THIRTEENTH
ANNUAL

WESTERN DAKOTA

CROPS DAY RESEARCH REPORT

HETTINGER ARMORY
DECEMBER 19, 1996

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1996 Hettinger Oat Hay Variety Trial

Variety	Plant height	Moisture at harvest	Yield* 1996	1995	1993	2yr	3yr
	cm	%	-------Tons per acre--------				
Porter	85	50	5.82	4.17	5.71	5.00	5.23
Otana	97	58	5.67	4.21	5.83	4.94	5.24
Robert	88	55	5.28	3.45	6.35	4.36	5.03
Newdak	80	52	6.09	3.79	5.08	4.94	4.99
Monida	88	57	5.64	3.81	5.05	4.72	4.83
Dumont	93	60	5.08	3.11	4.95	4.10	4.38
Whitestone	74	46	6.63	4.30		5.46	
Paul	92	54	5.69	3.29		4.49	
Settler	89	37	7.13				
Riel	92	48	6.25				
Derby	98	55	6.23				
Troy	90	52	6.07				
Jerry	89	48	5.61				
Hytest	95	52	5.45				
Bay	75	54	5.39				
Calibre	95	59	5.06				
Trial mean	89	52	5.82	3.75	4.98		
C.V. %	4		8.09	11.49	14.78		
LSD 5%	5		0.67	0.62	1.06		
LSD 1%	6		0.89	0.84	1.42		

Planting date: April 22
Harvest date: July 24 (soft dough growth stage)
Seeding rate: 750,000 live seeds/A
Yield goal: 5 Tons/A
Herbicide used: 1.5 pt/A Buctril + 1.5 oz/A MCPE
* Yields are adjusted to 0% moisture content.

13th ANNUAL WESTERN DAKOTA CROPS DAY
DECEMBER 19, 1996
HETTINGER ARMORY

MST

9:00 am Registration
Coffee and doughnuts. Free time to view exhibits and visit with Ag Industry Program Sponsors.

10:00 Earlybird Drawing

10:30 Welcome

10:45 Crop Variety Updates and Highlights of Ongoing Crop Production Research

Pat Carr, Agronomist, Dickinson Research Extension Center

Glenn Martin, Research Specialist II, Dickinson Research Extension Center

Lee Tisor, Ag. Research Tech III, Dickinson Research Extension Center

Eric Eriksmoen, Agronomist, Hettinger Research Extension Center

12:00 Lunch
Provided by Program Sponsors. Free time to visit with sponsors.

1:00 Ag Industry Update

1:30 Soil Fertility Issues
Dr. David Franzen, Extension Soils Specialist, NDSU, Fargo, ND.

2:15 Grain Outlook
Mr. Mark Jens, Grain Analyst, Agri-mark, West Fargo, ND.

3:00 Conclusion
Drawing for door prizes, coffee and opportunity to visit with sponsors.

ACKNOWLEDGEMENTS

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

1996 WESTERN DAKOTA CROPS DAY SPONSORS

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We also acknowledge and thank the following individuals for their willingness to cooperate with us at our off-station plot sites. Their participation has enabled us to gather valuable information which would not otherwise be possible.

Daryl Birdsall, New Leipzig
Neal and Monte Freitag, Scranton
August and Perry Kirschmann, Regent
Dale and Calvin Hepper, Selfridge
Daryl Anderson, Reeder
Amos Gietzen, Glen Ullin
Ted Reich, Beulah
Pat Doll, Hannover
Golden Valley SCD, Beach

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Weed Control Research

GROWING CONDITIONS
HETTINGER RESEARCH EXTENSION CENTER
-1996-

Hard red winter wheat was planted into dry soil during the last few days of September 1995. This was followed by mild temperatures and modest amounts of precipitation during October which provided excellent conditions for HRWW establishment prior to freeze up. The winter months of 1995/96 were generally mild with above normal temperatures and a normal accumulation of snow. HRWW winter survival was excellent.

Fertility levels were determined to a 3 foot depth at all research sites prior to seeding. Adequate fertilizer was applied to each crop according to set yield goals.

Early springtime conditions were generally cold, causing soil temperatures to remain cool and delaying field work. As soil temperatures began to warm during late April, the rains began, and kept farmers out of the fields through most of May. A measurable amount of rain was recorded on 22 days in May with a total accumulation of 5.20 inches for the month. Much of the small grain crop was planted during the first half of June. Fortunately mild temperatures were prevalent through the months of June and July. August generally had hot daytime temperatures and mild to cool night time temperatures with very little rainfall. These conditions were almost ideal for much of the late planted small grain crops with many farmers reporting 40 to 60 bushel per acre HRSW crops. Over 4 inches of rain fell in September. This would normally cause a tremendous amount of quality loss, however, again due to the delay in small grain maturity, most HRSW and durum crops were still green and avoided quality problems.

Row crops are becoming a more important part of our agricultural management system. Due to the price of HRSW ($6.00 and higher) at planting time and due to the delay in small grain planting, row crops were generally not planted or were planted relatively late. Cool soil temperatures also caused a delay in warm season crop planting. An April 30 planting of the corn trial at New Leipzig resulted in almost total non emergence due to seed rot. The trial was replanted in June. Weather conditions from July through late Fall were generally ideal for warm season crops. Corn and sunflower crops which were planted in a timely manor had excellent yield potential. Many fields of corn were harvested for grain. The sunflower trial at Hettinger saw a potentially great harvest fly away with a flock of fat blackbirds. The trial was not harvested.

Environmental conditions were generally favorable for foliar disease development through the early part of the growing season. Tan spot, septoria leaf blotch and other diseases were prevalent with infections generally being

limited to the lower leaves of the crop canopy. Higher temperatures and dryer conditions later in the growing season generally prevented the spread of these diseases onto the flag leaf.

Grasshoppers remain a concern. An explosion of hoppers during the Fall of 1994 and again during the Fall of 1995 were tempered by cool and wet environmental conditions during the following Spring. Grasshopper levels once again exploded during the summer of 1996 with alarming distruction. Almost all late season crops were destroyed or severely damaged at the Hettinger Research Center.

Precipitation (inches)	1993-94	1994-95	1995-96	41 year average
Sept. - Dec.	2.23	7.80	2.35	3.17
Jan. - March	2.03	1.37	1.82	1.27
April	1.33	1.18	1.02	1.67
May	0.72	6.07	5.20	2.66
June	2.11	2.88	2.45	3.45
July	3.49	2.21	0.86	2.06
August	0.51	3.71	0.53	1.73
September*			4.09	
Total	12.42	25.22	14.23	16.01

* September 1996 precip. played an important roll in the development of many small grain and row crops. This amount is not included in the 1995-96 precip. total.

Average Temperature F	1993	1994	1995	1996	41 year average
April	42.1	42.7	37.8	38.7	42.7
May	54.5	56.5	49.8	48.8	54.4
June	59.2	63.8	63.0	65.5	63.8
July	62.3	67.1	68.1	67.2	69.9
August	64.2	68.1	71.6	70.4	68.6
September	52.0	60.4	57.4	56.8	57.1

Growing Degree Units (50-86)	1993	1994	1995	1996	33 year average
May	255	321	186	148	329
June	309	414	412	457	426
July	375	484	559	550	500
August	452	519	644	591	537
September	245	377	348	276	386
Total	1636	2115	2149	2022	2178

	28 F	32 F	Normal 32 F
Date of last frost	May 5	May 13	May 18
Date of first frost	Oct 20	Sep 24	Sep 20
Frost free days	168	134	125

Precipitation during 1995-96 was 86% of the 100-year average. Dry conditions persisted during July and August, resulting in lower yields for canola, field pea, and other broadleaf crops than occured in 1994-95. Plant diseases were less of a problem in 1995-96 than in 1994-95.

Precipitation between September through December of 1995 was almost 2 inches less than the 100-year average, and the soil was drier going into the winter than it had been the previous year. Precipitation received between January and March was about 50% more than the 100-year average, but from April through August less than normal amounts of precipitation was received.

