	32.9	21.4
5/13 - Proseed 30-60	7/11	9/11	9/16	24	55.7	16.5	33.5	35.7
5/19 - Proseed 10-20	7/11	9/7	9/16	26	55.4	16.0	33.3	35.1
5/19 - Ashtabula	7/11	9/9	9/16	27	55.3	17.6	32.8	33.4
5/19 - Proseed 30-60	7/12	9/13	9/16	25	56.0	16.6	33.8	36.4
5/27 - Proseed 10-20	7/12	9/11	9/24	26	56.3	16.0	33.4	29.3
5/27 - Ashtabula	7/12	9/13	9/24	28	55.0	17.4	32.9	29.0
5/27 - Proseed 30-60	7/13	9/17	9/24	26	54.9	16.3	33.8	36.0
	NS	--	--	NS	***	NS	NS	***
Trial Mean	7/11	9/9	9/16	27	55.3	16.7	33.3	30.9
C.V. %	0.0	0.0	0.0	4.8	0.9	1.3	1.0	4.1


Hettinger Soybean Planting Date 2015
40
35
30
25
20
15
10
5
0
5-May
13-May
19-May
27-May
Proseed 10-20
Ashtabula
Proseed 30-60


Hettinger Soybean Planting Date 2016
40
35
30
25
20
15
10
5
0
4-May
19-May
2-Jun
Ashtabula
Proseed 50-60
Proseed 30-80
Prosoy

NDSU Hettinger Research Extension Center

Corn - 2016 **Hettinger, ND**

Company	Hybrid	Relavtive Maturity[1]	Days to Silk	Plant Height	Ear Height	Stalk Lodge	Moisture Content	Test Weight	Grain Yield	
									2016	2-Yr
		days	DAP[2]	inches	inches	%	%	lbs/bu	------bu/ac------	
AgVenture	AV2985AB	85	73	83	30	0	20.4	55.8	141.6	--
AgVenture	AV4491AM	91	75	81	33	0	26.0	54.9	107.1	--
AgVenture	RL2289AM	82	69	82	32	0	15.6	53.6	134.7	128.3
AgVenture	RL3645AM	89	74	87	33	0	19.0	52.8	129.5	124.7
Integra	3236 VT2PRIB	82	72	84	29	0	19.3	56.5	115.0	--
Integra	3325 GT/CB/LL	83	74	78	25	0	25.0	56.9	131.6	--
Integra	3537 VT2PRIB	85	73	86	33	0	22.4	56.1	130.3	129.9
Integra	9352 VT3PRO	85	72	83	28	0	21.9	56.0	138.8	131.8
Legacy	L-2245 VT2PRO	82	74	84	32	0	19.6	58.1	124.1	--
Legacy	L-2516 VT2PRO	85	72	81	28	0	20.8	55.0	137.5	--
Legacy	L-2813 VT2PRO	87	75	85	30	0	23.2	55.1	133.3	135.3
Legacy	L-2916 VT2PRO	88	71	84	27	0	23.1	56.1	134.1	--
Legacy	L-2924 VT2PRO	89	73	89	31	0	23.4	54.3	133.7	129.7
Proseed	1083	83	73	84	29	0	18.8	55.6	138.1	--
Proseed	1283	83	71	79	25	0	20.1	58.9	126.4	115.0
Proseed	1286	86	73	85	31	0	22.7	55.9	122.6	122.6
Proseed	1383	83	73	83	27	0	19.4	55.9	134.0	--
Proseed	1384	84	71	83	28	0	21.0	57.2	118.1	117.2
Proseed	1385	85	73	87	28	0	21.8	54.8	104.2	--
Proseed	1483	83	72	82	30	0	20.6	56.0	111.8	--
Proseed	1487	87	74	85	32	0	21.0	55.4	136.2	--
REA Hybrids	2A871-RIB	87	71	86	29	0	21.9	56.9	103.9	109.0
REA Hybrids	2B840-RIB	84	72	86	30	0	20.7	54.8	119.3	123.0
REA Hybrids	2B850-RIB	85	72	80	28	0	18.0	56.4	134.0	128.2
REA Hybrids	2B860-RIB	86	70	84	31	0	18.7	55.8	131.7	--
REA Hybrids	3A330-RIB	90	74	86	30	0	22.8	53.9	123.8	--
Trial Mean			72	84	29	0	21.0	55.7	126.7	124.5
C.V. %			1.6	3.3	10.4	1019.0	9.5	1.7	8.5	--
LSD 5%			1.6	3.9	4.3	0.2	2.8	1.4	15.2	--
LSD 10%			1.3	3.3	3.6	0.1	2.4	1.1	12.7	--

[1] Relavtive maturity provided by the company.

[2] Days after planting

Planting Date: May 17

Harvest Date: October 26

Previous Crop: Wheat

Anthem Flex Applied as Preemergence Burndown for Weed Control in Spring Wheat

Caleb Dalley, HREC, Hettinger, ND, 2016

A field trial was conducted to evaluate weed control and spring wheat tolerance to Anthem Flex applied as part of a PRE burndown combined with POST application of WideMatch compared to other PRE/POST and total POST herbicide options. Anthem Flex combines the contact herbicide carfentrazone with the soil active preemergence herbicide pyroxasulfone. Spring wheat 'Elgin' was planted at a rate of 100 lb/A on May 6, 2016 using a John Deere 1590 no-till drill. At planting, 40 lb/A of starter fertilizer (18-46-0) was drilled into the planting drill. Prior to planting, urea fertilizer (46-0-0) was broadcast applied at a rate of 120 LB/A. PRE burndown treatments were applied on May 9 using a tractor mounted research sprayer at a spray volume of 10 gal/A using flat fan nozzles spaced at 20 inches and using CO2 as a propellant. Wheat emerged on May 15. Little rainfall occurred between planting and crop emergence (0.36 inches) and daily rainfall never exceed 0.2 inches. POST treatments were applied on June 15 using the same equipment and procedures as previously described. Weeds present in the trial included field pennycress, shepherd's purse, flixweed, horseweed, common mallow, Japanese brome and common lambsquarters, and green foxtail. Wheat was evaluated for injury at 8 and 17 days after crop emergence and at 7, 16, 21, and 28 days after POST treatment application (DAT). No injury was observed as a result of PRE treatments at any of the evaluation dates. Mild injury in the form of stunting or slight yellowing was observed following POST application of Goldsky and WideMatch plus Axial. Injury would not have been noticed if not for side by side comparisons with untreated wheat. A general rating of annual mustard control was taken at 18 days after the PRE application. All Anthem Flex plus glyphosate treatments control annual mustards97-99%. Horseweed was controlled 100% with all PRE treatments of AnthemFlex plus glyphosate, regardless of rate. POST treatments controlled horseweed in a range of 74% with Goldsky to 88% with Olympus followed by WideMatch. Common lambsquarters was controlled 96 to 100% with PRE treatments of Anthem Flex plus glyphosate. At 28 DAT, common lambsquarters control was 71% or less with POST treatments. Prickly lettuce was controlled 100% with PRE application of Anthem Flex plus glyphosate. At 28 DAT, common lambsquarters control ranged from 65% with Goldsky to 80% with WideMatch plus Axial. Green foxtail control at 28 days after POST application ranged from 75 to 83% with PRE application of Anthem Flex plus glyphosate, with no significant increase in control as rate increased, however, there was a trend for increased green foxtail control as Anthem Flex rate increased from 2.5 oz/A (75%) to 4.5 oz/A (83%). Anthem Flex plus glyphosate followed by Everest 2.0 and WideMatch controlled green foxtail at 89%. POST applications provided poor control of green foxtail (30-54%). Spring wheat was harvested on August 4 using a Kincaid plot combine with a 5 foot header. All PRE Anthem Flex plus glyphosate treatments yielded similar to the weed free control. The highest yield was recorded in plots where the highest rate of Anthem Flex was used (4.5 oz/A). Yield was less than the weed free control with POST treatments of WideMatch plus Axial and Goldsky. Olympus PRE followed by WideMatch POST yielded similar to the weed free control. This year's trial alone would conclude that Anthem Flex is safe when applied PRE to spring wheat. However, conditions at Hettinger were very dry during 2016 with less than 4 inches of rain occurring between planting and harvest compared with average rainfall of around 8 inches during this time period. Further evaluation of Anthem Flex during average or above average rainfall is needed to come to firm conclusions regarding the safety of Anthem Flex applied PRE to spring wheat in western North Dakota.

