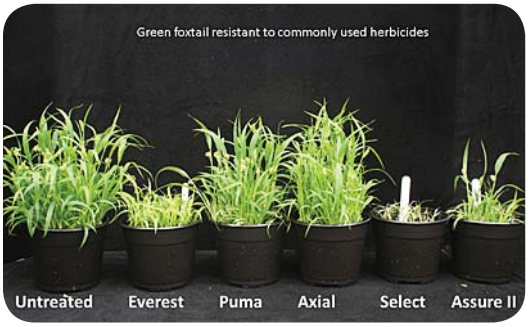
North Central
Research Extension Center

Minot, North Dakota

2011 Annual Research Report No. 29



- Agronomy
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NDSU EXTENSION SERVICE

NDSU NORTH DAKOTA AGRICULTURAL EXPERIMENT STATION

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Our goals at the North Central Research Extension Center (NCREC) are to conduct research to find practical answers to crop production problems, conduct educational programs and demonstrations to address these problems, and to increase foundation grade seed of new and popular varieties for this area. New crops, varieties, and production methods are tested as they become introduced to determine their feasibility in our environment.

Agronomy

The NCREC continues to be an important source of agronomic information for growers as they select cultivars adapted to their farming operations and make management decisions. Cropping systems and crop production studies, public and private seed company hybrid/variety performance trials, and advanced line breeder nurseries are evaluated in replicated field trials at the center. Cereal grains, broadleaf crops, oil-seed crops, and many other new or alternative crops are evaluated for their agronomic traits, seed quality, and yield potential. Fall seeded winter crops including wheat, triticale, rye, spelt, canola and dry pea are evaluated for winter-hardiness, disease, and yield. Off-station research trials are conducted to evaluate cereal grains, pulse crops, soybean, canola, and flax in other counties throughout north central North Dakota. NCREC provides an excellent source of data regarding the performance of both public and private varieties.

The bio-refinery industry is prompting significant research for both fiber and oilseed crops in north central North Dakota. A long-term biomass study was established in 2006 and is continuing to determine the potential value of perennial plant species in the cellulosic ethanol bio-refinery industry. Corn hybrid performance evaluations continue to increase as additional acres are required to support the ethanol industry. Canola and numerous other oilseed crops are being evaluated to identify high oil and high seed yield lines adapted to this region. Energy beets were grown at the center in 2011 and averaged about 28 ton per acre.

The NCREC works closely with the 10 plant breeding programs associated with NDSU. North Dakota leads the nation in the production of 13 crops. Genetic improvement, a consequence of NDSU Plant Breeding Programs is a major reason for the $4 billion in on-farm cash receipts each year. Varieties which are especially adapted to this region are identified as experimental lines and once released are increased. Clean, genetically pure seed ensures the producer will have enhanced yield, quality, and disease resistance of the new varieties brought forward.

North Dakota leads the nation in production of both dry pea and lentil. Because of the need for new varieties specifically adapted to ND. Legislature approved the establishment of a pulse crop breeding program at NDSU. This legislation provided two new positions: a pulse crop breeder stationed in Fargo and an assistant pulse crop breeder located in Minot. The position in Minot is advantageous because it gives the breeding program a strong presence and is centrally located in the main pulse growing region of ND. The main goal of this program is to develop new varieties of dry pea, lentil, and chickpea for ND and surrounding area producers. Experiments conducted in Minot and the surrounding region will include variety trials, early and advanced yield trials, disease screening nurseries, and single plant/row selections. Utilization of onsite greenhouse space to conduct crop hybridizations to recombine favorable traits will continue.

Weed Science
Weed control studies are being conducted in small grains, canola, mustard, juncea, sunflower, safflower, flax, dry bean, pea, lentil, chickpea, corn, and soybean. We are evaluating new herbicides/adjuvants or different uses of existing products in various crops. Other experiments involve evaluation of the impact of different cultural practices such as crop rotation and conventional tillage vs. no-till on crop yield, seed quality, weed control, and economic feasibility. We also conduct IR-4 residue trials to collect data for registration of pest control products in minor crops. We work closely with the North Dakota Department of Agriculture in developing Section 18 packages for EPA. We conduct studies that target specific weeds such as Canada thistle, wild oat, foxtails, biennial wormwood, kochia, common mallow, common milkweed, prickly lettuce, false chamomile, and others.

Extension
The North Central Region of North Dakota has a very diverse agricultural landscape with many different crops and types of agricultural operations. The NCREC works closely with NDSU state specialists and county extension staff to develop educational programs to address various issues pertaining to crop and livestock production systems. The 2009 program events included but were not limited to crop clinics, scout schools, field day presentations, commodity group meetings, marketing clubs, cow calf and feedlot workshops, cattlemen's webcasts, tours, and youth livestock shows.

The extension area specialists at NCREC participate in and conduct applied field research or demonstration trials in an attempt to gather useful information for producers. Extension research and demonstration trials for field crops in 2009 included evaluation of seed treatments on cereal and pulse crops, fungicide products and timing of application on cereal, pulse, and oilseed crops; different types of air-seeder openers; and studies on the ecology, biology, and control of insect pests, primarily wheat stem maggot and wheat stem sawfly. Livestock trials and educational activities in 2009 included farm/ranch plantings and tours of cover crops, bunching cereal residues, and bale grazing for reducing winter feeding and associated costs. Additionally, a multi-state two day feedlot school was conducted including a feedlot tour in the Sidney, Montana, area.

The NCREC strives to provide information which producers can use to help make management decisions and keep pace with their dynamic industry. Along with planned educational programs, the extension staff at NCREC will work together with county extension staff to address immediate production issues as they arise throughout the season. In some cases, informational meetings will be coordinated to provide knowledge and education on the issue at hand. Producers should also feel free to call the NCREC (701-857-7682) anytime they would like to discuss a particular issue with a crop or livestock specialist.

Seed Increase
The foundation seed increase program is a key part in the strategic planning and production of foundation seed in the region. The program produces seed on approximately 1,400 acres of owned, leased, and contract growers' land and is committed to improve upon its mission to provide producers with diverse crops and varieties which are well adapted to the region. Newly released seed varieties are made available through county crop/agriculture improvement associations. The Center also maintains inventory of popular established varieties that are available to seeds men and producers.

The different crops and varieties that will be available for the 2012 cropping season:
Barley – Celebration, Conlon, Pinnacle, Stellar-ND
Durum - Divide, Grenora
Flax - Carter, Omega, York
HRSW - Barlow, Brick, Faller, Glenn, Howard, RB07, Velva
Lentil - Crimson (red)

Temperatue Averages in Degrees Fahrenheit

2011 Crop Season - (November 2010 - October 2011)

Months	Minot Ward County	[1]Minot LT Ward County	Turtle Lake Sheridan/McLean Counties
Nov 2010 - Oct 2011	39	40	39
April	39	41	37
May	51	53	51
June	63	63	62
July	71	68	71
August	69	67	68
September	59	56	58
Coldest Date	2-Feb-11	15-Feb-36	02-Feb-11
Coldest Temp	-20	-49	-25
Days ≤ 0°	47	50	54
Days ≥ 90°	5	13	4
Highest Date	22-Aug-11	[2]see below	22-Aug-11
Highest Temp	93	109	92
Last Spring Frost	2-May-11	15-May	2-May-11
First Fall Frost	14-Sep-11	17-Sep	14-Sep-11
Frost Free Days	135	121	135
[3]GDD for Corn	2204	2023[4]	2162
[5]GDD for Wheat	3419	3403[4]	3371
[6]GDD for Sunflower	2798	2664[4]	2747

[1] Long-term average (105 years).

[2] July 11, 1936 and June 20, 1910.

[3] May 17 to October 14, 2011 for all locations.

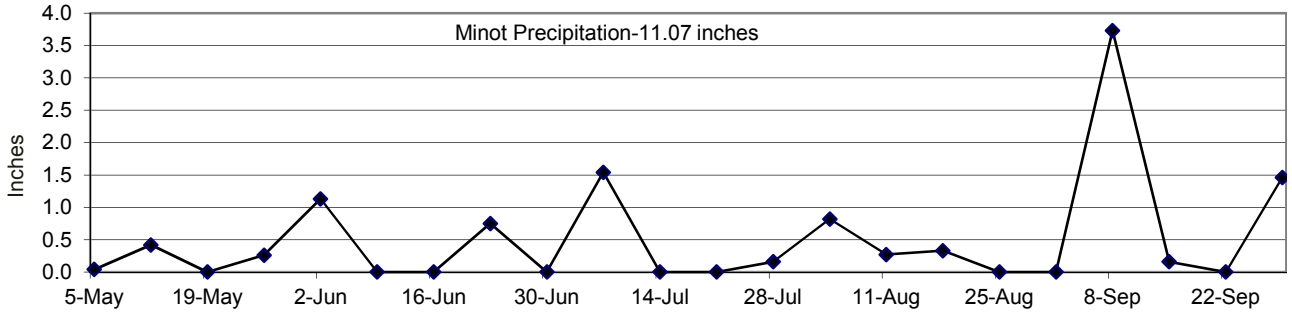
[4] 20 year NDAWN average.

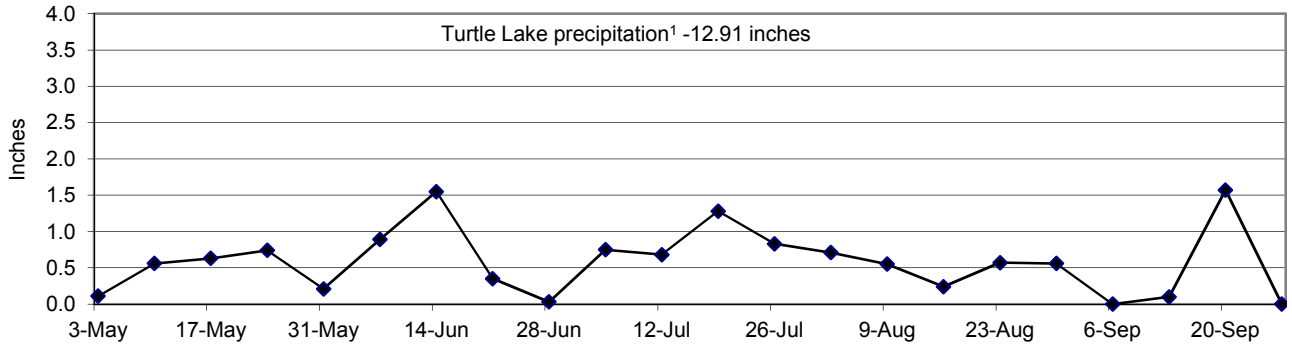
[5] Based on dates of May 17 to August 27 for Minot; May 26 to September 6, 2011 for Sheridan/McLean counties.

[6] Based on dates from June 6 to October 31, 2011 for all locations.

Precipitation Amounts Recieved at NCREC Research Sites

2011 Crop Season - (May - September 2011)





[1] Precipitation amounts presented as one week summations.

2011 Research Season

The North Central Research Extension Center conducted agronomic field research trials at numerous locations across the region in 2011. The majority of studies were conducted at the main research facility south of Minot and at three off-station locations in McHenry, McLean and Sheridan counties. Trials were also conducted at several smaller off-station locations in the region as noted in the individual research reports. The NCREC would like to thank the farmer-cooperator, Extension Agent(s), agricultural improvement associations, and everyone involved in the trials for their help and collaboration.

Special thanks goes out to the Co-op Elevator of McClusky for assisting in hosting the research planning session(s), instrumental in finding the area research location cooperators, and for supporting our field day near Denhoff in Sheridan county. Special thanks also goes to Sheridan county Crop Improvement Association, Emily Kline, county agent and to Diane (Annie) Fylling, county agent support staff for their contributions and dedication in assisting, organizing, moderating, and planning this research location.

At Garrison, two McLean county locations were used in 2011. One location for cereal crops was on Mike Zimmerman's field north of Garrison and one location was selected for the broadleaf crops on Shannon Seidler's land west of Garrison. The Garrison MEY club is the longest running research group in the state and it was an honor to conduct research based on their ideas. Thank you goes to all of MEY club members, to Garrison Farmers Elevator, Farm Credit Services, and the local businesses for the support and to Patrick Carpenter, McLean county agent, for his contributions in moderating and planning the research locations.

Off station research locations included one HRSW and preliminary and advanced canola evaluations on the Myron and Mary Blumhagen farm in McHenry County near Drake. A special thank you goes to Myron and Mary Blumhagen for allowing us to establish some evaluations at a moment's notice. Soil type was a Barnes Cresbard loam at that location. In Sheridan county one broadleaf crop site and one cereal testing location was conducted near Denhoff on Barnes-Svea association loam. Cooperators included Chad Rauser and Craig Peerboom farms, respectively. In McLean County, Shannon Seidler farm near Garrison had the broadleaf crop research site on Barnes Svea loam soil type, Mike Zimmerman had the cereal research location, however these evaluations were not taken to yield due to establishment issues and high heterogeneity in mid-season. A special thank you goes out to everyone that made these evaluations a success in 2011.

Research plots were planted on fallow and re-crop systems under Best Management Practices (BMP). Soil samples from the sites were randomly cored and analyzed. The research sites received fertilizer for high yield goals. Seeding rates were adjusted for seed size and germination to equalize the recommended number of pure live seeds (PLS) per acre for each crop and variety. The plots were seeded with a research press drill with 6-inch row spacing for cereal grains, small seeded oilseed crops, dry pea, lentil, chickpea and soybean. Corn, sunflower, and dry bean were planted on a 30-inch row spacing. Each variety or treatment was generally replicated in four plots to further reduce differences due to undetectable soil and fertility variations. The agronomic traits, seed quality factors, and yields were determined on all plots and were reported in the tables for each specific trial.

The primary purpose of this report is to assist producers in the region to make better crop variety selection, insect and plant disease control, soil fertility, crop production, and weed control decisions based on sound, unbiased research. The agronomic data presented in this publication are from replicated research plots using experimental field designs that enable the use of statistical analysis. The field trials were designed so the "real" yield differences can be statistically separated from yield differences that occur by chance. Since other factors such as environment, soil pH, soil organic matter, and soil texture can affect yield, treatments were randomized and replicated. Data was analyzed statistically to show the Least Significant Difference (LSD 5%) required to reflect a true difference in measurable variables. These values for each variable are given below each table. For example, the yield of the Barley Variety Trial on Fallow indicates a value for LSD 5% of 8.0 bushels. This shows that if there is a difference greater than 8.0 bushels between two varieties, then they were significantly different 95% of the time under these growing conditions. For a variable that has NS (not significant) for the LSD 5% value, it means that there was no significant difference between varieties for that particular variable grown in that environment. The coefficient of variability (C.V.) for a variable is included as an indicator of how much variation occurred across replications for a treatment in the trial and is expressed as a percentage.

Excessively wet field conditions brought about by a late snow melt, and spring rains greatly impeded spring field activities across much of North Dakota. The north central and northwest regions of the state were particularly hard hit by adverse field conditions. North Dakota saw a record 5.6 million acres go unplanted based on USDA FSA reports and the north central/northwest area of the state had the highest percentage of unplanted acres. In general, the percentage of unplanted acres was greater north, with some northern counties seeing only 10-15 percent of their acres planted. Conditions were somewhat better as you moved south and east across the region. The wet spring conditions also had an effect on field research at the North Central Research Extension Center (NCREC) with as many as 30 percent of trials lost due to inability to plant or flooding after planting. Planting delays caused some alteration in crop choices in the area. Many crops such as field peas, barley, and canola were replaced with other choices such as wheat, flax, or other warm season crops as planting dates approached mid to late May.

Crops were generally seeded two to three weeks later than normal and experienced a growing season far different than the past two. Weather conditions early in the season were generally cool and wet. During the time period between May 18 and July 1, wheat accumulated growing degree days (AGGD) lagged 99 degrees Fahrenheit behind normal and 56 degrees Fahrenheit behind the five-year average (NDAWN, Minot station). During this same time-frame, total rainfall was measured at 7.4 inches, which is 173 percent of normal for that time. July and August were drier than the early part of the season, but were still 122 percent of normal with 5.5 inches measured at the NCREC during the two months (NDAWN). Temperatures increased during July and August and by the end of August wheat AGGD surpassed the long term and five-year averages. The high temperatures that helped make up the difference in wheat GDDs may have led to some of the yield disappointments in the 2011 cereal crop. Due to later than normal planting dates, much of the cereal crop flowered during the middle two weeks of July; the same period of time when some of the highest day time and night time temperatures were recorded. The high temperatures had a negative impact on the seed set and grain-fill process of the 2011 cereal crop.

Fungal diseases were present on many crops throughout the season due to wet conditions. Root rots were devastating in some areas with crops suffering from anaerobic soil conditions early in the season. The lack of root development came to light later in the season as some crops did not have the root system to sustain healthy plant growth through maturation. Leaf diseases appeared early in the season and persisted with the wet conditions. Fusarium head blight (scab) was also present throughout the region and varied greatly in severity due to variety, weather conditions, and cropping systems.

The warm temperatures during July and August pushed along the warm season crops nicely and created an environment for excellent yield potential. A mid-September frost event jeopardized this potential as much of the corn and soybean crop had not reached physiological maturity. The damage from the frost was minimal in most areas as corn and soybean yields were good to excellent with decent test weight. Warm temperatures during late September and into October allowed many of the warm season crops to be harvested in October with relatively low harvest moistures.

As fields finally started to dry out in July many producers were struggling with how to manage fields that were not planted. The idea of planting cover crops to use soil moisture was popular in theory, but issues such as cost and field access may have limited the actual number of acres that were planted to cover crop. Another management strategy employed by area producers was to plant winter wheat on unplanted acres. Field conditions allowed for timely planting of winter wheat in many areas of the region, and planted winter wheat acreage will be up significantly for 2011. Soil moisture levels going into freeze-up are near saturation in many areas, and there is some concern regarding field access in 2012. Should we have another heavy snowfall winter with a late melt there certainly is a threat for repeated inability to plant some acres in 2012. A bright spot, however, is that reasonably cooperative weather conditions during the fall allowed time for a lot of field work to be completed in an attempt to prepare a seed bed for next spring. As is often the case in the business of agriculture, we will once again be at the mercy of Mother Nature as we wait to see what the winter and spring brings us. One thing we should not have to worry about is a shortage of soil moisture, but nothing is a guarantee.

Barley Variety Descriptions

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

[1] *M = malting, MT = Being tested in plant-scale tests for malting and brewing quality, F = feed, SP = special uses (hulless).*

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

[3] *R = rough, S = smooth, H = hulless, NA = not available.*

[4] *S = short, L = long.*

[5] *R = resistant, MR = moderately resistant, MS = moderately susceptible, S = susceptible, NA = not available.*

[6] *Moderately resistant to Fusarium head blight.*

[7] *Lower DON accumulations than other varieties tested.*

[8] *Recommended as a malting barley in western U.S.*

Note: Published in NDSU publication A-1049 (revised).

North Central Research Extension Center—Minot
Barley Variety Trial on Fallow

Variety	Days to Head	Plant Height	% Plump	% Thin	Kernel Weight	Test Weight	Protein	Grain Yield 2009	2010	2011	2 Year	3 Year
	DAP[1]	in	>6/64	<5/64	g/1000	lb/bu	%	bu/A				
Six-rowed												
Celebration	52	33	55	5.9	24.3	37.6	15.0	119.1	110.2	52.3	81.3	90.7
Innovation	51	31	61	3.9	29.2	38.2	13.7	--	101.3	47.8	74.5	--
Lacey	51	34	64	4.2	29.9	40.6	14.3	107.8	100.5	60.2	80.4	87.2
Quest	51	35	64	5.1	29.4	41.1	14.0	109.8	97.8	59.5	78.6	86.4
Rasmusson	50	32	58	5.1	28.5	40.5	13.6	122.5	99.2	63.7	81.4	91.7
Robust	51	34	58	5.0	28.3	39.0	14.7	112.0	87.3	46.4	66.8	78.1
Stellar-ND	51	34	69	3.5	28.0	38.7	13.9	114.0	97.6	43.2	70.4	81.3
Tradition	51	34	59	5.8	28.8	39.6	13.9	115.9	94.1	55.6	74.9	85.1
Two-rowed												
Moravian 133	56	26	36	13.6	29.2	35.2	13.8	--	--	27.0	--	--
AC Metcalfe	54	34	63	4.7	31.9	41.2	15.3	128.3	89.3	45.7	67.5	82.7
CDC Copeland	55	32	56	7.0	30.7	39.6	15.1	125.3	95.1	46.7	70.9	84.5
Conlon	50	31	78	2.2	36.1	45.6	13.9	120.2	96.0	49.8	72.9	84.7
Conrad	55	28	56	5.9	30.8	40.2	15.0	126.8	102.9	43.0	73.0	86.4
Harrington	57	32	26	10.6	30.0	41.6	15.2	128.4	90.7	34.5	62.6	79.0
Haxby	53	33	58	6.7	32.6	43.0	14.7	132.2	114.2	53.4	83.8	95.9
Lilly	54	26	54	9.3	30.4	37.5	13.4	--	100.3	42.2	71.3	--
Pinnacle	52	33	74	2.7	34.4	39.8	13.1	129.5	102.6	44.1	73.3	87.4
Rawson	52	29	78	2.7	38.5	40.8	13.0	122.8	96.0	43.8	69.9	83.1
LSD 5%	1	3	9	2.8	3.1	2.3	0.7	10.1	13.2	8.0	--	--
C.V.%	1.7	5.1	8.9	32.7	6.2	3.5	3.0	6.0	9.6	10.0	--	--
Mean	52	32	62	5.3	31.1	39.9	13.8	118.6	97.6	48.4	--	--

Planted on May 18 with a seeding rate of 1 million PLS and harvested on August 18.

[1] DAP = Days after planting.

[2] Lodging score based on scale 0-9 (0 = upright, 9 = flat).

North Central Research Extension Center—Minot
Barley Variety Trial—Sheridan County—McClusky

Variety	Plant Height	% Plump	% Thin	Kernel Weight	Test Weight	Protein	Grain Yield 2009	2010	2011	2 Year	3 Year
	in	>6/64	<5/64	g/1000	lb/bu	%	bu/A				
Six-rowed											
Celebration	35	86	0.8	32.6	41.5	13.2	--	90.2	70.4	80.3	--
Innovation	35	87	0.6	33.3	41.2	11.9	--	84.2	63.6	73.9	--
Lacey	35	85	0.7	34.2	42.2	12.2	--	84.8	58.4	71.6	--
Quest	37	77	1.7	32.3	40.2	11.9	--	86.6	63.8	75.2	--
Tradition	37	87	0.7	33.8	42.8	12.1	--	78.4	76.0	77.2	--
Two-rowed											
AC Metcalfe	35	93	0.7	39.9	45.7	13.5	--	85.7	65.7	75.7	--
Conlon	36	96	0.3	43.4	45.4	12.6	--	75.7	60.1	67.9	--
Conrad	32	93	1.0	39.3	44.4	12.8	--	93.9	72.7	83.3	--
Haxby	35	81	1.9	36.8	44.3	12.8	--	--	65.0	--	--
Harrington	35	66	4.0	32.7	43.5	14.0	--	--	48.8	--	--
Pinnacle	35	93	0.7	42.7	41.9	10.9	--	89.6	67.1	78.3	--
LSD 5%	2	NS	0.9	NS	NS	NS	--	10.4	NS	--	--
C.V.%	3.8	21.3	55.6	17.8	17.8	17.3	--	8.7	25.2	--	--
Mean	35	86	1.1	36.4	42.7	12.5	--	83.7	65.0	--	--

Planted on May 26 with a seeding rate of 1 million PLS and harvested on August 30.

[2] DAP = Days after planting.