ANNUAL PRECIPITATION — DICKINSON

	Precipitation					
	1992-93	1993-94	1994-95	1995-96	Average 100-year	1995-96 Change from Mean
	inches					%
Sept.-Dec.	2.34	1.80	6.44	1.38	3.16	44
Jan.-March	1.13	1.26	1.85	2.38	1.55	154
Apr.-June	7.88	8.06	7.34	4.72	5.23	90
July-Aug.	5.46	1.74	10.54	4.41	5.12	86
Total	16.81	12.86	26.17	12.89	15.06	86

ANNUAL TEMPERATURE — DICKINSON

	Temperature					
Month	1992-93	1993-94	1994-95	1995-96	Average 100-year	1995-96 Change from Mean
	°F					%
April	41	42	37	40	41	90
May	54	56	51	49	54	94
June	57	62	64	65	61	105
July	62	64	67	68	69	97
August	64	66	70	71	67	104
Average	56	58	58	59	58	

GROWING DEGREE DAYS — DICKINSON

	Growing degree days (GDDs)	
Month	Wheat	Corn
April	328	103
May	539	171
June	992	468
July	1111	559
August	1209	609
Average	4179	1910

INTERPRETING STATISTICAL ANALYSIS

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

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

One of these tools is the Coefficient of Variability (C.V.). This statistic gives an indication of the amount of variation in an experimental trial. Trials conducted at Hettinger use four replications or repetitions of the variable in question. For example, the variety Amidon HRSW appeared four times (four replications) in the HRSW variety trial. In this case, the C.V. for yield of the Hettinger HRSW variety trial on fallow was 9.6%. This C.V. is a relative measure of how much the yield of all HRSW varieties varied between replications. In other words, C.V. is a measure of the precision or effectiveness of the trial and procedures used in conducting the trial. More can be said about a field trial with a relatively low C.V. (10 or less) than one with a C.V. greater than 10. Attempts are made to control human error and some environmental conditions such as conducting field studies on a uniform soil so that variability between replicates is minimized with a resulting low C.V. value (10 or less). In summation, a trial with a C.V. of 8 is more precise and more can be concluded from it than a trial with a C.V. of 18.

Another important statistical tool is the Least Significant Difference or LSD. If the yield of variety A exceeds variety B by more than the LSD 5% value you can conclude that under like environmental conditions, variety A will significantly out-yield variety B 95% of the time. The LSD value allows you to separate varieties, tillage practices, or any other variable and determine whether or not they are actually different. The LSD 1% value is always larger than the value for LSD 5% and is used in the same manner. If the yield of variety A exceeds variety B by more than the LSD 1% value you can conclude that under like environmental conditions, variety A will significantly out-yield variety B 99% of the time. Little confidence can be placed in variety or treatment differences unless the results differ by more than the LSD value.

Hard Red Spring Wheat Variety Description

Variety	Agent or Origin[1]	Released	Beard	Height	Strength of Straw	Maturity	Reaction to Disease[2] Stem rust	Leaf rust	Foliar Disease	Root Rot	Hd. Blight (Scab)	Quality factors Test wt.	Wheat protein	Quality rating[3]
Grandin	ND	1989	yes	s.dwf.	strg.	early	R	R	MS	M	S	high	avg.	4.0
Gus	ND	1989	yes	s.dwf.	strg.	m.early	R	R	M	M	VS	high	high	4.0
Amidon	ND	1988	yes	med.	med.	med.	R	R	M	MR	S	high	avg.	4.0
Len	ND	1979	yes	s.dwf.	v.strg.	m.early	R	R	S	S	MS	high	avg.	4.0
Coteau	ND	1978	yes	med.	m.strg.	med.	R	R	M	MS	S	avg.	high	4.0
Kulm	ND	1994	yes	med.	strg.	early	R	R	MS	MS	S	high	high	3.0
Butte 86	ND	1986	yes	med.	m.strg.	early	R[5]	R	MS	MS	MS	high	avg.	3.0
Stoa	ND	1984	yes	med.	m.strg.	m.early	R	R	MS	M	MS	high	avg.	3.0
2371	NDSURF	1991	yes	s.dwf.	v.strg.	m.early	R[5]	R	M	S	MS	high	avg.	3.0
2375	NDSURF	1990	yes	s.dwf.	med.	m.early	R	R	MS	M	MS*	high	avg.	2.5
2370	NDSURF	1990	yes	s.dwf.	v.strg.	m.early	R[6]	R	MS	S	MS*	high	avg.	2.5
Norm	MN	1992	yes	s.dwf.	v.strg.	med.	R	R	MR	MR	VS	high	low	2.0
Sharp	SD	1990	yes	med.	med.	early	R	R	MS	S	MS*	v.high	avg.	2.0
Prospect	SD	1988	yes	s.dwf.	v.strg.	m.early	R[6]	MR	MS	MR	MS	high	avg.	2.0
CDC Teal	CDC	1991	no	med.	med.	m.early	R	MR	MR	MS	VS	high	avg.	N/A
Hamer	AgriPro	1995	yes	s.dwf.	v.strg.	med.	R	R	M	N/A	S	avg.	avg.	2.0
Lars	AgriPro	1995	yes	s.dwf.	v.strg.	med.	R	R	MR	N/A	S*	avg.	avg.	2.0
Norlander	AgriPro	1995	yes	s.dwf.	med.	m.early	MS	MR	M	N/A	S	avg.	avg.	2.0
Trenton	ND	1995	yes	med.	med.	med.	R	R	MS	S	S*	high	high	2.5
Ernest	ND	1995	yes	med.	med.	med.	R	R	MS	M	S	high	high	2.5
Russ	SD	1995	yes	med.	med.	m.early	R	R	S	S	S*	avg.	avg.	N/A
AC Domain	Can	1993	no	med.	med.	early	R	R	S	M	MS	high	high	N/A
McNeal	MT	1995	yes	med.	strg.	m.early	MS	S	M	M	VS	avg.	avg.	N/A
2398	NDSURF	1995	yes	s.dwf.	strg.	m.late	R	R	MR	MS	VS	avg.	low	2.0
Verde	MN	1995	yes	s.dwf.	strg.	med.	R	R	MR	M	MS*	high	low	N/A
Glupro	ND	1995	yes	tall	med.	m.late	R	MS	N/A	N/A	VS	avg.	high	4.0
Sonja	AgriPro	1992	yes	s.dwf.	v.strg.	m.early	R	MR	MR	M	VS	high	avg.	N/A
Bergen	AgriPro	1990	yes	s.dwf.	v.strg.	m.early	R[6]	R	MR	MS	S	high	avg.	2.0
Nordic	AgriPro	1986	yes	s.dwf.	strg.	m.late	R	MR	MR	MR	MS	high	low	2.0
Keene	ND	1996	yes	med.	med.	med.	R	R	MR	M	S	high	avg.	4.0
Oxen	SD	1996	yes	s.dwf.	strg.	m.early	R[7]	R	N/A	N/A	S	high	high	N/A
Gunner	AgriPro	1995	yes	med.	m.strg.	med.	R[5]	R	MR	N/A	M	high	N/A	N/A
AC Barrie	Can	1994	no	med.	med.	med.	R[7]	R	M	N/A	M	high	N/A	N/A
AC Cora	Can	1996	no	med.	med.	med.	R[6]	R	MS	N/A	M	high	N/A	N/A

[1] Refers to agent or developer: NDSURF = North Dakota State University Research Foundation; CDC = Crop Development Center, University of Saskatchewan; Can = Agriculture Canada.

[2] R =resistant; MR =moderately resistant; M =intermediate; MS =moderately susceptible; S =susceptible; VS =very susceptible; [4] =occasionally mixed with some susceptible plant; [5] =MR, [6] =M, [7]=S or MS in artificially induced epidemics; N/A =data not available; Head blight =scab; Foliar disease=reaction to tan spot and septoria leaf spot complex. **Letter ratings for head blight (scab) based on visual head symptoms. * Indicates yield and/or quality have often been higher than would be expected based on visual head blight symptoms alone.**

[3] 1.0=Very poor quality; 2.0=Poor quality; 2.5=Poor to average quality; 3.0=Average quality; 3.5=Average to good quality; 4.0=Good quality; N/A=Quality data not available. Bread making quality assessed by the Department of Cereal Science, NDSU.

Durum Variety Description

Variety	Agent or Origin[1]	Year Released	Chaff Color	Straw Height	Straw Strength	Straw Maturity	Reaction to Disease[2] Stem Rust	Leaf Rust	Foliar Disease	Head Blight (Scab)	Quality Factors Test Wt.	Kernel Size[3]	Overall Quality[4]
AcMelita	Can.	1995	white	tall	med.	med.	R	N/A	N/A	S	avg.	large	4
Ben	ND	1996	white	med.	strong	med.	R	R	MR	S*	high	large	4
Cando	ND	1975	tan	s.dwf.	v.strg.	med.	R	R	M	VS	avg.	small	2
Dressler	AgriPro	1996	white	tall	med.	med.	R	MR	N/A	VS	avg.	large	4
Fjord	AgriPro	1986	white	tall	strg.	m.early	R	R	M	S	high	large	4
Kyle	Can.	1984	white	tall	weak	med.	R	MR	M	N/A	avg.	large	4
Laker	WPB	1985	white	s.dwf.	strg.	med.	R	MR	S	S	avg.	med.	3
Lloyd	ND	1983	white	s.dwf.	v.strg.	med.	R	MR	S	VS	avg.	med.	3
Medora	Can.	1983	white	tall	strg.	m.early	R	R	MS	VS	high	large	4
Monroe	ND	1985	white	tall	med.	early	R	R	M	VS	avg.	large	4
Munich	ND	1995	white	med.	v.strg.	med.	R	R	MR	S*	avg.	med.	4
Renville	ND	1988	white	tall	med.	med.	R	R	M	S*	high	med.	4
Rugby	ND	1973	tan	tall	v.strg.	m.early	R	R	MR	S*	avg.	med.	2
Vic	ND	1979	white	tall	med.	m.early	R	R	MR	S*	high	large	4
Voss	AgriPro	1994	white	s.dwf.	v.strg.	med.	R	MR	MS	S	avg.	med.	3
Ward	ND	1972	tan	tall	v.strg.	m.early	R	R	MR	S	avg.	med.	2

[1] Refers to agent or developer: WPB = Western Plant Breeder.