Treatment	Rate	Wheat injury 7 DAT	Wheat injury 16 DAT	Wheat injury 28 DAT	Common lambsquarters	Green foxtail	Prickly Lettuce	Horseweed	Test wt	Yield
		——%——			——control at 28 DAT (%)——				lbs/bu	bu/A
1 Anthem Flex	2.5 oz/a	0 c	0 a	0 b	100 a	75 c	100 a	100 a	54 a	22.7 ab
Glyphosate	32 oz/a									
AMS	17 lb/100 gal									
WideMatch	1.33 pt/a									
2 Anthem Flex	3 oz/a	0 c	0 a	0 b	96 a	76 c	100 a	100 a	53 abc	25.6 a
Glyphosate	32 oz/a									
AMS	17 lb/100 gal									
WideMatch	1.33 pt/a									
3 Anthem Flex	3.5 oz/a	0 c	0 a	0 b	100 a	81 bc	100 a	100 a	53 ab	25.8 a
Glyphosate	32 oz/a									
AMS	17 lb/100 gal									
WideMatch	1.33 pt/a									
4 Anthem Flex	4.5 oz/a	0 c	0 a	0 b	100 a	83 bc	100 a	100 a	53 abc	27.0 a
Glyphosate	32 oz/a									
AMS	17 lb/100 gal									
WideMatch	1.33 pt/a									
5 Anthem Flex	3.5 oz/a	0 c	0 a	0 b	100 a	89 b	100 a	100 a	53 ab	23.3 ab
Glyphosate	32 oz/a									
AMS	17 lb/100 gal									
Everest 2.0	1 oz/a									
WideMatch	1.33 pt/a									
6 WideMatch	1.33 pt/a	3 b	0 a	3 a	68 bc	54 d	80 b	85 b	52 c	14.3 d
Axial XL	16.4 oz/a									
7 Olympus	0.9 oz/a	0 c	0 a	0 b	71 b	30 f	74 c	88 b	53 abc	25.1 a
WideMatch	1.33 pt/a									
8 GoldSky	1 pt/a	6 a	0 a	1 b	59 c	40 e	65 d	74 c	53 bc	17.1 cd
9 Weed Free		0 c	0 a	0 b	100 a	100 a	100 a	100 a	53 bc	25.7 a
Glyphosate	32 oz/a									
AMS	17 lb/100 gal									
Olympus	0.9 oz/a									
10 Untreated		0 c	0 a	0 b	0 d	0 g	0 e	0 d	50 d	19.0 bc
LSD P=.10		1.1	NS	1.3	10.6	9.0	4.6	4.6	1.5	4.46
Standard Deviation		0.9	0.0	1.1	8.8	7.4	3.8	3.8	1.3	3.70
CV		118.34	0.0	252.43	11.05	11.87	4.64	4.54	2.43	16.4
Treatment F		14.9	0.00	3.38	53.8	70.07	277.9	262.1	3.71	5.43
Treatment Prob(F)		0.0001	1.0000	0.0067	0.0001	0.0001	0.0001	0.0001	0.0039	0.0003

PRE/POST Combinations of Varro, Olympus, and Huskie Complete for Weed Control in Spring Wheat

Caleb Dalley, HREC, Hettinger, ND, 2016

A field trial was conducted to evaluate weed control and spring wheat tolerance to pre and postemergence combinations of Varro, Olympus, and Huskie Complete. Spring wheat 'Elgin' was planted using a John Deere 1590 into barley stubble. At planting, starter fertilizer (18-46-0) was drilled into the planting furrow at a rate of 40 lbs/A. Prior to planting urea (46-0-0) was broadcast applied at a rate of 120 lbs/A using a drop spreader. PRE treatments were applied on May 9 using a tractor mounted research sprayer at a spray volume of 10 gal/A using flat fan nozzles spaced at 20 inches. Wheat emerged on May 15. The growing season at Hettinger was dryer than average with only 3.4 inches of rain falling in between planting and harvest; compared to an average of 7.9 inches during this time period. Low rainfall limited the efficacy of soil applied PRE herbicides. POST treatments were applied as previously described on June 2. At time of application, wheat was in the tillering stage and had an average height of 7 inches to the longest extended leaf. Crop injury and weed control were evaluated at 12, 22, and 35 days after treatment (DAT). Minor injury (,6%), in the form of stunted growth, was observed with some treatments at 12 DAT. No significant injury was observed at 22 or 35 DAT. Weed control increased in nearly all cases when going from 12 to 35 DAT. At 35 DAT, Japanese brome, prickly lettuce, and horseweed control were 89 to 100%; wild oat control ranged from 88 to 95%; and green foxtail control ranged from 77 to 87%. Wheat was harvested on August 4 using a Kincaid plot harvester with a 5 foot wide header. No significant differences in yield were observed due to herbicide treatment. All herbicide combinations provided good or excellent weed control with little to no injury to the spring wheat crop. POST options for weed control were valuable in a season where low rainfall limited the efficacy of soil-applied PRE herbicides.

Treatment	Rate	Wheat injury			J. brome	G. foxtail	Wild oat	Horseweed	Test wt	Yield
		12 DAT	22 DAT	35 DAT						
		————%————			————control at 35 DAT (%)————				-lbs/bu-	-bu/A-
1 Untreated		0 d	0 a	0 a	0 c	0 c	0 e	0 c	53 a	30.5 a
2 Varro	6.85 oz/a	1 cd	1 a	0 a	96 b	84 a	88 d	92 b	55 a	30.2 a
Carnivore	1 pt/a									
AMS	0.5 lb/a									
3 Varro	6.85 oz/a	2 bcd	1 a	0 a	100 a	85 a	92 a-d	93 b	55 a	31.8 a
Carnivore	1 pt/a									
Olympus	0.2 oz/a									
AMS	0.5 lb/a									
4 Olympus	0.2 oz/a	6 a	2 a	0 a	100 a	83 a	94 ab	94 ab	54 a	31.2 a
Varro	6.85 oz/a									
Carnivore	1 pt/a									
AMS	0.5 lb/a									
5 Olympus	0.2 oz/a	0 d	1 a	0 a	100 a	87 a	95 a	94 ab	55 a	33.9 a
Varro	6.85 oz/a									
Carnivore	1 pt/a									
Olympus	0.2 oz/a									
AMS	0.5 lb/a									
6 Huskie Complete	13.7 oz/a	4 ab	3 a	0 a	99 a	84 a	89 cd	100 a	54 a	31.5 a
AMS	0.5 lb/a									
7 Huskie Complete	13.7 oz/a	3 bc	4 a	0 a	100 a	87 a	89 bcd	96 ab	55 a	36.2 a
Olympus	0.2 oz/a									
AMS	0.5 lb/a									
8 Olympus	0.2 oz/a	4 ab	3 a	0 a	98 ab	77 b	90 bcd	89 b	53 a	32.3 a
Huskie Complete	13.7 oz/a									
AMS	0.5 lb/a									
9 Olympus	0.2 oz/a	4 abc	0 a	0 a	100 a	85 a	93 abc	95 ab	55 a	33.7 a
Huskie Complete	13.7 oz/a									
Olympus	0.2 oz/a									
AMS	6.85 lb/a									
LSD P=.10		2.8	2.5	NS	2.3	4.6	5.0	7.2	1.5	4.47
Standard Deviation		2.3	2.1	0.0	1.9	3.8	4.1	6.0	2.21	11.4
CV		85.73	119.04	0.0	2.2	5.07	5.07	7.15	1.247	1.065
Treatment F		3.158	1.947	0.000	1166	221	221	111	1.247	1.065
Treatment Prob(F)		0.0145	0.1010	1.0000	0.0001	0.0001	0.0001	0.0001	0.3178	0.4200

Postemergence Options for Weed Control in Spring Wheat

Caleb Dalley, HREC, Hettinger, ND, 2016

A field trial was conducted to evaluate weed control and spring wheat tolerance to several POST herbicides. Spring wheat 'Elgin' was planted on May 6, 2016 at a rate of 100 lbs/A using a John Deere 1590 no-till drill into barley stubble using no-till practices. At planting, starter fertilizer (18-46-0) was applied to the drill at a rate of 40 lbs/A. Prior to planting, urea was broadcast applied at a rate of 120 lbs/A. Wheat emerged on May 15. Treatments were applied on June 10 using a tractor mounted research sprayer with flat fan nozzles spaced at 20 inches using a spray volume of 10 gal/A to wheat that was in the tillering stage with an average height of 11 inches to the longest extended leaf. Weeds present at time of application included prickly lettuce (1/m2, 26.5 cm in height), green foxtail (156/m2, 7.4 cm in height), Shepherd's purse (0.5/m2, 53 cm in height), wild oat (4.5/m2, 32.4 cm in height), common lambsquarters (1/m2, 2 cm in height), kochia (0.5/m2, 16 cm in height), horseweed (0.5/m2, 19 cm in height), and Japanese brome (2.5/m2, 39.5 cm in height). Wheat injury was evaluated at 7, 13, 21, and 28 days after treatment (DAT) and weed control was evaluated at 13, 21, and 28 DAT. Injury, in the form of slight chlorosis (yellowing) of wheat was observed at 7 DAT with nearly all treatments. However, injury was slight and was not observed at later evaluations. There was some wheat injury in the form of slight stunting observed in later evaluations, but it was inconsistent and did not result in any significant differences between treatments. Wild oat control was greatest (93%) at 28 DAT with the Axial XL + WideMatch treatment; all other treatments provided good wild oat control (77 to 82%). Prickly lettuce control was greatest with PerfectMatch + 2,4-D (93%) and Huskie Complete (94%); All other treatments control prickly lettuce within a range of 80 to 87%. Common lambsquarters control was greatest with Goldsky + 2.4-D (100%), PerfectMatch + 2.4-D (98%), TeamMate + Hat Trick (100%), and Huskie Complete (100%); poor control was observed with Glodsky (68%), Axial SL + WideMatch (55%), and Everest + WideMatch (63%); PerfectMatch alone controlled common lambsquarters at 84%. Kochia control was greatest with Goldsky + 2,4-D (99%); Goldsky alone (72%) and TeamMate + Hat Trick (78%) provided fair control; all other treatment provided good control of kochia (83-89%). Horseweed control was greatest with Huskie Complete (100%); PerfectMatch + 2,4-D (94%) and TeamMate + Hat Trick (93%) provided excellent control; all other treatments provided good control of horseweed (81-85%). Green foxtail control was greatest with Axial XL + WideMatch (88%); other treatments controlled green foxtail in a range from 78 to 83%. Wheat was harvested on August 4 using a Kincaid plot harvester with a 5 foot head. No differences in wheat yield was observed for any of the treatments in this trial. Weed densities were relatively low and did not significantly reduce wheat yield in the untreated control compared to other treatments, although yield was in most cases lower than in treatments where weeds were controlled.