North Central Research Extension Center—Minot
Canola Variety Trial on Fallow—Conventional

Company/Brand	Variety	Type[1]	Black Leg[2]	Early Vigor	Percent Cover	Days 10% Flower	Plant Height	Seed Weight	Test Weight	Oil Content	Seed Yield 2009	Seed Yield 2010	Seed Yield 2 Year
				1-5[3]	%	DAP[4]	inch	g/1000	lb/bu	%[5]	----------lb/A----------		
Bayer CropScience	InVigor 8440	H, LL, TR	R	6.8	87	24	34	3.0	49.9	44.1	4038	2836	2068
Bayer CropScience	InVigor 5440	H, LL, TR	R	5.3	89	25	33	3.0	50.7	44.8	4284	3616	2475
Bayer CropScience	InVigor L130	H, LL, TR	R	7.0	96	24	35	2.9	50.8	44.6	--	3895	2612
Bayer CropScience	InVigor L150	H, LL, TR	R	4.0	76	25	31	3.1	50.6	45.7	--	2804	1868
CROPLAN GENETICS	XCEED Oasis CL	OP, CL, TR	R	4.3	70	24	28	2.9	50.5	44.3	--	--	--
Mycogen Seeds	2012 CL	H, CL, HO	R	6.8	96	25	33	3.4	50.7	44.5	--	--	--
Mycogen Seeds	2014 CL	H, CL, HO	MR	4.5	89	26	31	3.2	50.9	45.6	--	--	--
Mycogen Seeds	CL166102H	H, CL, HO	R	5.0	84	25	33	3.4	50.8	45.0	--	--	--
Mycogen Seeds	CL166103H	H, CL, HO	R	5.3	86	18	31	3.4	50.9	45.2	--	--	--
TCI	Heara[6]	H, CL, HO	R	2.3	65	23	26	3.1	--	43.3	--	--	--
TCI	Rodin[6]	H	R	6.3	89	26	36	3.3	49.5	40.3	--	--	--
LSD 5%	--	--	--	1.7	11	4	3	0.3	0.9	1.2	643	944	--
C.V.%	--	--	--	23.9	8.7	12.8	6.6	7.1	1.2	1.9	11.0	18.3	--
Mean	--	--	--	4.8	84	24	34	3.1	50.3	44.2	3983	2953	--

Trial was planted on May 19 with a seeding rate of 685,000 PLS and harvested on August 24.

[1] H = Hybrid, OP = Open Pollinated, LL = Liberty Link, CL = Clearfield System, HO = High Oleic, TR = Traditional Oil Type.

[2] Blackleg: R = Resistant. Blackleg rating provided by company.

[3] Early Vigor: Vigor of plants 4 weeks after planting where 1 = poor and 5 = excellent.

[4] DAP = Days after planting.

[5] Oil adusted to 8.5% moisture.

[6] Rapeseed variety.

Due to the high CV% value for seed yield in 2011 no data is available. Additional data sites should be used for making decisions.

North Central Research Extension Center—Minot
Canola Variety Trial on Fallow–Roundup Ready

Company/Brand	Variety	Type[1]	Black Leg[2]	Days 10% Flower	Days 90% Flower	Bloom Duration	Days to Maturity	Plant Height	Seed Weight	Test Weight	Oil Content	Seed Yield		
												2009	2010	2 Year
				DAP[3]	DAP[3]	days	DAP[3]	inch	g/1000	lb/bu	%[4]	lb/A	lb/A	lb/A
BrettYoung	6040 RR	H, TR	R	43	65	15	80	44	3.1	50.1	44.4	4008	3098	3553
BrettYoung	6070 RR	H, TR	R	39	62	16	79	42	3.4	50.2	45.5	--	--	--
BrettYoung	BY11-860	H, TR	R	42	64	15	81	45	3.2	49.2	45.1	--	--	--
Cargill	v2035	H, HO	R	43	66	15	82	34	3.6	45.9	42.4	--	2635	--
Cargill	07H874	H, HO	R	43	63	13	81	42	3.6	50.0	43.8	--	--	--
Cargill	08H1134	H, HO	R	42	64	15	79	39	3.7	50.1	45.3	--	--	--
CROPLAN GENETICS	HyClass 940	H, TR	R	38	61	15	78	37	3.3	50.3	44.7	3827	3261	3544
CROPLAN GENETICS	HyClass 947	H, TR	R	40	62	15	79	39	3.1	50.4	45.8	--	3360	--
CROPLAN GENETICS	HyClass 955	H, TR	R	39	62	16	77	41	3.4	51.0	46.9	--	--	--
CROPLAN GENETICS	HyClass 988	H, TR	R	42	66	16	84	42	3.8	48.9	45.5	--	3662	--
DEKALB	DKL30-42	H, TR	R	39	64	18	76	37	3.5	51.1	44.8	3943	3358	3651
DEKALB/Monsanto	DKL51-45	H, TR	R	39	60	14	75	39	3.6	51.2	45.8	--	3342	--
DEKALB	DKL52-41	H, TR	R	40	63	16	80	44	3.3	50.3	44.6	--	--	--
DEKALB	DKL55-55	H, TR	R	38	60	16	77	41	3.6	51.1	46.5	--	--	--
DEKALB	DKL70-07	H, TR	R	40	61	14	79	42	3.6	51.4	45.1	--	--	--
DEKALB/Monsanto	DKL72-40	H, TR	R	38	60	15	81	41	3.3	50.7	45.2	--	3446	--
DEKALB	DKL72-55	H, TR	R	39	62	15	79	43	3.6	51.1	44.6	3740	3012	3376
DL SEEDS INC	30512-D8	H, TR	R	41	65	17	81	44	3.2	50.1	44.9	--	3396	--
Integra FortifiedSeed	7121R	H, TR	R	42	65	16	79	40	3.2	50.6	44.1	3964	3135	3550
Integra FortifiedSeed	7150R	H, TR	R	40	63	16	79	35	3.2	50.3	45.3	4395	3231	3813
Integra FortifiedSeed	7152R	H, TR	R	40	64	17	78	38	3.5	50.9	45.2	--	--	--

North Central Research Extension Center—Minot
Canola Variety Trial on Fallow–Roundup Ready–Cont.

Company/Brand	Variety	Type[1]	Black Leg[2]	Days 10% Flower DAP[3]	Days 90% Flower DAP[3]	Bloom Duration days	Days to Maturity DAP[3]	Plant Height inch	Seed Weight g/1000	Test Weight lb/bu	Oil Content %[4]	Seed Yield 2009 lb/A	Seed Yield 2010 lb/A	Seed Yield 2 Year lb/A
Monsanto	G08027	H, TR	R	43	67	17	83	48	3.4	51.1	43.2	--	--	--
Monsanto	G08039	H, TR	R	42	65	15	80	43	3.5	51.1	44.4	--	--	--
Monsanto	G88605	H, TR	R	39	61	15	78	38	3.2	50.9	46.3	--	--	--
Monsanto	G89304	H, TR	R	38	62	17	76	38	3.2	51.3	46.5	--	2901	--
Monsanto	G98689	H, TR	R	39	62	15	77	37	3.1	50.2	44.8	--	--	--
Monsanto	G98739	H, TR	R	41	63	15	78	40	3.4	49.3	46.2	--	--	--
Monsanto	G98767	H, TR	R	40	62	15	79	42	3.5	50.8	46.7	--	--	--
Monsanto	G99010	H, TR	R	39	61	15	78	37	3.3	50.7	48.4	--	--	--
Monsanto	G99396	H, TR	R	41	63	16	80	37	3.2	50.7	48.4	--	--	--
Monsanto	G99402	H, TR	R	40	62	16	79	42	3.1	50.7	48.4	--	--	--
Mycogen Seeds	1012 RR	H, HO	R	44	66	16	84	47	3.2	50.6	43.5	--	--	--
Mycogen Seeds	1014 RR	H, HO	MR	44	67	16	82	43	3.3	49.8	42.9	--	--	--
Mycogen Seeds	G152936H	H, HO	R	43	63	14	81	41	3.5	50.6	43.7	--	--	--
Mycogen Seeds	G152951H	H, HO	R	44	66	15	81	45	3.3	50.7	43.6	--	--	--
Pioneer	45H29	H, TR	R	40	61	14	79	46	3.1	50.7	44.5	--	--	--
Pioneer	45S52	H, TR	MR	41	63	15	79	44	3.4	49.9	44.6	--	--	--
LSD 5%	--	--	--	2	3	3	2	6	NS	1.2	2.3	597	458	--
C.V.%	--	--	--	2.9	3.1	10.4	1.9	9.3	11.4	1.4	3.1	10.9	10.5	--
Mean	--	--	--	41	63	15	79	41	3.4	50.5	45.3	3921	3123	--

Trial was planted on May 18 with a seeding rate of 685,000 PLS and harvested on August 24.

[1] OP = Open Pollinated, H = Hybrid, Syn= Synthetic, TR = Traditional Oil Type, HO = High Oleic Oil Type .

[2] Blackleg: R = Resistant, MR = Moderately Resistant. Blackleg rating provided by company.

[3] DAP = Days after planting.

[4] Oil adjusted to 8.5% moisture.

Due to the high CV% value for seed yield in 2011 no data is available. Additional data sites should be used for making decisions.

North Central Research Extension Center—Minot
Corn Hybrid Trial

Company/Brand	Variety	RM[1]	Days to Tassel	Plant Height	Cob Height	Harvest Moisture	Seed Weight	Test Weight	Seed Protein	Seed Starch	Grain Yield				
											2009	2010	2011	2 Year	3 Year
			DAP[2]	in	in	%	g/1000	lb/bu	%	%	bu/A				
AgVenture	7900	79	49	75	28	17.0	243	57.9	9.1	67	--	--	118	--	--
AgVenture	8300	83	49	73	31	21.7	244	52.9	7.8	68	--	--	153	--	--
AgVenture	2949	83	53	79	30	17.6	228	54.8	8.1	67	--	--	143	--	--
DEKALB	DKC30-20	80	46	75	29	18.6	289	60.3	9.6	66	--	125	113	119	--
DEKALB	DKC33-53	83	49	73	28	19.4	256	56.5	9.2	65	79	--	109	--	94
Dyna-Gro Seed	50K21	78	45	71	22	16.5	314	59.3	10.7	65	82	122	95	108	100
Dyna-Gro Seed	51V45	82	46	78	31	18.7	266	59.9	9.9	67	93	131	125	128	116
Dyna-Gro Seed	CX11179	79	44	75	23	16.4	245	59.5	9.5	67	--	--	114	--	--
Hyland Seeds	HL 3085	79	44	66	25	14.9	296	60.2	10.2	67	--	--	97	--	--
Hyland Seeds	8098	80	48	72	28	21.4	242	56.0	8.9	65	--	--	105	--	--
Hyland Seeds	8105	81	46	77	28	16.4	260	58.5	8.7	67	--	--	109	--	--
Integra Fortified Seed	6385 VT3	85	51	69	25	18.1	256	56.5	9.1	67	111	129	117	123	119
Integra Fortified Seed	9312 VT3	--	44	73	26	19.2	301	59.9	9.5	65	--	--	104	--	--
Integra Fortified Seed	9333 VT2 Pro	--	48	81	35	20.1	297	59.4	10.1	67	--	--	135	--	--
Integra Fortified Seed	9350 VT3	--	47	72	28	19.8	291	56.2	9.3	67	--	--	131	--	--
NuTech Seed	3A-080	80	47	71	28	20.9	243	53.8	7.6	68	--	--	133	--	--
NuTech Seed	3A-183	82	50	79	30	18.8	251	55.8	8.9	68	--	--	157	--	--
NuTech Seed	5H-080	82	47	76	31	23.3	253	53.5	7.7	68	--	--	167	--	--
NuTech Seed	5H-279	79	45	72	27	23.7	276	56.5	8.8	68	--	--	147	--	--
NuTech Seed	5N-183	82	49	80	30	21.3	255	55.0	8.6	67	--	--	160	--	--
PFS	76782 PFS	82	50	80	34	21.9	306	59.7	10.0	67	--	--	131	--	--

North Central Research Extension Center—Minot
Corn Hybrid Trial–Cont.

Company/Brand	Variety	RM[1]	Days to Tassel	Plant Height	Cob Height	Harvest Moisture	Seed Weight	Test Weight	Seed Protein	Seed Starch	Grain Yield				
											2009	2010	2011	2 Year	3 Year
			DAP[2]	in	in	%	g/1000	lb/bu	%	%	bu/A				
PROSEED INC.	781 RRBt	81	52	72	32	30.6	276	52.7	9.4	67	123	149	151	150	141
PROSEED INC.	981 GTCBLL	81	49	79	35	23.4	256	57.5	9.3	66	115	136	145	140	132
PROSEED INC.	1083 GT	83	52	81	32	19.3	249	55.3	8.9	67	--	--	141	--	--
REA Hybrids	1A218	80	50	80	32	23.0	301	58.2	9.6	67	--	126	134	130	--
REA Hybrids	1B880	82	47	73	29	14.9	251	57.2	9.2	67	--	--	132	--	--
REA Hybrids	1C101	76	44	71	25	15.6	289	61.4	10.2	67	--	--	100	--	--
REA Hybrids	1T345	79	47	75	32	18.9	288	58.8	9.8	66	84	125	99	112	103
REA Hybrids	1V115	78	44	74	28	19.9	303	60.5	9.9	67	--	--	110	--	--
Seeds 2000	2771 GT	77	48	75	29	21.6	249	55.4	10.0	66	--	--	125	--	--
Seeds 2000	2823 GTCBLL	82	51	79	30	17.3	240	56.3	8.4	67	--	--	151	--	--
Seeds 2000	8201 VT3	82	50	75	30	16.8	245	56.8	8.5	67	--	--	124	--	--
LSD 5%	--	--	2	4	3	2.7	18	0.9	0.4	NS	14	18	18	--	--
C.V.%	--	--	3.6	3.4	8.2	9.7	4.9	1.2	3.4	2.7	10.0	9.6	10.1	--	--
Mean	--	--	48	75	29	19.6	268	57.2	9.2	67	100	132	127	--	--

Trial was planted on May 17 with a seeding rate of 22,000 PLS and harvested on October 18.

[1] *RM = Relative maturity in days; information provided by company.*

[2] *DAP = Days after planting.*

Dry Bean Variety Description

Class and Cultivar	Origin	RM[1]	Plant Type[2]	-------Blight------- Common	Halo[3]	-----BCMV----- Type	NY15[4]	Fusarium Root Rot	White Mold
PINTO									
AC Island	Ag. Can	ME	V	-	-	-	-	-	-
Baja	Provita	E	V	-	-	-	-	-	-
Bill-Z	CSU	M	V	-	T	R	R	-	S
Buster	Seminis	ME	UV	S	T	R	R	-	S
Croissant	CSU	L	V	-	-	-	-	-	-
Durango	Provita	E	V	-	-	-	-	-	-
Galeena	Provita	L	V	-	-	-	-	-	-
GTS-900	GenTec	L	UV	S	T	-	-	-	A
GTS-903	GenTec	L	UV	-	-	-	-	-	-
GTS-904	GenTec	L	UV	-	-	-	-	-	-
GTS-907	GenTec	M	UV	-	-	-	-	-	-
Kimberly	U. Idaho	M	V	-	-	-	-	-	-
La Paz	Rogers	L	USV	-	-	-	-	-	-
Lariat	NDSU	L	USV	-	-	R	R	-	A
Mariah	Seminis	ME	UV	-	-	-	-	-	-
Maverick	NDSU	ME	V	S	T	S	S	-	A
Max	Idaho Seed Bean	E	V	-	-	-	-	-	-
Medicine Hat	Seminis	ME	UV	-	-	-	-	-	-
Montrose	CSU	E	V	-	T	R	R	-	S
ND-307	NDSU	M	UV	-	-	R	R	-	-
Odyssey	Idaho Seed Bean	ME	V	-	-	-	-	-	-
Othello	USDA-Prosser	E	V	S	T	R	R	-	S
Pinata	Idaho Seed Bean	VE	V	-	-	R	R	-	A
Quincy	WSU/USDA	M	V	-	-	-	-	-	-
Rally	GenTec	L	UV	-	-	-	-	-	A
Remington	Rogers	ME	UV	S	T	-	-	-	A
Santa Fe	MSU	M	USV	-	-	-	-	-	A
Sequoia	Idaho Seed Bean	ML	USV	-	-	-	-	-	-
Shoshone	U. Idaho	ML	V	S	-	-	-	-	S
Sinaloa	Provita	-	-	-	-	-	-	-	-
Sonora	Provita	E	V	S	-	-	-	-	S
Stampede	NDSU	M	USV	-	-	R	R	-	A
Topaz	Rogers	E	V	S	T	R	R	-	S
Topaz R	Rogers	E	V	S	-	-	-	-	S
Winchester	Rogers	ME	UV	VS	-	-	-	-	A
Windbreaker	Seminis	M	UV	-	-	-	-	-	-
NAVY									
Avalanche	NDSU	ME	USV	-	-	R	R	-	A
CDC Whitecap	U. Sask	M	USV	S	-	-	-	-	S
Cirrus	Hyland	ME	USV	-	-	-	-	-	S
Envoy	GenTec	M	B	-	-	R	R	-	S
Ensign	Roger	M	USV	-	-	R	R	-	-
GTS-544	GenTec	M	USV	-	-	-	-	-	-
GTS-564	GenTec	M	USV	-	-	-	-	-	-
HMS Medalist	Provita	M	UV	-	-	-	-	-	-
HY 4181	Hyland	-	-	-	-	-	-	-	-
Indi	ADM-Seedwest	M	USV	-	-	-	-	-	-
Lightning	U. of Guelph	M	UV	-	-	-	-	-	-
Mayflower	MSU	ML	USV	-	T	R	R	T	T
Navigator	Rogers	M	USV	-	-	R	R	-	T

Class and Cultivar	Origin	RM[1]	Plant Type[2]	-------Blight------- Common	Halo[3]	-----BCMV----- Type	NY15[4]	Fusarium Root Rot	White Mold
Norstar	NDSU	ME	USV	S	T	R	R	-	T
Octaine	United Pulse	-	-	-	-	-	-	-	-
Premiere	Ag. Can.	M	UV	S	-	R	R	-	-
Regent	Ag. Can.	ME	UV	S	-	R	R	-	-
Reliant	GenTec	-	-	-	-	-	-	-	-
Rexeter	U. of Guelph	-	USV	-	-	-	-	-	-
ROG 331	Rogers	M	UV	S	-	R	R	-	A
Schooner	Rogers	ML	USV	-	-	R	R	-	S
Seabiskit	ADM	ME	USV	-	-	-	-	-	-
Seahawk	MSU	ML	USV	S	-	R	R	-	T
Skyline	United Pulse	-	-	-	-	-	-	-	-
T9903	Hyland	ME	USV	-	-	-	-	-	-
T9905	Hyland	ME	USV	-	-	-	-	-	-
Viscount	GenTec	-	-	-	-	-	-	-	-
Vista	Ag. Can.	ML	USV	-	-	R	R	-	T
SMALL RED									
AC Earlired	Ag. Can	E	V	S	-	-	-	-	S
AC Scarlet	Ag. Can	ME	USV	S	S	-	-	S	S
Cajun	Rogers	E	UV	-	-	-	-	-	-
Carman	Idaho Seed Bean	E	V	-	-	R	-	-	S
Garnet	Rogers	M	V	-	R	R	-	-	S
Merlot	MSU	ME	USV	S	S	R	R	T	S
Ryder	Rogers	M	USV	-	-	MR	-	-	-
UI-259	U. Idaho	M	V	-	-	-	-	-	S
BLACK									
Black Jack	GenTec	ML	USV	-	-	R	R	-	-
Black Magic	GenTec	L	USV	S	T	R	R	T	T
Black Velvet	Seminis	-	USV	-	-	-	-	-	-
Blackhawk	MSU	L	USV	S	T	R	R	T	T
CDC Jet	U. Sask.	ME	USV	R	-	-	-	T	T
CDC Super Jet	U. of Sask.	ME	USV	-	-	-	-	-	-
Condor	MSU	ML	USV	S	S	-	R	R	T
Domino	MSU	L	USV	S	T	R	R	T	T
Eclipse	NDSU	M	USV	-	-	R	R	T	T
GTS-1103	GenTec	-	USV	-	-	-	-	-	-
Jaguar	MSU	M	USV	-	-	R	R	-	T
Jet Black	-	L	USV	-	-	-	-	-	-
Loreto	Provita	M	USV	-	-	-	-	-	-
T-39	U. Calif.	M	USV	S	T	R	R	T	T
Zorro	MSU	L	USV	-	-	-	-	-	-
PINK									
Alberta Pink	U. Alberta	E	V	S	-	S	S	-	S
Flamingo	Idaho Seed Bean	E	V	-	-	-	-	-	S
Floyd	Rogers	ML	V	-	-	-	-	-	S
ROG 922	Rogers	M	V	-	-	R	R	-	S
Rosalee	U. Sask.	E	V	S	-	-	-	-	S
Sedona	MSU/ARS	M	USV	S	-	R	-	R	A
UI-537	U. Idaho	E	V	-	-	R	R	-	S
Viva	USDA-Prosser	M	V	-	-	-	-	R	S
LT RED KIDNEY									
Blush	WSU/USDA	ML	B	-	-	-	-	-	-
California Early (Celrk)	U. Calif.	E	B	S	S	R	R	S	S
Chinook 2000	MSU	M	B	-	T	R	R	S	-

Class and Cultivar	Origin	RM[1]	Plant Type[2]	-------Blight------- Common	Halo[3]	-----BCMV----- Type	NY15[4]	Fusarium Root Rot	White Mold
Clouseau	Seminis	M	B	-	-	-	-	-	-
Foxfire	Rogers	ME	B	T	R	R	R	T	T
OAC Inferno	U. of Guelph	-	-	-	-	-	-	-	-
OAC Lyrik	U. of Guelph	ME	B	-	-	-	-	-	-
Pink Panther	Seminis	M	B	-	-	-	-	-	-
Sacramento	Agri-Sales	E	B	S	S	S	S	S	S
DK RED KIDNEY									
Cabernet	Rogers	ML	B	VS	S	R	R	MR	S
Drake	Seminis	M	B	S	S	R	R	S	T
GTS-104	GenTec	M	B	-	-	-	-	-	-
GTS-106	GenTec	M	B	-	-	-	-	-	-
Majesty	Ag. Can.	-	-	-	-	-	-	-	-
Montcalm	MSU	ML	B	T	T	R	R	S	T
Redhawk	MSU	M	B	S	T	R	R	-	T
Red Rover	Seminis	ME	B	-	-	-	-	-	-
WHITE KIDNEY									
Beluga	MSU	M	B	S	T	R	R	S	S
Lassen	Agri-Sales	E	B	S	S	R	R	S	S
Silvercloud	WSU/USDA	-	-	-	-	-	-	-	-
GREAT NORTHERN									
Beryl	Rogers	M	V	S	S	-	-	-	S
Gemini	Provita	E	-	-	-	-	-	-	-
Hungerford	U. Idaho	M	V	-	-	-	-	-	-
Matterhorn	MSU	ME	USV	S	T	R	R	-	A
Orion	Provita	E	V	-	-	-	-	-	-
Sawtooth	U. Idaho	L	V	-	-	-	-	-	-
UI-465	U. Idaho	M	V	S	-	R	R	T	S
OTEBO									
Fuji	MSU	E	B	-	-	R	R	-	-
Hime	-	ME	B	-	-	S	S	-	-

Not all entries appear in the table due to lack of information.

[1] RM = Relative Maturity, E = Early, ME = Medium Early, M = Medium, ML = Medium Late, L = Late.

[2] V = Vine, B = Bush, UV = Upright Vine, USV = Upright Short Vine.

[3] Disease reactions based upon field observations in North Dakota. A = Avoidance, S = Susceptible, T = Tolerant, R = Resistant, MS = Moderately Susceptible, MR = Moderately Resistant.

[4] BCMV = Bean Common Mosaic Virus reaction with two strains (Type and NY15).

Note: Published in NDSU publication A-654 (revised).

North Central Research Extension Center—Minot
Dry Edible Bean Variety Trial—McLean County

Variety	Seed Weight	Seeds/ Pound	Seed Yield 2009	2010[1]	2011	2 Year	3 Year
	g/1000	seeds	----------lb/A----------				
Navy							
Avalanche	163.6	2776	--	1378	766.68	1072	--
HMS Medalist	136.7	3326	--	1104	816	960	--
Vista	147.1	3107	--	1268	843	1056	--
Pinto							
La Paz	296.5	1533	--	1640	913	1277	--
Medicine Hat	359.5	1263	--	1310	970	1140	--
Stampede	314.2	1449	--	1270	1039	1154	--
Black							
Eclipse	173.4	2619	--	1210	532	871	--
Zorro	171.2	2654	--	1327	700	1013	--
LSD 5%	13.6	185	--	302	NS	--	--
C.V.%	4.2	5.4	--	15.2	25.8	--	--
Mean	220.3	2340.77	--	1375	822	--	--

Planted on June 6 with a seeding rate of variable PLS and harvested on September 27.