[2] R = resistant; MR = moderately resistant (slow rusters); M = intermediate; MS = moderately susceptible; S = susceptible; VS = very susceptible; Head Blight = Scab; Foliar Disease = reaction to tan spot and septoria leaf spot complex. **Letter ratings for head blight (scab) based on visual head symptoms.**

*** Indicates yields and/or quality have often been higher than would be expected based on visual head blight symptoms done.**

[3] No. seeds/lb.: Large = less than 11,000; medium = 11,000-12,000; small = more than 12,000.

[4] 1. Very poor quality; 2. Poor quality; 3. Average quality; 4. Good quality. Quality assessment by the Department of Cereal Science, NDSU.

Variety	Days to Head	Plant Height	Lodging Score	Foliar Disease	Seeds	Test Weight
		in	0-9	%	lbs	lbs/bu
Semidwarf						
2370	61	26.4	0.0	67.5	16174	61.1
2371	64	28.3	0.0	51.0	16193	60.5
2375	61	27.0	0.0	60.5	15159	60.6
2398	62	25.6	0.3	9.8	13089	62.4
Grandin	61	27.4	0.0	68.3	15935	60.3
Gus	63	24.8	0.0	36.2	16843	61.1
Hamer	61	24.8	0.0	38.7	14193	61.0
Lars	63	21.4	0.0	20.2	15271	60.6
McNeal	63	27.2	0.0	29.3	14683	61.0
Norlander	60	24.4	0.0	83.7	17855	60.1
Norm	62	26.8	0.0	14.2	14063	61.6
Oxen	61	25.6	0.0	59.3	16186	61.4
Penewawa	63	23.0	0.0	40.8	15659	61.3
Sonja	62	24.4	0.0	57.7	15363	59.8
Verde	63	26.0	0.0	10.0	14358	61.5
Wawawai	62	27.5	0.3	38.7	12919	61.0
Whitebird	62	25.0	0.0	26.7	16186	62.9
Conventional						
AC Barrie	62	29.5	0.0	27.7	14922	61.5
AC Cora	62	31.3	0.8	24.8	15444	60.5
AC Domain	61	30.3	0.0	42.7	15883	61.1
AC Eatonia	63	28.9	0.8	23.8	15267	61.8
AC Majestic	64	28.5	0.0	31.0	17131	59.5
AC Reed	61	25.8	0.0	13.8	15317	61.0
Amidon	62	30.9	0.0	19.7	14876	61.9
Bacup	59	27.5	0.8	92.2	16425	62.9
Butte 86	60	30.3	0.0	24.5	13776	62.5
CDC Teal	61	29.3	0.0	12.0	15179	60.9
Ernest	61	31.3	0.0	8.0	14296	62.6
Gunner	63	27.4	0.0	24.7	16483	62.8
Keene	62	29.9	0.0	25.5	15815	62.5
Kulm	60	28.3	0.3	80.2	16245	62.4
Russ	61	27.4	0.0	78.2	15546	60.5
Sharp	60	31.3	0.3	50.8	14790	62.9
Trenton	62	30.9	0.3	28.0	14471	62.3
Mean	62	27.5	0.1	38.8	15353	61.4
C.V. %	1.1	8.4	233.8	59.0	8.3	1.7
LSD .05	1	3.2	0.3	37.3	1791	1.4

Planting Date: April 29
Harvest Date: August 14
Lodging: 0 = No lodging, 9 = Completely flat
Previous crop: Black lentil (plow down); Soil test results 118lbs N and 13ppm P - Applied 60lbs Urea and 25lbs DAP per acre; Applied 2pt Hoelon per acre on June 3; Applied .33oz Harmony Extra + .75pt MCPA ester per acre on June 3

Hard Red Spring Wheat - Green Fallow **Dickinson**

Variety	Protein	Returns	Grain Yield 1994	1995	1996	Average Yield 2 year	3 year
	%			bu/ac			
Semidwarf							
2370	16.1	200.96	44.2	46.8	44.5	45.7	45.2
2371	17.0	184.41	42.3	49.1	40.4	44.8	43.9
2375	14.9	190.57	44.1	49.1	45.5	47.3	46.2
2398	14.5	215.23	50.7	60.7	53.5	57.1	55.0
Grandin	15.5	180.55	42.3	54.0	41.2	47.6	45.8
Gus	16.3	192.88	44.7	52.8	42.5	47.7	46.7
Hamer	15.2	187.57	52.3	53.8	42.8	48.3	49.6
Lars	14.1	164.22	49.3	62.1	41.1	51.6	50.8
McNeal	15.4	207.81	47.4	61.5	48.6	55.1	52.5
Norlander	16.2	199.74	40.9	53.7	45.3	49.5	46.6
Norm	14.4	192.40	49.3	54.6	48.2	51.4	50.7
Oxen	15.4	200.91	--	54.5	44.7	49.6	--
Penewawa	12.6	177.81	43.2	47.0	47.2	47.1	45.8
Sonja	14.9	183.88	44.6	53.8	43.7	48.7	47.4
Verde	14.9	196.69	49.6	56.4	47.4	51.9	51.1
Wawawai	13.2	199.81	--	--	52.6	--	--
Whitebird	12.0	186.70	--	--	50.3	--	--
Conventional							
AC Barrie	15.4	194.51	40.0	50.7	43.3	47.0	44.7
AC Cora	15.9	203.83	38.4	45.3	45.0	45.1	42.9
AC Domain	16.2	175.98	39.4	39.4	38.8	39.1	39.2
AC Eatonia	16.4	173.62	39.1	36.0	38.4	37.2	37.8
AC Majestic	15.9	155.79	--	--	36.7	--	--
AC Reed	12.4	187.90	--	--	50.4	--	--
Amidon	14.8	183.81	40.0	59.6	45.3	52.4	48.3
Bacup	17.8	151.42	--	--	33.2	--	--
Butte 86	14.9	202.16	43.5	52.7	48.6	50.6	48.3
CDC Teal	15.9	215.10	38.2	45.5	47.5	46.5	43.7
Ernest	15.5	218.76	45.3	55.2	48.5	51.8	49.7
Gunner	16.5	199.14	--	--	43.7	43.7	43.7
Keene	14.9	193.76	51.8	58.8	45.8	52.3	52.1
Kulm	16.0	179.52	47.3	51.8	39.6	45.7	46.2
Russ	15.2	162.22	41.8	49.7	38.4	44.0	43.3
Sharp	14.6	179.34	44.3	48.2	44.6	46.4	45.7
Trenton	15.1	201.70	44.4	53.6	47.1	50.3	48.4
Mean	15.2	189.43	--	--	44.5	--	--
C.V. %	4.5	13.9	--	--	14.6	--	--
LSD .05	1.0	36.83	--	--	9.1	--	--

Returns were calculated by multiplying the 1996 yield by the protein premium/discount and test weight discount paid at the Southwest Grain Terminal located at Gladstone on October 4.

Durum Wheat - Fallow — **Dickinson**

Variety	Type	Days to Head	Plant Height	Lodging Score	Seeds	Test Weight
			in	0-9	lbs	lbs/bu
AC Melita	Tall	64	32.3	0.0	10245	60.3
Ben	Medium	65	32.9	0.3	9880	59.6
Dressler	Tall	64	32.3	0.0	11159	62.1
Laker	Semidwarf	66	29.7	0.0	9694	59.1
Lloyd	Semidwarf	64	29.6	0.0	9740	60.6
Medora	Tall	64	31.9	0.0	11070	60.3
Monroe	Tall	62	33.5	0.0	10815	62.0
Munich	Medium	65	31.7	0.0	12669	61.8
Plenty	Tall	64	35.4	0.5	11149	61.4
Regold	Tall	65	33.6	0.0	10176	58.9
Renville	Tall	64	33.3	0.5	11391	60.6
Rugby	Tall	65	32.7	0.0	11698	60.0
Sceptre	Medium	64	32.7	0.0	11753	61.6
Vic	Tall	64	32.7	0.0	10311	60.6
Voss	Semidwarf	65	28.3	0.0	10367	59.5
Ward	Tall	64	33.1	0.3	11792	62.4
Mean		64	32.2	0.1	10869	60.7
C.V. %		0.8	7.0	283.8	4.2	1.5
LSD .05		0.8	3.2	0.4	647	1.3

Planting Date: April 29
Harvest Date: August 15
Lodging: 0 = No lodging, 9 = Completely flat
Previous crop: Fallow; Soil test results: 67lbs N and 9ppm P - Applied 160lbs Urea and 50lbs DAP per acre; Applied 2pt Hoelon per acre on June 3; Applied .33oz Harmony Extra + .75pt MCPA ester per acre on June 3.