	Treatment	Rate	Wheat injury			Wild Oat	Green foxtail	Kochia	Prickly Lettuce	Common lamsquaters	Test wt	Yield
			7 DAT	13 DAT	21 DAT							
			——%——			——control at 28 DAT (%)——					lbs/bu	bu/A
1	Untreated		0 d	0 a	0 a	0 d	0 f	0 d	0 e	0 e	55 a	39.9 a
2	Goldsky Activator 90 AMS	16 oz/a 0.5 % v/v 1.51 lb/a	5 ab	0 a	1 a	81 bc	81 bcd	72 c	85 cd	68 c	55 a	40.5 a
3	Goldsky 2,4-D ester LV AMS	16 oz/a 7.26 oz/a 1.51 lb/a	6 a	2 a	3 a	82 b	80 cde	99 a	87 bc	100 a	55 a	43.7 a
4	PerfectMatch Activator 90 AMS	16 oz/a 0.5 % v/v 1.51 lb/a	3 c	1 a	0 a	82 b	79 de	85 b	85 cd	84 b	55 a	42.6 a
5	PerfectMatch 2,4-D ester LV AMS	16 oz/a 7.26 oz/a 1.51 lb/a	4 bc	0 a	3 a	80 bc	82 bc	83 bc	93 ab	98 a	55 a	39.3 a
6	TeamMate Hat Trick AMS	1 oz/a 1.5 pt/a 1.51 lb/a	0 d	0 a	3 a	77 c	78 e	78 bc	83 cd	100 a	55 a	39.6 a
7	Huskie complete	13.7 oz/a	7 a	3 a	3 a	82 b	78 e	89 ab	94 a	100 a	55 a	42.6 a
8	Axial SL WideMatch AMS	16.4 oz/a 16 oz/a 1.51 lb/a	2 cd	0 a	0 a	93 a	88 a	84 bc	82 cd	55 d	55 a	40.5 a
9	Everest 2.0 WideMatch Activator 90 AMS	0.75 oz/a 16 oz/a 0.25 % v/v 1.51 lb/a	7 a	0 a	3 a	81 bc	83 b	83 bc	80 d	63 cd	54 a	43.4 a
	LSD P=.10		2.2	NS	NS	3.9	2.3	12.9	6.7	9.7	1.1	4.77
	Standard Deviation		1.8	1.9	2.5	3.2	1.9	10.3	5.5	8.0	0.9	3.94
	CV		48.4	286.41	158.13	4.46	2.68	13.82	7.14	10.8	1.67	9.53
	Treatment F		9.137	1.320	1.037	290	796	31.5	113	68	0.506	0.754
	Treatment Prob(F)		0.0001	0.2809	0.4368	0.0001	0.0001	0.0001	0.0001	0.0001	0.8398	0.6451

Varro tank-mixes for Weed Control in Spring Wheat

Caleb Dalley, HREC, Hettinger, ND, 2016

A field trial was conducted to evaluate weed control and spring wheat tolerance to postemergence applications of Varro tank-mixes. Spring wheat 'Elgin' was planted into no-till barley stubble on May 6, 2016 using a John Deere 1590 no-till drill. During planting, starter fertilizer (18-46-0) was drilled into the planting furrow at a rate of 40 lbs/A. Prior to planting, urea (46-0-0) was broadcast applied at a rate of 120 lbs/A using a broadcast spreader. Spring wheat emerged on May 15. Below average rainfall occurred at the research field where this trial was conducted with only 3.4 inches of rain falling between planting and harvest, compared to an average rainfall of 7.9 inches during this time period. Herbicide treatments were applied on June 2 using a tractor mounted research sprayer at a spray volume of 10 gal/A using flat fan nozzles spaced at 20 inches. Wheat was at the tillering stage and averaged 7 inches to the longest extended leaf. Wheat injury and weed control were evaluated at 12, 22, and 35 days after application. Only minor injury was observed with any treatment consisting of primarily slight stunting in growth and there were no significant differences in injury due to treatment. At 35 DAT, Japanese brome control ranged from 81% with Wolverine to 98% with Varro + Widematch + 2,4-D ester; Wild oat control ranged from 84 to 91% with no significant differences due to treatment; green foxtail control with Varro tank-mixes ranged from 80 to 89%, compared to 78% with the Huskie Complete treatment, and 83% with Wolverine Advanced. Common lambsquarters control was 90 to 100% with all treatments except Varro + Bison (80%); prickly lettuce was control 95 to 100% with all treatments. Wheat was harvested on August 1 using a Kincaid plot harvester with a 5 foot header. There were no significant differences in yield due to herbicide treatment, although yield was lowest in the untreated plots. POST options for weed control are valuable, especially in years where deficiencies in rainfall limit the efficacy of soil-applied PRE herbicides.

Treatment	Rate	Wheat injury			J. brome	G. foxtail	Wild oat	Test wt	Yield
		12 DAT	22 DAT	35 DAT					
		————%————			——control at 35 DAT (%)——			-lbs/bu-	bu/A
1 Untreated		0 a	0 a	0 a	0 d	0 e	0 b	54 a	44.7 a
2 Varro	6.85 oz/a	1 a	4 a	0 a	93 ab	82 bcd	84 a	56 a	57.1 a
Bison	1 pt/a								
AMS	0.5 lb/a								
3 Varro	6.85 oz/a	1 a	1 a	0 a	92 ab	89 ab	90 a	55 a	57.0 a
Weld	18 oz/a								
AMS	0.5 lb/a								
4 Varro	6.85 oz/a	1 a	1 a	0 a	95 ab	86 abc	90 a	55 a	53.7 a
Carnivore	1 pt/a								
AMS	0.5 lb/a								
5 Varro	6.85 oz/a	0 a	2 a	0 a	98 a	84 a-d	91 a	53 a	65.3 a
WideMatch	1 pt/a								
2,4-D ester	0.5 pt/a								
AMS	0.5 lb/a								
6 Varro	6.85 oz/a	0 a	4 a	0 a	96 a	84 a-d	90 a	55 a	56.5 a
WideMatch	1 pt/a								
MCPA Ester	0.5 pt/a								
AMS	0.5 lb/a								
7 Varro	6.85 oz/a	1 a	3 a	0 a	92 ab	80 cd	91 a	54 a	54.3 a
WideMatch	1 pt/a								
Affinity TankMix	0.6 oz/a								
AMS	0.5 lb/a								
8 Varro	6.85 oz/a	4 a	3 a	0 a	87 bc	89 a	91 a	56 a	67.6 a
Olympus	0.2 oz/a								
Carnivore	1 pt/a								
AMS	0.5 lb/a								
9 Huskie complete	13.7 oz/a	3 a	3 a	0 a	90 abc	78 d	89 a	55 a	64.5 a
10 Wolverine Adv	0.5 lb/a	0 a	2 a	0 a	81 c	72 abc	84 a	54 a	61.6 a
LSD P=.10		NS	NS	NS	9.7	7.4	8.5	NS	NS
Standard Deviation		1.9	2.5	0	8.1	6.2	7.0	1.5	13.8
CV		172.7	107.5	0	9.8	8.17	8.8	2.7	23.7
Treatment F		1.638	1.075	0	6.502	75.328	64.038	1.563	0.965
Treatment Prob(F)		0.1543	0.4218	1.000	0.0001	0.0001	0.0001	0.1970	0.4967

Comparison of Varro Tank-mix Combinations for Weed Control in Durum

Caleb Dalley, HREC, Hettinger, ND, 2016

A field trial was conducted to evaluate crop safety and weed control with tank-mixes of Varro (thiencarbazone-methyl) in durum wheat. Durum 'Carpio' was planted on May 11, 2016 with a John Deere 1590 no-till drill at a rate of 120 lbs/A. Starter fertilizer (18-46-0) was applied at planting at a rate of 40 lbs/A. Prior to planting, urea (46-0-0) was applied at a rate of 100 lbs/A. Durum emerged on May 23. Herbicide treatments were applied on June 2 when durum was at the 3 to 6 leaf stage with an average height to the longest extended leaf of 5 inches. Weeds present in the trial included kochia, wild buckwheat, and Russian thistle. The trial was evaluated at 11, 21, and 35 days after treatment (DAT). No injury was observed due to any of the treatments applied in this study at any of the dates treatments were rated. At 21 DAT, Russian thistle control ranged from 70% with Wolverine and from 73 to 83% with Varro tank-mixes and 83% with Huskie Complete. Also at 21 DAT, wild buckwheat control ranged from 81 to 95% control, with Varro plus Carnivore, Varro plus Bison, and Huskie Complete having the highest control ratings. At 21 DAT, kochia control ranged from 64 to 85%, with Wolvernine Advanced at 64% and Varro plus WideMatch plus 2,4-D ester at 85%. Due to droughty conditions this season, durum wheat yield was very low and variable with yield ranging from 12.5 to 23.3 bu/A and test weights ranging from 43 to 45 lbs/bu with no yield difference due to treatment.