[1] Study site initiated in 2010.

Durum Variety Descriptions

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

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

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

[3] Days to Head = the number of days from planting to head emergence from the boot. Averaged from several locations in

*[4] R = resistant, MR = moderately resistant, M = intermediate, MS = moderately susceptible, S = susceptible, VS = very susceptible, Foliar Disease = reaction to tan spot and septoria leaf spot complex. * Indicates yields and/or quality often have been higher than would be expected based on visual symptoms. NA = Not adequately tested.*

[5] Alzada has a disease-resistance package that is best suited for western North Dakota (drier growing conditions).

Note: Published in NDSU publication A-1067 (revised).

North Central Research Extension Center—Minot
Durum Variety Trial—Sheridan County—McClusky

Variety	Plant Height	Kernel Weight	Test Weight	Protein	Grain Yield 2009	2010	2011	2 Year	3 Year
	in	g/1000	lb/bu	%	bu/A				
Tioga	41	36.4	57.4	13.2	--	65.1	51.3	58.2	--
Alkabo	36	33.0	56.4	13.7	--	64.1	44.8	54.5	--
Divide	37	32.8	56.8	13.8	--	70.1	48.5	59.3	--
Grenora	37	35.3	55.9	13.7	--	75.9	54.8	65.3	--
Pierce	38	30.5	57.0	14.0	--	71.4	44.7	58.0	--
Lebsock	36	33.1	58.6	13.0	--	71.4	44.4	57.9	--
Mountrail	38	33.3	55.9	13.8	--	72.3	46.1	59.2	--
Dilse	36	32.0	56.1	14.8	--	69.4	40.2	54.8	--
Ben	38	34.2	56.4	13.9	--	65.9	44.6	55.3	--
Strongfield	36	29.8	53.5	15.0	--	63.1	40.6	51.8	--
Wales	37	31.0	54.9	14.4	--	70.2	39.2	54.7	--
Westhope	36	31.1	53.9	14.3	--	62.5	42.8	52.7	--
DG Star	38	29.2	53.4	14.8	--	61.9	32.7	47.3	--
DG Max	37	31.0	55.6	14.3	--	71.6	40.0	55.8	--
LSD 5%	1	1.7	1.7	0.3	--	NS	6.7	--	--
C.V.%	2.2	3.6	2.1	1.6	--	10.6	10.4	--	--
Mean	37	32.6	56.0	13.9	--	69.0	44.7	--	--

Planted on May 26 with a seeding rate of 1.5 million PLS and harvested on September 6.

[1] *DAP = Days after planting.*

North Central Research Extension Center—Minot
Emmer Variety Trial

Variety	Days to Head	Plant Height	Lodge	Kernel Weight	Test Weight	Protein	Grain Yield 2009	2010	2011	2 Year	3 Year
	DAP[1]	in	0-9[2]	g/1000	lb/bu	%	bu/A				
Common_MC	72	42	6.0	65.3	34.1	15.1	--	91.4	98.7	95.1	--
Lucille	70	36	5.3	56.7	37.5	15.0	115.2	117.0	85.7	101.3	106.0
Vernal	72	40	6.0	62.1	34.6	15.0	--	112.2	90.3	101.3	--
ND Common	72	41	6.3	62.2	34.7	15.0	121.0	110.7	100.5	--	110.7
LSD 5%	NS	NS	NS	NS	NS	NS	13.0	11.0	NS	--	--
C.V.%	2.1	13.9	22.0	24.0	8.5	1.3	8.4	7.7	18.5	--	--
Mean	72	40	5.9	61.6	35.2	15.0	104.6	98.4	93.8	--	--

Planted on May 18 with a seeding rate of 1 million PLS and harvested on August 29.

[1] DAP = Days after planting.

[2] Lodging score based on scale 0-9 (0 = upright, 9 = flat).

Due to the high CV% value for seed yield in 2011 no data is available. Additional data sites should be used for making decisions.

Flax Variety Descriptions

Variety[1]	Origin[2]	Year Released	Relative Maturity	Seed Color	Plant Height	Wilt[3]
AC Lightning	Can.	2002	Late	Brown	Med.tall	R
Bison	ND	1926	Med.	Brown	Med.	MR
Carter	ND	2004	Med.	Yellow	Med.	R
Cathay	ND	1998	Med.	Brown	Med.	MR
CDC Arras	Can.	1999	Med.	Brown	Med.	MR
CDC Bethune	Can.	1999	Med.late	Brown	Med.tall	MR
CDC Mons	Can.	2003	Med.late	Brown	Med.	MR
CDC Sorrel	Can.	2007	Med.late	Brown	Med.tall	MR
Hanley	Can.	2002	Med.early	Brown	Med.	R
Linott	Can.	1966	Med.early	Brown	Med.	MS/MR
McGregor	Can.	1980	Late	Brown	Med.tall	MR
Neche	ND	1988	Med.	Brown	Med.	R
Nekoma	ND	2002	Late	Brown	Med.	MR
Omega	ND	1989	Med.	Yellow	Med.	MS
Pembina	ND	1998	Med.	Brown	Med.	MR
Prairie Blue	Can.	2003	Med.late	Brown	Med.tall	MR
Prairie Grande	Can.	2008	Med.early	Brown	Med.	MR
Prairie Thunder	Can.	2006	Med.	Brown	Short	MR
Rahab 94	SD	1994	Med.	Brown	Med.	MR
Selby	SD	2000	Late	Brown	Tall	MR
Shape	Can.	2010	Med.	Brown	Med.	R
Webster	SD	1998	Late	Brown	Tall	MR
York	ND	2002	Late	Brown	Med.	R

[1] *All varieties have resistance to prevalent races of rust, all have good oil yield and oil quality.*

[2] *Can. = Canada, ND = North Dakota State University, SD = South Dakota State University.*

[3] *R = resistant, MR = moderately resistant, MS = moderately susceptible, NA = not available.*

Note: Published in NDSU publication A-1105 (revised).

North Central Research Extension Center—Minot

Flax Variety Trial—McLean County

Variety	Seed Weight	Test Weight	Oil[1]	Seed Yield 2009	2010	2011	2 Year	3 Year
	g/1000	lb/bu	%	bu/A				
Carter[2]	5.2	48.4	42.7	--	21.8	18.8	20.3	--
Nekoma	5.1	47.1	42.1	--	21.8	18.0	19.9	--
Omega[2]	5.6	47.2	43.2	--	20.5	21.7	21.1	--
Prairie Thunder	5.3	47.6	42.6	--	14.0	19.0	16.5	--
Rahab 94	5.6	45.1	41.9	--	16.0	17.4	16.7	--
York	5.4	47.3	41.3	--	19.1	18.3	18.7	--
LSD 5%	0.2	NS	0.7	--	4.3	NS	--	--
C.V.%	3.0	5.3	1.1	--	15.2	23.3	--	--
Mean	5.4	47.1	42.3	--	18.8	18.8	--	--

Planted on May 25 with a seeding rate of 4 million PLS and harvested on September 9.

[1] Oil adjusted to 9% moisture.

[2] Yellow-seed type.

Due to the high CV% value for seed yield in 2011 no data is available. Additional data sites should be used for making decisions.

North Central Research Extension Center—Minot

Flax Variety Trial—Sheridan County

Variety	Days to Maturity	Plant Height	Seed Weight	Test Weight	Oil[1]	Seed Yield				
						2009	2010	2011	2 Year	3 Year
	DAP[2]	in	g/1000	lb/bu	%	bu/A				
Carter[3]	83.0	22.0	1.0	53.7	41.4	--	--	26.1	--	--
Nekoma	82.0	21.3	1.0	53.3	40.9	--	--	21.6	--	--
Omega[3]	83.0	21.8	1.0	52.5	40.6	--	--	18.6	--	--
Prairie Thunder	79.8	21.5	1.0	52.7	40.1	--	--	21.4	--	--
Rahab 94	80.0	23.5	1.1	53.1	40.9	--	--	25.5	--	--
York	83.0	21.5	1.0	53.0	38.8	--	--	27.2	--	--
LSD 5%	1.7	NS	0.1	NS	0.7	--	--	4.8	--	--
C.V.%	1.4	5.0	4.5	1.0	1.1	--	--	13.7	--	--
Mean	81.8	21.9	1.0	53.0	40.5	--	--	23.4	--	--

Planted on May 26 with a seeding rate of 4 million PLS and harvested on September 19.

[1] Oil adjusted to 9% moisture.

[2] DAP = Days after planting.

[3] Yellow-seed type.

Hard Red Spring Wheat Variety Descriptions

Variety	Agent or Origin[1]	Year Rlsd	Height (in)	Straw Strgth[2]	Days to Head[3]	Reaction to Disease[4]			
						Stem Rust	Leaf Rust	Leaf Spot[5]	Head Scab
Agawam[6]	WestBred	2008	30	7	58	NA	MR-MS	NA	MS
Albany	Limagrain	2008	32	5	62	MR	S	MS	M
Alpine[7]	AgriPro	2008	34	6	62	NA	S	MS	MS
Alsen	ND	2000	34	3	63	R	MR-MS	S	MR
Barlow	ND	2009	35	6	62	R	MR-MS[9]	MR	M
Blade	WestBred/Sabre	2007	33	4	64	R	MS[9]	MS	M
Breaker	WestBred	2007	34	3	64	R	MR-MS[9]	MS	M
Brennan	AgriPro	2009	30	4	62	R	MR	M	MS
Brick	SD	2009	35	5	60	R-MR	MR-MS	MS/S	MR
Briggs	SD	2002	35	7	61	R-MR	MR-MS	MS	S
Brogan	WestBred	2009	32	3	64	MR	MR-MS	MS	S
Carberry	Can.	2009	32	4	57	NA	MR-MS	NA	NA
Choteau[6]	MT	2004	32	7	66	NA	MR-MS	NA	NA
Cromwell	Thunder Seed	2007	33	5	67	R	MR	MR	S
Dapps	ND	2003	39	5	59	R	MS[9]	M	S
Edge	WestBred/Sabre	2008	33	5	62	NA	S	MS	MS
Faller	ND	2007	35	5	65	R	S[9]	MR	M
Freyr	AgriPro	2004	34	6	64	R	S	MS	MR
Glenn	ND	2005	37	4	61	R	MR-MS[9]	M	MR
Hat Trick	Limagrain	2007	34	5	61	R	MR-MS[9]	M	MS
Howard	ND	2006	36	7	63	R	MS[9]	M	M
Jenna	AgriPro	2009	32	4	66	R	MR-MS	M	M
Kelby	AgriPro	2006	30	4	62	MR	MR-MS[9]	M	M
Kuntz	AgriPro	2007	31	4	65	R	MS[9]	MS	M
Mott[6]	ND	2009	36	3	66	MR	S[9]	MS	MS
Muchmore	Can.	2009	32	4	57	NA	MR-MS	NA	NA
ND 901CL PLUS[8]	ND	2010	36	4	60	R-MR	MR	NA	M
Pivot	WestBred	2010	27	3	67	MS	S[9]	MR	S
Powerplay	**Limagrain**	**2011**	**33**	**NA**	**65**	**NA**	**NA**	**NA**	**NA**
Prosper	**NDSU**	**2011**	**35**	**5**	**65**	**R**	**S[9]**	**M**	**M**
RB07	MN	2007	32	5	62	R	R-MR	MS	MR
Reeder	ND	1999	35	3	63	R	S	S	S
Rollag	**MN**	**2011**	**35**	**3**	**63**	**R**	**MS[9]**	**MR**	**MR**
Sabin	MN	2009	33	6	65	R	MR	MS	M
Samson	WestBred	2007	31	2	63	R	MR-MS	MS	S
Select	SD	2010	35	6	60	R-MR	R-MR	R-MR	MR
Steele-ND	ND	2004	35	7	63	R	MS-S[9]	MS	M
SY Soren	**Sygenta/AgriPro**	**2011**	**30**	**4**	**63**	**R**	**MR**	**M**	**M**
SY Tyra[6]	**Sygenta/AgriPro**	**2011**	**30**	**NA**	**62**	**R**	**MR**	**NA**	**S**
SY605 CL[8]	AgriPro	2009	34	7	62	R-MR	MR-MS	MS	S
Tom	MN	2008	34	6	64	R	MR-MS	NA	M
Traverse	SD	2006	37	6	60	R	MR	NA	M
Vantage	WestBred	2007	32	2	67	MR	MR-MS	MS	MS
Velva	**NDSU**	**2012**	**35**	**4**	**63**	**R**	**MR-MS[9]**	**M**	**MS**
WB Digger	WestBred	2009	34	6	63	MR	MR-MS	NA	MS
WB Mayville	**Monsanto/WB**	**2011**	**30**	**4**	**63**	**R**	**MR-MS**	**MS**	**S**

[1] Refers to agent or developer: Can. = varieties developed in Canada, MN = University of Minnesota, MT = Montana State University, ND = North Dakota State University, SD = South Dakota State University. ***Bold*** *varieties are those recently released so data is limited and rating values may change.*

[2] Straw Strength = 1-9 scale with 1 the strongest and 9 the weakest. These values are based on recent data and may change as more data become available.

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

[4] R = resistant, MR = moderately resistant, M = intermediate, MS = moderately susceptible, S = susceptible, VS = very susceptible. NA indicates insufficient information is available to make an accurate assessment.

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

[6] Solid stemmed or semisolid stem, imparting resistance to sawfly. *[7] Hard white wheat.*

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

[9] These lines were resistant to moderately resistant to races prevalent prior to 2011. Resistance may have been defeated by new races of the pathogen that exist at an unknown prevalence in natural population.

Note: Published in NDSU publication A-574 (revised).

North Central Research Extension Center—Minot
HRSW Variety Trial on Fallow

Variety	Days to Head	Plant Height	Kernel Weight	Test Weight	Protein	Grain Yield 2009	2010	2011	2 Year	3 Year
	DAP[1]	in	g/1000	lb/bu	%	bu/A				
Alsen	56	33	21.8	55.3	18.3	78.0	57.5	23.1	40.3	52.9
Faller	57	34	23.8	53.2	17.4	86.6	70.3	24.9	47.6	60.6
Barlow	55	29	22.6	55.2	17.9	82.9	68.8	23.5	46.1	58.4
Mott	58	34	21.6	55.7	18.4	86.0	51.5	26.1	38.8	54.5
ND 901CL PLUS	56	35	21.7	53.6	17.8	76.9	60.2	23.6	41.9	53.6
Velva	57	30	22.5	52.4	17.3	98.9	68.2	27.6	47.9	64.9
RB07	55	30	20.8	54.8	17.4	77.5	67.5	20.1	43.8	55.0
Select	54	32	23.5	57.6	17.3	82.3	66.8	27.9	47.3	59.0
Brick	53	33	24.7	58.4	17.1	77.3	67.3	29.4	48.4	58.0
Briggs	53	33	24.3	55.3	18.0	77.5	61.9	26.1	44.0	55.2
Choteau	56	33	20.0	50.2	18.1	86.1	66.0	14.6	40.3	55.6
Lochsa[2]	56	31	21.7	48.4	16.7	65.8	33.4	21.4	27.4	40.2
Otis	58	33	20.0	52.7	16.0	--	--	15.7	--	--
SY Soren	57	28	21.1	55.0	18.2	--	--	28.2	--	--
Brennan	57	28	19.0	53.2	18.2	77.2	65.1	22.9	44.0	55.1
Jenna	58	32	27.7	54.8	18.4	91.7	64.6	28.3	46.4	61.5
Freyr	58	30	20.8	52.4	17.7	77.9	66.1	20.9	43.5	55.0
BW394	58	40	22.1	53.3	18.4	--	49.2	25.3	--	--
Carberry	54	33	21.5	55.1	17.5	--	58.8	30.0	--	--
HY682	61	33	23.5	56.1	17.0	--	30.3	27.9	--	--
Snowstar[2]	55	30	21.3	54.4	18.2	69.7	42.0	15.1	28.5	42.3
Albany	60	31	23.3	57.9	17.8	98.9	73.8	30.0	51.9	67.6
WB-Gunnison	56	29	21.2	52.8	16.6	--	--	14.9	--	--
WB-Mayville	56	29	24.7	53.2	17.3	--	--	24.7	--	--
WB-Digger	56	32	21.3	51.8	17.4	--	56.9	21.2	39.1	--
Brogan	57	29	20.5	55.1	18.1	93.3	63.3	21.5	42.4	59.4
Edge	56	30	21.3	53.1	17.8	--	52.0	21.3	36.7	--
Agawam[2]	55	29	20.9	53.5	16.5	59.2	38.4	15.0	26.7	37.5
Blade	56	32	25.4	58.0	18.4	93.6	61.9	20.9	41.4	58.8
Breaker	57	34	24.7	56.8	18.7	79.4	65.6	21.1	43.4	55.4
Vantage	57	31	22.4	57.3	19.3	84.6	58.7	25.4	42.0	56.2
LSD 5%	3	5	2.6	3.1	0.9	13.2	6.6	7.0	--	--
C.V.%	2.7	7.8	5.8	2.9	2.6	11.5	7.6	14.9	--	--
Mean	56.1	30.3	21.8	54.1	17.5	82.7	62.0	23.4	--	--

Planted on May 17 with a seeding rate of 1 million PLS and harvested on August 29.

[1] *DAP = Days after planting.*

[2] *Hard white spring wheat variety.*

North Central Research Extension Center—Minot
HRSW Variety Trial–Sheridan County—McClusky

Variety	Days to Head	Plant Height	Kernel Weight	Test Weight	Protein	Grain Yield 2009	2010	2011	2 Year	3 Year
	DAP[1]	in	g/1000	lb/bu	%	bu/A				
Prosper	56	32	30.0	58.0	15.2	--	61.4	49.5	55.4	--
Velva	55	33	27.3	56.6	15.8	--	56.3	44.9	50.6	--
ND 901CL PLUS	54	34	27.0	57.6	16.3	--	48.8	41.9	45.3	--
Barlow	51	32	27.1	58.7	16.1	--	61.2	44.1	52.7	--
Mott	58	35	25.9	58.6	15.6	--	51.7	51.0	51.4	--
Faller	57	31	30.9	58.0	14.8	--	64.3	52.7	58.5	--
Howard	53	32	27.9	58.7	15.6	--	56.8	45.5	51.1	--
Glenn	53	32	26.1	60.7	15.9	--	49.3	39.3	44.3	--
Steele-ND	53	32	29.0	59.2	16.1	--	56.3	43.7	50.0	--
RB07	52	31	26.2	58.5	15.9	--	58.8	50.3	54.6	--
Select	49	33	27.7	58.1	15.9	--	44.9	41.2	43.0	--
Albany	58	30	27.0	59.2	15.5	--	--	47.9	--	--
SY Soren	54	28	26.1	57.5	15.7	--	--	46.7	--	--
SY Tyra	57	27	25.8	57.1	15.2	--	--	42.2	--	--
Brennan	53	27	25.3	57.1	15.9	--	51.2	42.1	46.7	--
Jenna	57	30	33.4	58.1	16.2	--	56.1	47.9	52.0	--
SY 605CL	51	32	25.8	58.5	16.5	--	--	44.1	--	--
Kelby	52	27	25.9	57.1	15.9	--	50.9	41.1	46.0	--
Freyr	55	32	26.6	57.0	16.4	--	51.8	41.6	46.7	--
Brogan	55	29	26.5	56.8	15.9	--	--	41.0	--	--
Vantage	57	30	25.4	58.5	16.7	--	--	43.8	--	--
LSD 5%	2	1	1.9	1.4	0.5	--	5.7	6.0	--	--
C.V.%	2.2	2.7	4.9	1.7	2.4	--	7.5	9.5	--	--
Mean	54	31	27.2	58.0	15.9	--	53.9	45.0	--	--

Planted on May 26 with a seeding rate of 1 million PLS and harvested on September 6.

[1] *DAP = Days after planting.*

Hard Winter Wheat Variety Descriptions

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

[1] R = resistant, MR = moderately resistant, MS = moderately susceptible, S = susceptible, VS = very susceptible, NA = not available. ***Bold*** *varieties are those recently released.*

[2] W. Ag =Western Ag, WB = WestBred.

[3] Days to heading relative to Jerry.

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

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

[6] White wheat.

[7] Curl mite resistant.

Note: Published in NDSU publication A-1196 (revised).

Oat Variety Descriptions

Variety	Origin[1]	Year Rlsd	Grain Color	Height	Straw Strength	Mat[2]	Reaction to Diseases: Stem Rust[3]	Reaction to Diseases: Crown Rust[3]	Reaction to Diseases: Barley Y.Dwf[4]	Bu/Wt.	Protein[5]
AC Assiniboia	CPS	1997	Red	Med	Strong	L	S	S	T	Good	ML
AC Gwen	CSC	2000	Hulless	Tall	Strong	L	S	S	R	Good	L
AC Kaufman	Can.	2000	Yellow	Tall	Strong	L	S	S	MT	V.good	ML
AC Pinnacle	CQAS	1999	White	Tall	Med.	L	S	S	S	V.good	L
AC Ronald	CSC	2001	White	M.short	V.strg.	L	S	S	T	V.good	M
Beach	ND	2004	White	Tall	M.strg.	ML	S	MR/MS	MS	V.good	M
Buff	SD	2002	Hulless	Med.	M.strg.	L	S	MR/MS	MT	Good	H
CDC Dancer	CC	2000	White	Tall	Strong	L	S	MS	S	V.good	M
CDC Minstrel	Sask.	2006	White	Tall	M.strg.	L	S	S	S	Good	M
CDC Orrin	CQC	2001	White	Tall	Strong	L	S	S	S	Good	ML
CDC Weaver	Can.	2005	Yellow	Med.	M.strg.	L	S	S	S	Good	M
Drumlin	WI	2003	Yellow	Med.	Strong	M	S	MR	VT	Good	M
Excel	IN	2006	White	Med.	Strong	M	S	MS	T	V.good	M
Furlong	AW	2003	Red	Tall	M.strg.	L	S	S	T	V.good	M
HiFi	ND	2001	White	Tall	Strong	L	MR/MS	R	T	Good	M
Hytest	SD	1986	White	Tall	M.strg.	E	S	MS	S	V.good	H
Jerry	ND	1994	White	Tall	Strong	M	S	MS	MT	V.good	M
Jud	ND	1997	Ivory	Tall	Med.	L	R	MR/MS	T	Good	MH
Killdeer	ND	2000	White	Med.	Strong	M	S	MS	MT	Good	M
Leggett	AW	2005	White	Tall	Strong	L	MR	R	S	Good	M
Leonard	MN	2001	Yellow	Tall	M.strg.	L	S	S	T	Fair	ML
Loyal	SD	2000	Ivory	Tall	M.strg.	L	S	MR	T	Good	MH
Maida	ND	2005	Yellow	Med.	Strong	M	R	S	MS	V.good	MH
Minstrel	Sask.	2008	White	M.tall	Strong	L	MR/MS	S	S	Good	M
Monida	MT/ID	1985	White	M.tall	Strong	L	S	S	S	Fair	ML
Morton	ND	2001	White	Tall	V.strg.	L	S	S	MT	V.good	M
Newburg	ND	2011	White	Tall	Med.	L	R	R	MT	Good	M
Otana	MT	1977	White	M.tall	M.weak	L	S	S	S	V.good	ML
Paul	ND	1994	Hulless	V.tall	Strong	L	R	MR/MS	T	Good	H
Reeves	SD	2002	White	M.tall	Med.	E	S	MR	MT	Good	H
Rockford	ND	2008	White	Tall	Strong	L	S	R	MT	V.good	M
Sesqui	MN	2001	Yellow	M.tall	Strong	L	S	S	T	Good	M
Shelby427	SD	2008	White	Med.	Strong	E	S	R	NA	V.good	NA
Souris	ND	2006	White	Med.	Strong	M	MS	R	MS	V.good	M
Stallion	SD	2006	White	Tall	Med.	L	S	MR	NA	V.good	M
Stark	ND	2004	Hulless	Tall	M.strg.	L	R	MR/MS	T	V.good	M
Streaker	SD	2008	Hulless	Tall	M.weak	M	S	R/MR	NA	V.good	MH
Summit	AW	2008	White	Med.	Strong	L	S	R	MT	Good	M
Vista	WI	2000	Yellow	Tall	Strong	L	S	R	MT	Good	M
Youngs	ND	1999	White	Med.	Strong	L	S	MS/S	MT	Good	M

[1] Can = Canada, ND = North Dakota State University, SD = South Dakota State University, WI = University of Wisconsin, IN = Purdue University, MT = Montana State University, ID = Idaho, Sask. = Saskatchewan, CPS = Can. Proven Seed, CC = Can. Cargill, AW = AAFC Winnipeg, CSC = Can. SeCan, CQAS = Can. QAS, CQC = Can. QAS/Cargill, MN = Minnesota.