Durum Wheat - Fallow — **Dickinson**

Variety	Protein	Returns	Grain Yield			Average Yield	
			1994	1995	1996	2 year	3 year
	%	$/ac	bu/ac				
AC Melita	14.1	247.37	--	49.1	56.4	52.8	--
Ben	--	235.56	35.7	60.1	59.3	59.7	51.7
Dressler	14.0	256.22	--	--	58.3	--	--
Laker	13.3	244.49	40.7	50.0	57.0	53.5	49.2
Lloyd	12.9	270.37	38.1	46.9	63.8	55.3	49.6
Medora	14.1	230.66	38.7	45.0	52.5	48.8	45.4
Monroe	14.4	230.14	33.3	48.7	52.3	50.5	44.8
Munich	14.1	246.63	35.1	56.9	56.1	56.5	49.4
Plenty	14.1	251.24	35.7	50.3	57.2	53.7	47.7
Regold	13.7	241.12	33.4	53.0	55.7	54.4	47.4
Renville	14.0	267.30	38.0	54.3	60.9	57.6	51.1
Rugby	14.2	226.53	41.1	56.0	51.6	53.8	49.6
Sceptre	13.9	255.42	39.3	52.9	58.1	55.5	50.1
Vic	14.4	245.19	37.8	56.2	55.7	56.0	49.9
Voss	13.3	232.90	39.8	59.6	54.2	56.9	51.2
Ward	14.1	251.14	42.6	53.9	57.1	55.5	51.2
Mean	13.9	245.77	--	--	56.6	--	--
C.V. %	2.0	5.6	--	--	5.7	--	--
LSD .05	0.2	19.45	--	--	4.6	--	--

Returns were calculated by multiplying the 1996 yield by the protein premium/discount and test weight discount paid at the Southwest Grain Terminal located at Gladstone on October 4.

Hard Red Spring Wheat - Fallow **Glen Ullin**

Variety	Seeds	Test Weight	Returns	Protein	% of Grandin	Grain Yield 1994	1995	1996	Average Yield 2 year	3 year
	lbs	lbs/bu	$/acre	%		bu/ac				
2371	14780	59.9	235.72	15.1	81	--	51.8	53.9	52.9	--
2375	12708	61.4	273.10	13.5	107	51.3	63.8	71.4	67.6	62.2
2398	12787	60.9	263.35	13.3	105	--	--	69.6	--	--
Amidon	13573	61.3	272.69	14.3	103	49.4	60.4	68.5	64.5	59.4
Ernest	13623	60.9	277.39	14.6	102	--	62.9	67.6	65.2	--
Grandin	12681	61.8	282.85	15.0	100	46.5	54.8	66.5	60.7	55.9
Hamer	12225	60.3	271.97	14.2	103	--	--	68.6	--	--
Kulm	13656	62.0	286.32	14.8	102	48.9	59.8	67.7	63.7	58.8
McNeal	16294	57.3	215.43	14.1	83	48.2	60.1	55.1	57.6	54.5
Keene	14479	62.0	261.98	14.6	98	--	--	65.2	--	--
Russ	12865	60.8	266.69	14.2	101	--	--	67.1	--	--
Trenton	12652	61.9	275.02	14.6	100	--	59.6	66.8	63.2	--
Mean	13527	60.8	265.21	14.4	--	--	--	65.7	--	--
C.V. %	3.6	0.5	4.7	1.3	--	--	--	4.0	--	--
LSD .05	693.6	0.4	18.1	0.3	--	--	--	3.8	--	--

Planting Date: May 28
Harvest Date: September 12
Previous crop: Fallow; Soil test results: 86lbs N and 14ppm P - applied 130lbs Urea and 25lbs DAP per acre; Applied 1.25pt Bronate per acre on June 17.
Returns were calculated by multiplying the 1996 yield by the protein premium/discount and test weight discount paid at the Southwest Grain Terminal located at Gladstone on October 4.

Durum - Fallow	Glen Ullin

Variety	Seeds	Test Weight	Protein	Returns	% of Renville	Grain Yield 1994	Grain Yield 1995	Grain Yield 1996	Average Yield 2 year	Average Yield 3 year
	lbs	lbs/bu	%	$/acre		bu/ac	bu/ac	bu/ac	bu/ac	bu/ac
Ben	10346	62.1	14.0	299.15	96	--	--	67.7	--	--
Munich	12673	60.1	13.8	305.89	100	--	63.4	69.9	66.7	--
Renville	11900	61.4	13.7	308.02	100	48.6	66.5	70.3	68.4	61.8
Vic	10524	61.6	14.2	293.28	94	43.7	65.3	66.1	65.7	58.4
Voss	10967	61.0	13.8	266.26	86	--	--	60.5	--	--
Mean	11282	61.3	13.9	294.52	--	--	--	66.9	--	--
C.V. %	3.5	0.6	1.1	4.7	--	--	--	4.5	--	--
LSD .05	602.4	0.5	0.2	21.3	--	--	--	4.7	--	--

Planting Date: May 28
Harvest Date: September 12
Previous crop: Fallow; Soil test results: 86lbs N and 14ppm P - applied 130lbs Urea and 25lbs DAP per acre; Applied 1.25pt Bronate per acre on June 17.
Returns were calculated by multiplying the 1996 yield by the protein premium/discount and test weight discount paid at the Southwest Grain Terminal located at Gladstone on October 4.

1996 Hettinger Hard Red Spring Wheat Variety Trial on Fallow

Variety	Test weight	Grain protein	Days to head	Ht	Yield 1996	1995	1993	2yr	3yr
	lbs/bu	%		cm	bu/A				
2398	62.2	15.2	73	70	63.3	64.7	78.0	64.0	68.7
2371	60.6	15.6	73	72	57.1	64.9	68.1	61.0	63.4
Trenton	62.2	15.6	72	94	55.0	64.2	70.8	59.6	63.3
McNeal	60.4	14.9	75	79	57.2	61.7	71.1	59.4	63.3
Kulm	63.4	15.6	70	87	56.1	62.1	70.8	59.1	63.0
Butte 86	62.8	15.5	69	86	57.3	64.3	66.2	60.8	62.6
Sharp	64.0	15.3	69	90	58.1	65.8	62.6	62.0	62.2
Keene	62.6	15.6	72	88	53.1	62.1	70.8	57.6	62.0
2375	62.4	15.5	70	77	60.1	64.7	61.1	62.4	62.0
2370	62.2	15.2	72	76	56.9	68.6	57.5	62.8	61.0
Norm	62.0	14.8	73	73	56.6	57.2	69.3	56.9	61.0
Gus	61.6	15.9	73	81	55.4	62.7	63.1	59.0	60.4
Grandin	62.5	15.7	71	82	54.9	62.4	58.8	58.6	58.7
Amidon	61.8	15.4	74	91	55.5	54.0	62.0	54.8	57.2
Ernest	61.9	15.6	73	91	51.5	53.8	65.0	52.6	56.8
AC Domain	62.4	16.7	71	90	52.8	53.2	55.3	53.0	53.8
CDC Teal	60.9	16.6	72	85	49.9	46.6	51.8	48.2	49.4
AC Eatonia	61.8	16.7	72	94	45.8	48.8	47.7	47.3	47.4
Verde	61.0	15.0	74	76	56.6	72.4		64.5	
Norlander	61.7	15.4	70	78	59.2	67.8		63.5	
Russ	62.3	15.1	71	86	57.9	68.4		63.2	
Hamer	62.2	15.3	72	74	60.5	63.3		61.9	
Lars	60.7	14.6	73	66	62.9	60.5		61.7	
Oxen	62.4	14.9	70	77	58.7	61.7		60.2	
AC Barrie	61.8	16.0	73	87	55.6	42.8		49.2	
AC Cora	60.9	16.5	74	94	48.7	38.8		43.8	
Glupro	58.6	19.2	74	101	40.2	28.6		34.4	
Gunner	62.4	16.0	75	84	51.0				
Coteau	60.6	16.2	76	92	46.7				
BacUp	63.6	17.9	68	82	41.6				
SBF0402	62.3	15.6	71	77	60.9				
SD3156	64.0	14.4	69	84	60.8				
ND695	62.4	15.8	70	76	59.9				
ND696	62.8	15.0	73	93	59.1				
ND690	63.2	15.5	71	83	58.6				
ND694	63.0	16.4	71	90	57.6				
N89-0562	61.6	16.4	72	66	57.2				
ND697	63.2	15.0	72	92	56.6				
BW 674	60.4	16.0	73	77	55.6				
ND692	61.7	15.4	75	89	54.3				
ND700	62.3	15.2	74	86	54.3				
ND693	62.0	15.9	72	94	54.0				
ND691	59.5	15.0	77	85	53.1				
Trial mean	61.9	15.7	72	84	55.3	59.1	60.0		
C.V. %	1.2	2.1	1	4	9.6	8.3	10.2		
LSD 5%	1.0	0.5	1	5	7.4	8.0	8.6		
LSD 1%	1.4	0.6	1	6	9.8	10.6	11.3		