Treatment	Rate	Spring wheat injury			Kochia	Russian thistle	Wild buckwheat	Test wt	Yield
		11 DAT	21 DAT	35 DAT				Aug 10	Aug 10
		——————%——————			— Control at 21 DAT (%) ——			lbs/bu	bu/A
1 Untreated		0 a	0 a	0 a	0 d	0 d	0 d	43.5 a	16.5 a
2 Varro	6.85 oz/a	0 a	0 a	0 a	70 bc	79 ab	91 ab	45.2 a	12.5 a
Bison	1 pt/a								
AMS	0.5 lb/a								
3 Varro	6.85 oz/a	0 a	0 a	0 a	75 abc	73 bc	83 c	43.7 a	22.9 a
Weld	18 oz/a								
AMS	0.5 lb/a								
4 Varro	6.85 oz/a	0 a	0 a	0 a	78 ab	80 ab	95 a	43.9 a	24.0 a
Carnivore	1 pt/a								
AMS	0.5 lb/a								
5 Varro	6.85 oz/a	0 a	0 a	0 a	85 a	83 a	88 abc	45.8 a	21.5 a
WideMatch	1 pt/a								
2,4-D ester	0.5 pt/a								
AMS	0.5 lb/a								
6 Varro	6.85 oz/a	0 a	0 a	0 a	68 bc	77 abc	81 c	43.9 a	17.5 a
WideMatch	1 pt/a								
MCPA Ester	0.5 pt/a								
AMS	0.5 lb/a								
7 Varro	6.85 oz/a	0 a	0 a	0 a	79 ab	79 ab	86 bc	45.6 a	18.6 a
WideMatch	1 pt/a								
Affinity TankMix	0.6 oz/a								
AMS	0.5 lb/a								
8 Varro	6.85 oz/a	0 a	0 a	0 a	74 bc	83 a	91 ab	45.3 a	23.3 a
Olympus	0.2 oz/a								
Carnivore	1 pt/a								
AMS	0.5 lb/a								
9 Huskie complete	13.7 oz/a	0 a	0 a	0 a	75 abc	83 a	87 bc	45.3 a	21.0 a
AMS	0.5 lb/a								
10 Wolverine Adv	27.4 oz/a	0 a	0 a	0 a	64 c	70 c	84 c	44.6 a	21.5 a
LSD P=.05		NS	NS	NS	11.1	8.6	7.4	NS	NS
Standard Deviation		0.0	0.0	0.0	9.1	7.1	6.2	1.9	6.1
CV		0.0	0.0	0.0	13.7	10.1	7.9	4.2	30.6
Treatment F		0.000	0.000	0.000	27.9	29.3	81.5	0.764	1.409
Treatment Prob(F)		1.000	1.000	1.000	0.0001	0.0001	0.0001	0.6499	0.2391

Flax Tolerance to Pre and Postemergence application of the Herbicide Pyroxasulfone

Caleb Dalley, HREC, Hettinger, ND, 2016

A field trial was conducted to evaluate flax tolerance to the herbicide pyroxasulfone. Flax was planted at a rate of 30 lb/A on May 5, 2016 using a John Deere 1590 no-till drill at a depth of 1.5 inches into wheat stubble. Starter fertilizer (18-46-0) was applied at a rate of 40 lbs/A at planting. Prior to planting, urea was broadcast applied at a rate of 100 lbs/A (46 lbs N). Preemergence treatments were applied on the same day of planting using a tractor mounted research sprayer at a volume of 10 gal/A using compressed CO2 as a propellant. Glyphosate was applied (0.75 lbs ae/A) across all treatments except the untreated control to control emerged weeds. Flax emergence occurred on May 16. Postemergence applications were made on June 6 (21 days after flax emergence) using the same methods previously described. Flax was harvested on August 1 using a Kincaid research plot combine with a 5 foot header. Injury was evaluated 7, 16, and 36 days after flax emergence (DAE). Injury was slight to none and was not significant during any of the evaluations taken and flax height was not reduced by any of the herbicide treatments when measure 36 DAE. Lack of rainfall following planting reduced exposure of the flax to the PRE herbicides applied and may not be representative of what would be expected during a year with average or above average rainfall. PRE burndown with glyphosate was effective at controlling weeds present. Few annual weeds emerged following the burndown, likely because of the dry conditions, and no evaluation for weed control could be taken. Flax yields were reduced only in the untreated plots, which were heavily infested with downy brome and tumble mustard. Yields were low due to the dry conditions at Hettinger this year. Additional trials should be conducted to further evaluate safety of pyroxasulfone in flax to increase confidence in crop safety.

Treatment	Rate	Flax injury			Flax Height	Test wt	Yield
		7 DAE	16 DAE	36 DAE		Aug 10	Aug 10
		——————%——————			-cm-	-lbs/bu-	-lbs/A-
1 Pyroxasulfone	1.48 oz/a	1 bc	0 a	0 a	36.0 a	56 a	766.8 a
2 Pyroxasulfone	2.1 oz/a	0 c	0 a	0 a	34.9 a	55 a	805.1 a
3 Pyroxasulfone	3.45 oz/a	4 ab	0 a	0 a	34.9 a	55 a	667.7 ab
4 Spartan Pyroxasulfone	6 oz/a 1.03 oz/a	4 abc	0 a	0 a	35.3 a	56 a	687.5 ab
5 Spartan Pyroxasulfone	6 oz/a 1.64 oz/a	4 ab	0 a	2 a	35.2 a	54 a	599.1 ab
6 Spartan Pyroxasulfone	6 oz/a 2.05 oz/a	6 a	0 a	4 a	32.5 a	56 a	522.9 b
7 Spartan Section 2 EC	6 oz/a 8.04 oz/a	3 abc	0 a	1 a	33.4 a	55 a	693.1 ab
8 Untreated check		0 c	0 a	0 a	30.1 a	55 a	249.7 c
9 Hand weeded check		0 c	0 a	0 a	33.7 a	56 a	660.2 ab
LSD P=.10		3.5	NS	NS	3.53	NS	240
Standard Deviation		2.9	0.0	0.0	2.92	1.2	199
CV		120	0.0	0.0	8.59	2.12	31.6
Treatment F		2.282	0.000	0.000	1.561	0.786	2.738
Treatment Prob(F)		0.0565	1.000	1.000	0.0001	0.6251	0.0267

Safflower Tolerance and Weed Control Efficacy with PRE Herbicides

Caleb Dalley, HREC, Hettinger, ND, 2016

Safflower was planted into no-till wheat stubble on May 4, 2016 using a John Deere 1590 no-till drill. At planting 40 lbs/A of starter fertilizer (18-46-0) was added to the planting drill. Prior to seeding, urea fertilizer (46-0-0) was broadcast applied at a rate of 75 lbs/A. Herbicide treatments were applied on May5, the day after planting, using a tractor-mounted research sprayer at a 10 gal/A spray volume using flat fan nozzles and compressed CO2 as a propellant. Glyphosate (Roundup PowerMAX) was tank-mixed with all herbicide treatments (22 oz/A) plus AMS (5.8 lb/100 gal). The month after planting was dryer than average with just over one inch of rainfall, most of which occurred in small increments with only one rainfall greater than 0.15 inches when 0.46 inches of rain fell on May 30, at 26 days after planting. The small amounts of rain resulted in poor PRE weed control and also resulted in reduced stand of safflower. Dry conditions continued through the summer months, with 1.04, 0.87, 1.5, 1.71 inches of rainfall in May, June, July, and August, respectively, which was less than half of average rainfall for these months. Low rainfall reduced safflower growth and ultimately seed yield.

At planting, weeds present included prickly lettuce, tumble mustard, and downy brome. All were effectively controlled with herbicide treatments applied after planting. Safflower tolerance to herbicide treatments was evaluated at 20, 27, and 39 days after treatment. The only herbicide treatments that caused significant injury were ones containing sulfentrazone. Injury with these treatments included yellow or chlorotic spotting of younger leaves. PRE control of wild buckwheat and wild oat were evaluated 39 days after treatment and were poor due to lack of incorporation of herbicides at planting due to low rainfall. Safflower was harvested on September 6 using a Kincaid plot harvester. Yield was reduced comparing safflower treated with Zidua at 2 oz/A compared with Spartan Charge. All other herbicide treatments were similar in yield. Yield in the untreated control was reduced 85% compared with the hand weeded control. This year's trial would suggest that Zidua is safe for application in safflower. Outlook also appeared to be safe for PRE application to safflower at both rates tested. However, due to the lower than average rainfall for 2016, further evaluations are needed to confirm the safety of these herbicide in safflower. There was a slight reduction in yield and some visual injury observed for Spartan Charge (carfentrazone + sulfentrazone), however, yield was not less than the hand-weeded control.

Treatment	Rate	Safflower injury			Test wt	Yield
		7 DAE	14 DAE	26 DAE		
		——————%——————			-lbs/bu-	-lbs/A-
1 Prowl H2O	32 oz/A	0 b	2 bcd	0 b	41 bc	1207 ab
2 Zidua	2 oz/A	0 b	2 bc	0 b	42 ab	1341 a
3 Zidua SC	3.25 oz/A	1 ab	3 abc	0 b	41 bc	1219 ab
4 Zidua SC	7 oz/A	1 ab	1 bcd	0 b	41 bc	1280 ab
5 Zidua SC	10.6 oz/A	3 a	1 bcd	5 b	42 abc	1185 ab
6 Outlook	10 oz/A	0 b	1 cd	0 b	42 ab	1330 ab
7 Outlook	20 oz/A	0 b	0 d	0 b	43 a	1336 ab
8 Spartan	3.5 oz/A	2 a	9 a	5 b	41 bc	1190 ab
9 Spartan Charge	4.4 oz/A	2 a	4 ab	16 a	40 c	1004 b
10 Check (Weed Free)		0 b	0 d	0 b	41 bc	1111 ab
11 Untreated		0 b	0 d	0 b	12 d	170 c
LSD P=.10		2.2	6.8	6.8	1.3	336
Standard Deviation		0.3	0.4	5.6	1.1	280
CV		189	103.7	234.8	46.79	24.9
Treatment F		1.915	2.968	3.203	271.6	5.654
Treatment Prob(F)		0.0841	0.0107	0.0082	0.0001	0.0001

Safflower Varietal Tolerance to Preemergence Application of Sulfentrazone

Caleb Dalley, HREC, Hettinger, ND, 2016

Safflower was planted into no-till wheat stubble on April 22, 2016 using a no-till plot drill. Soil type at the location was a loam (38% sand, 38% silt, 24% clay) with a pH of 5.2 (0-6 inches) and 4.1% organic matter. At planting 40 lbs/A of starter fertilizer (18-46-0) was added to the planting drill. Prior to seeding, urea fertilizer (46-0-0) was broadcast applied at a rate of 55 lbs/A. Herbicide treatments were applied on April 23, one day after planting, using a tractor-mounted research sprayer at a 10 gal/A spray volume using flat fan nozzles and compressed CO2 as a propellant. Glyphosate (Roundup PowerMAX) was tank-mixed with all herbicide treatments (22 oz/A) plus AMS (5.8 lb/100 gal) to control existing weeds. Rainfall totaling 1.6 inches occurred during the week after planting. However, the remainder of the growing season was dryer than average with 1.04, 0.87, 1.5, 1.71 inches of rainfall in May, June, July, and August, respectively, which was less than half of average rainfall for these months. Low rainfall reduced safflower growth and ultimately seed yield.