[2] E = Early, M = medium, L = Late, V = very late.

[3] R = resistant, MR = moderately resistant, MS = moderately susceptible, S = susceptible.

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

[5] H = high, M = medium, L = low.

Note: Published in NDSU publication A-1049 (revised).

North Central Research Extension Center—Minot
Oat Variety Trial on Fallow

Variety	Days to Head	Plant Height	Lodge	Kernel Weight	Test Weight	Protein	Grain Yield 2009	2010	2011	2 Year	3 Year
	DAP[1]	in	0-9[2]	g/1000	lb/bu	%	bu/A				
Conventional											
AC Pinnacle	62	43	3.8	25.9	28.9	11.4	226.8	164.8	98.5	131.7	163.4
Beach	61	44	3.5	27.1	33.1	12.5	188.4	123.9	91.5	107.7	134.6
CDC Dancer	61	42	0.8	27.8	31.6	12.7	199.3	121.9	86.2	104.1	135.8
CDC Minstrel	61	39	4.5	25.8	28.2	10.7	212.3	143.9	98.1	121.0	151.4
AC Furlong	64	42	6.3	30.9	27.0	11.5	229.0	148.3	74.2	111.3	150.5
HiFi	60	41	0.5	28.2	33.3	13.0	181.9	159.9	119.1	139.5	153.6
Hytest	56	40	6.8	25.1	30.4	14.3	158.2	119.5	73.5	96.5	117.1
Jerry	58	40	7.8	25.0	28.2	12.6	161.4	114.2	80.1	97.1	118.5
Killdeer	58	34	6.8	22.4	26.7	10.7	217.7	157.0	88.6	122.8	154.4
Leggett	60	39	0.5	30.9	33.6	13.9	205.4	148.3	114.9	131.6	156.2
Monida	61	42	8.3	24.2	24.3	11.8	206.6	173.9	73.4	123.6	151.3
Morton	60	43	5.0	25.1	28.6	12.1	184.7	120.0	76.3	98.1	127.0
Newburg	60	42	1.3	30.5	32.9	13.2	179.9	177.3	122.4	149.9	159.9
Otana	61	42	6.0	23.2	24.6	12.5	198.5	144.0	48.4	96.2	130.3
Rockford	63	42	0.5	25.7	34.6	13.2	189.4	161.6	116.4	139.0	155.8
Shelby 427	54	40	0.0	29.5	36.1	13.3	--	126.6	122.6	124.6	--
Souris	60	40	0.0	28.2	34.4	12.9	196.3	160.4	129.1	144.7	161.9
Stallion	60	39	6.8	25.7	34.7	14.2	174.3	140.7	104.5	122.6	139.8
Trucker	55	37	3.3	23.3	30.1	15.0	150.2	114.0	56.4	85.2	106.8
Hulless											
Buff	54	36	1.5	25.1	44.7	15.1	116.4	86.6	67.3	76.9	90.1
Paul	62	42	2.5	22.7	42.6	17.5	141.3	106.2	59.1	82.7	102.2
Stark	61	41	2.5	24.9	42.1	15.2	150.2	135.0	91.9	113.4	125.7
Streaker	56	39	5.3	26.3	43.5	16.8	--	119.4	73.8	96.6	--
LSD 5%	2	2	1.9	2.1	1.9	0.8	18.5	14.6	11.9	--	--
C.V.%	1.8	3.5	50.9	5.4	4.1	4.3	7.1	7.4	8.3	--	--
Mean	60	40	2.7	27.8	33.2	13.2	185.7	140.8	101.2	--	--

Planted on May 18 with a seeding rate of 1 million PLS and harvested on August 25.

[1] *DAP = Days after planting.*

[2] *Lodging score based on scale 0-9 (0 = upright, 9 = flat).*

North Central Research Extension Center—Minot
Soybean Variety Trial—Roundup Ready

Company/Brand	Variety	Maturity Group	Plant Height	Seed Weight	Test Weight	Protein	Oil[1]	Seed Yield 2009	Seed Yield 2010	Seed Yield 2 Year
			in	g/1000	lb/bu	%	%			
ASGROW	AG00632	00.6	23	158.1	57.8	26.0	22.2	--	--	--
ASGROW	AG00931	00.9	20	120.0	58.3	23.1	22.6	--	38.8	--
ASGROW	AG00932	00.9	24	138.3	58.4	25.2	21.9	--	--	--
ASGROW	AG0131	00.1	23	136.8	58.2	25.6	22.1	--	31.2	--
ASGROW	AG0231	0.2	20	130.2	58.3	22.4	22.7	--	40.0	--
AgVenture	03K3	0.3	18	131.7	57.6	25.1	23.1	--	--	--
AgVenture	05C5	0.4	19	124.4	57.8	24.8	21.6	--	--	--
AgVenture	009K9	00.9	18	103.2	57.4	23.2	23.4	--	--	--
Dyna-Gro Seed	30RY04	00.4	18	137.7	57.6	23.8	23.5	--	--	--
Dyna-Gro Seed	30RY07	00.7	18	131.3	57.5	22.9	23.3	--	--	--
Dyna-Gro Seed	35RY01	0.1	22	119.2	58.4	22.2	22.6	--	39.5	--
GOLD COUNTRY SEED	0140	0.1	27	148.6	58.6	25.9	21.2	--	35.4	--
GOLD COUNTRY SEED	0071	00.7	22	144.8	58.5	23.0	22.0	--	--	--
Integra Fortified Seed	20052 R2Y	00.5	19	131.6	57.5	24.8	22.7	--	--	--
Integra Fortified Seed	20090 R2Y	00.9	22	135.7	58.4	23.9	21.8	--	33.8	--
Integra Fortified Seed	20100 R2Y	0.1	18	130.6	57.8	26.0	21.9	--	--	--
Integra Fortified Seed	79020 R	0.2	22	113.0	58.6	27.4	20.6	24.2	40.9	32.6
NuTech - G2	0090 RR	00.9	16	102.7	57.5	21.4	23.8	20.0	34.8	27.4
NuTech	6006	00.6	23	119.9	58.7	28.6	20.4	22.8	39.6	31.2
NuTech	6011	0.1	19	109.9	57.5	22.4	22.1	--	--	--
NuTech - G2	6009	00.9	18	140.7	56.8	24.4	23.9	--	--	--
NuTech - G2	6012	0.1	17	120.2	57.3	20.0	24.2	--	--	--
NuTech - G2	6025	0.2	19	136.1	57.7	25.8	23.0	--	--	--
PFS	12R007PFS	00.7	22	141.2	57.8	27.7	21.6	--	--	--
PFS	11R01	0.1	21	118.7	58.3	23.1	22.3	--	--	--
PROSEED INC.	P2 10-08	00.8	20	130.0	58.3	22.9	22.5	--	39.2	--
PROSEED INC.	P2 10-20	00.2	20	121.8	57.7	23.1	21.1	--	27.0	--
PROSEED INC.	P2 11-00	00.0	19	95.6	57.3	23.2	21.4	--	--	--
PROSEED INC.	P2 11-10	00.1	19	135.7	57.7	26.7	21.7	--	--	--
PROSEED INC.	P2 11-05	00.5	19	126.6	57.4	23.5	23.0	--	--	--
PROSEED INC.	P2 11-07	00.7	19	135.7	58.0	25.1	22.8	--	--	--
SEEDS 2000	0091 RR2Y	00.9	24	146.3	58.7	25.7	21.2	--	--	--
LSD 5%	--	--	NS	15.7	0.4	NS	1.3	6.6	NS	--
C.V.%	--	--	24.0	8.7	0.5	13.6	4.2	18.4	20.0	--
Mean	--	--	20	128.6	57.9	24.3	22.3	22.1	35.2	--

Trial was planted on May 25 with a seeding rate of 200,000 PLS and harvested on October 6.

[1] Oil adjusted to 13% moisture.

Maturity group information provided by company.

Due to the high CV% value for seed yield in 2011 no data is available. Additional data sites should be used for making decisions.

North Central Research Extension Center—Minot
Soybean Variety Trial—Roundup Ready—McLean County

Company/Brand	Variety	Maturity Group	Seed Weight	Test Weight	Protein	Oil[1]	Seed Yield 2009	2010	2011	2 Year	3 Year
			g/1000	lb/bu	%	%	bu/A				
Integra Fortified Seed	20100 R2Y	0.1	120.9	57.8	25.2	22.7	--	--	18.4	--	--
Integra Fortified Seed	79020 R	0.2	99.1	58.4	24.2	21.9	--	24.9	14.3	19.6	--
NuTech - G2	6012	0.1	106.9	58.0	20.1	23.8	--	--	15.5	--	--
NuTech - G2	6025	0.2	117.6	57.7	22.6	23.7	--	--	15.7	--	--
PROSEED INC.	P2 10-08	00.8	122.5	58.1	21.7	22.5	--	23.7	16.3	20.0	--
PROSEED INC.	P2 10-20	00.2	96.3	--	22.0	21.5	--	24.7	6.1	15.4	--
PROSEED INC.	P2 11-10	00.1	117.3	57.3	23.1	23.0	--	--	17.1	--	--
SEEDS 2000	0091 RR2Y	00.9	122.7	58.1	20.9	22.4	--	--	17.4	--	--
LSD 5%	--	--	4.1	0.5	1.2	0.4	--	5.1	2.1	--	--
C.V.%	--	--	2.4	0.6	3.7	1.3	--	15.1	9.4	--	--
Mean	--	--	112.9	57.9	22.5	22.7	--	23.7	15.1	--	--

Trial was planted on June 6 with a seeding rate of 200,000 PLS and harvested on September 27.

[1] *Oil adjusted to 13% moisture.*

Maturity group information provided by company.

North Central Research Extension Center—Minot
Soybean Variety Trial—Roundup Ready—Sheridan County

Company/Brand	Variety	Maturity Group	Plant Height	Seed Weight	Test Weight	Protein	Oil[1]	Seed Yield 2009	2010[2]	2011	2 Year	3 Year
			in	g/1000	lb/bu	%	%	bu/A				
Gold Country Seed	0140	0.1	38	156.8	58.9	22.0	19.2	--	--	52.0	--	--
Gold Country Seed	0071	00.7	36	151.4	58.9	24.0	19.4	--	--	49.8	--	--
Integra Fortified Seed	20100 R2Y	0.1	33	136.8	58.5	23.6	19.4	--	--	46.3	--	--
Integra Fortified Seed	79020 R	0.2	38	121.4	59.7	23.6	18.3	--	28.5	46.3	37.4	--
NuTech-G2	6025	0.2	34	134.0	58.7	24.5	19.0	--	--	42.0	--	--
NuTech-G2	6050	0.4	38	102.0	59.3	22.6	18.1	--	30.4	43.9	37.2	--
PROSEED INC.	P2 10-08	00.8	36	152.1	59.2	23.7	19.4	--	34.7	50.5	42.6	--
PROSEED INC.	P2 10-20	00.2	35	116.2	58.6	23.1	18.1	--	30.9	41.1	36.0	--
PROSEED INC.	P2 11-00	00.0	34	110.8	58.8	21.8	17.6	--	--	40.9	--	--
PROSEED INC.	P2 11-10	00.1	35	137.6	58.7	24.2	19.5	--	--	49.8	--	--
Seeds 2000	0091 RR2Y	00.9	38	157.6	59.2	24.4	19.2	--	--	53.2	--	--
LSD 5%	--		3	8.5	0.4	NS	0.3	--	NS	4.0	--	--
C.V.%	--		5.5	4.4	0.5	6.3	1.2	--	8.5	6.0	--	--
Mean	--		36	134.2	58.9	23.4	18.8	--	30.6	46.9	--	--

Trial was planted on May 26 with a seeding rate of 200,000 PLS and harvested on October 4.

[1] Oil adjusted to 13% moisture.

[2] Study site initiated in 2010.

Maturity group information provided by company.

North Central Research Extension Center—Minot
Sunflower Variety Trial—Non-Oil

Company/Brand	Variety	Hybrid Type[1]	Days 50% Flower	Plant Height	Lodge	Seed Weight	Seeds/ Pound	Test Weight	Seed Over Screen			Seed Yield			2 Year	3 Year
									>22/64	>20/64	>18/64	2009	2010	2011		
			DAP[2]	in	0-9[3]	g/1000	seeds	lb/bu	----------%----------			----------lb/A----------				
CHS	**RH400CL**	CL	66	63	4.3	156.8	2900	22.4	54.5	65.3	70.8	1935	1696	1274	1485	1635
CHS	**RH402CL**	CL	71	67	1.3	135.8	3357	24.0	76.7	89.3	95.8	--	--	2392	--	--
CHS	10EXP02	E	69	58	4.3	164.3	2777	21.5	44.0	61.5	70.0	--	2000	1516	1758	--
Dahlgren & Company	D-EX610	Conv.	66	58	5.5	138.8	3275	21.4	52.5	66.3	70.5	--	--	1143	--	--
Dahlgren & Company	**D-9530**	Conv.	69	72	2.3	135.5	3351	24.8	62.3	83.8	93.0	2495	3258	2655	2957	2803
Dahlgren & Company	**D-9530CL**	CL	71	74	5.5	136.8	3333	23.5	73.5	88.5	93.3	3076	3132	2118	2625	2775
Mycogen Seeds	**8C410CL**	CL	71	78	1.8	139.8	3274	25.0	49.0	63.3	69.3	--	--	2285	--	--
Mycogen Seeds	**8C451**	Conv.	68	66	3.5	140.5	3248	22.2	65.6	84.5	93.5	2667	2549	1830	2190	2349
Red River Commodities	**2215**	CL	69	74	3.3	128.5	3542	24.4	50.4	76.5	90.0	2887	2980	2130	2555	2666
Red River Commodities	**2215 CL**	CL	71	76	2.8	139.8	3249	24.3	45.8	62.5	69.5	--	2642	2064	2353	--
Red River Commodities	**2217**	CL	70	69	2.8	134.3	3376	22.9	54.1	66.5	70.8	2662	2868	1967	2418	2499
Seeds 2000	**Jaguar**	CL	67	69	2.8	149.3	3049	23.3	49.5	63.5	70.5	2379	1982	1966	1974	2109
Seeds 2000	**Jaguar DMR[4]**	CL	64	68	2.3	153.5	2958	24.9	32.6	77.0	91.3	2628	2853	2148	2500	2543
Seeds 2000	**6946 DMR[4]**	Conv.	66	62	3.8	119.8	3794	26.7	55.5	75.5	89.8	--	2612	1982	2297	--
Seeds 2000	X3207	Conv.	68	72	2.5	153.3	2971	27.3	36.0	58.3	69.3	--	--	2865	--	--
Seeds 2000	X9180	E	66	65	2.8	132.0	3446	25.8	39.1	57.8	69.3	--	--	1780	--	--
Syngenta Seed	3733 NS Coated	Conv.	70	61	4	64.5	7104	33.3	21.2	36.5	44.3	--	--	2269	--	--
Syngenta Seed	**3845 HO**	Conv.	69	65	1.8	69.3	6609	34.6	40.8	60.8	68.0	--	--	1812	--	--
Syngenta Seed	7120 HO/DM	Conv.	68	61	4.5	67.5	6767	32.6	47.3	61.5	69.3	--	--	1433	--	--
LSD 5%	--	--	2	5	3	10.6	384	1.3	NS	NS	NS	478	451	685	--	--
C.V.%	--	--	2.0	5.3	58.7	6.0	6.7	3.7	63.1	53.0	51.0	13.4	12.5	25.4	--	--
Mean	--	--	68	67	3.5	125.3	4037	25.8	47.5	65.7	74.6	2501	2517	1904	--	--

Trial was planted on May 28 with a seeding rate of 18,000 PLS and harvested on November 4.

[1] Hybrid Type: Conv. = Conventional, CL = Clearfield, E = Express.

[2] DAP = Days after planting.

[3] Lodging score based on scale 0-9 (0 = upright, 9 = flat).

[4] Downy Mildew resistant.

Due to the high CV% value for seed yield in 2011 no data is available. Additional data sites should be used for making decisions.

Bold varieties commercially available.

North Central Research Extension Center—Minot
Sunflower Variety Trial—Oilseed

Company/Brand	Variety	Oil Type[1]	Hybrid Type[2]	DMR[3]	Days 50% Flower	Days to Maturity	Plant Height	Lodge	Harvest Moisture	Seed Weight	Seeds/ Pound	Test Weight	Oil[4]	Seed Yield				
																	2	3
														2009	2010	2011	Year	Year
					DAP[5]	DAP[5]	in	0-9[6]	%	g/1000	seeds	lb/bu	%	lb/A				
Advanta US Inc.	0238 NS/SU	NS	E	unknown	68	90	68	4.0	15.0	48.1	9492	30.9	43.1	--	--	859	--	--
Advanta US Inc.	3651 NS/CL	NS	CL	unknown	68	92	70	5.5	13.6	57.9	7898	29.2	40.6	--	--	1144	--	--
Advanta US Inc.	4551 NS/CL	NS	CL	unknown	69	89	72	5.5	10.4	50.0	9117	29.7	41.3	--	--	1248	--	--
Advanta US Inc.	4651 NS/CL	NS	CL	unknown	70	91	70	6.3	10.2	50.6	8983	30.1	41.0	--	--	1004	--	--
Advanta US Inc.	6752 NS/SU	NS	E	unknown	69	92	69	5.5	13.2	46.7	9728	32.1	42.1	--	--	1136	--	--
Advanta US Inc.	6838 NS/SU	NS	E	unknown	68	89	71	3.5	9.2	52.4	8711	31.8	41.5	--	--	1352	--	--
Advanta US Inc.	6852 NS/SU	NS	E	unknown	64	88	62	3.3	10.0	42.6	10683	34.6	42.5	--	--	725	--	--
Advanta US Inc.	6938 NS/SU	NS	E	unknown	69	90	68	4.5	11.4	48.3	9421	31.0	42.4	--	--	1477	--	--
Advanta US Inc.	6952 NS/SU	NS	E	unknown	65	90	61	5.0	11.6	44.0	10377	32.2	41.0	--	--	723	--	--
Advanta US Inc.	7052 NS/SU	NS	E	unknown	68	95	66	6.0	14.4	42.4	10727	32.1	41.5	--	--	1181	--	--
Croplan Genetics	**442 E NS**	NS	E	N	70	95	65	5.0	16.7	52.8	8606	29.9	44.9	--	--	1511	--	--
Croplan Genetics	**460 E NS**	NS	E	N	70	95	67	4.5	14.5	59.0	7723	30.5	45.2	1893	2529	1297	1913	1906
Croplan Genetics	**559 CL DMR NS**	NS	CL	Y	69	95	82	1.3	12.3	49.4	9208	31.7	44.5	--	2926	2445	2686	--
Croplan Genetics	548 CL DMR NS	NS	CL	Y	67	90	73	1.8	9.6	49.2	9232	29.5	41.2	--	--	2163	--	--
Dahlgren & Company	DO-2012CLDM	HO	CL	Y	65	91	70	3.0	11.4	52.5	8678	32.4	42.0	--	--	1565	--	--
Dahlgren & Company	**DO-4421**	NS	Conv	N	65	93	72	3.3	14.7	82.1	5571	28.2	36.2	--	--	2131	--	--
Dahlgren & Company	DO-44EXCL	NS	CL	N	65	93	75	2.0	13.7	77.2	5885	28.0	37.9	--	--	2323	--	--
Elite Seeds	ES Balistic CL	HO	CL	Y	68	95	79	2.3	14.6	67.5	6731	30.3	38.7	--	--	2268	--	--
Elite Seeds	ESTR 10402	--	--	--	68	94	70	4.3	13.2	53.3	8569	31.2	42.3	--	--	2172	--	--
Elite Seeds	ES Ethic	HO	Conv	N	68	95	80	7.0	14.0	54.5	8524	30.9	37.0	--	--	1098	--	--
Elite Seeds	**Pacific**	HO	Conv	Y	69	95	77	3.8	16.2	54.6	8319	27.6	39.3	--	--	1795	--	--
Elite Seeds	**Pomar**	Trad.	Conv	Y	70	95	76	5.0	13.1	57.5	7960	29.7	42.3	--	--	1746	--	--
Genosys	**8037**	HO	CL	Y	69	91	71	6.3	11.6	50.6	8988	32.8	39.2	--	--	1087	--	--
Genosys	**9008**	NS	Conv	Y	70	90	75	4.5	10.6	50.2	9131	32.4	39.7	--	--	1241	--	--
Genosys	**9319**	NS	Conv	Y	70	90	74	5.5	11.5	47.0	9712	33.1	43.8	--	--	857	--	--
Integra Fortified Seed	**735 NSCLDM**	NS	CL	Y	66	91	68	5.5	10.1	60.7	7605	31.5	41.4	2118	2412	1117	1764	1882
Integra Fortified Seed	**756 NSCL**	NS	CL	N	69	92	74	1.8	11.6	58.0	7843	33.6	41.9	--	--	1870	--	--
Integra Fortified Seed	IX09-95010 NSDM	NS	CL	N	70	93	74	4.0	15.8	59.1	7692	29.1	40.6	--	--	1084	--	--
Integra Fortified Seed	IX10-94 NSSU	NS	E	N	70	91	70	5.0	11.4	56.3	8081	30.4	39.9	--	2802	1020	1911	--
Mycogen Seeds	**8D310**	NS	Conv	N	66	94	73	2.0	12.6	78.4	5798	29.2	39.4	2555	2514	2388	2451	2486
Mycogen Seeds	**8D481**	NS	Conv	N	71	95	72	5.8	17.0	73.6	6186	30.7	41.1	2472	2426	1831	2129	2243
Mycogen Seeds	**8H288CLDM**	HO	CL	Y	67	94	70	4.8	12.9	40.9	11149	32.4	43.2	1829	2763	1316	2040	1969
Mycogen Seeds	**8H449CLDM**	HO	CL	Y	71	95	66	6.8	18.6	38.3	11880	32.7	43.8	2142	3066	1443	2255	2217
Mycogen Seeds	**8N270CLDM**	NS	CL	Y	66	91	69	3.0	10.7	50.9	8956	32.8	43.9	1835	2462	1435	1948	1911
Mycogen Seeds	**8N358CLDM**	NS	CL	Y	69	91	69	6.0	14.4	45.2	10134	30.6	44.2	1992	2709	1483	2096	2061
Mycogen Seeds	**8N421CLDM**	NS	CL	Y	69	90	73	1.0	13.5	47.7	9645	31.4	43.4	--	--	1779	--	--
Mycogen Seeds	E80159CLDM	NS	CL	Y	61	89	58	6.0	11.1	44.2	10426	31.2	42.9	--	--	1133	--	--

North Central Research Extension Center—Minot
Sunflower Variety Trial—Oilseed—Cont.