Planting date: April 19 Harvest date: August 13
Seeding rate: 1.1 million live seeds/A (approx. 1.6 bu/A)
Yield goal: 60 bu/A
Herbicide application: 2 pts/A Hoelon + 1.5 pt/A Buctril
Yields are adjusted to 12.5% moisture

1996 Hettinger Hard Red Spring Wheat Variety Trial on Recrop

Variety	Test weight	Grain protein	Days to head	Ht	Yield 1996	1995	1993	2yr	3yr
	lbs/bu	%		cm	bu/A				
2398	62.6	13.2	70	68	68.9	58.7	63.7	63.8	63.8
Sharp	63.8	14.3	67	82	64.1	56.8	61.7	60.4	60.9
2375	62.7	13.5	67	74	67.2	56.0	55.7	61.6	59.6
McNeal	61.2	13.8	71	78	66.1	54.8	54.0	60.4	58.3
Butte 86	62.9	15.1	67	78	57.8	57.7	55.2	57.8	56.9
Kulm	63.0	14.6	66	81	61.9	59.9	48.5	60.9	56.8
Grandin	62.2	14.4	70	76	55.1	52.9	58.9	54.0	55.6
2371	60.7	14.2	69	67	57.6	50.2	54.4	53.9	54.1
Amidon	61.9	14.1	70	87	58.2	47.4	53.8	52.8	53.1
Norlander	62.0	13.7	67	70	65.7	58.6		62.2	
Verde	61.4	12.5	69	74	64.4	59.9		62.2	
Hamer	62.5	13.8	69	72	68.9	55.2		62.0	
Lars	60.6	13.8	70	60	65.0	55.9		60.4	
Trenton	62.5	14.2	69	86	61.1	57.0		59.0	
Ernest	62.8	15.0	69	84	59.4	52.7		56.0	
Glupro	58.9	18.5	70	91	42.6	26.7		34.6	
Russ	62.6	14.0	69	82	70.5				
Oxen	62.7	14.0	68	71	66.6				
Keene	62.9	15.6	69	86	63.5				
Trial mean	62.1	14.3	68	77	62.3	52.2	53.7		
C.V. %	0.9			6	9.2	10.3	13.6		
LSD 5%	0.8			6	8.1	7.6	12.0		
LSD 1%	1.0			8	10.7	10.0	16.0		

Planting date: April 23 Harvest date: August 13
Seeding rate: 1.1 million live seeds/A (approx. 1.6 bu/A)
Yield goal: 60 bu/A
Previous crop: HRSW
Herbicide application: 2 pts/A Hoelon + 1.5 pt/A Buctril
Yields are adjusted to 12.5% moisture

1996 Hettinger Durum Variety Trial

Variety	Test weight	Grain protein	Days to head	Ht	Yield 1996	1995	1993	2yr	3yr
	lbs/bu	%		cm	bu/A				
Ben	62.6	15.3	72	85	71.0	63.6	66.5	67.3	67.0
Plenty	61.4	15.3	71	94	71.8	62.6	65.2	67.2	66.5
Rugby	61.9	13.5	71	92	68.2	67.2	61.8	67.7	65.7
Renville	61.8	14.9	71	92	74.7	61.9	59.8	68.3	65.5
Regold	62.5	14.9	73	92	73.5	66.9	54.4	70.2	64.9
Monroe	61.9	14.6	68	90	72.3	66.5	55.5	69.4	64.8
Ward	62.0	13.7	70	90	71.8	58.8	60.5	65.3	63.7
Lloyd	62.9	13.4	73	73	79.7	58.4	51.3	69.0	63.1
Munich	61.3	15.3	72	78	70.2	53.6	64.0	61.9	62.6
Sceptre	61.3	15.0	71	84	70.9	56.9	60.1	63.9	62.6
Voss	62.2	14.3	72	74	78.8	55.2	51.9	67.0	62.0
Vic	62.7	14.6	71	93	70.8	55.7	56.2	63.2	60.9
Medora	61.9	15.5	70	90	67.5	58.2	53.7	62.8	59.8
Laker	62.7	13.7	72	79	73.1	58.1	45.1	65.6	58.8
AC Melita	61.6	15.3	71	94	71.4	62.2		66.8	
Dressler	61.8	15.2	71	90	71.6		59.8	65.7	
D901313	62.0	14.9	72	84	79.9				
D88303	61.7	14.8	72	72	79.5				
D901786	62.4	14.3	68	74	78.6				
D901442	63.2	15.0	70	83	76.9				
D89135	62.8	15.9	72	82	75.9				
D91080	61.1	14.4	72	76	75.3				
D901536	62.9	14.7	71	80	74.9				
D911551	62.2	14.7	71	83	74.9				
D901518	61.5	14.1	71	78	73.5				
D901419	62.2	15.0	70	72	73.4				
D87240	60.6	14.2	72	88	72.7				
D901486	60.6	14.8	71	78	70.7				
D91321	61.0	15.0	70	85	68.6				
D91066	61.4	15.5	73	85	65.8				
D91103	63.1	15.1	71	94	65.3				
D91058	60.9	15.6	73	76	63.1				
Trial mean	62.0	14.8	71	84	72.6	61.7	55.8		
C.V. %	0.6		1	4	8.4	11.0	10.9		
LSD 5%	0.5		1	5	8.5	9.5	8.5		
LSD 1%	0.7		2	7	11.1	12.7	11.3		

Planting date: April 22 Harvest date: August 12
Seeding rate: 1.25 million live seeds/A (approx. 2.2 bu/A)
Yield goal: 60 bu/A
Herbicide application: 2 pts/A Hoelon + 1.5 pt/A Buctril
Yields are adjusted to 12.5% moisture

1996 Scranton Hard Red Spring Wheat Variety Trial

Variety	Test weight	Grain protein	Plant height	Yield 1996	1995	1994	2yr	3yr
	lbs/bu	%	cm	bu/A				
2398	63.0	14.0	64	54.8	46.6	57.4	50.7	52.9
2375	63.6	13.6	70	57.2	47.2	50.6	52.2	51.7
2371	61.2	15.4	65	47.3	47.1	49.4	47.2	47.9
Amidon	61.0	14.5	83	55.6	41.1	44.4	48.4	47.0
McNeal	60.8	14.8	68	52.4	42.1	46.6	47.2	47.0
Ernest	62.9	14.7	82	47.1	42.6	45.5	44.8	45.1
Grandin	63.4	15.1	67	47.7	41.7	43.0	44.7	44.1
Kulm	63.6	14.9	74	45.9	40.4	37.3	43.2	41.2
Russ	61.8	14.0	71	55.1	41.8		48.4	
Trenton	62.5	14.5	79	50.1	43.5		46.8	
Keene	61.7	14.9	81	55.4				
Norlander	62.7	15.1	68	51.9				
Trial mean	62.3	14.6	73	51.7	41.9	47.6		
C.V. %	1.0		6	8.5	8.3	10.6		
LSD 5%	1.1		7	7.4	5.8	7.4		
LSD 1%	1.4		10	10.0	7.8	10.0		

Planting date: April 29 Harvest date: August 14
Seeding rate: 1.1 million live seeds/A (approx. 1.6 bu/A)
Yield goal: 60 bu/A
Herbicide application: 2 pt/A Hoelon + 1 pt/A Buctril
Yields are adjusted to 12.5% moisture.
Minor hail damage on 6/11/96.