Injury to safflower from sulfentrazone at 2, 3.5, and 5 oz/A averaged 4, 9, and 13% across varieties at 4 weeks after treatment. However, Hybrid 9049 and Hybrid 1601 had higher injury at the 5 oz/A of Spartan, while MonDak, NutraSaff, and Cardinal appeared to better tolerate Spartan application. Injury included yellow or chlorotic spotting of younger leaves. At 7 WAT, safflower plant populations were determined by counting two 0.5 m^2 quadrats from each plot. There was no effect of Spartan treatment on safflower population. However, population was lower in MonDak and Hybrid 1601 compared to the other varieties. Safflower was harvested on September 6 using a Kincaid plot harvester having a 5 ft header. Yield and test weight were similar among all Spartan treatments. This study shows that although some injury may be observed to safflower following preemergence application, these effects diminish over time and did not affect final yield of safflower. The growing season in Hettinger in 2016 was very dry and later in the season, the safflower would have been relying on deeper moisture that may not have contained sufficient amounts of sulfentrazone to cause injury. With higher and more frequent rainfall, injury may have increased or may have had negative effects on yield. This trial will be repeated in 2017.

Safflower variety	Spartan rate	Safflower injury 4 WAT	Safflower Stand 7 WAT	Test wt	Yield
	oz product/A	———%———	plants/m^2	lbs/bu	-lbs/bu-
Cardinal	0	0	48 a	43 a	2299 a
	2	4 ef	51 a	43 a	2246 a
	3.5	8 d	48 a	43 a	2300 a
	5	12 bc	43 a	43 a	2533 a
Hybrid 9049	0	0	41 a	43 a	2863 a
	2	3 f	46 a	42 a	2014 a
	3.5	11 cd	44 a	43 a	2267 a
	5	15 ab	36 a	43 a	2767 a
MonDak	0	0	39 a	42 a	1899 a
	2	4 f	39 a	42 a	2131 a
	3.5	9 cd	42 a	42 a	2168 a
	5	11 cd	31 a	42 a	2396 a
NutraSaff	0	0	56 a	36 a	2120 a
	2	8 de	41 a	37 a	1982 a
	3.5	11 cd	45 a	36 a	1911 a
	5	8 c	47 a	36 a	1761 a
Hybrid 1601	0	0	40 a	36 a	2165 a
	2	1 f	31 a	37 a	2182 a
	3.5	8 d	35 a	37 a	2080 a
	5	17 a	27 a	36 a	2120 a
LSD P=0.05		3.9	NS	NS	NS
Standard Deviation		2.7	11.4	0.6	449
CV		42.1	27.6	1.6	20.3
Treatment F (variety)		0.733	3.176	405.723	4.798
Treatment (V) Prob(F)		0.5870	0.0537	0.0001	0.0152
Treatment F (rate)		92.619	1.924	0.425	0.758
Treatment (R) Prob(F)		0.0001	0.1963	0.7396	0.5453
Treatment F (variety x rate)		2.937	0.537	0.681	0.952
Treatment (VxR) Prob(F)		0.0092	0.8759	0.7579	0.5092

Options for PRE Weed Control in Lentil

Caleb Dalley, HREC, Hettinger, ND, 2016

A field trial was conducted to evaluate lentil tolerance and weed control with herbicides applied preplant and preemergence. Lentil were planted on May 4, 2016 at a rate of 75 lbs/A using a John Deere 1590 no-till drill. Lentil were planted no-till into wheat stubble. Pea/lentil inoculant was applied to the planting drill during planting along with starter fertilizer (18-46-0) at a rate of 40 lb/A. Preplant herbicide application (treatment 10) was applied on May 3, 2010 using a tractor-mounter research sprayer using a spray volume of 10 gal/A with compressed CO2 as the propellant. PRE herbicide treatments were applied on May 4, 2016 using the same methods as described previously. Lentil emerged on May 16. In May of 2016, just over one inch of rainfall occurred, mostly in small increments that were ineffective at activating and incorporating PRE herbicides. The first rainfall with an accumulation of more than 0.15 inches was on May 30, when 0.46 inches of rain fell at Hettinger. The remaining summer months were also dry, with less than four inches of accumulated rainfall between May 1 and August 1. This resulted in reduced survival, growth, and yield of lentil, but also reduced weed emergence in plots as well. Weeds present at planting were all controlled effectively with glyphosate. Few weeds beyond field bindweed emerged and grew after planting. No injury was observed for any of the treatments applied preplant or preemergence at evaluations taken 19 and 28 days after planting. Lentil was harvested on August 1 using a Kincaid plot harvester with a 5 foot header. Lentil seed moisture ranged from 11 to 14% and was adjusted to 12% moisture when calculating yields. Lentil yield ranged from 56 lbs/A in the untreated control to 1067 lbs/A in lentil treated with BAS 85800H (4.5 oz/A). In herbicide treated lentil, the lowest yield occurred in lentil treated PRE with Zidua at 3 oz/A (824 lbs/A), however, the highest rate of Zidua SC (6.25 oz/A) yielded similar (953 lbs/A) to the treatment with the highest yield. Lentil treated with Prowl H2O preplant yielded more than lentil treated PRE with Prowl. Due to dry conditions, further research is needed to determine crop safety and herbicide efficacy with PRE herbicides in lentil.