Company/Brand	Variety	Oil Type[1]	Hybrid Type[2]	DMR[3]	Days 50% Flower	Days to Maturity	Plant Height	Lodge	Harvest Moisture	Seed Weight	Seeds/ Pound	Test Weight	Oil[4]	Seed Yield 2009	2010	2011	2 Year	3 Year
					DAP[5]	DAP[5]	in	0-9[6]	%	g/1000	seeds	lb/bu	%	lb/A				
PROSEED INC.	**E-10**	NS	Conv	Y	71	95	81	6.3	24.3	62.0	7329	27.4	38.6	--	--	1428	--	--
PROSEED INC.	**E-14**	NS	Conv	Y	70	95	68	6.8	13.2	55.0	8295	31.7	39.5	--	--	1311	--	--
PROSEED INC.	**E-21CL**	NS	CL	Y	68	94	76	5.5	12.6	58.5	7799	32.9	38.5	--	--	1767	--	--
PROSEED INC.	**E-22CL**	NS	CL	Y	67	94	81	4.3	12.0	62.0	7335	32.5	37.7	--	--	1955	--	--
Seeds 2000	**Badger**	Trad.	CL	N	67	94	74	3.0	13.4	80.7	5632	29.8	37.8	--	--	2222	--	--
Seeds 2000	**Camero**	NS	CL	Y	70	95	75	1.8	16.4	54.9	8286	31.5	41.9	--	--	1836	--	--
Seeds 2000	**Defender Plus**	NS	--	Y	68	92	67	3.0	9.5	47.6	9544	31.2	41.5	1802	1948	1537	1743	1762
Seeds 2000	**Falcon**	NS	E	N	69	95	69	1.3	13.9	44.7	10168	31.4	42.4	--	--	1890	--	--
Seeds 2000	**Torino**	NS	CL	N	71	95	77	4.5	23.3	52.5	8656	30.8	42.5	--	--	1947	--	--
Seeds 2000	X9822	HO	CL	Y	68	94	71	1.5	14.5	54.7	8320	30.8	39.9	--	--	1398	--	--
Syngenta Seeds	3158 NS/CL/DM	NS	CL	Y	68	95	66	3.5	14.0	45.2	10063	29.6	43.1	--	--	1930	--	--
Syngenta Seeds	NX01162	NS	CL	Y	68	94	67	4.3	11.6	45.8	9920	29.4	38.4	--	--	1565	--	--
Syngenta Seeds	NX82758	NS	CL	Y	68	95	70	2.3	12.9	49.2	9246	31.5	44.5	--	--	2039	--	--
Syngenta Seeds	**3480 NS/CL/DM**	NS	CL	Y	70	94	71	2.0	11.2	48.3	9436	31.4	43.6	1831	2699	1916	2307	2149
Syngenta Seeds	**3495 NS/CL/DM**	NS	CL	Y	69	91	75	1.8	11.0	56.0	8126	31.8	41.6	--	--	2067	--	--
Syngenta Seeds	**3990 NS/CL/DM**	NS	CL	Y	70	94	75	2.3	15.3	53.0	8570	29.3	41.6	--	--	1670	--	--
Syngenta Seeds	**3733 NS/CL/DM**	NS	Conv	Y	70	94	68	2.5	10.8	57.0	7984	34.0	45.2	--	--	2125	--	--
Syngenta Seeds	3995 NS/SU	NS	E	N	70	95	72	2.5	12.9	47.9	9513	30.7	40.5	--	--	1942	--	--
Syngenta Seeds	**4596 HO/DM**	HO	Conv	Y	68	95	79	2.3	13.3	49.8	9138	33.8	42.6	--	--	2295	--	--
Triumph Seed Co. Inc.	**TRXs10424**	NS	Conv	N	73	95	61	3.8	13.8	42.8	10618	30.7	45.8	--	--	1595	--	--
Triumph Seed Co. Inc.	**810HCLD**	HO	CL	Y	68	92	68	6.3	11.9	57.8	7911	29.5	42.0	--	--	1110	--	--
Triumph Seed Co. Inc.	TRXs11430HOD	HO	Conv	Y	71	95	56	3.8	18.6	37.5	12210	31.0	42.3	--	--	1459	--	--
Triumph Seed Co. Inc.	TRX11345CLD	NS	CL	Y	69	95	78	4.8	13.2	58.6	7768	28.8	45.1	--	--	1406	--	--
LSD 5%	--	--	--	--		3	5	2.7	3.6	8.3	1378	2.1	2.1	454	411	478	--	--
C.V.%	--	--	--	--		1.5	5.2	47.8	19.0	7.7	7.9	4.9	3.6	16.8	11.9	21.6	--	--
Mean	--	--	--	--		93	71	4.0	13.4	53.6	8748	31.0	41.6	1934	2501	1577	--	--

Trial was planted on May 26 with a seeding rate of 22,000 PLS and harvested on October 20.

[1] Oil Type: NS = NuSun, HO = High Oleic, Trad = Traditional

[2] Hybrid Type: C = Conventional, CL = Clearfield, E = Express.

[3] Downy Mildew Resistance: Y = yes, N = no. Downy mildew resistance information provided by company.

[4] Oil % adjusted based on oil type.

[5] DAP = Days after planting.

[6] Lodging score based on scale 0-9 (0 = upright, 9 = flat).

Bold varieties commercially available.

North Central Research Extension Center—Minot
Triticale Variety Trial on Fallow (spring)

Variety	Plant Height	Kernel Weight	Test Weight	Protein	Grain Yield 2009	2010	2011	2 Year	3 Year
	in	g/1000	lb/bu	%	bu/A				
AC Ultima	39	33.9	47.9	15.8	--	75.3	17.4	46.3	--
Companion	47	35.9	50.6	15.7	97.1	94.9	23.1	59.0	71.7
Laser	44	35.2	48.8	13.8	82.9	86.7	21.8	54.3	63.8
Marvel	42	33.9	45.0	17.3	80.8	69.6	25.6	47.6	58.7
Merlin	41	31.6	46.2	17.1	--	80.7	23.6	52.1	--
Trical 141	41	28.6	45.6	17.4	--	74.1	20.2	47.2	--
Trical 2700	43	33.2	47.4	14.0	95.8	92.4	31.8	62.1	73.4
Wapiti	49	36.2	50.2	15.0	92.5	90.3	22.6	56.4	68.4
LSD 5%	4	NS	1.0	1.1	12.3	14.0	5.3	--	--
C.V.%	4.9	8.6	1.2	4.0	9.0	11.4	13.1	--	--
Mean	43	33.6	47.7	15.8	90.6	83.0	23.3	--	--

Planted on May 18 with a seeding rate of 1.2 million PLS and harvested on August 29.

[1] *DAP = Days after planting.*

[2] *Lodging score based on scale 0-9 (0 = upright, 9 = flat).*

Minot Clearfield Lentil Variety Trial

Trial information

Design: RCB with four replicates
Planting Date: May 7
Harvest Date: August 30
Planting Rate: 600K PLS/acre
Fertility: Granular inoculant placed with seed
Previos Crop: Fallow
Weed Control: 2.7 5pt/acre Prowl + 22 oz/acre Roundup WeatherMax PRE on May 8 , 8 oz/acre
Volunteer on June 23, 2 pt/acre Gramoxone NTEON pre-harvest on August 25

		Seed	Days		Plant	Disease Ratings		1000			Seed Yield			
Variety	Market Class	Coat Color	to Flower	Canopy Height	Height Index	Necrosis[1]	SB[2]	Seed Weight	Seeds/ Pound	Test Weight	2008	2009	2011	3 Yr Ave
			DAP[3]	cm		%	%	g		bu/A		lb/A		
CDC IMPACT-CL	Small	Red	54.5	26.5	0.74	18.0	86.3	28.6	15903	59.6	1328	2369	1000	1566
CDC IMPALA-CL	Extra Small	Red	58.8	28.3	0.66	11.5	57.5	23.1	19724	61.5	1382	2519	1125	1675
CDC IMPERIAL-CL	Extra Small	Red	54.8	27.3	0.65	33.3	82.5	21.1	21589	59.0	1145	2343	1047	1512
CDC IMPRESS-CL	Medium	Green	57.0	26.4	0.63	34.5	7.5	37.6	12098	56.5	1474	2646	964	1695
CDC IMPROVE-CL	Large	Green	57.0	29.8	0.67	70.8	3.8	48.6	9351	55.1	1391	2454	875	1573
CDC MAXIM-CL	Small	Red	56.3	31.0	0.84	6.5	100.0	30.6	14902	60.5	1870	2828	1358	2019
GRAND MEAN			56.4	28.2	0.69	29.1	56.3	31.6	15595	58.7	1446	2504	1061	
CV			2.1	9.4	12.9	14.9	11.8	6.1	7.6	1.2	24.7	10.1	15.7	
LSD (0.05)			1.8	4.0	0.14	14.7	46.5	2.9	1787	1.0	589	357	251	

[1] Necrosis=Botrytis+Sclerotinia+Anthrancnose

[2] SB=Stemphylium Blight

[3] Days after Planting

Disease ratings courtesy of Michael Wunsch, CREC

Minot Pea Variety Trial

Design: RCB with four replicates[1]

Planting Date: May 19 Harvest Date: August 22

Planting Rate: 300K PLS/acre

Fertility: Granular inoculant placed with seed

Weed Control:2.5 pt/acre Prowl H20 + 3 oz/acre Spartan + 32 oz/acre Gly-Star+ PRE on May 19, 8 oz/acre Volunteer on June 27

Variety	Market Class	Plant Stand	Days to Flower	Bloom Period	Plant Height Index	Canopy Height	Lodging[2]	1000 Seed Weight	Protein	Seeds/ Pound	Test Weight	Seed Yield 2009	2010	2011	3 yr Ave
		pl/ft^2	DAP[3]	days		cm	1-9	g	%		lb/bu		bu/A		
AGASSIZ	LY	16.5	49	22	0.59	48	6	187	24.9	2388	62.9	70.1	51.5	40.6	60.8
ARAGORN	LG	18.0	46	20	0.57	37	7	170	25.2	2672	62.7			22.6	
BANNER	LG	21.5	47	24	0.51	37	7	155	21.8	2944	64.0			31.1	
BLUEMOON	LG	20.3	50	16	0.55	46	6	196	24.9	2347	63.4			35.3	
BRIDGER	LY	16.5	49	18	0.88	59	4	204	25.8	2207	64.0			35.8	
CAROUSEL	LY	17.8	49	15	0.64	44	7	178	25.0	2564	63.6			36.6	
CDC CENTENNIAL	LY	21.3	48	18	0.30	17	9	195	25.1	2323	63.2	69.1	47.7	43.5	58.4
CDC GOLDEN	LY	17.8	49	20	0.64	39	6	166	25.9	2705	63.8	75.4	46.8	37.1	61.1
CDC MEADOW	LY	17.0	51	19	0.74	55	6	164	24.4	2788	64.4	49.5	49.0	33.2	49.3
CDC PATRICK	LG	16.0	51	18	0.64	42	7	138	25.2	3242	63.2	57.9	53.0	28.0	55.5
CDC STRIKER	LG	19.0	49	16	0.68	48	6	205	25.9	2162	64.5	64.8	51.5	33.0	58.2
CDC TREASURE	LY	17.3	49	20	0.86	49	6	169	24.3	2682	63.7			34.3	
CRUISER	LG	16.3	51	20	0.65	40	6	164	25.0	2798	63.7	48.3	39.3	30.5	43.8
DS ADMIRAL	LY	15.0	48	17	0.64	48	6	212	24.6	2150	63.3	59.7	43.2	38.0	51.5
EMERALD	LG	16.3	48	17	0.73	49	5	200	25.8	2290	62.8			17.3	
MAJORET	LG	20.8	50	16	0.62	35	7	206	25.0	2162	63.9	50.6	46.6	37.2	48.6
PUSA 09003	LY	17.5	52	22	0.85	63	3	218	25.0	2009	63.5	66.4	50.9	34.5	58.7
SPIDER	LY	8.3	50	25	0.63	49	6	203	25.3	2205	64.1	62.8	39.5	36.0	51.2
THUNDERBIRD	LY	17.8	54	17	0.74	52	5	165	25.0	2735	64.0	62.7	50.6	38.1	56.7
UNIVERSAL	LY	18.8	46	20	0.64	44	6	179	26.1	2554	63.9			35.7	
VEGAS	LY	20.3	48	17	0.71	54	4	216	26.1	2129	63.6			41.9	
GRAND MEAN		16.6	49	19	0.59	41	6	180	25.1	2564	63.4	61.7	45.9	31.8	
CV		21.9	2.8	16.2	17.6	14.9	11.5	5.0	1.3	5.9	0.6	17.0	23.3	9.8	
LSD (0.05)		7.4	3	6	0.21	13	1	18	0.7	308	0.7	17.3	15.1	6.3	

[1] Analysis based on two reps due to water damage

[2] Lodging (1=erect, 9=flat) [3] Days after planting

Sheridan County Pea Variety Trial

Trial Information

Design: RCB with four replicates
Plot size: 80 ft^2
Planting Date: May 26
Harvest Date: August 30
Planting Rate: 300K PLS/acre
Fertility: Granular inoculant placed with seed
Previous Crop: HRSW
Weed Control: 9 oz/acre Assure II + 2 pt/acre Basagran on June 30

Variety	Market Class	1000 Seed Weight	Protein	Seeds/ Pound	Test Weight	Seed Yield 2011	Seed Yield 2010	Seed Yield 2 Yr Ave
		g	%		lb/bu		bu/A	
CDC GOLDEN	LY	202	25.7	2245	62.4	40.0	63.0	51.5
DS ADMIRAL	LY	229	24.9	1983	62.0	37.0	54.6	45.8
MAJORET	LG	216	25.4	2109	64.2	34.0	45.1	39.5
CDC STRIKER	LG	212	26.2	2146	63.7	31.5	45.6	38.5
AGASSIZ	LY	222	25.2	2047	62.4	31.2	60.8	46.0
CRUISER	LG	191	25.5	2371	60.7	23.4	37.3	30.4
GRAND MEAN		212	25.5	2150	62.6	32.8	49.9	
CV		3.3	1.8	3.3	1.2	17.7	10.2	
LSD (0.05)		11	0.7	106	1.1	8.8	7.3	

North Central Research Extension Center-Minot

Canola Flea Beetle Species Survey and Implications for Control

Daniel Waldstein-Area Extension Specialist, Crop Protection

Introduction: Flea beetle control problems are becoming evident in some canola growing areas of Canada. They are beginning to see a shift from the previously dominant, crucifer flea beetle (*Phllotreta cruciferae*) to the striped flea beetle (*Phyllotreta striolata*) which had been a relatively minor species in the past. Scientists published a study in 2008 that demonstrated reduced efficacy of Helix, Helix Xtra, and Prosper seed treatments against striped flea beetle while control of crucifer flea beetle was very good. Canadian researchers believe the population shift is a result of the differential effectiveness of the seed treatments against the two species of flea beetles.

Purpose: The purpose of this study was to conduct a trapping study to determine the proportion and abundance of different flea beetle populations in canola producing areas of North Dakota.

Results: The striped flea beetle was either absent or comprised a small percentage (<10%) of the total number of flea beetles in spring planted canola fields in North Dakota. The highest number of flea beetles trapped in Canada in 2010 occurred southeast of Regina at 58.8 beetles per trap per day and near Bottineau in North Dakota with 44.8 flea beetles per trap per day. In addition, the flea beetle natural enemy and native wasp parasitoid, *Microctonus vitattae* was found on traps in four locations in the state.

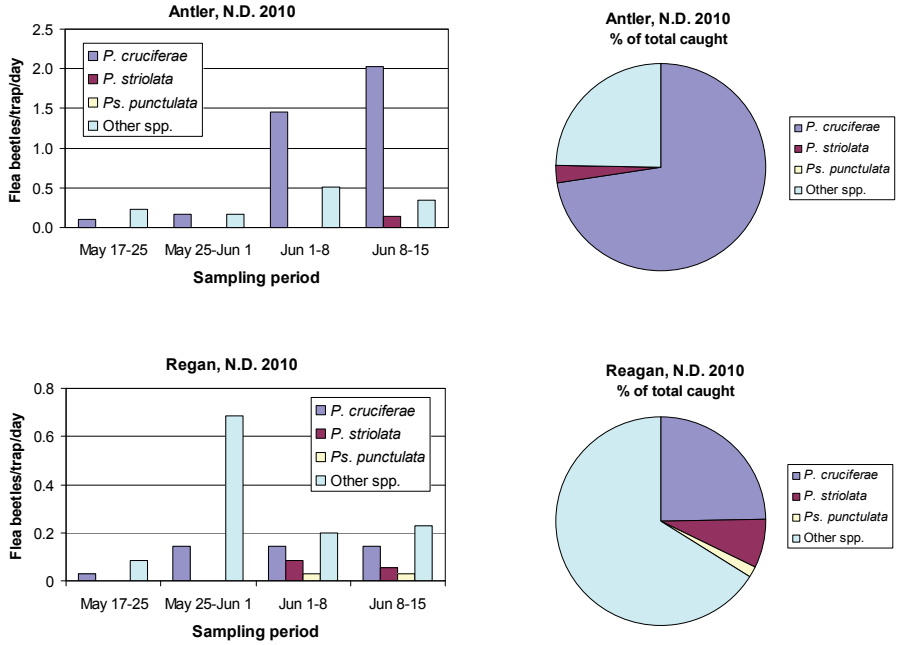
Acknowledgements: This project was done in conjunction with Dr. Julie Soroka, working with the Saskatoon Research Centre in Saskatchewan, Canada. North Dakota collaborators included, Dwain Barondeau and Janet Knodel of the NDSU extension service and Paul Gregor of WinField Solutions/LandOLakes.

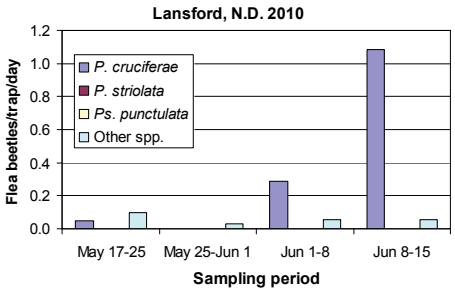
Table 1. Locations of yellow sticky cards used to trap crucifer-feeding flea beetles, dates of occurrence and values for maximum numbers of flea beetles caught in North Dakota in 2010.

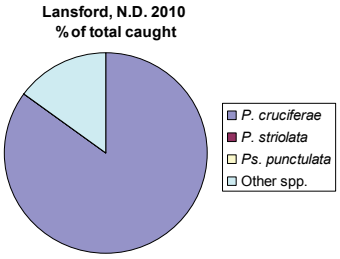
Nearest town	Region	Sampling period	Maximum numbers		Parasitoids present
			Dates for max. nos.	Flea beetles/ trap/day	
Langdon	North East	May 27- July 12	June 14-23	11.6	No
Milton	NE	May 25 - June 22	June 2-9	0.43	No
Antler	North Central	May 17 – June 15	June 8-15	2.51	Yes (1)
Lansford	NC	May 17 – June 15	June 8-15	1.14	No
Bottineau	NC	May 25 – June 22	June 9-15	44.8	No
Bisbee	NC	May 21 – June 25	June 18-25	6.46	Yes (2)
Norwich	NC	May 20 – June 15	May 26-June 1	10.6	No
Minot SC	NC	May 10 – June 2	May 26-June 2	3.76	No
Minot WC	NC	Apr 30 – June 22	June 9-16	5.06	Yes (2)
Minot PG	NC	May 26 – June 21	June 15-21	5.75	No

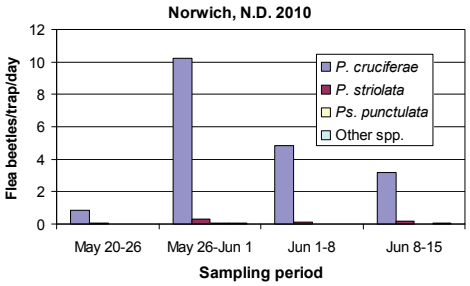
Charlson	North West	May 14 – June 6	June 1-6	1.00	No
Keene	NW	May 5 – June 7	May 31-June 7	0.46	No
Max	Central	May 26 – June 24	June 17-24	0.57	No
Harvey	C	May 26 – June 21	May 26-June 1	2.77	No
Regan	C	May 17 – June 15	May 25-June 1	0.83	Yes (3)
Regent	South West	May 10 – June 7	June 2-7	0.40	No
Mott1	SW	May 3 – June 7	June 1-7	0.33	No
Mott2	SW	May 3 – June 7	June 1-7	0.60	No
Mott3	SW	May 3 – June 7	June 1-7	12.5	No
Mott4	SW	May 10 – June 7	June 2-7	0.32	No
Mott5	SW	May 10 – June 7	June 1-7	0.33	No
Mott6	SW	May 10 – June 7	June 7-	2.91	No
Prosper	South East	June 4 – July 12	June 15-29	4.14	No

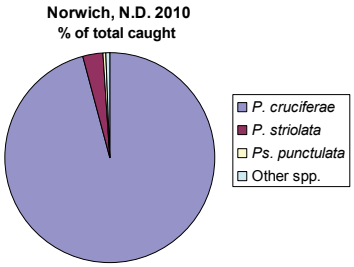
Figure 1. Flea beetle numbers and species composition on sticky traps placed in or near canola fields in North Dakota, 2010, Group 1.

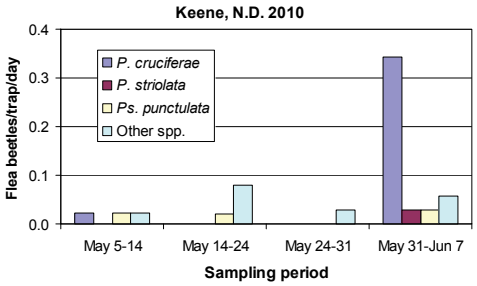


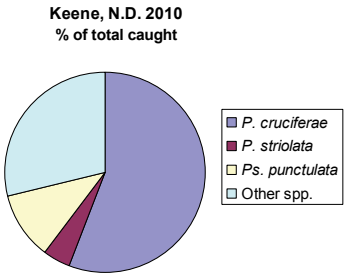

Lansford, N.D. 2010
Flea beetles/trap/day
1.2
1.0
0.8
0.6
0.4
0.2
0.0
P. cruciferae
P. striolata
Ps. punctulata
Other spp.
May 17-25
May 25-Jun 1
Jun 1-8
Jun 8-15
Sampling period

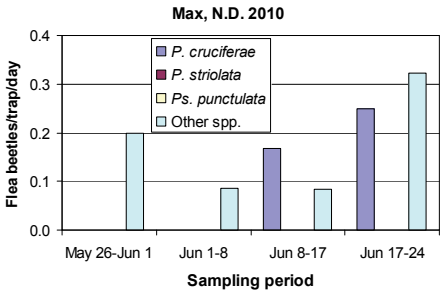

Lansford, N.D. 2010
% of total caught
P. cruciferae
P. striolata
Ps. punctulata
Other spp.

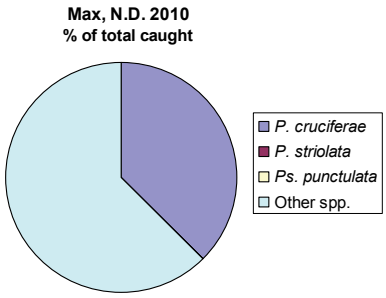

Norwich, N.D. 2010
Flea beetles/trap/day
12
10
8
6
4
2
0
P. cruciferae
P. striolata
Ps. punctulata
Other spp.
May 20-26
May 26-Jun 1
Jun 1-8
Jun 8-15
Sampling period

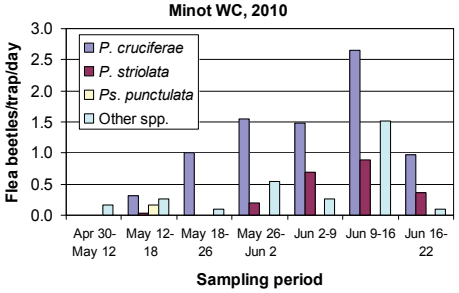

Norwich, N.D. 2010
% of total caught
P. cruciferae
P. striolata
Ps. punctulata
Other spp.

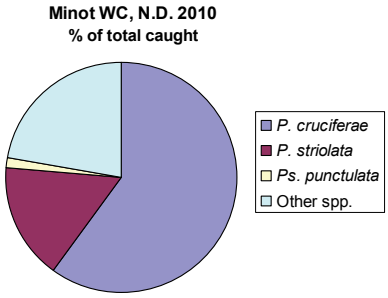

Keene, N.D. 2010
Flea beetles/trap/day
0.4
0.3
0.2
0.1
0.0
P. cruciferae
P. striolata
Ps. punctulata
Other spp.
May 5-14
May 14-24
May 24-31
May 31-Jun 7
Sampling period


Keene, N.D. 2010
% of total caught
P. cruciferae
P. striolata
Ps. punctulata
Other spp.