1996 Scranton Durum Variety Trial

Variety	Test weight	Grain protein	Plant height	Yield 1996	1995	1994	2yr	3yr
	lbs/bu	%	cm	bu/A				
Renville	61.8	13.9	79	57.1	41.9	53.7	49.5	50.9
Voss	61.7	13.3	60	56.7	34.9	49.9	45.8	47.2
Vic	62.6	14.0	78	52.6	36.1	48.5	44.4	45.7
Munich	61.8	14.1	66	55.9	40.8		48.4	
Ben	62.2	14.3	74	58.4				
Trial mean	62.0	13.9	72	56.1	39.8	52.2		
C.V. %	1.0		4	6.6	7.4	6.5		
LSD 5%	ns		5	ns	5.2	5.0		

Planting date: April 29 Harvest date: August 14
Seeding rate: 1.25 million live seeds/A (approx. 2.2 bu/A)
Yield goal: 60 bu/A
Herbicide application: 2 pt/A Hoelon + 1 pt/A Buctril
Yields are adjusted to 12.5% moisture.
ns = no statistical difference between varieties.
Minor hail damage on 6/11/96.

1996 Regent Hard Red Spring Wheat Variety Trial

Variety	Test weight	Grain protein	Plant height	Yield 1996	1994	1993	2yr	3yr
	lbs/bu	%	cm	bu/A				
2398	63.2	13.7	64	43.0	54.4	75.8	48.7	57.7
McNeal	60.9	14.0	72	38.6	52.6	72.3	45.6	54.5
2375	63.7	14.3	65	37.8	50.5	58.3	44.2	48.9
2371	62.4	14.4	66	37.0	49.0	58.4	43.0	48.1
Kulm	64.1	15.2	75	34.9	47.9	61.3	41.4	48.0
Grandin	64.2	15.0	70	36.1	42.2	62.2	39.2	46.8
Amidon	59.2	14.6	80	32.4	42.8	62.6	37.6	45.9
Ernest	63.8	14.8	78	36.1	46.3		41.2	
Russ	63.6	13.9	73	38.7				
Trenton	63.6	14.6	78	37.8				
Norlander	63.0	14.8	66	35.3				
Keene	61.4	14.8	78	32.1				
Trial mean	62.8	14.5	72	36.7	49.1	64.2		
C.V. %	0.7		5	6.7	9.5	4.2		
LSD 5%	0.6		5	3.5	6.7	3.9		
LSD 1%	0.8		7	4.8	9.0	5.2		

Planting date: April 30 Harvest date: August 14
Seeding rate: 1.1 million live seeds/A (approx. 1.6 bu/A)
Yield goal: 60 bu/A
Herbicide application: 2 pt/A Hoelon + 1 pt/A Buctril
Yields are adjusted to 12.5% moisture.

1996 Regent Durum Variety Trial

Variety	Test weight	Grain protein	Plant height	Yield 1996	1994	1993	2yr	3yr
	lbs/bu	%	cm	bu/A				
Renville	63.0	13.8	76	35.5	57.4	62.1	46.4	51.7
Vic	63.4	14.3	73	32.0	57.9	60.0	45.0	50.0
Munich	62.8	14.4	65	30.7	58.1		44.4	
Voss	63.2	13.4	60	34.3	54.2		44.2	
Ben	64.3	14.1	70	35.9				
Trial mean	63.3	14.0	69	33.7	57.1	61.6		
C.V. %	0.6		7	8.7	5.6	6.3		
LSD 5%	0.6		7	4.4	ns	ns		

Planting date: April 29 Harvest date: August 14
Seeding rate: 1.25 million live seeds/A (approx. 2.2 bu/A)
Yield goal: 60 bu/A
Herbicide application: 2 pt/A Hoelon + 1 pt/A Buctril
Yields are adjusted to 12.5% moisture.
ns = no statistical difference between varieties.

1996 Selfridge Hard Red Spring Wheat Variety Trial

Variety	Test weight	Grain protein	Plant height	Yield 1996	1995	1994	2yr	3yr
	lbs/bu	%	cm	bu/A				
2398	62.9	13.9	72	68.8	28.4	64.4	48.6	53.9
2375	62.9	13.7	67	62.9	30.3	59.2	46.6	50.8
Kulm	63.6	14.8	76	59.1	31.4	56.3	45.2	48.9
2371	61.6	14.9	75	60.8	26.9	57.0	43.8	48.2
Ernest	62.8	14.3	82	62.0	24.5	52.6	43.2	46.4
McNeal*	58.2	13.7	84	53.5	28.6	56.9	41.0	46.3
Amidon	61.3	14.6	93	70.3	20.3	48.1	45.3	46.2
Grandin	63.4	14.8	80	60.9	24.2	44.6	42.6	43.2
Trenton	63.1	14.6	90	71.6	29.9		50.8	
Russ	62.5	14.4	80	69.6	29.6		49.6	
Keene	61.8	14.6	83	69.0				
Norlander	62.2	14.5	75	64.6				
Trial mean	62.2	14.4	80	64.4	27.4	56.3		
C.V. %	1.1		10	8.7	8.1	7.1		
LSD 5%	1.2		14	9.5	3.2	5.7		
LSD 1%	1.6		19	12.9	4.3	7.6		

Planting date: April 30 Harvest date: August 15
Seeding rate: 1.1 million live seeds/A (approx. 1.6 bu/A)
Yield goal: 60 bu/A
Herbicide application: 2 pt/A Hoelon + 1 pt/A Buctril
Yields are adjusted to 12.5% moisture.
* Severe late season stem rust infection.

1996 Selfridge Durum Variety Trial

Variety	Test weight	Grain protein	Plant height	Yield 1996	1995	1993	2yr	3yr
	lbs/bu	%	cm	bu/A				
Renville	62.0	13.3	90	62.5	30.0	40.4	46.2	44.3
Vic	63.2	13.6	94	59.2	26.5	40.3	42.8	42.0
Munich	60.8	13.2	85	59.6	31.2		45.4	
Voss	61.7	13.0	79	60.6	26.2		43.4	
Ben	63.1	13.1	90	62.2				
Trial mean	62.2	13.2	87	60.9	29.0	40.4		
C.V. %	1.2		6	5.8	9.8	7.5		
LSD 5%	1.4		10	ns	4.2	ns		

Planting date: April 30 Harvest date: August 15
Seeding rate: 1.25 million live seeds/A (approx. 2.2 bu/A)
Yield goal: 60 bu/A
Herbicide application: 2 pt/A Hoelon + 1 pt/A Buctril
Yields are adjusted to 12.5% moisture.
ns = no statistical difference between varieties.

1996 New Leipzig Hard Red Spring Wheat Variety Trial

Variety	Test weight	Grain protein	Plant height	Yield 1996	1995	1994	2yr	3yr
	lbs/bu	%	cm	bu/A				
2398	62.7	14.4	62	67.5	51.9	43.5	59.7	54.3
2375	63.3	14.7	64	63.0	58.9	36.8	61.0	52.9
Kulm	63.6	14.7	72	58.9	55.4	36.9	57.2	50.4
McNeal	60.2	14.2	73	57.0	42.2	40.5	49.6	46.6
Amidon	62.5	15.1	76	58.5	43.8	36.7	51.2	46.3
2371	61.4	15.1	63	53.3	47.2	35.3	50.2	45.3
Ernest	62.5	14.8	77	56.1	43.9	33.1	50.0	44.4
Grandin	63.2	15.2	70	57.2	37.2	33.1	47.2	42.5
Russ	62.8	14.0	68	59.2	53.5		56.4	
Trenton	62.5	14.6	77	58.4	46.7		52.6	
Keene	62.7	15.2	78	63.4				
Norlander	62.1	15.2	71	56.2				
Trial mean	62.5	14.8	71	59.1	47.0	38.1		
C.V. %	0.6	3.0	7	9.2	11.2	6.7		
LSD 5%	0.6	0.6	7	7.8	7.5	4.3		
LSD 1%	0.8	0.9	10	ns	10.1	5.8		

Planting date: April 30 Harvest date: August 19
Seeding rate: 1.1 million live seeds/A (approx. 1.6 bu/A)
Yield goal: 60 bu/A
Herbicide application: 2 pt/A Hoelon + 1 pt/A Buctril
Yields are adjusted to 12.5% moisture.
ns = no statistical difference between varieties.

1996 Hettinger Off-Station HRSW Variety Trials
Combined Means - 6 Sites***

Variety	Test weight	Grain protein	Plant height	Yield 1996	1995*	1994**	2yr	3yr
	lbs/bu	%	cm	bu/A				
2398	62.8	14.4	67	60.6	48.9	55.2	54.8	54.9
2375	63.1	14.7	70	57.2	49.1	49.4	53.2	51.9
McNeal	60.4	14.4	75	54.3	44.9	49.8	49.6	49.7
Kulm	63.5	15.0	77	52.7	49.8	45.6	51.2	49.4
2371	61.3	15.2	68	52.1	45.6	47.8	48.8	48.5
Ernest	62.8	15.1	82	51.3	42.3	44.8	46.8	46.1
Amidon	61.3	15.0	85	53.7	40.5	42.9	47.1	45.7
Grandin	63.1	15.2	74	51.8	43.3	40.8	47.6	45.3
Russ	62.6	14.4	76	57.4	47.8		52.6	
Trenton	62.7	14.9	84	54.7	47.6		51.2	
Keene	62.2	15.3	82	55.2				
Norlander	62.3	15.0	70	54.6				

* 5 sites - Hettinger fallow & recrop, Scranton, New Leipzig and Selfridge.
** 4 sites - Regent, Scranton, New Leipzig and Selfridge.
*** 6 sites - Hettinger fallow & recrop, Regent, Scranton, New Leipzig and Selfridge.
Yields are adjusted to 12% moisture.