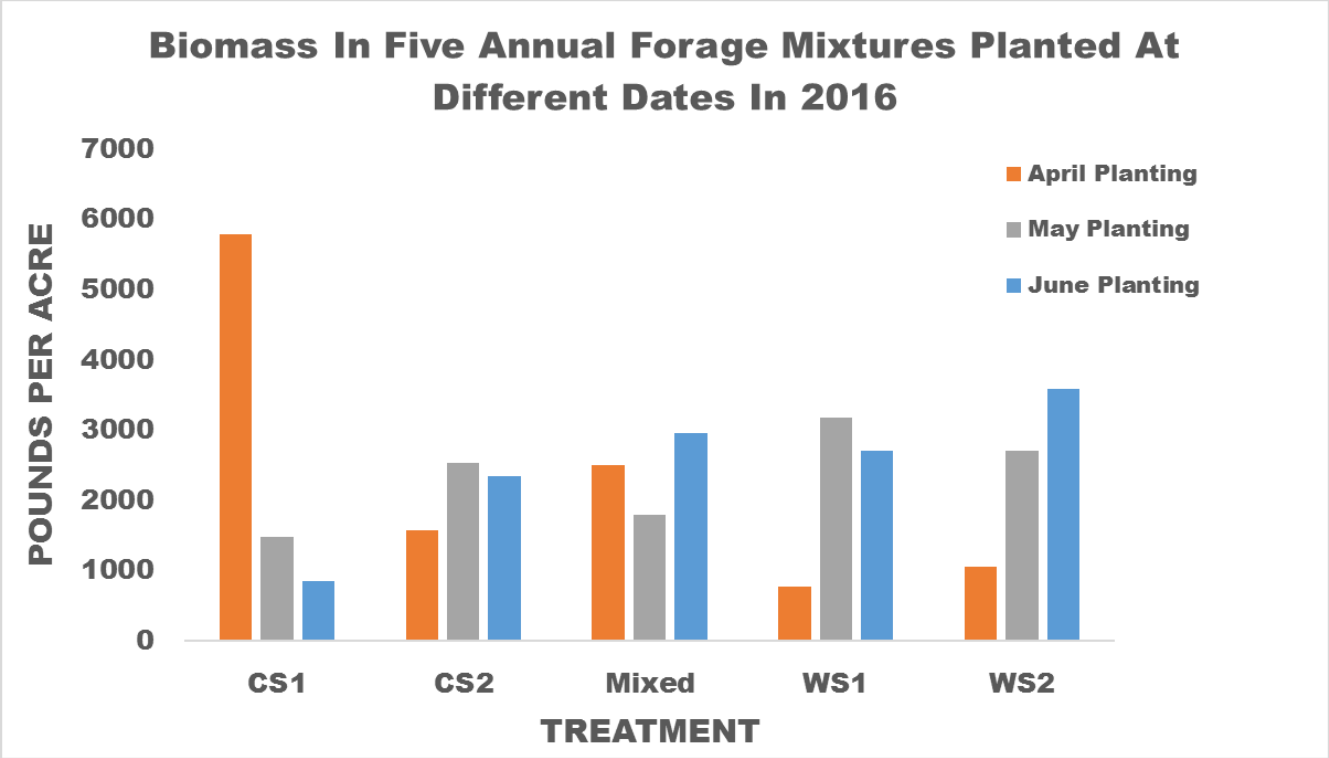
Treatment	Rate	Timing	Lentil injury 7 DAE	Lentil injury 16 DAE	Test wt	Yield	
			——%——		-lbs/bu-	-bu/A-	-lbs/A-
1 Roundup PowerMAX	22 fl oz/a	PRE	0 b	1 bc	38 a	13.7 c	824 d
Zidua	3 oz wt/a	PRE					
Ammonium Sulfate	5.67 lb/100 gal	PRE					
2 Roundup PowerMAX	22 fl oz/a	PRE	1 b	0 c	56 a	15.8 abc	956 a-d
Zidua SC	2.5 fl oz/a	PRE					
Ammonium Sulfate	5.67 lb/100 gal	PRE					
3 Roundup PowerMAX	22 fl oz/a	PRE	0 b	0 c	58 a	15.6 abc	930 a-d
Zidua SC	3.75 fl oz/a	PRE					
Ammonium Sulfate	5.67 lb/100 gal	PRE					
4 Roundup PowerMAX	22 fl oz/a	PRE	0 b	0 c	55 a	15.8 abc	942 a-d
Zidua SC	5 fl oz/a	PRE					
Ammonium Sulfate	5.67 lb/100 gal	PRE					
5 Roundup PowerMAX	22 fl oz/a	PRE	0 b	0 c	53 a	16.0 abc	953 a-d
Zidua SC	6.25 fl oz/a	PRE					
Ammonium Sulfate	5.67 lb/100 gal	PRE					
6 Roundup PowerMAX	22 fl oz/a	PRE	0 b	3 bc	56 a	14.8 bc	892 bcd
Sharpen	0.75 fl oz/a	PRE					
Pursuit	2 fl oz/a	PRE					
Methylated Seed Oil	16 fl oz/a	PRE					
Ammonium Sulfate	5.67 lb/100 gal	PRE					
7 Roundup PowerMAX	22 fl oz/a	PRE	0 b	0 c	57 a	16.1 abc	977 abc
Sharpen	0.75 fl oz/a	PRE					
Prowl H2O	1.054 fl oz/a	PRE					
Methylated Seed Oil	16 fl oz/a	PRE					
Ammonium Sulfate	5.67 lb/100 gal	PRE					
8 Roundup PowerMAX	22 fl oz/a	PRE	0 b	0 c	54 a	17.1 ab	1040 a
Bas 85800H	3 fl oz/a	PRE					
Methylated Seed Oil	16 fl oz/a	PRE					
Ammonium Sulfate	5.67 lb/100 gal	PRE					
9 Roundup PowerMAX	22 fl oz/a	PRE	0 b	0 c	56 a	17.6 a	1067 a
Bas 85800H	4.5 fl oz/a	PRE					
Methylated Seed Oil	16 fl oz/a	PRE					
Ammonium Sulfate	5.67 lb/100 gal	PRE					
10 Roundup PowerMAX	22 fl oz/a	PRE	6 a	14 a	56 a	14.7 bc	860 cd
Prowl H2O	32 fl oz/a	PRE					
Ammonium Sulfate	5.67 lb/100 gal	PRE					
11 Roundup PowerMAX	22 fl oz/a	PREPLA	0 b	5 b	56 a	17.6 a	1062 a
Prowl H2O	32 fl oz/a	PREPLA					
Ammonium Sulfate	5.67 lb/100 gal	PREPLA					
12 Roundup PowerMAX	22 fl oz/a	PRE	0 b	0 c	57 a	17.4 a	1038 ab
Outlook	14 fl oz/a	PRE					
Ammonium Sulfate	5.67 lb/100 gal	PRE					
13 Untreated Check			0 b	0 c		0.9 d	56 e
LSD P=.10			1.7	4.2	NS	2.4	149
Standard Deviation			1.4	3.5	9.0	2.01	124
CV			269	205	16.6	13.53	13.95
Treatment F			4.821	4.847	1.396	18.714	17.791
Treatment Prob(F)			0.0001	0.0001	0.2311	0.0001	0.0001

Lentil Tolerance to Pre and Postemergence application of the Herbicide Pyroxasulfone

Caleb Dalley, HREC, Hettinger, ND, 2016

A field trial was conducted to evaluate lentil tolerance to the herbicide pyroxasulfone. Lentil were planted at a rate of 75 lb/A on May 4, 2016 using a John Deere 1590 no-till drill. During planting, 40 lbs of starter fertilizer (18-46-0) and pea/lentil inoculant were applied in the planting drill. Preemergence treatments were applied on the same day as planting. Glyphosate (0.75 lb ae/A) was also applied to the entire trial site after planting to control emerged weeds. Herbicides were applied using a tractor mounted research sprayer at a volume of 10 gallons per acre using flat fan nozzles and compressed CO2 as a propellant. The site of this trial in Hettinger experienced below average rainfall for the summer months which limited both the injury of herbicide treatments to lentil and weed control from these treatments. During May there was 1.04 inches of rain recorded; in June there was 0.87 inches of rain; in July there was 0.81 inches of rain. Most rainfall occurred in amounts of less than 0.2 inches and only one daily rainfall totaled greater than 0.5 inches. Due to low rainfall, few annual weeds emerged following planting with the primary weed present in the trial after planting being field bindweed, although there was a scattered population of kochia and wild buckwheat. No herbicide treatment was effective at controlling any of these weeds, partly due to less than ideal incorporation of the herbicides due to low rainfall. Lentil were harvested on August 1. All treatments yielded less lentil than the hand weeded control. Yields were very low due to the dry summer and averaged less than 900 lbs per acre for most treatments. Additional trials evaluating lentil response to pyroxasulfone should be conducted to develop firm conclusions concerning its safety.

Treatment	Rate	Lentil injury 7 DAE	Lentil injury 16 DAE	Lentil injury 36 DAE	Lentil Height	Test wt Aug 10	Yield Aug 10
		——————%——————			-cm-	-lbs/bu-	-lbs/A-
1 Pyroxasulfone	1.5 oz/a	0 a	0 a	0 a	21 a	56 a	872 b
2 Pyroxasulfone	2.1 oz/a	0 a	0 a	0 a	21 a	54 a	838 b
3 Pyroxasulfone	3.5 oz/a	0 a	0 a	0 a	22 a	53 a	879 b
4 Prowl H2O Pyroxasulfone	51 oz/a 1.0 oz/a	0 a	0 a	0 a	22 a	49 a	902 b
5 Prowl H2O Pyroxasulfone	51 oz/a 1.7 oz/a	0 a	0 a	0 a	21 a	53 a	867 b
6 Prowl H2O Pyroxasulfone	51 oz/a 2 oz/a	0 a	0 a	0 a	22 a	53 a	851 b
7 Prowl H2O Pursuit	51 oz/a 2 oz/a	0 a	0 a	0 a	22 a	56 a	954 b
8 Untreated check		0 a	0 a	0 a	22 a	56 a	899 b
9 Hand weeded check		0 a	0 a	0 a	23 a	55 a	1086 a
LSD P=.10		NS	NS	NS	NS	4.0	127.49
Standard Deviation		0.0	0.0	0.0	0.87	3.2	105.39
CV		0.0	0.0	0.0	4.0	5.97	11.64
Treatment F		0.000	0.000	0.000	1.546	2.358	2.067
Treatment Prob(F)		1.000	1.000	1.000	0.1937	0.0724	0.0808



Planted annual forage production across five treatments replicated three times each at three different planting dates. Forage production was measured mid-August. Annual mixtures were designed to provide biomass for livestock and nectaring resources for pollinators.

CS1 = Cool Season 1 = buckwheat, lentil, flax, oat, barley, radish, safflower, sunflower, turnip

CS2 = Cool Season 2 = buckwheat, pea, flax, millet, barley, radish, safflower, sunflower, turnip

Mixed = buckwheat, lentil, turnip, radish, barley, sorghum-sudan grass

WS1 = Warm Season 1 = flax, radish, sunflower, turnip, proso millet, sorghum-sudan grass, barley

WS2 = Warm Season 2 = buckwheat, lentil sunflower, radish, proso millet, sorghum-sudan grass, flax, safflower

Christopher Schauer, Hettinger REC Director and Animal Scientist

Presentations and Outreach

Rambouillet Ram Test Results.
Ram Test Field Day, Hettinger, ND
March 12, 2016

Carcass Ultrasound and OFDA demonstrations
Columbia Sheep Breeders National Show and Sale
June 8-9, 2016

OFDA Demonstration
Newell Ram Sale, Newell, SD
September 15-16, 2016

Sheep Nutrition for Beginners
Starter Flock Sheep School, Hettinger, ND
September 17, 2016

Effects of dried distiller's grains and lasalocid on feedlot lamb growth, carcass traits, nutrient digestibility, ruminal fluid volatile fatty acid concentrations, and ruminal hydrogen sulfide concentration
NDLWPA 2016 Annual Convention, Minot, ND
October 1, 2016

NDSU Hettinger REC Sheep Research and Outreach Update
NDLWPA 2016 Annual Convention, Minot, ND
October 1, 2016

Carcass and Reproductive Ultrasound
BSC Animal Science Lab, Bismarck, ND
October 28, 2016

Evaluation of an integrated sheep-crop system using winter wheat and annual forages.
NDSU Extension and REC Fall Conference, Fargo, ND
October 19, 2016

NDSU Shearing School
Hettinger, ND
November 21-23, 2016

NDSU and ASI Wool Classing School
Hettinger, ND
November 21-23, 2016

Publications

Crane, A.R., R.R. Redden, M.L. VanEmon, T.L. Neville, L.P. Reynolds, J.S. Caton, and **C.S. Schauer***. 2016. Impacts of supplemental arginine on the reproductive performance of fall lambing ewes. J. Anim. Sci. 94:3540-3549. doi: 10.2527/jas2016.0379

Olson, K.C., **C.S. Schauer**, C. Engel, J.J. Kincheloe, J.R. Brennan, and B.L. Hauptman. 2016. Effects of Grazing on Rangeland with Prairie Dog Colonies on Cattle Nutrition and Performance: A Progress Report. Rangelands. 38(1):29-33.