Max, N.D. 2010
Flea beetles/trap/day
0.4
0.3
0.2
0.1
0.0
P. cruciferae
P. striolata
Ps. punctulata
Other spp.
May 26-Jun 1
Jun 1-8
Jun 8-17
Jun 17-24
Sampling period


Max, N.D. 2010
% of total caught
P. cruciferae
P. striolata
Ps. punctulata
Other spp.


Minot WC, 2010
Flea beetles/trap/day
3.0
2.5
2.0
1.5
1.0
0.5
0.0
P. cruciferae
P. striolata
Ps. punctulata
Other spp.
Apr 30-May 12
May 12-18
May 18-26
May 26-Jun 2
Jun 2-9
Jun 9-16
Jun 16-22
Sampling period


Minot WC, N.D. 2010
% of total caught
P. cruciferae
P. striolata
Ps. punctulata
Other spp.

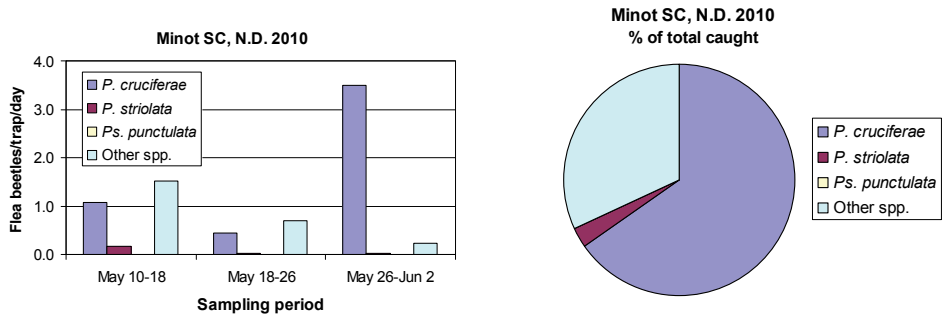


Figure 2. Flea beetle numbers and species composition on sticky traps placed in or near canola fields in North Dakota, 2010, Group 2.

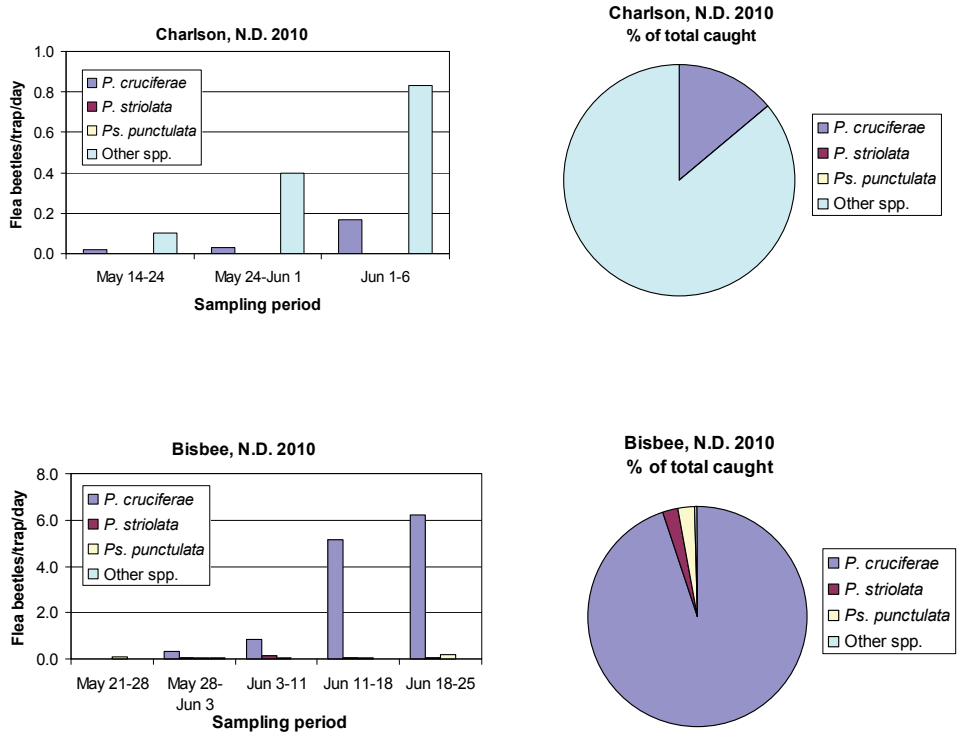
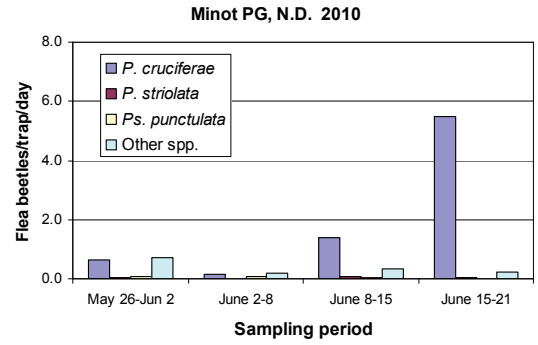
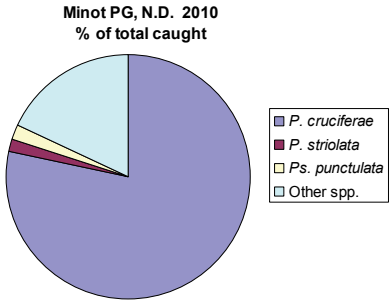
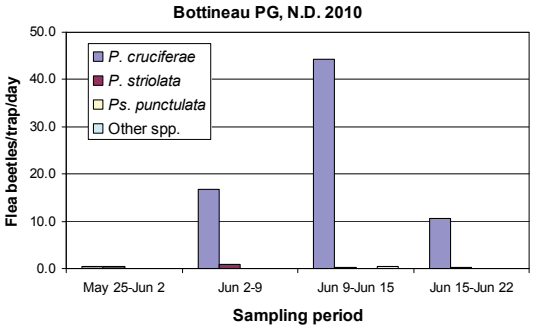
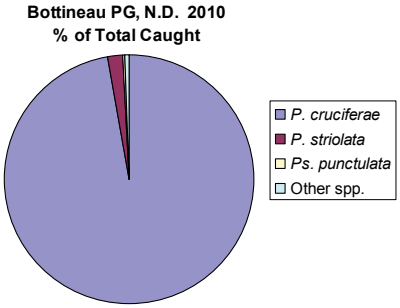


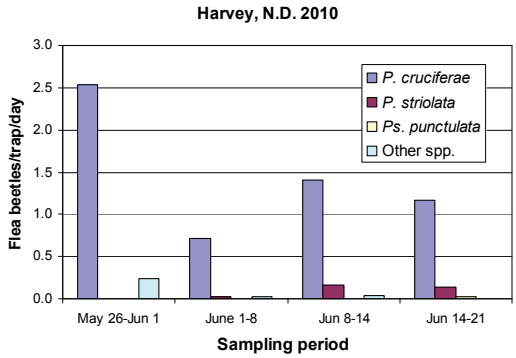
Figure 3. Flea beetle numbers and species composition on sticky traps placed in or near canola fields in North Dakota, 2010, Group 3.

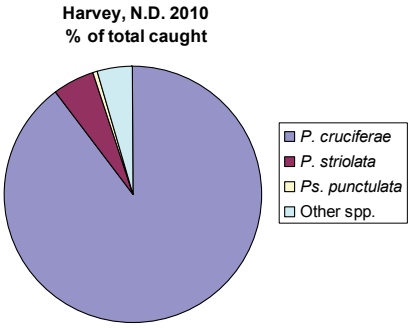


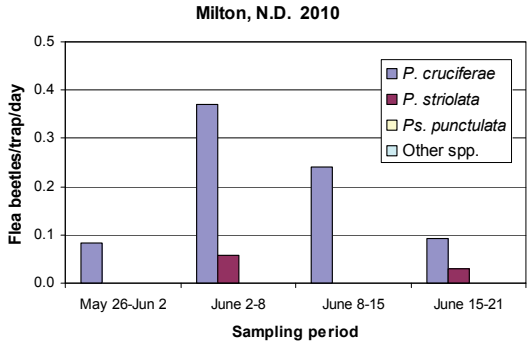












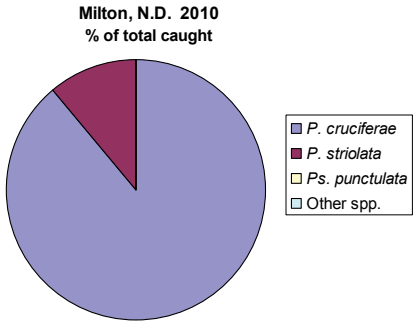
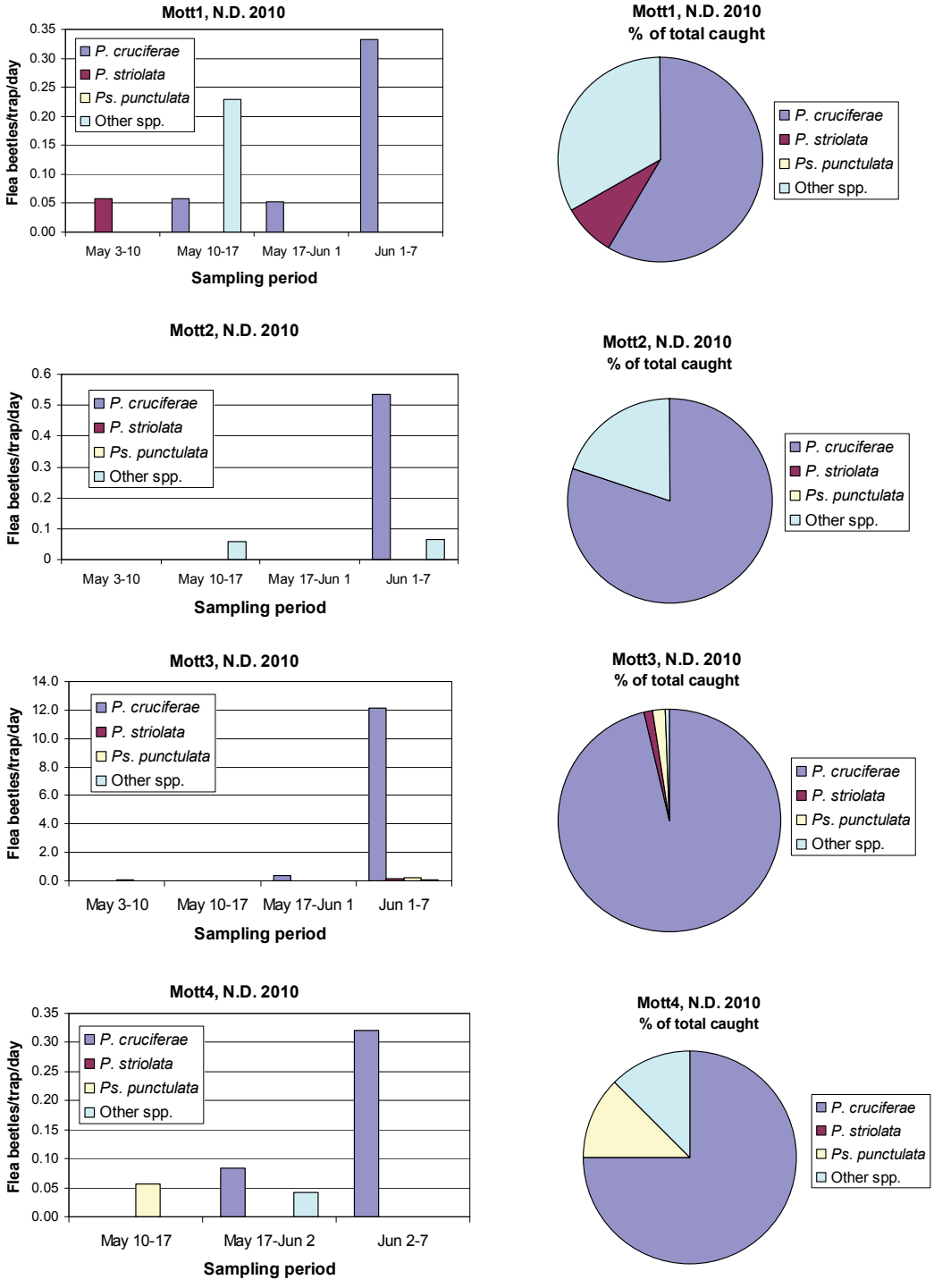
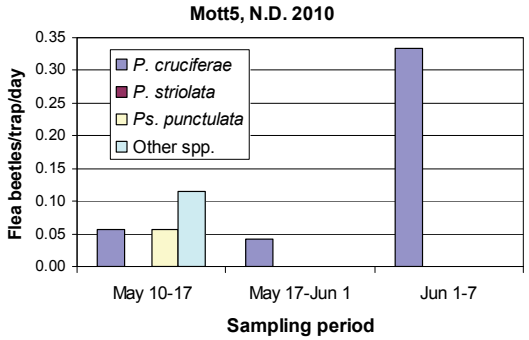
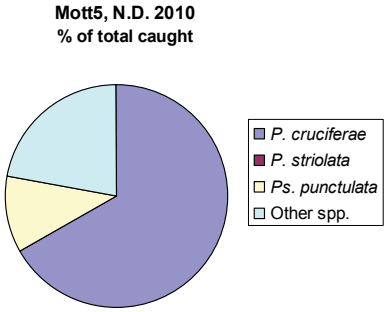
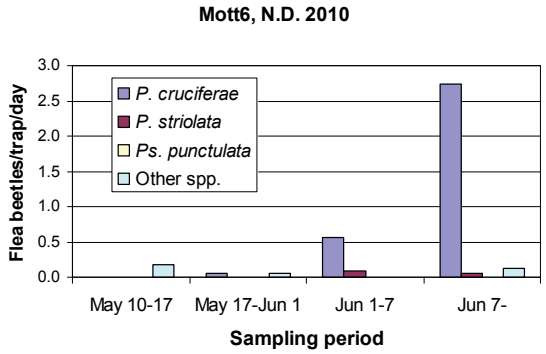


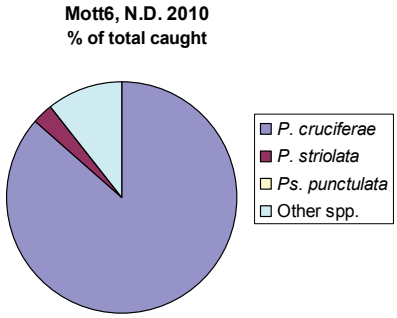
Figure 4. Flea beetle numbers and species composition on sticky traps placed in or near canola fields in North Dakota, 2010, Group 4.

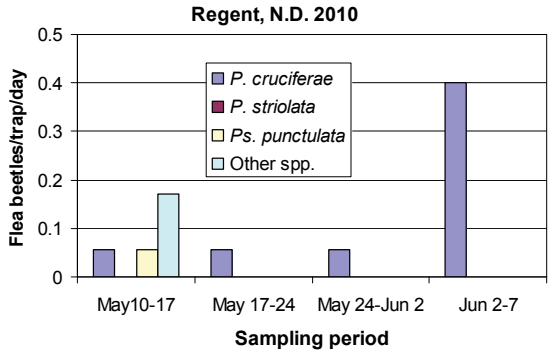


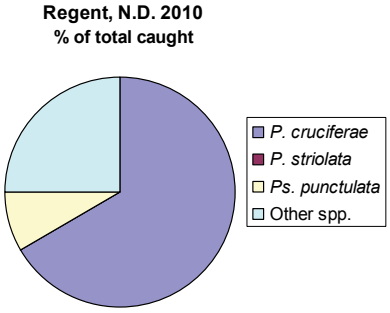

Mott5, N.D. 2010
Flea beetles/trap/day
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
P. cruciferae
P. striolata
Ps. punctulata
Other spp.
May 10-17
May 17-Jun 1
Jun 1-7
Sampling period


Mott5, N.D. 2010
% of total caught
P. cruciferae
P. striolata
Ps. punctulata
Other spp.


Mott6, N.D. 2010
Flea beetles/trap/day
3.0
2.5
2.0
1.5
1.0
0.5
0.0
P. cruciferae
P. striolata
Ps. punctulata
Other spp.
May 10-17
May 17-Jun 1
Jun 1-7
Jun 7-
Sampling period


Mott6, N.D. 2010
% of total caught
P. cruciferae
P. striolata
Ps. punctulata
Other spp.


Regent, N.D. 2010
Flea beetles/trap/day
0.5
0.4
0.3
0.2
0.1
0
P. cruciferae
P. striolata
Ps. punctulata
Other spp.
May10-17
May 17-24
May 24-Jun 2
Jun 2-7
Sampling period


Regent, N.D. 2010
% of total caught
P. cruciferae
P. striolata
Ps. punctulata
Other spp.

North Central Research Extension Center-Minot
Pea Aphid Control and Fungicide Enhancement on Field Pea
Daniel Waldstein-Area Extension Specialist, Crop Protection

Crop and Variety: Field Pea 'Majoret'
Insecticides: Baythroid and Movento
Fungicides: Proline, Trilex 2000 (seed treatment for all plots)
Planting: May 18, rate of 150 lbs/acre, 7.5 inch 1560 John Deere no-till drill
Herbicides: Prowl (2 pt/acre) and Spartan (3 oz/acre) applied May 19
Plot size: 7 ft. by 30 ft.
Design: 4 replicates, randomized complete block
Application: July 10 (early pod), hand boom with flat fan nozzles, 10 gallons/acre
Aphid sampling: 15 inch diameter sweep net, 5 sweeps per plot (10 aphids/sweep = threshold)
Harvest: August 17

Results: At 2 days after insecticides were applied, Baythroid, was the most effective insecticide at reducing pea aphid populations (Table 1). At 9 days after insecticides were applied, however, the number of aphids in the Baythroid plots was not significantly different than the untreated check. Movento, on the other hand, did not significantly reduce pea aphids at 2 days after application, but significantly reduced aphids by more than 90% relative to the untreated check 9 days after it was applied. Insecticide treatments significantly improved yield as compared with the untreated check. Approximately half of this yield gain appears to have come from disease control with the fungicide Proline.

This research was supported by an industry gift from Bayer Crop Science.

Table 1.

		Pea aphids/5 sweeps			Yield bu/acre
Treatment	Rate/acre	12-Jul	19-Jul	1-Aug	
Baythroid XL 1EC[a]	2.4 fl oz	75.0c	68.5a	1.8a	55.3a
Movento 240 SC[a]	3.0 fl oz	151.3abc	19.5b	1.8a	52.8a
Movento 240 SC[a]	5.0 fl oz	202.5ab	15.3b	4.3a	54.4a
Proline Check	5.7 fl oz	101.5bc	198.0a	0.3a	47.7ab
Untreated Check		217.0a	226.0a	2.0a	40.8b

Means within the same column followed by the same letter are not significantly different, Tukey's HSD (P = 0.05). Data was transformed log(x+1) prior to analysis when treatment variances were not homogeneous, untransformed means shown.
[a]The fungicide, Proline 480 SC, was tank mixed with the insecticide.

North Central Research Extension Center-Minot
Soybean Aphid Control
Daniel Waldstein-Area Extension Specialist, Crop Protection

Crop and Variety: Soybean 'AGO 0501'
Insecticides: Baythroid, Leverage 360, and Endigo
Fungicides: Quadris
Planting: June 6
Plot size: 4.5 ft. by 16 ft.
Design: 4 replicates, randomized complete block
Application Timing: July 28 at bloom initiation (R1)- Leverage 360, August 15 at early pod (R3)- all treatments
Application Method: Hand boom with flat fan nozzles, 10 gallons/acre
Aphid sampling: Number of aphids on 10 plants per plot (250 aphids/plant = threshold)
Harvest: October 6

Results: Soybean aphid populations were relatively low during the study and never reached the economic threshold of 250 aphids per plant. Leverage 360 applied at the initiation of bloom (R1) did not significantly reduce the number of soybean aphids at 2 d or 20 d after the treatment (Table 1). However, at the early pod (R3) timing, Leverage 360, Baythroid XL, and the Endigo treatments significantly reduced the number of soybean aphids by more than 95%. Yields were not significantly different among treatments.

Table 1.

			Soybean aphids/10 plants			
Treatment	Rate/acre	Timing	30-Jul	17-Aug	3-Sep	Yield (bu/acre)
Leverage 360 3SC[a]	2.8 fl oz	R1	86.3a	90.8a	0.0a	30.1a
Baythroid XL 1EC[b]	2.4 fl oz	R3		4.3b	0.0a	29.2a
Endigo ZC	4.0 fl oz	R3		3.3b	1.0 a	33.2a
Endigo ZC[c]	4.0 fl oz	R3		4.5b	0.8a	35.1a
Leverage 360 3SC[a]	2.8 fl oz	R3		8.0b	2.3a	30.7a
Untreated Check			136.8a	187.0a	0.5a	32.9a

Means within the same column followed by the same letter are not significantly different, Tukey's HSD (P = 0.05). Data was transformed log(x+1) prior to analysis when treatment variances were not homogeneous, untransformed means shown.
[a] Leverage 360 was applied with a 1% by volume solution of Agri-dex crop oil.
[b] Baythroid XL was applied with a 0.5% by volume solution of the non-ionic surfactant, Preference.
[c] The fungicide, azoxystrobin (Quadris), was tank mixed with this treatment at a rate of 6.0 fl oz/acre.

2011 Cooperative Durum Wheat Fungicide Trial - BASF

Jeremy Pederson, NDSU Area Extension Specialist – Cropping Systems

Site Description: The trial was conducted in a field located 3 miles north of Ray, ND. 'Alkabo' durum what was sown into undisturbed durum residue on June 5 at a rate of 1.3 million pure live seeds/acre using a John Deere 1895 air seeder on 10 inch spacing. Fertilizer amendments were added at time of seeding based on soil test results. A blend of urea and ammonium sulfate was applied in a mid-row band and a blend of mono-ammonium phosphate and potassium chloride was applied in the seed row. Weeds were adequately controlled with an application of glyphosate prior to planting and herbicides which were tank mixed with fungicide treatments. Fungicide treatments were applied at the 4.5-leaf stage on July 2, flag leaf on July 17, and early flower on July 27 using a CO_2 pressurized hand-held boom with 4 nozzles on 20 inch spacing. Four leaf and flag leaf treatments were applied with 10 gallons of water/acre through flat fan nozzles and early-flower treatments were applied with 20 gallons of water/acre through twin jet nozzles with a forward and backward spray pattern. The trial was designed as a randomized complete block with four replicates and treated plot size equal to the spray boom width (6.7 feet) x 24 feet long. The center 4.3 feet of each 24 foot plot was harvested using a plot combine on September 26.

[1]Fungicide Treatment	Rate (fl oz/acre)	Crop Stage	[2]Leaf Disease (7/9)	[2]Leaf Disease (7/17)	[2]Leaf Disease (7/27)	Yield	Test Weight
			----------%----------			*Bu/a*	*Lb/bu*
Untreated	--	--	23.8	28.8	42.5	25.6	56.5
Twinline	7.0	4.5 leaf	12.5	12.5	30.0	25.5	55.9
Headline SC	3.0	4.5 leaf	11.9	13.1	27.5	27.9	56.4
Headline AMP	5.0	4.5 leaf	12.5	14.4	31.3	26.6	56.7
Priaxor	2.0	4.5 leaf	13.1	13.1	25.0	25.5	55.5
Priaxor	4.0	4.5 leaf	10.6	10.6	23.8	27.8	57.5
Tilt	2.0	4.5 leaf	18.1	20.6	36.3	25.5	56.2
Quilt Excel	5.0	4.5 leaf	13.8	16.3	31.3	28.3	57.0
Evito	2.0	4.5 leaf	12.5	15.0	26.3	26.0	57.2
Headline SC Headline SC	3.0 6.0	4.5 leaf Flag leaf	13.8	15.0	15.0	31.3	58.0
Headline SC Caramba	3.0 13.5	4.5 leaf Early flower	13.1	14.4	26.3	32.2	59.2
Headline SC Headline SC Caramba	3.0 6.0 13.5	4.5 leaf Flag leaf Early flower	12.5	13.8	13.8	39.9	59.4
LSD (0.05)			4.02	2.29	4.82	4.23	1.19
CV(%)			19.85	10.17	12.18	10.3	1.44

1. Each treatment included Wolverine herbicide (27.4 fl oz/acre) either alone on July 2, or in a tank mix the with 4.5-leaf fungicide treatment.
2. Plots were visually evaluated for percent of leaf area affected by fungal leaf disease.