1996 Hettinger Off-Station Durum Variety Trials
Combined Means - 4 Sites***

Variety	Test weight	Grain protein	Plant height	Yield 1996	1995*	1994**	2yr	3yr
	lbs/bu	%	cm	bu/A				
Renville	62.2	14.0	84	58.4	43.5	55.6	51.0	52.5
Voss	62.2	13.5	68	58.7	38.3	52.0	48.5	49.7
Vic	63.0	14.1	84	54.5	38.7	53.2	46.6	48.8
Munich	61.8	14.2	73	54.2	40.8		47.5	
Ben	63.0	14.2	79	57.8				

* 3 sites - Hettinger, Scranton and Selfridge.
** 2 sites - Regent and Scranton.
*** 4 sites - Hettinger, Regent, Scranton, and Selfridge.
Yields are adjusted to 12.5% moisture.

Barley Variety Description

Variety	Use[3]	Origin	Year Released	Awn Type[1]	Aleurone Color	Height	Straw Strength	Relative Maturity	Reaction to Disease[2]			
									Stem Rust	Loose Smut	Spot Blight	Net Blotch
Six-rowed												
Azure	M/F	ND	1982	S	blue	med.	strg.	m.early	S	S	MR-R	MS-S
Excel	M/F	MN	1990	S	white	m.short	v.strg.	med.	S	S	MR-R	MS-S
Foster	M/F	ND	1995	S	white	m.short	v.strg.	med.	S	S	MR-R	MS-S
Hazen	F	ND	1984	S	white	med.	m.strg.	med.	S	S	MR-R	MS-S
Morex	M/F	MN	1978	S	white	tall	med.	early	S	S	MR	S
Robust	M/F	MN	1983	S	white	tall	m.strg.	med.	S	S	MR-R	MS-S
Stander	M/F	MN	1993	S	white	m.short	v.strg.	med.	S	S	MR-R	MS-S
Two-rowed												
Bowman	F	ND	1984	S	white	m.short	m.strg.	m.early	S	S	MS-S	MS
Chinook[4]	F	MT	1994	R	white	med.	med.	m. late	S	S	MS	MS
Conlon	F	ND	1996	S	white	m.short	m.strg.	early	S	S	MS	R
Gallatin	F	MT	1986	R	white	med.	med.	m.late	S	S	MS	MS
Harrington[4]	F	Can.	1981	R	white	med.	m.weak	late	S	S	MS	MR
Logan	F	ND	1995	S	white	med.	strg.	med.	S	S	MR	R
Stark	F	ND	1991	S	white	med.	m.strg.	m.late	S	S	MS	MR
Specialty												
Wanubet	SP	MT	1990	R	white	med.	weak	late	S	S	MS	S

[1] Rough or smooth awned.

[2] R = resistant; MR = moderately resistant; MS = moderately susceptible; S = susceptible; N/A = not available.

[3] M = malting; F = feed; SP = special uses.

[4] Recommended as a malting barley in western US.

Barley - Green Fallow	Dickinson

Variety	Days to Head	Plant Height	Lodging Score	Seeds	Test Weight
		in	0-9	lbs	lbs/bu
Six Row					
Azure	59	31.4	2.5	14047	43.5
Excel	61	30.3	1.3	14448	42.5
Foster	60	30.6	0.3	14189	42.6
Hazen	59	27.4	0.8	13190	43.8
Morex	58	30.6	4.0	13303	44.6
Robust	60	30.6	2.5	13846	43.8
Royal	61	26.1	0.0	13377	45.0
Stander	61	27.4	0.0	15450	42.0
Two-Row					
Bowman	58	27.5	1.5	10983	48.0
Chinook	64	27.9	1.0	12726	46.1
Conlon	58	27.9	0.3	9490	48.6
Gallatin	63	27.5	0.0	11452	47.6
Harrington	66	27.5	0.0	13243	44.1
Logan	61	29.4	0.0	9707	48.1
Stark	62	29.5	0.0	9847	48.5
Mean	61	28.8	0.9	12594	45.3
C.V. %	1.6	11.5	127.1	7.8	3.6
LSD .05	1	4.7	1.6	1396	2.3

Planting Date: April 30
Harvest Date: August 5
Lodging: 0 = No lodging, 9 = Completely flat
Previous crop: Black lentil (plow down); Soil test results: 32lbs N, 12ppm P - applied 250lbs Urea and 25lbs DAP per acre; Applied 2pt Hoelon per acre on June 3; Applied .33oz Harmony Extra +.75pt MCPA ester per acre on June 3.

Variety	Protein	Returns	Grain Yield 1994	Grain Yield 1995	Grain Yield 1996	Average Yield 2 year	Average Yield 3 year
	%	$/ac			bu/ac		
Six Row							
Azure	14.6	129.49	94.6	57.8	60.7	59.2	71.0
Excel	14.1	140.51	95.7	65.2	67.2	66.2	76.0
Foster	14.1	134.14	97.8	56.3	64.1	60.2	72.7
Hazen	14.6	133.98	91.2	51.5	62.2	56.8	68.3
Morex	14.9	118.83	84.1	45.8	54.2	50.0	61.4
Robust	14.8	122.41	90.4	56.7	56.8	56.7	68.0
Royal	14.5	135.13	84.5	48.7	61.8	55.2	65.0
Stander	14.6	131.10	102.8	67.1	62.2	64.7	77.4
Two-Row							
Bowman	15.3	128.91	81.0	56.7	56.3	56.5	64.7
Chinook	15.0	128.58	--	62.9	57.7	60.3	--
Conlon	14.2	143.72	94.9	68.9	62.7	65.8	75.5
Gallatin	14.1	155.26	96.9	54.8	68.5	61.6	73.4
Harrington	15.0	122.93	89.9	50.4	56.9	53.7	65.7
Logan	14.2	171.61	98.1	73.0	74.9	73.9	82.0
Stark	14.7	129.29	97.0	58.9	56.2	57.6	70.7
Mean	14.6	136.70			62.2		
C.V. %	3.2	15.2			13.4		
LSD .05	0.7	29.67			11.8		

Returns were calculated by multiplying the 1996 yield by the price for feed barley minus the test weight discount paid at the Southwest Grain Terminal located at Gladstone on October 4.

Barley - Fallow **Glen Ullin**

Variety	Seeds	Test Weight	Protein	Returns	% of Stark	Grain Yield 1994	Grain Yield 1995	Grain Yield 1996	Average Yield 2 year	Average Yield 3 year
	lbs	lbs/bu	%	$/acre		bu/ac				
Six Row										
Foster	11257	49.9	12.8	260.00	130	--	65.3	110.7	88.0	--
Logan	9396	52.4	13.8	244.84	121	--	71.4	103.3	87.4	--
Two Row										
Bowman	9916	52	14.1	172	86	68.8	51.3	72.9	62.1	64.3
Chinook	10771	51	14.2	238	118	--	--	100.2	--	--
Conlon	8860	53	13.8	217	107	--	70.8	91.4	81.1	--
Stander	11531	50	13.0	276	138	--	--	117.5	--	--
Stark	8981	53	14.4	202	100	84.6	61.9	85.1	73.5	77.2
Mean	10101	51.5	13.7	229.88	--	--	--	97.3	--	--
C.V. %	4.5	1.2	1.2	5.9	--	--	--	5.6	--	--
LSD .05	675.2	0.9	0.2	20.2	--	--	--	8.1	--	--

Planting Date: May 28
Harvest Date: August 27
Previous crop: Fallow; Soil test results: 86lbs N and 14ppm P - applied 130lbs Urea and 25lbs DAP per acre; Applied 1.25pt Bronate per acre on June 17.
Returns were calculated by multiplying the 1996 yields by the price paidfor feed barley minus the test weight discount paid at the Southwest Grain Terminal located at Gladstone on October 4.