Misar, C., B. Arvid, P. Johnson, R. Gates, **C.S. Schauer**, and J. Rickertsen. 2016. Establishment and persistence of yellow-flowered alfalfa no-till interseeded into crested wheatrgrass stands. Agron. J. 108:141-150.

Crane, A.R., R.R. Redden, K.C. Swanson, B.M. Howard, T.J. Frick, K.R. Maddock-Carlin, and **C.S. Schauer**. 2016. Effects of dried distiller's grains and lasalocid on feedlot lamb growth, carcass traits, nutrient digestibility, ruminal fluid volatile fatty acid concentrations, and ruminal hydrogen sulfide concentration. J. Anim. Sci. Proc. 67:29-33.

Engel, C.L., A. Taylor, **C.S. Schauer**, R. Maddock, and K.C. Olson. 2016. Effects of whole or rolled corn and 20 or 40 percent grass hay levels on finishing performance of yearling steers. J. Anim. Sci. 94(Supp. 2):#343.

Wildlife and Range Science Program

Benjamin Geaumont, Research Assistant Professor and
Daniel Graham, Research Specialist

Projects Conducted

i. Prairie Dogs and Livestock Maintain Dynamic Vegetation Features that Support Bird Diversity. Completed fifth year of data collection concerning the interactions among prairie dogs, wildlife, and livestock on the Standing Rock Reservation in South Dakota. Research is ongoing.

ii. Prairie Restoration on the Historic Elkhorn Ranch. Completed final year of data collection at the Elkhorn Ranch on our restoration plots. Manuscript in preparation.

iii. On-Farm Crop and Livestock Integration – Second year of an integrated livestock-crop project that incorporates winter wheat and annual forages into a grazing regime. This project has many response variables with pollinators being a major emphasis. I have worked to integrate all HREC scientists into the project. Research is ongoing.

iv. Food Plot Establishment for Wildlife and Pollinators. Second year of a small scale collaborative project with Pheasants Forever and ND Game and Fish Department with the goal of improving food plots in Adams county. In addition to providing cover for pheasants and opportunity for sportspeople, the project is focused on pollinators and annual forage production. Research is ongoing.

v. Patch-Burn Grazing to Improve Ecosystem Services on Post-Conservation Reserve Program Grasslands. Initiated a patch burn study on post-CRP lands to evaluate the response of livestock, plants, pollinators and birds to such a system. Pastures were fenced, fire lines established, and baseline data were collected. Burns were conducted in summer 2016. This project is being done in collaboration with the Range Science Faculty at North Dakota State University. Research is ongoing.

vi. Annual Forage Plots for Forage, Soil Health, and Pollinators. Initiated an annual forage/pollinator project. The goal of this project is to establish forage plots that can maximize biomass production for livestock while providing surrogate feeding sites for pollinators. The project was done on a 14 acre site where each of 5 treatments (mixtures) were replicated 3 times each in 0.5 acre plots during 3 planting dates. Research is ongoing.

vii. The Role of Invasive Plants on Bird Densities in Mixed-Grass Prairie. Initiated a study designed to evaluate the impact of exotic plant invasion (woody and Kentucky bluegrass) on bird populations in mixed-grass prairie. Collaboration with Torre Hovick, NDSU Range Science Program and Scott Kronberg USDA-ARS. Research is ongoing.

Presentations

i. **Geaumont, B.A.** 2016. Adams County habitat project – Cover for pheasants and resources for pollinators. Pheasants Forever Informational Meeting for Conservation Reserve Program General Sign-up. Hettinger, ND.

ii. **Geaumont, B.A**., **D.L. Graham**, J.W. Stackhouse, and K.K. Sedivec. 2016. Nest site selection of sharp-tailed grouse: A management indicator species in Northwest South Dakota. North Dakota Chapter of the Wildlife Society. Bismarck, ND.

iii. Marshall, C, T. Hovick, **B. Geaumont**, and S. Kronberg. 2016. Grassland breeding bird response to encroachment of woody plant species. ND Chapter of the Society for Range Management, Bismarck, ND.

iv. **Geaumont, A.**, T. Hovick, **D. Graham**, A. Robinson, and J. Nowatzki. 2016. The utility of unmanned aerial systems for monitoring sharp-tailed grouse leks (proposal). NDSU Extension and Research Centers Spring Conference, Fargo, ND.

v. **Geaumont, B.A., D.L. Graham**, J.W. Stackhouse, and K.K. Sedivec. 2016. Nest Ecology of sharp-tailed grouse: a management indicator species in northwest South Dakota. NDSU Research Center Spring Conference, Fargo, ND.

Publications

i. Fields, A., K. Sedivec, J. Hendrickson, P. Johnson, **B. Geaumont**, X. Lan, R. Gates, and R. Limb. 2016. Effects of short term cattle exclusion on plant community composition: prairie dog and ecological site influences. Rangelands 38:34-37.

ii. **Geaumont, B.A**., K.K. Sedivec, and W. Mack. 2016. History of occurrence and present home territory sizes for black-tailed prairie dogs on the Standing Rock Sioux Reservation. Rangelands 38:38-41.

iii. **Geaumont, B**.A., K.K. Sedivec, and A. Fields. 2016. Raising Pheasants. North Dakota State University Extension Service, Fargo, ND, R1803.

John Rickertsen, Hettinger REC Research Agronomist

Presentations and Outreach

New Varieties and Research Update
Hettinger County Crop Imp. Asso., Regent, ND
February 9, 2016

New Varieties and Research Update
Taylor Farm Institute, Taylor, ND
February 9, 2016

New Varieties Update
West River Breeders, Reeder, ND
February 16, 2016

New Varieties and Research Update
Logan County Crops Meeting, Napoleon, ND
February 29, 2016

Spring Wheat Varieties
Hettinger REC Crop Tour, Hettinger, ND
July 12, 2016

Small Grain Varieties
Hettinger County Crop Tour, Regent, ND
July 14, 2016

Small Grain Varieties
Bowman County Crop Tour, Scranton, ND
July 18, 2016

Small Grain Varieties
Grant County Crop Tour, New Leipzig, ND
July 18, 2016

HREC Booth
USDA-ARS Northern Plains Friends & Neighbors Day, Mandan, ND
July 28, 2016

New Varieties and Research Updates
33rd Western Dakota Crops Day, Hettinger, ND
December 15, 2016

Publications

Misar, C. G., L. Xu, R. N. Gates, A. Boe, P. S. Johnson, C. S. Schauer, J. R. Rickertsen, and W. W. Stroup. 2016. Establishment and Persistence of Yellow-Flowered Alfalfa No-Till Interseeded into Crested Wheatgrass Stands. Agron. J. 108:141-150. doi:10.2134/agronj2015.0271

North Dakota Alternative Crop Variety Trial Results for 2015. January 2016. NDSU Extension Service circular A1105-16.

2015 Research Results, Area 4 SCD Cooperative Research Farm & USDA-NGPRL. Spring Wheat, Durum Wheat and Barley Variety Performance Results. In Proc. March 2, 2016.

North Dakota Hard Winter Wheat Variety Trial Results for 2016. October 2016. NDSU Extension Service circular A1196-16.

North Dakota Canola Variety Trial Results for 2016 and Selection Guide - A1124-16. October 2016. NDSU Extension Service circular A1124-16.

North Dakota Hard Red Spring Wheat Variety Trial Results for 2016. November 2016. NDSU Extension Service circular A574-16.

North Dakota Durum Wheat Variety Trial Results for 2016. November 2016. NDSU Extension Service circular A1067-16.

North Dakota Barley, Oat and Rye Variety Trial Results for 2016. November 2016. NDSU Extension Service circular A1049-16.

North Dakota Dry Pea Variety Trial Results for 2016. November 2016. NDSU Extension Service circular A1469-16.

North Dakota and South Dakota Sunflower Hybrid Trial Results for 2016. December 2016. NDSU Extension Service circular A652-16.

North Dakota Soybean Variety Trial Results for 2016. December 2016. NDSU Extension Service circular A842-16.

North Dakota Corn Hybrid Trial Results for 2016. December 2016. NDSU Extension Service circular A793-16.

North Dakota Dry Bean Variety Trial Results for 2016. December 2016. NDSU Extension Service circular A654-16.

33rd Annual Western Dakota Crops Day Research Report. December 2016. NDSU Hettinger Research Extension Center Ag. Report No. 33.

No-till Weed Science Research Program

Caleb Dalley, Weed Scientist
Daniel G. Abe, Research Specialist

Presentations and Outreach

Weed Control Program in Southwest North Dakota
Wild World of Weeds Workshop
January 19, 2016

Weed Control Updates for Southwest North Dakota
Hettinger REC Crop Tour, Hettinger, ND
July 12, 2016

Weed Control Updates and Herbicide Resistance Management
33rd Western Dakota Crops Day, Hettinger, ND
December 15, 2016

Publications

2016 North Dakota Weed Control Guide. January 2016. Richard Zolliger, ed. NDSU Publication W-253.

33rd Annual Western Dakota Crops Day Research Report. December 2016. NDSU Hettinger Research Extension Center Ag. Report No. 32.