2011 Cooperative Hard Red Spring Wheat Fungicide Trial - BASF

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Site Description: The trial was conducted at the NDSU North Central Research Extension Center on hard red spring wheat residue that had not been tilled. 'RB07' hard red spring wheat was sown on May 18 at 1.3 M PLS/acre using a plot seeder equipped with six Bourgault 3710 disc openers on 7.5 inch spacing. Plots were trimmed to a length of 19 feet after emergence. A blend of Urea, Ammonium Sulfate, and Potassium Chloride (132 + 42 + 26 lb/acre) was applied at time of seeding in a mid-row band. Herbicides applied included GlyStar Plus + AMS (32 fl oz/acre + 4 lb/100 gal) applied PRE on May 19, Wolverine (27.2 fl oz/acre) applied June 16, and Everest 2.0 + Affinity TM + MCPA (1.0 fl oz/acre + 0.6 oz/acre + 0.75 pt/acre) applied on June 17. Fungicide treatments were applied to 4-leaf wheat on June 16, flag leaf wheat on July 7, and early flower wheat on July 15 using a CO_2 pressurized hand-held boom with 3 nozzles on 20 inch spacing. Four leaf and flag leaf treatments were applied with 10 gallons of water/acre through flat fan nozzles and early-flower treatments were applied with 20 gallons of water/acre through twin jet nozzles with forward and backward spray pattern. The trial was harvested with a plot combine on August 24.

[1]Fungicide Treatment	Rate (fl oz/acre)	Crop Stage	Plant Stand (6/15)	[2]Leaf Disease (6/23)	[2]Leaf Disease (7/3)	[2]Leaf Disease (7/29)	[3]FHB Incidence	[3]FHB Head Severity	[3]FHB Field Severity	Yield	Test Weight
			Plant/sq ft	*----------%----------*						*Bu/a*	*Lb/bu*
Untreated	--	--	24.2	25.0	18.3	61.3	61.9	21.8	13.6	30.2	57.4
Headline SC	3.0	4 leaf	--	10.0	11.7	53.8	50.0	27.1	14.6	32.0	58.0
Priaxor	NA	Flag leaf	--	20.0	11.7	19.4	64.4	26.0	16.8	38.4	59.1
Caramba	13.5	Early flower	--	21.7	15.0	21.3	47.5	14.3	6.8	41.7	59.3
Headline SC Headline SC	3.0 6.0	4 leaf Flag leaf	--	13.3	10.0	16.3	56.9	24.7	14.2	37.6	58.9
Headline SC Priaxor	3.0 NA	4 leaf Flag leaf	--	15.0	11.7	16.9	58.8	24.6	15.2	40.6	59.3
Headline SC Priaxor Caramba	3.0 NA 13.5	4 leaf Flag leaf Early flower	--	13.3	13.3	12.5	43.8	17.9	7.8	45.3	60.3
Stamina F3 Headline SC Priaxor Caramba	4.6 (oz/cwt) 3.0 NA 13.5	Seed Treat 4 leaf Flag leaf Early flower	25.6	11.7	10.0	16.3	43.1	24.2	10.7	43.3	59.5
LSD (0.05)			NS	6.0	4.2	14.0	10.9	7.0	5.5	4.1	1.1
CV(%)			15.6	21.2	19.0	35.1	13.9	21.2	30.2	7.2	1.2

Soil Test Report for site: N(0-6)=17, N(0-24)=60, P=39, K=560, pH=5.3, OM = 3.7, S=10, Zn=2.0, Mn=96.3, Cu=0.61, Cl=7.4, Mg=717.1, CEC=27

1. *Each treatment included nonionic surfactant at 0.125% v/v.*
2. *Plots were visually evaluated for percent of leaf area affected by fungal leaf disease.*
3. *Forty grain heads were evaluated in each plot for Fusarium head blight (FHB): Incidence = percent of heads affected, Head severity = average percent of head affected in symptomatic heads, Field severity = Percent incidence x percent head severity.*

Wild oat control with Everest 2.0 tank mixes

The objective of the study was to evaluate wild oat control with Everest 2.0 alone, as a premix, or tank mixed with broadleaf herbicides. Two treatments were applied June 6 to 2- to 3-leaf wheat, while the remaining treatments were applied June 16 to 4-leaf wheat. Wild oat were about the same stage as the wheat with an average of 10 plants per ft^2. The wild oat population in this field is known to be resistant to Puma, but not to Axial. All treatments provided good to excellent wild oat control with the exception of Wolverine (Puma + Huskie). Raze (Everest 2.0 + fluroxypyr) tank mixed with Bronate resulted in slightly lower wild oat control. All other treatments containing Everest 2.0 alone or in a mix provided excellent wild oat control. The early application did not show a yield advantage from removing weed competition early. In a similar study in 2010, a yield advantage was observed when treatments applied to 5-leaf wheat yielded more than treatments applied to 6.5 leaf-jointing. Wild oat density in the 2010 study was higher at 25 plants/ft^2.

Table. Wild oat control with Everest 2.0 tank mixes. (1104)

			HRSW		Weed Control		HRSW	
			Injury		Wild Oat		Yield	TW
Treatment	Rate/ha	Timing	28-Jun	7-Jul	28-Jun	16-Jul	22-Aug	
			----% injury----		----% control----		bu/A	lb/bu
Untreated			0	0	0	0	16.0	55.9
Everest 2.0[a]	23g	2-3 leaf	1	0	90	99	30.6	58.5
ARY-0454-107[c]	139g + 1%	2-3 leaf	4	0	90	99	30.8	59.0
Everest 2.0 + WM[e] + MCPe[d]	23g + 210g + 280g	4-leaf	0	0	85	95	30.2	58.8
Everest 2.0[a]	23g	4-leaf	0	0	83	98	29.7	59.0
ARY-0454-107[c]	139g + 1%	4-leaf	0	0	87	99	29.6	58.9
Everest 2.0[a]	30.6g	4-leaf	2	0	87	99	30.2	58.3
Raze[b]	123g	4-leaf	0	0	85	99	31.7	58.7
Raze[b]	158g	4-leaf	0	0	84	99	30.6	58.1
Raze + 2,4-De[d]	123g + 420g	4-leaf	0	0	80	94	32.0	58.7
Raze + Bronate[d]	123g + 560g	4-leaf	0	0	81	87	32.9	59.2
Axial XL + Supremacy	60g + 109g	4-leaf	0	0	94	99	31.3	58.7
GoldSky[c]	117g	4-leaf	7	0	85	99	30.0	58.7
Wolverine	329g	4-leaf	0	0	33	28	25.1	58.5
LSD (0.05)			2	NS	8	5	4.5	NS
CV			110	0	6	3	9	2

[a]Applied with Supremacy (109g) + Basic Blend (1%)

[b]Applied with ARY-0546-001 (15.8g) + ARY-0547-001 (5.25g) + Basic Blend (1%)

[c]Applied with Basic Blend (1%)

[d]Applied with Basic Blend (0.5%)

[e]WM = WideMatch

Weed control and barley tolerance with Axial Star

The objective of the study was to evaluate barley tolerance to Axial Star as well as control of broadleaf weeds. Axial Star is a premix of Axial + Starane. Axial Star was tank mixed with various standard broadleaf herbicides. We also evaluated barley tolerance to Group 2 herbicides (GoldSky, Everest, and Rimfire Max). Axial Star tank mixes caused minimal barley injury. GoldSky, Everest, and Rimfire caused severe injury to barley soon after application (chlorosis, stunting). Barley maturity was delayed in these treatments and reduced yield only slightly. They did not cause enough injury that they could be relied upon to provide volunteer barley control in a wheat crop. Most treatments provided good to excellent control of common mallow, wild buckwheat, and redroot pigweed. It should be noted that the barley crop was very competitive and that weed density was generally low.

Table. Weed control and barley tolerance with Axial Star. (1110)

		Barley			Weed Control[c]						Barley	
		Injury			Coma		Wibw		Rrpw		Yield	TW
Treatment[b]	Rate	25-Jun	8-Jul	22-Jul	8-Jul	22-Jul	8-Jul	22-Jul	8-Jul	22-Jul	15-Aug	
		----------%----------									bu/A	lb/bu
Untreated		0	0	0	0	0	0	0	0	0	69.6	42.2
Orion + Axial Star	17 fl oz + 1.03 pt	8	4	0	95	95	99	99	98	98	74.8	42.9
Affinity TM + Axial Star	0.60 oz + 1.03 pt	3	1	0	95	95	99	99	99	99	72.5	42.5
Affinity BS + Axial Star	0.4 oz + 1.03 pt	4	2	0	95	95	99	99	99	99	72.1	42.4
Bronate Adv. + Axial Star	0.6 pt + 1.03 pt	3	2	0	87	86	99	99	93	93	74.6	43.2
Huskie + Axial Star + AMS	11 fl oz + 1.03pt + 1.5%	1	1	0	93	93	99	99	99	99	76.3	42.3
Wolverine	1.7 pt	0	0	0	91	90	99	99	99	99	71.8	41.9
Goldsky + NIS	1 pt + 0.25%	63	52	21	93	95	99	99	99	99	55.7	39.7
Everest 2.0[a]	0.75 oz	62	55	22	79	63	99	99	99	99	59.6	40.0
Rimfire Max[a]	3 oz	57	40	18	85	88	99	99	97	99	69.5	40.8
LSD (0.05)		3	7	1	5	8	NS	NS	6	6	7.7	1.4
CV		8	25	12	4	6	0	0	4	4	6	2

[a]*Applied with Basic Blend (1%); Bronate (1 pt) applied 7 days after POST treatment*

[b]*All treatments applied to 5- 5.5-leaf barley*

[c]*Coma=Common mallow; Wibw=Wild buckwheat; Rrpw=Redroot pigweed*

Evaluation of barley variety sensitivity to Beyond carryover

The objective of the study was to evaluate barley variety sensitivity to Beyond carryover from the previous year. In 2010, Beyond was applied postemergence to Clearfield lentil at 2, 3, 4, 6, and 8 fl oz. Tradition, Celebration, Pinnacle, and Conlon were planted in 2011 into the treated blocks. Each variety was evaluated for visual injury, height, yield, test weight, and percent plump and thin. All Beyond rates were compared to an untreated. No visual injury was observed with any treatment. There were no differences between treatments for height, yield, test weight, or percent plump and thin. Excessive rainfall flooded out the Conlon block, so no data is presented for Conlon. This study was also conducted by Vision Research (Berthold) with similar results.

Table 1. Evaluation of barley variety sensitivity to Beyond carryover. (1111)

		Barley								
		Visual injury						Height		
		Tradition		Celebration		Pinnacle		Tradition	Celebration	Pinnacle
Treatment[ab]	Rate	14-Jul	4-Aug	14-Jul	4-Aug	14-Jul	4-Aug	5-Aug		
		----------%----------						----------cm----------		
Untreated		0	0	0	0	0	0	92.2	101.6	91.7
Beyond	2 fl oz	0	0	0	0	0	0	88.8	102.5	91.7
Beyond	3 fl oz	0	0	0	0	0	0	89.3	99.3	91.8
Beyond	4 fl oz	0	0	0	0	0	0	92.6	102.8	93.5
Beyond	6 fl oz	0	0	0	0	0	0	89.9	102.8	93.3
Beyond	8 fl oz	0	0	0	0	0	0	91.6	100.4	90.5
LSD (0.05)		NS	NS	NS	NS	NS	NS	NS	NS	NS
CV		0	0	0	0	0	0	4	2	3

[a]*All treatments applied postemergence to Clearfield lentil in 2010 with NIS (0.25%) + 28% N (2.5%)*

Table 2. Evaluation of barley variety sensitivity to Beyond carryover. (1111)

		Barley											
		Tradition		Celebration		Pinnacle		Tradition		Celebration		Pinnacle	
Treatment[ab]	Rate	Plump	Thin	Plump	Thin	Plump	Thin	Yield	TW	Yield	TW	Yield	TW
		----------%----------						bu/A	lb/bu	bu/A	lb/bu	bu/A	lb/bu
Untreated		87.5	3.6	93.3	6.6	94.8	2.7	79.7	44.8	78.8	42.0	72.8	43.1
Beyond	2 fl oz	88.1	3.7	93.6	6.3	94.3	2.6	73.0	44.2	83.1	42.8	79.0	43.9
Beyond	3 fl oz	84.3	5.1	89.3	6.5	96.7	2.1	70.5	43.6	77.6	42.1	75.8	43.9
Beyond	4 fl oz	81.6	5.8	94.7	5.2	96.4	2.4	85.2	44.3	81.4	42.8	80.3	43.9
Beyond	6 fl oz	82.5	5.2	94.6	5.4	94.5	2.5	79.2	44.0	87.7	42.3	78.6	43.6
Beyond	8 fl oz	84.3	5.5	95.7	4.2	93.5	2.8	78.8	43.4	82.5	42.7	76.8	44.4
LSD (0.05)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
CV		5	34	3	34	2	23	8	2	7	2	6	2

[a]*All treatments applied postemergence to Clearfield lentil in 2010 with NIS (0.25%) + 28% N (2.5%)*

Does Express or Affinity increase green foxtail control in wheat?

The objective of the study was to determine if green foxtail control with Everest 2.0, GoldSky, and Rimfire Max will increase when tank mixed with Express or Affinity. Everest 2.0, GoldSky, and Rimfire Max were applied alone or tank mixed with Express or Affinity. At the pre-harvest evaluation on August 9, foxtail control increased 6-14% when the grass herbicides were tank mixed with Express or Affinity compared to the grass herbicide alone.

Table. Green foxtail control with SU's (1113)

		Weed Control			HRSW	
		Green Foxtail			Yield	TW
Treatment[abc]	Rate	9-Jul	22-Jul	9-Aug	29-Aug	
		----------%----------			bu/A	lb/bu
Untreated		0	0	0	15.9	54.0
Everest 2.0	0.5 fl oz	72	75	71	27.5	57.4
Everest 2.0 + Express	0.5 fl oz + 0.4 oz	83	82	83	31.5	58.5
Everest 2.0 + Affinity BS	0.5 fl oz + 0.6 oz	87	89	84	29.2	57.9
GoldSky	1 pt	86	78	80	25.5	56.7
GoldSky + Express	1 pt + 0.4 oz	85	81	86	29.2	57.1
GoldSky + Affinity BS	1 pt + 0.6 oz	85	87	88	29.1	57.8
Rimfire Max	3 oz	59	39	37	23.6	56.9
Rimfire Max + Express	3 oz + 0.4 oz	70	60	51	24.3	57.1
Rimfire Max + Affinity BS	3 oz + 0.6 oz	73	50	48	26.2	57.2
Express	0.4 oz	23	23	23	26.7	56.1
Affinity BS	0.6 oz	27	22	13	23.5	56.5
Affinity TM	0.5 oz	28	20	15	27.0	57.7
Affinity TM + Everest 2.0	0.5 oz + 0.5 fl oz	85	87	85	29.5	56.4
LSD (0.05)		9	17	15	4.0	1.8
CV		9	18	17	9	2

[a] *All treatments applied at 4-leaf wheat*

[b] *Rimfire Max applied with MSO (1.5 pt)*

[c] *Everest, Affinity, Goldsky, and Express applied with NIS (0.25%)*

Broadleaf weed control in HRSW with Starane Flex

The objective of the study was to evaluate wheat tolerance and weed control with Starane Flex (Starane + florasulam). All treatments were applied at 4-leaf wheat. Weeds included wild buckwheat (4-lf), horseweed (8 in), and greenflower pepperweed (8 in). Very little injury was observed with any treatment. Generally, most treatments provided excellent control of all weeds. The only exceptions were Affinity + MCPA ester, which provided only fair control of horseweed, and Huskie which provided slightly lower control of greenflower pepperweed.

Table. Broadleaf weed control in HRSW with Starane Flex. (1114)

		HRSW				Weed Control[b]					
		Chlorosis		Stunting		Howe		Grpw		Wibw	
Treatment[a]	Rate	25-Jun	1-Jul	25-Jun	1-Jul	1-Jul	11-Aug	1-Jul	11-Aug	1-Jul	11-Aug
		----------%----------				----------%----------					
Untreated		0	0	0	0	0	0	0	0	0	0
Starane Flex	13.5 fl oz	0	0	0	0	88	98	85	93	92	99
Starane Flex + MCPe	13.5 fl oz + 8.63 fl oz	0	0	0	0	90	99	88	96	92	98
Starane Flex + 2,4-De	13.5 fl oz + 12.6 fl oz	1	0	0	0	90	99	88	98	92	99
Affinity TM + MCPe + NIS	0.6oz + 13oz + 0.25%	1	0	0	0	83	74	88	99	95	98
Huskie + AMS	11 fl oz + 1.5%	0	0	0	0	92	93	94	88	96	98
LSD (0.05)		NS	NS	NS	NS	3	12	1	10	1	2
CV		177	0	0	0	3	9	1	7	1	1

[a] *All treatments applied POST at HRSW 4-Leaf*

[b] *Howe=Horseweed; Grpw=Greenflower pepperweed; Wibw=Wild buckwheat*

Control of ACCase resistant green foxtail and wild oat with Rimfire tank mixes

The objective of the study was to evaluate Rimfire tank mixes for control of ACCase-resistant green foxtail and wild oat in spring wheat. All treatments were applied on June 6 at the 3- to 4-leaf wheat stage. Foxtail was about 0.5 inch tall and wild oat was 2- to 3-leaf. Rimfire tank mixed with Huskie plus MSO or Basic Blend caused 13-15% injury within 7-10 days after application, mostly expressed as chlorosis with slight stunting. However, by early July no injury symptoms were visible. At the pre-harvest evaluation on Aug 2, Rimfire tank mixes provided excellent wild oat control, but poor foxtail control. Wolverine provided poor control of both grasses. An experimental product to be marketed by Bayer in 2012 provided excellent wild oat control and good foxtail control.

Table. Control of ACCase-resistant green foxtail and wild oat with Rimfire tank mixes. (1115)

		HRSW			Weed Control					
		Injury			Green foxtail			Wild oat		
Treatment[ab]	Rate	18-Jun	30-Jun	2-Aug	18-Jun	30-Jun	2-Aug	18-Jun	30-Jun	2-Aug
		----------%----------			----------%----------					
Untreated		0	0	0	0	0	0	0	0	0
Rimfire + Huskie + MSO	3 oz + 11 oz + 1.5 pt	15	9	0	89	76	59	93	95	99
Rimfire + Huskie + BB	3 oz + 11 oz + 1%	13	5	0	87	68	57	90	95	99
Rimfire + Huskie + Destiny HC	3 oz + 11 oz + 0.75 pt	8	4	0	86	66	57	89	95	99
Rimfire + Aff TM + Starane + BB	3 oz + 0.6 oz + 0.18 pt + 1%	6	2	0	87	73	65	91	95	98
Experimental	13.7 oz	6	2	0	88	87	88	88	95	99
Wolverine	27.4 oz	0	0	0	33	30	30	47	33	30
LSD (0.05)		3	4	NS	5	9	14	8	4	2
CV		22	64	0	4	9	16	6	3	1

[a] *All treatments applied at 2- to 3-leaf wheat, 2- to 3-leaf wild oat, and 0.5 inch foxtail*

[b] *Rimfire=Rimfire Max; Starane=Starane Ultra; MSO=Methylated seed oil; BB=Basic blend*

Lentil tolerance to Sharpen applied preemergence

The objective of the study was to evaluate lentil tolerance to Sharpen applied preemergence alone or tank mixed with Prowl H2O. The last treatment in the table below represents a 2X rate for all herbicides. All treatments caused slight to moderate injury at the June and July evaluations. However, by August there was minimal visible injury. Sharpen alone caused only 10% injury or less. Including Prowl in the tank mix resulted in more injury. The 2X treatment caused moderate to severe injury throughout the season.

Table. Lentil tolerance to Sharpen applied preemergence. (1116)

		Lentil		
		Injury		
Treatment[ab]	Rate	29-Jun	16-Jul	4-Aug
		----------%----------		
Glyphosate	22 fl oz	0	0	0
Sharpen + Glyphosate	0.75 fl oz + 22 fl oz	7	2	0
Sharpen + Glyphosate	1 fl oz + 22 fl oz	10	5	0
Sharpen + Glyphosate + Prowl H2O	0.75 fl oz + 22 fl oz + 2 pt	19	13	1
Sharpen + Glyphosate + Prowl H2O	1 fl oz + 22 fl oz + 2 pt	23	16	0
Handweeded + Glyphosate + Prowl H2O	22 fl oz + 1.5 pt	12	8	2
Sharpen + Glyphosate + Prowl H2O[c]	1.5 fl oz + 44 fl oz + 4 pt	55	47	22
Untreated		0	0	0
LSD (0.05)		9	10	4
CV		31	50	74

[a] *Glyphosate applied with AMS (2.5%); Sharpen applied with MSO (1%)*

[b] *All treatments applied PRE*

[c] *All rates in this treatment are 2X*

Impact of herbicides and seeding rate on lentil yield and quality

The objective of the study was to determine if a higher lentil seeding rate would help offset any herbicide injury. Lentil was planted at 12 or 18 plants/ft^2. Various herbicides were applied preemergence (June 1) after planting on May 26. All treatments caused slight to moderate lentil injury at the July evaluation; however, in most treatments, the lentils generally grew out of the injury. In early August, there were no differences in height between treatments. There were no yield differences between treatments; however, wet soil conditions in some areas of the plot contributed to yield variability and a high CV. Lentil yields were higher where seeded at 18 plants/ft^2 compared to 12 plants/ft^2. There tended to be slightly less visible injury (3-8%) with the higher seeding rate.

Table. Impact of herbicides and seeding rate on lentil yield and quality (1119)

			Lentil				
			Injury		Height	Yield	TW
Treatment[ab]	Rate	Timing	9-Jul	17-Aug	4-Aug	15-Sep	
12 Plants per ft^2			----------%----------		cm	lb/A	lb/bu
Sharpen + Prowl H2O	1 fl oz + 3 pt	PRE	23	5	33.7	1068	62.8
Prowl	3 pt	PRE	17	5	33.3	1182	62.8
Sharpen + KIH-485	1 fl oz + 0.15 lb	PRE	16	8	34.2	1254	62.5
KIH-485	0.15 lb	PRE	15	6	35.1	1233	62.3
Sharpen + Spartan	1 fl oz + 3 fl oz	PRE	24	15	31.7	799	62.8
Spartan	3 fl oz	PRE	11	7	32.4	1124	62.8
Handweeded			10	3	33.8	1160	62.4
18 Plants per ft^2							
Sharpen + Prowl H2O	1 fl oz + 3 pt	PRE	17	2	33.5	1214	62.2
Prowl	3 pt	PRE	14	2	35.8	1373	62.2
Sharpen + KIH-485	1 fl oz + 0.15 lb	PRE	16	3	33.7	1282	61.6
KIH-485	0.15 lb	PRE	10	3	34.3	1358	61.6
Sharpen + Spartan	1 fl oz + 3 fl oz	PRE	20	7	34.3	1336	62.1
Spartan	3 fl oz	PRE	19	5	35.3	1677	62.6
Handweeded			0	0	35.3	1592	62.1
LSD (0.05)			5	5	NS	NS	NS
CV			24	64	5.2	23	1.4

[a] *Sharpen applied with MSO (1%) + AMS (2.5%); Beyond applied with NIS (0.25%) + 28% N (2.5%)*

[b] *Beyond (4 fl oz) applied POST to all treatments*

Management of ACCase resistant wild oat in wheat with Pre-Pare/Sierra

The objective of the study was to evaluate ACCase-resistant wild oat control with PRE and POST herbicides including Pre-Pare and Sierra compared to standard wild oat herbicides. Pre-Pare was applied preemergence (PRE) on May 19 while all other herbicides were applied postemergence (POST) on June 6 to 2- to 3-leaf wheat and 3-leaf wild oat. Sierra is a new formulation of flucarbazone plus a safener marketed by Syngenta. Pre-Pare applied preemergence caused slight to moderate crop injury that was visible through about six weeks after seeding. All Group 2 herbicides (Sierra, Rimfire, GoldSky) also caused slight crop injury mostly in the form of chlorosis. All injury ratings were less than 10% by about three weeks after the POST treatments. Pre-Pare alone provided about 50% wild oat control and increased yield by about 7 bushels over the untreated check. Discover, a Group 1 herbicide, provided poor wild oat control resulting in lower wheat yields. Axial XL and all Group 2 herbicides applied POST provided excellent wild oat control. Wheat yields more than doubled where wild oat was controlled effectively.