Cole, MR, G Eggleston, E Petrie, SM Uchimiya, **CD Dalley**. 2016. Cultivar and maturity effects on the quality attributes and ethanol potential of sweet sorghum. Biomass and Bioenergy. 96:183-192

Webber III, CL, PM White, Jr, **CD Dalley**, EC Petrie, RP Viator, and JW Shrefler. 2016. Kenaf (Hibiscus cannabinus) and cowpea (Vigna unguiculata) as sugarcane cover crops. J Agricultural Sci. 8:13-20

Hettinger Research Extension Center
Advisory Board Meeting
February 23, 2016

Board members present included Justin Freitag, Jeremy Huether, Matt Neiderman, Kat Weinert, Ethan Andress, Lyle Warner, Duaine Marxen, Ashley Sabin, Cody Jorgenson and Cole Ehlers. Special guests: Ken Grafton, Chris Boerboom, Jim Gray and Tim Faller. Staff: Christopher Schauer, John Rickertsen, Benjamin Geaumont, Caleb Dalley, Alison Crane, Daniel Abe, Wyatt Mack and Cassie Dick.

The meeting was called to order at 12:40 pm by Chairman Cole Ehlers.

Cole Ehlers asked for a motion to approve the minutes from the previous meeting, Matt Neiderman motioned to approve, Lyle Warner seconded. The motion passed, no opposing.

Cole Ehlers asked for any changed to the agenda. Chris Schauer had one adjustment: there would be four elections, not three as listed. Cole Ehlers has served his term as the chairman and a new chairman will also need to be elected. Kat Weinert moved to approve the agenda change and approve the new agenda. Ashley Sabin seconded. The motion passed, no opposing.

Legislative Update

- Ken Grafton, Director NDSU Ag Experiment Stations- 4.05% budget cuts
- Chris Boerboom, Director NDSU Extension Services- budget cuts, working on filling open Sheep Extension Specialist position/in process before cuts.
- Jim Gray, SW District Director for Extension- new SW District Director
- Lyle Warner, SBARE Representative- meeting more often to get priorities ranked

Director's Report- Chris Schauer, handout given

- Discussion on Strategic Plan 2015-2019.

Animal Science Report- Chris Schauer, handout given

- Wool testing project presentation. The "NDSU OONSA" program.

Wildlife and Range Report- Ben Geaumont, handout given

- Wyatt Mack (M.S. student) presentation on the Prairie Dog Project.

Agronomy Report- John Rickertsen, handout given

- 2015 good year/good yields, rain in June helped. More soybean and corn trials/able to test varieties throughout the state.

Weed Science Report- Caleb Dalley, handout given

- 2015 first field season. Need more weed seeds/collected weed seeds this fall to establish plots for more accurate pesticide testing.

Open Discussion

- Jim Gray- Question on relationship between AES and County Agents. Work on maintaining/building good working relations.

Elections

- Cole Ehlers asked Jeremy Huether and Matt Neiderman if they would be willing to serve another 3-year term on the board. They agreed to serve another term.
- Cole Ehlers then asked for nominations to replace the three members who have completed their two three-year terms.
    - Justin Freitag found a replacement for his position: Dustin Freitag.
    - Chris Schauer asked for suggestions from members leaving that were not present and two names were given as replacement: Sean Seamands and Jamie Enerson.

Cole Ehlers asked for a motion to nominate Dustin Freitag, Sean Seamands and Jamie Enerson to be new members of the board. Kat Weinert motioned to contact Dustin, Sean and Jamie to see their interest and ask them to become members if they accept the nomination. Cody Jorgenson seconded. The motion passed no opposing. Chris will contact Dustin Freitag, Sean Seamands and Jamie Enerson.

Cole Ehlers then asked for a motion to replace him on the board, as his appointment as chairman has come to an end. Jeremy Huether moved to ask Dave Ollila to serve on our board. Matt Neiderman seconded. The motion passed no opposing. Chris will contact Dave Ollila.

Cole Ehlers then asked for nominations to replace him as the chairman. Matt Neiderman nominated Kat Weinert, Kat accepted the nomination and Lyle Warner seconded. The motion passed no opposing. Kat Weinert will be the new chairman the Advisory Board.

Cole Ehlers then had to ask for a nomination to replace Kat Weinert as the vice-chair. Kat Weinert nominated Wade Henderson for vice-chair. Matt Neiderman seconded. The nomination passed no opposing.

The next meeting will be July 12, 2016 in conjunction with the summer Crop Tour.

Staff Dismissed for Executive Session.

Hettinger Research Extension Center
Advisory Board Meeting
July 12, 2016

Board members present include Kat Weinert, Duaine Marxen, Cody Jorgenson, Wade Henderson, Tom DeSutter, Dave Ollila, Jeremy Huether, Matt Neiderman, Dustin Freitag, Sean Seamands. Special guests: Chris Boerboom, Jim Grey, and Tim Faller. Staff: Christopher Schauer, Ben Geaumont, John Rickertsen, Caleb Dalley, Alison Crane and Cassie Dick.

The meeting was called to order at 12:40 by Chair Kat Weinert.

Kat Weinert asked for a motion approving the minutes from the last meeting. Wade Henderson moved to approve, Matt Neiderman seconded, the motion passed, no opposing.

Kat Weinert asked for a motion approving the meeting agenda. Matt Neiderman moved to approve the agenda, Cody Jorgenson seconded, the motion passed, no opposing.

Chris Schauer gave an intro to the new board members and an explanation of how the advisory board functions.

Legislative Update/Director's Report- Chris Schauer, handout given

Dr. Chris Boerboom, budget cuts, 80% of extension budget is staff- 20% is operating, not rehiring retired positions. SBARE rankings- first we need to restore budgets.

Tim Faller, restoring budgets

Jim Gray, restoring budgets

Chris Schauer- handout given and explained the way the Hettinger REC budget works within NDSU. Also informed the board that a new Livestock Extension Specialist, Janna Kincheloe will be starting with the Center in December 2016.

Agronomy Report- John Rickertsen, handout given

Things are looking good; despite that we have not had rain

Weed Science- Caleb Dalley, handout given

Not enough rain for pre-emergent, hard to tell progress

Range & Wildlife Report- Benjamin Geaumont, handout given

Lots of projects, big prairie dog project wrapping up this fall

Animal Science- Christopher Schauer, handout given

Alison Crane, (Ph.D. student) gave a power point presentation on "The effects of DDGS and Lasalocid on feedlot lamb growth and ruminal traits".

Strategic Plan- Christopher Schauer, Director's report handout

Discussed progress towards goals.

Open Discussion

Talk of advocating for REC's, extension and agriculture in general. Chris Boerboom stated we should use the word "education" instead of "advocacy" as what Extension and the REC's do is science/and research based.

Dave Ollila- As a board member I don't want to contradict Chris' vision or direction for Center.

Jim Grey- Priority issues from extension study shows disconnect with the public, REC's role?

Kat- Participate in more community activities.

Wade Henderson- We don't want to miss out target audience, producers.

Chris Schauer- Vision is becoming complete with four scientists, Ben's program pulling everything together and bringing in Janna as a new Extension Specialist, should help bridge that gap between scientists, county agents, producers and the general public. Scientists are 100% research appointed, still do field days (Shearing School, Field Tours, ect.), work with 4-H programs, participate in Hettinger Farm & Home Show and would like to start doing articles for the paper.

Tim Faller- If doing articles, maybe go into bigger publication besides local paper.

Dave Ollila- Should try to bring commodity groups together with producers for a voice for the REC's.

Advisory Board Executive Session- staff dismissed

Next meeting- February 2017

Meeting Adjourned: 3 pm

2016 Personnel

Hettinger Research Extension Center

Christopher Schauer	Director and Animal Scientist
Benjamin Geaumont	Research Assistant Professor/Wildlife and Range Science
John Rickertsen	Associate R/E Center Specialist/Agronomy
Caleb Dalley	Research Weed Scientist
Daniel Graham	Wildlife and Range Technician
Daniel Guimaraes Abe	Weed Science Technician
Terri Lindquist	Finance Paraprofessional
Cassie Dick	Administrative Secretary
Don Stecher	Manager of Ag Operations
Nels Olson	Research Technician/Agronomy
David Pearson	Research Technician/Shepherd
Donald Drolc	Research Technician/Livestock
Clint Clark	Research Technician/Beef Herdsman
Stephanie Schmidt	Research Technician/Livestock

Range and Wildlife Graduate Students
Wyatt Mack
Craig Marshall
Animal Science Graduate Students
Alison Crane

The Hettinger Research Extension Center hires individuals on a part-time basis to help in the research effort. Many of these are students as well as local residence. We would like to acknowledge the following people who helped at some time during the past year: John White, Devin Faller, Brody Vorderstrasse, Michael Vater, Jason Schade, Zach Rickertsen, Rebecca Knutson, Samuel Harwood and Ben Dalley.

Advisory Board Members

Kat Weinert, Chair	Hettinger, ND	Tom DeSutter	Fargo, ND
Ethan Andress	Hettinger, ND	Dave Ollila	Rapid City, SD
Chuck Christman	Lemmon, SD	Jeremy Huether	Mott, SD
Lyle Warner	Baldwin, ND	Matt Neiderman	Morristown, SD
Duaine Marxen	Mott, ND	Dustin Freitag	Bowman, ND
Ashley Sabin	Elgin, ND	Sean Seamands	Lemmon, SD
Cody Jorgenson	Hettinger, ND	Jamie Enerson	Hettinger, ND
Wade Henderson, Vice Chair	Lodgepole, SD	Dean Wheri, SBARE Rep.	Mott, SD

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