Table. Management of ACCase-resistant wild oat in wheat with Pre-Pare/Sierra. (1120)

			HRSW			Weed Control		Yield	TW
			Injury			Wild Oat		HRSW	
Treatment[a]	Rate	Timing	15-Jun	29-Jun	15-Jul	29-Jun	15-Jul	22-Aug	
			----------%----------			--------%--------		bu/A	lb/bu
Untreated			0	0	0	0	0	15.9	58.5
Pre-Pare		PRE	14	5	0	52	49	23.4	58.7
Pre-Pare/Sierra	0.3 oz / 0.35 fl oz	PRE / 2-3 lf	16	8	0	95	99	32.8	59.3
Pre-Pare/ Sierra	0.3 oz / 0.5 oz	PRE / 2-3 lf	15	7	0	96	99	31.9	59.7
Pre-Pare/Axial XL	0.3 oz / 16.4 fl oz	PRE / 2-3 lf	15	7	0	94	98	31.3	59.4
Pre-Pare / Discover NG	0.3 oz / 12.8 fl oz	PRE / 2-3 lf	13	6	0	64	55	26.1	59.2
Sierra	0.5 fl oz	2-3 lf	5	5	0	88	98	33.0	59.6
Sierra	0.75 fl oz	2-3 lf	5	5	0	90	98	33.9	59.8
Sierra	1 fl oz	2-3 lf	5	6	0	95	99	32.7	59.9
Axial XL	16.4 fl oz	2-3 lf	4	0	0	94	98	35.4	59.7
Discover NG	12.8 fl oz	2-3 lf	3	0	0	27	23	17.6	57.7
Rimfire Max	3 oz	2-3 lf	11	6	0	94	99	32.8	59.4
Goldsky + NIS + AMS	16 fl oz + 0.25% + 4.4%	2-3 lf	12	9	0	94	98	31.9	59.5
LSD (0.05)			2	3	NS	8	10	4.2	0.96
CV			11	32	0	6	7	9	1

[a] *Pre-Pare applied preemergence; Sierra and Rimfire Max applied with Quad 7 (1%)*

Evaluation of glyphosate antagonism from Sharpen on Canada thistle control

In 2010, we observed that tank mixing Sharpen and glyphosate (11 fl oz) resulted in reduced long-term Canada thistle control. In 2011, our main objective was to determine if higher rates of glyphosate would help overcome the antagonism from Sharpen. Glyphosate was applied at 11, 16, and 22 fl oz alone or with Sharpen at 1 fl oz. Treatments were applied on June 9 to 2- to 6-inch weeds. Canada thistle treated with Sharpen + glyphosate were quickly burned down; however, by 3 weeks after application, treated Canada thistle had started to re-grow. Plants treated with just glyphosate provided more consistent control over time. Increasing the glyphosate rate from 11 to 22 fl oz did increase Canada thistle control, but not to the level of glyphosate applied alone. It should be noted that we have not observed antagonism from Sharpen + glyphosate on annual weeds.

Table. Evaluation of glyphosate antagonism from Sharpen on Canada thistle control. (1121)

		Canada Thistle Control		
Treatment[ab]	Rate	18-Jun	29-Jun	15-Jul
		----------%----------		
Glyphosate	11 fl oz	60	83	79
Glyphosate	16 fl oz	60	85	82
Glyphosate	22 fl oz	60	87	82
Sharpen + Glyphosate	1 fl oz + 11 fl oz	76	43	38
Sharpen + Glyphosate	1 fl oz + 16 fl oz	83	60	58
Sharpen + Glyphosate	1 fl oz + 22 fl oz	85	69	65
Untreated		0	0	0
LSD (0.05)		6	16	17
CV		6	13	17

[a] *Glyphosate applied with AMS (2.5%); Treatments applied to 2-6 inch weeds*

[b] *Sharpen applied with MSO (1%)*

Weed control in sunflower with BroadAxe

The objective of the study was to evaluate weed control in sunflower with BroadAxe, a new premix formulation of Spartan + Dual by FMC. Treatments were applied premergence on June 9. Select Max was applied POST to only two of the treatments listed in the table below. No crop injury was observed with any treatment. BroadAxe or Dual provided good to excellent foxtail control. Foxtail control with Prowl H2O alone weakened over time. The best foxtail control was from the high rate of BroadAxe or the low rate followed by Select Max. None of the preemergence treatments controlled volunteer wheat. All treatment generally provided good pigweed control, although the pigweed density was very light.

Table. Weed control in sunflower with BroadAxe. (1123)

		Injury		Weed Control[b]					
		Sunflower		Yeft		Vowh		Rrpw	
Treatment[c]	Rate	9-Jul	16-Jul	9-Jul	2-Aug	9-Jul	2-Aug	9-Jul	2-Aug
		-------%------		----------%----------					
BroadAxe	25 oz	0	0	96	89	23	15	100	100
BroadAxe	35 oz	0	0	97	94	32	27	100	100
Spartan Charge	5.75 oz	0	0	30	18	3	3	100	100
Prowl	2.5 pt	0	0	96	77	15	13	98	81
BroadAxe / Select[c]	25 oz / 9 oz	0	0	100	93	98	96	100	100
Dual Magnum	1.25 pt	0	0	97	91	23	18	100	100
Spartan + Prowl / Select[c]	3 oz + 2.5 pt / 9 oz	0	0	100	87	98	96	98	97
Untreated		0	0	0	0	0	0	0	0
LSD (0.05)		NS	NS	11	8	9	7	3	5
CV		0	0	8	7	13	12	2	3

[a] *All treatments applied PRE; Prowl=Prowl H20*

[b] *Yeft=Yellow foxtail; Vowh=Volunteer wheat; Rrpw=Redroot pigweed*

[c] *Select Max (9 oz)+ NIS (0.25%) applied POST*

Residual broadleaf weed control with soil-applied Express + Ally

The objective of this study was to evaluate residual broadleaf weed control from a soil-applied treatment of Express + Ally compared to other commercial products. All treatments were applied in a chemical fallow situation on May 19. Grasses were controlled with later applications of Select. The goal was to determine which weeds would be controlled and for how long by a preplant application. All treatments generally provided good weed control from the May 19 application date through the June 25 evaluation. However, by mid-July several weeds started to break through. Express + Ally tank mixed with glyphosate controlled all weeds as well as or better than other treatments.

Table. Residual broadleaf weed control with soil-applied Express + Ally. (1124)

		Weed Control[b]											
		Howe		Wibw		Colq		Rrpw		Prle		Shep	
Treatment[a]	Rate	25-Jun	19-Jul	25-Jun	19-Jul	25-Jun	19-Jul	25-Jun	19-Jul	25-Jun	19-Jul	25-Jun	19-Jul
		----------%----------											
Untreated		0	0	0	0	0	0	0	0	0	0	0	0
Glyphosate	1 qt	78	40	98	50	98	43	87	25	98	97	90	43
Express + Ally	0.25 oz + 0.036 oz	98	83	99	73	100	57	99	70	100	100	95	55
Express + Ally	0.5oz + 0.036 oz	98	87	99	62	100	60	99	77	100	100	97	57
Gly + Express + Ally	1 qt + 0.25 oz + 0.036 oz	99	87	100	87	100	63	99	82	100	100	95	52
Gly + Express + Ally	1 qt + 0.5 oz + 0.036 oz	98	85	100	77	100	58	100	73	100	100	96	50
Gly + Orion	1 qt + 17 fl oz	98	87	97	57	100	53	97	57	100	100	100	60
Gly + Sharpen	1 qt + 1 fl oz	99	91	98	73	100	67	97	62	100	100	82	37
LSD (0.05)		3	9	4	21	3	18	3	10	2	4	16	18
CV		2	7	2	20	2	21	2	10	1	2	11	23

[a] *All treatments applied May 19 in fallow; All Express + Ally treatments applied with NIS (0.25%); Glyphosate applied with AMS (2.5%); Sharpen applied with MSO (1%); Gly=Glyphosate*

[b] *Howe=Horseweed; Wibw=Wild buckwheat; Colq=Common lambsquarters; Rrpw=Redroot pigweed; Prle=Prickly lettuce; Shep=Shepherdspurse*

Control of ACCase-resistant foxtail with Rimfire tank mixes

The objective was to evaluate ACCase-resistant green foxtail control with Rimfire Max tank mixes. Treatments were applied June 23 to 4-leaf wheat and 1-inch foxtail. Rimfire Max tank mixes caused 25-45% injury at the June 30 evaluation in the form of chlorosis and stunting. However, the injury symptoms subsided significantly by mid-July. Wolverine nor any of the Rimfire Max tank mixes effectively controlled foxtail at the August 2 pre-harvest evaluation. An experimental herbicide to be marketed by Bayer in 2012 provided 84% foxtail control and caused less crop injury than the Rimfire tank mixes.

Table. Control of ACCase-resistant foxtail with Rimfire tank mixes. (1126)

		Injury			Weed Control		
		HRSW			Foxtail		
Treatment[abc]	Rate	30-Jun	16-Jul	2-Aug	30-Jun	16-Jul	2-Aug
		----------%----------					
Untreated		0	0	0	0	0	0
Rimfire + Huskie + MSO	3 oz + 11 oz + 1.5 pt	45	18	3	80	57	47
Rimfire + Huskie + BB	3 oz + 11 oz + 1%	25	6	1	72	48	43
Rimfire + Huskie + HC	3 oz + 11 oz + 0.75 pt	32	8	1	75	55	47
Rim + Affin + Star + BB	3 oz + 0.6 oz + 0.18 pt + 1%	30	7	1	77	65	65
Experimental	13.7 oz	14	2	1	81	80	84
Wolverine	27.4 oz	1	0	0	17	23	13
LSD (0.05)		5	3	1	11	16	17
CV		13	28	79	11	19	22

[a] *Rimfire=Rimfire Max; Affin=Affinity TM; Star=Starane Ultra*

[b] *MSO=Methylated seed oil; BB=Basic Blend; HC=Destiny HC*

[c] *All treatments applied POST to 4-leaf wheat*

Wild oat and green foxtail control with Rimfire in spring wheat

The objective of the study was to evaluate wild oat and green foxtail control with Rimfire Max tank mixes. The field site had documented resistance to Puma. Treatments were applied on June 9 to 3-leaf wheat and 3-leaf wild oat. Rimfire Max tank mixes caused 15-21% injury at the June 18 evaluation in the form of chlorosis and stunting. However, the injury symptoms subsided significantly by mid-July. All treatments except for Wolverine provided excellent wild oat control. Wolverine had almost no effect on the wild oat. None of the Rimfire treatments effectively controlled green foxtail. An experimental to be marketed by Bayer in 2012 provided better foxtail control at 71%.

Table. Wild oat and green foxtail control with Rimfire in HRSW. (1133)

		Injury			Weed Control			
		HRSW			Wild Oat			Grft[b]
Treatment[a]	Rate	18-Jun	30-Jun	2-Aug	18-Jun	30-Jun	2-Aug	2-Aug
		----------%----------						
Untreated		0	0	0	0	0	0	0
Rimfire + Huskie + MSO	3 oz + 11 oz + 1.5 pt	21	19	0	76	93	99	38
Rimfire + Huskie + BB	3 oz + 11 oz + 1%	16	12	0	71	92	99	38
Rimfire + Huskie + Destiny HC	3 oz + 11 oz + 0.75 pt	15	13	0	67	90	99	40
Rimfire + Affinity TM + Starane + BB	3 oz + 0.6 oz + 0.18 pt + 1%	15	13	0	67	91	99	40
Experimental	13.7 oz	11	10	0	65	89	99	71
Wolverine	27.4 oz	0	0	0	27	7	10	---
LSD (0.05)		4	4	NS	9	8	7	16
CV		19	21	0	9	7	5	23

[a] *Rimfire=Rimfire Max; Starane=Starane Ultra; BB=Basic Blend; All treatments applied to 3-leaf wheat*

[b] *Grft=Green Foxtail*

Wild oat control in spring wheat with GoldSky

The objective of the study was to evaluate wild oat control with GoldSky in spring wheat. All treatments were applied June 9 to 3-leaf wheat and 3-leaf wild oat. GoldSky treatments caused as much as 8% chlorosis and 17% growth reduction one week after application, but the injury symptoms subsided by early July. All treatments provided excellent wild oat control with the exception of Wolverine, which provided almost no wild oat control. Wild oat at this location has been documented previously to be resistant to Puma.

Table. Wild oat control in HRSW with GoldSky. (1135)

		HRSW						Weed Control	
		Chlorosis			Growth Reduction			Wild Oat	
Treatment[a]	Rate	15-Jun	29-Jun	8-Jul	18-Jun	8-Jul	3-Aug	29-Jun	3-Aug
		----------%----------							
Untreated		0	0	0	0	0	0	0	0
Goldsky[bc]	16 fl oz	8	2	0	17	6	0	93	99
Goldsky + 28% N[b]	16 fl oz + 64 fl oz	8	2	0	14	4	0	93	99
Goldsky + MCPe[c]	16 fl oz + 8.63 fl oz	8	2	0	14	5	0	94	99
Axial XL + WM + MCPe	16.4 oz + 16 oz + 13 oz	5	0	0	1	0	0	95	97
Everest 2.0 + 2,4-De	1 fl oz + 12.6 fl oz	3	2	0	2	0	0	81	98
Wolverine	27.3 fl oz	0	1	0	0	0	0	10	12
LSD (0.05)		NS	1	NS	3	2	NS	2	3
CV		0	33	0	24	41	0	2	2

[a] *WM=WideMatch; All treatments applied to 3-leaf wheat*

[b] *Applied with NIS (0.5%)*

[c] *Applied with AMS (4.44%)*

Crop tolerance and weed control in Clearfield wheat

The objective of the study was to evaluate weed control and Clearfield wheat tolerance with Beyond tank mixes. Treatments were applied July 5 to 4.5-leaf wheat, 2-inch yellow foxtail, and 1-inch pigweed. No crop injury was observed with any of the treatments. Beyond provided good to excellent foxtail control except when applied at 4 fl oz tank mixed with Bronate. Wolverine, Everest 2.0, and Axial XL provided poor to fair foxtail control. All treatments provided excellent pigweed control, with the exception of Axial XL + WideMatch + MCPA ester.

Table. Crop tolerance and weed control in Clearfield wheat. (1139)

		Injury		Weed Control					
		HRSW		Yellow Foxtail			Redroot Pigweed		
Treatment[a]	Rate	15-Jul	19-Jul	19-Jul	4-Aug	18-Aug	19-Jul	4-Aug	18-Aug
		----------%----------							
Untreated		0	0	0	0	0	0	0	0
Beyond + MSO	4 fl oz + 1%	0	0	83	82	86	95	99	99
Beyond + MSO	6 fl oz + 1%	0	0	92	91	94	95	99	99
Beyond + Bronate + NIS	4 fl oz + 1 pt + 0.25%	0	0	71	67	64	95	99	99
Beyond + Bronate + NIS	6 fl oz + 1 pt + 0.25%	0	0	79	80	81	95	99	99
Beyond + Widematch + NIS	4 fl oz + 1 pt + 0.25%	0	0	81	83	85	95	99	99
Wolverine	1.7 pt	0	0	81	37	33	99	99	99
Everest 2.0 + Widematch + MCPe	1 fl oz + 1 pt + 0.5 pt	0	0	80	60	54	86	99	99
Axial XL + Widematch + MCPe	16.4 fl oz + 1 pt + 0.5 pt	0	0	89	77	70	50	50	45
LSD (0.05)		NS	NS	13	16	17	6	6	3
CV		0	0	10	15	15	4	4	2

[a] *All treatments applied to 4.5-leaf wheat*

Yellow toadflax control in rangeland with DPX-MAT28

The study objective was to evaluate DPX-MAT28 (aminocyclopyrachlor) for long-term yellow toadflax control in rangeland compared to Tordon. DPX-MAT28 was applied at 1.5 or 3 oz ai/A or at 2 oz tank mixed with Telar. Tordon was applied at 2 pt/A. Treatments were applied at vegetative stage, flowering, and late fall. Treatments were applied in 2008 and evaluated in 2009, 2010, and 2011. Toadflax density was measured before application in 2008 and again each year after. Tordon provided poor toadflax control at any stage. DPX-MAT28 provided excellent control after 1 year with any rate. However, after 2 years, control with the 1.5 oz rate dropped off significantly, while the 3 oz rate still maintained excellent control. Toadflax control with DPX-MAT28 + Telar was 8-13% lower than with 3 oz. No treatment caused more than 6% grass injury. After 3 years, the 3 oz rate is still providing ≥95% control at any stage, while the 2 oz rate + Telar provided 76-89% control.

Table. Yellow toadflax control with DPX-MAT28. (0949)

			Injury			Weed Control			Density			
			Grass			Yellow Toadflax						
Treatment[a]	Rate	Stage	7-Aug-09	10-Sep-10	22-Aug-11	7-Aug-09	10-Sep-10	22-Aug-11	4-Aug-08	14-Jul-09	15-Sep-10	25-Aug-11
			----------%----------						----------sq ft----------			
Untreated			0	0	0	0	0	0	9.6	11.9	8.7	9.9
DPX-MAT28	1.5 oz	Veg.	5	0	0	93	55	27	8.3	0.2	3.1	4.9
DPX-MAT28	1.5 oz	Flow.	1	0	0	95	62	43	6.1	1	3.4	3.1
DPX-MAT28	1.5 oz	Fall	1	0	0	90	64	40	7.8	1	1.7	4.1
DPX-MAT28	3 oz	Veg.	5	0	0	100	98	95	8.3	0	0	0.3
DPX-MAT28	3 oz	Flow.	3	0	0	100	99	95	7.6	0	0	0.2
DPX-MAT28	3 oz	Fall	3	0	0	100	99	98	5.9	0	0	0
Tordon	2 pt	Veg.	1	0	0	23	0	0	6.2	5.8	7.2	9.1
Tordon	2 pt	Flow.	1	0	0	32	0	0	10	6.8	7	11.9
Tordon	2 pt	Fall	1	0	0	60	13	10	6.4	2.9	3.8	6.9
DPX-MAT28 + Telar	0.75 oz	Veg.	4	0	0	99	85	76	7.9	0.1	0.6	1
DPX-MAT28 + Telar	0.75 oz	Flow.	6	0	0	100	91	89	7.1	0	0.3	1.3
DPX-MAT28 + Telar	0.75 oz	Fall	3	0	0	100	92	86	8.6	0	0.7	0.9
Untreated			0	0	0	0	0	0	6.1	6.4	5	8.4
LSD (0.05)			7	15	17	NS	NS	NS	NS	2	3	3
CV			6	17	22	111	0	0	40	56	57	45

[a] *All treatments applied with MSO (1%)*

Canada thistle and grass control in wheat

The objective of the stud was to evaluate Canada thistle control in spring wheat with WideMatch compared to a new formulation, PerfectMatch. PerfectMatch is not labeled for use as of 2011. None of the treatments caused significant crop injury. All treatments provided good Canada thistle control with the exception of Everest 2.0 + 2,4-D amine. A side note observation was the difference in grass control provided by the different treatments. GoldSky provided excellent control of barnyardgrass, fair control of green foxtail, and excellent control of yellow foxtail. Axial XL provided fair control of barnyardgrass, poor control of green foxtail, and excellent control of yellow foxtail. Everest 2.0 provided poor control of barnyardgrass, excellent control of green foxtail, and fair control of yellow foxtail.

Table. Canada Thistle and grass control in wheat. (1151)

		HRSW			Weed Control[c]					
		Growth Reduction			Canada Thistle			Bygr	Grft	Yeft
Treatment[a]	Rate	15-Jul	19-Jul	5-Aug	19-Jul	5-Aug	24-Aug	5-Aug	5-Aug	5-Aug
		----------%----------			----------% control----------					
Untreated		0	0	0	0	0	0	0	0	0
GoldSky + WideMatch + NIS + AMS	16 fl oz + 16 fl oz + 0.5% + 4.4%	0	6	5	77	83	81	99	79	95
PerfectMatch[b] + NIS + AMS	16 fl oz + 0.5% + 4.44%	0	0	1	75	85	84	99	78	94
PerfectMatch[b] + MCPe + AMS	16 fl oz + 8.63 fl oz + 4.44%	0	0	3	79	86	85	99	74	94
PerfectMatch[b] + NIS + 28% N	16 fl oz + 0.5% + 64 fl oz	0	0	0	76	88	87	99	85	93
Widematch + Pyroxsulam + NIS + AMS	16 fl oz + 6.84 fl oz + 0.5% + 4.44%	0	0	1	78	91	90	99	77	93
Axial XL + WideMatch	16.4 fl oz + 16 fl oz	0	0	0	76	90	91	75	48	96
Everest 2.0 + 2,4-D Amine	0.75 fl oz + 14.9 fl oz	0	0	0	52	42	41	37	94	67
LSD (0.05)		NS	NS	2	8	7	7	4	19	4
CV		0	0	83	7	5	6	3	16	3

[a] *All treatments applied to 5- to 5.5-leaf wheat*

[b] *PerfectMatch is not registered for use in 2011*

[c] *Bygr=Barnyardgrass; Grft=Green foxtail; Yeft=Yellow foxtail*

Weedy grass control with Starane Flex plus graminicides in spring wheat

The objective of the study was to evaluate control of weedy grasses with Starane Flex tank mixed with standard grass herbicides such as Axial XL, Puma, and Discover. Weedy grasses evaluated included wild oat, barnyardgrass, green foxtail, and yellow foxtail. Treatments were applied June 23 to 5-leaf wheat, 3-leaf wild oat, 2-4 inch barnyardgrass, and 1-inch foxtail. None of the treatments caused significant crop injury. In this study, good grass control or the lack thereof is likely due to a combination of factors. It is possible that some wild oat and green foxtail at this location may be resistant to Group 1 herbicides, as we have seen in other fields. Axial XL, Puma, and Discover are all Group 1 herbicides; however, this does not mean that a weed will be resistant to all three herbicides. There also appears to be some level of antagonism between the Starane Flex and the grass herbicides.

Table. Wild oat, barnyardgrass, and foxtail control with Starane Flex plus graminicides. (1152)

		HRSW				Weed Control[b]						
		Chlorosis		Growth reduction		Wioa		Bygr		Grft		Yeft
Treatment[a]	Rate	29-Jun	15-Jul	29-Jun	15-Jul	15-Jul	3-Aug	15-Jul	3-Aug	15-Jul	3-Aug	3-Aug
		----------%----------				----------% control----------						
Axial XL	16.4 oz	2	0	0	0	99	99	99	99	77	70	95
Axial XL + Starane Flex	16.4 oz + 13.5 oz	5	0	0	0	99	99	53	75	40	35	95
Axial XL + Starane Flex + MCPe	16.4 oz + 13.5 oz + 8.63 oz	5	0	0	0	99	99	30	23	33	33	95
Puma	6.4 oz	0	0	0	0	81	53	95	99	30	17	99
Puma + Starane Flex	6.4 oz + 13.5 oz	1	0	0	0	57	33	93	99	27	38	38
Puma + Starane Flex + MCPe	6.4 oz + 13.5 oz + 8.63 oz	0	0	0	0	42	20	95	99	27	32	32
Discover NG	12.8 oz	0	0	0	0	90	90	95	98	28	18	96
Discover NG + Starane Flex	12.8 oz + 13.5 oz	0	0	0	0	68	37	58	45	23	33	27
Discover NG + Starane + MCPe	12.8 oz + 13.5 oz + 8.63 oz	0	0	0	0	57	28	53	38	23	28	25
Untreated		0	0	0	0	0	0	0	0	0	0	0
LSD (0.05)		1	NS	NS	NS	10	15	15	11	4	14	8
CV		29	0	0	0	8	16	13	9	8	26	7

[a] *All treatments applied at 5-leaf wheat; Starane=Starane Flex*

[b] *Wioa=Wild Oat; Bygr=Barnyardgrass; Grft=Green foxtail; Yeft=Yellow foxtail*

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