1996 Hettinger Barley Variety Trial on Fallow

Variety	Test weight	Grain protein	Days to head	Ht	Yield 1996	1995	1993	2yr	3yr
	lbs/bu	%		cm	bu/A				
Excel	50.4	13.9	69	76	121.6	106.8	117.0	114.2	115.1
Foster	50.9	13.8	68	74	117.2	101.0	113.6	109.1	110.6
Morex	51.9	14.5	68	84	117.3	105.2	100.9	111.2	107.8
Hazen	50.9	15.0	69	82	112.5	94.2	113.4	103.4	106.8
Logan	52.9	14.4	68	76	108.8	94.3	111.1	101.6	104.7
Robust	52.4	15.1	68	84	112.1	98.1	102.3	105.1	104.2
Azure	52.1	15.2	69	81	102.6	98.3	107.4	100.4	102.8
Stark	54.2	14.4	67	81	118.7	90.2	99.1	104.4	102.7
Stander	50.8	14.0	71	73	108.6	80.6	113.3	94.6	100.8
Gallatin	52.4	14.2	69	75	110.5	92.2	95.4	101.2	99.3
Bowman	53.4	15.0	66	77	106.8	87.6	93.2	97.2	95.9
Harrington	50.1	14.7	74	76	99.6	56.3	96.5	78.0	84.1
Conlon	53.7	14.1	66	76	110.6	88.4		99.5	
Royal	51.5	14.7	70	65	92.7	81.1		86.9	
M66	51.8	14.5	68	73	114.5				
Chinook	52.2	14.7	72	74	113.8				
ND14119	49.8	14.0	68	74	112.7				
ND14275	50.4	14.7	70	78	110.9				
ND14636	54.3	15.0	68	75	103.0				
ND14321	51.2	15.1	68	77	101.3				
6B88-3213	52.0	14.4	68	72	92.6				
Trial mean	51.9	14.5	69	76	109.0	85.5	102.6		
C.V. %	0.8	1.6	1	4	5.6	11.5	10.2		
LSD 5%	0.6	0.3	1	5	8.6	14.0	14.8		
LSD 1%	0.8	0.4	2	6	11.5	18.6	19.7		

Planting date: April 22 Harvest date: August 7
Seeding rate: 750,000 live seeds/A (approx. 1.4 bu/A)
Yield goal: 80 bu/A
Herbicide application: 1.5 pt/A Buctril + 1.5 oz/A MCPE
Yields are adjusted to 12% moisture.

1996 Hettinger Barley Variety Trial on Recrop

Variety	Test weight	Grain protein	Days to head	Ht	Yield 1996	1995	1993	2yr	3yr
	lbs/bu	%		cm	bu/A				
Stark	53.2	14.8	70	73	81.9	73.6	102.3	77.8	85.9
Gallatin	50.0	15.5	71	70	77.2	78.4	99.9	77.8	85.2
Bowman	53.5	14.5	68	73	81.7	72.1	93.6	76.9	82.5
Logan	53.2	14.7	70	68	89.1	80.7		84.9	
Conlon	53.0	14.4	66	71	87.2	78.8		83.0	
Chinook	51.5	15.3	75	68	80.8				
Harrington	49.8	15.4	76	70	69.3				
ND14636	55.3	14.7	68	67	85.9				
Trial mean	52.4	14.9	70	70	81.6	68.6	94.6		
C.V. %	0.8	4.1	1	6	9.2	5.7	13.2		
LSD 5%	0.6	ns	1	ns	11.0	5.8	ns		
LSD 1%	0.9	ns	2	ns	14.9	7.9	ns		

Planting date: April 23 Harvest date: August 6
Seeding rate: 750,000 live seeds/A (approx. 1.4 bu/A)
Yield goal: 80 bu/A
Previous crop: Barley
Herbicide application: 2 pts/A Hoelon + 1.5 pt/A Buctril
Yields are adjusted to 12% moisture.
ns = no statistical difference between varieties.

1996 Scranton Barley Variety Trial

Variety	Test weight	Grain protein	Plant height	Yield 1996	1995	1994	2yr	3yr
	lbs/bu	%	cm	bu/A				
Logan	52.7	14.8	65	104.3	84.6	71.9	94.4	86.9
Gallatin	51.3	15.1	68	100.7	77.1	71.1	88.9	83.0
Stark	53.4	15.3	68	78.2	83.2	71.0	80.7	77.5
Bowman	52.6	15.3	61	79.6	69.7	70.3	74.6	73.2
Conlon	53.1	14.3	66	91.4	80.4		85.9	
Trial mean	52.6	15.0	66	90.8	79.0	68.2		
C.V. %	1.0		5	11.4	11.2	7.3		
LSD 5%	0.8		5	15.8	13.1	ns		
LSD 1%	1.1		ns	21.9	ns	ns		

Planting date: April 29 Harvest date: August 14
Seeding rate: 750,000 live seeds/A (approx. 1.4 bu/A)
Yield goal: 80 bu/A
Herbicide application: 2 pt/A Hoelon + 1 pt/A Buctril
Yields are adjusted to 12% moisture.
Minor hail damage on 6/11/96.
ns = no statistical difference between varieties.

1996 Regent Barley Variety Trial

Variety	Test weight	Grain protein	Plant height	Yield 1996	1994	1993	2yr	3yr
	lbs/bu	%	cm	bu/A				
Stark	53.0	13.8	64	48.9	99.8	82.2	74.4	77.0
Gallatin	51.3	13.9	55	52.1	97.8	75.6	75.0	75.2
Bowman	51.6	13.9	88	44.5	88.8	58.6	66.6	64.0
Logan	52.3	13.4	58	54.3	97.3		75.8	
Conlon	51.2	12.7	54	46.7				
Trial mean	51.9	13.5	58	49.3	94.4	77.4		
C.V. %	0.8	3.1	5	7.3	5.1	11.5		
LSD 5%	0.6	0.6	5	5.4	7.1	13.3		
LSD 1%	0.9	0.9	7	7.5	9.7	17.2		

Planting date: April 29 Harvest date: August 14
Seeding rate: 750,000 live seeds/A (approx. 1.4 bu/A)
Yield goal: 80 bu/A
Herbicide application: 2 pt/A Hoelon + 1 pt/A Buctril
Yields are adjusted to 12% moisture.

1996 New Leipzig Barley Variety Trial

Variety	Test weight	Grain protein	Plant height	Yield 1996	1995	1994	2yr	3yr
	lbs/bu	%	cm	bu/A				
Gallatin	51.4	14.7	63	84.6	62.6	56.9	73.6	68.0
Logan	52.3	15.2	60	75.1	80.8	40.2	78.0	65.4
Bowman	52.9	15.6	62	63.7	82.5	42.2	73.1	62.8
Stark	53.2	15.2	68	69.6	70.5	41.9	70.0	60.7
Conlon	51.8	14.2	59	62.9	81.7		72.3	
Trial mean	52.4	15.0	62	71.2	67.2	44.9		
C.V. %	0.9	2.2	5	12.4	9.1	9.9		
LSD 5%	0.7	0.5	5	13.4	9.0	8.0		
LSD 1%	1.0	0.7	7	18.6	12.3	11.3		

Planting date: April 30 Harvest date: August 19
Seeding rate: 750,000 live seeds/A (approx. 1.4 bu/A)
Yield goal: 80 bu/A
Herbicide application: 2 pt/A Hoelon + 1 pt/A Buctril
Yields are adjusted to 12% moisture.

1996 Selfridge Barley Variety Trial

Variety	Test weight	Grain protein	Plant height	Yield				
				1996	1995	1994	2yr	3yr
	lbs/bu	%	cm	bu/A				
Stark	52.0	13.2	76	95.1	37.1	71.0	66.1	67.7
Gallatin	50.4	13.2	75	93.3	34.4	71.1	63.8	66.3
Bowman	51.4	14.1	73	81.0	45.9	70.3	63.4	65.7
Logan	51.8	13.4	73	94.3	30.5	71.9	62.4	65.6
Conlon	51.2	12.9	73	93.0	38.5		65.8	
Trial mean	51.4	13.4	74	91.3	33.1	68.2		
C.V. %	0.7		5	9.1	20.9	7.3		
LSD 5%	0.7		ns	ns	10.2	7.3		
LSD 1%	1.0		ns	ns	13.9	ns		

Planting date: April 30 Harvest date: August 15
Seeding rate: 750,000 live seeds/A (approx. 1.4 bu/A)
Yield goal: 80 bu/A
Herbicide application: 2 pt/A Hoelon + 1 pt/A Buctril
Yields are adjusted to 12% moisture.
ns = no statistical difference between varieties.

1996 Hettinger Off-Station Barley Variety Trials

Combined Means - 6 Sites***

Variety	Test weight	Grain protein	Plant height	Yield				
				1996	1995*	1994**	2yr	3yr
	lbs/bu	%	cm	bu/A				
Logan	52.6	14.4	66	88.3	74.2	82.2	81.2	81.6
Gallatin	51.2	14.5	67	87.1	69.0	85.1	78.0	80.4
Stark	53.2	14.5	71	82.4	70.9	80.1	76.6	77.8
Bowman	52.6	14.8	67	76.8	71.6	74.8	74.2	74.4
Conlon	52.4	13.8	66	82.4	73.6		78.0	
Chinook	51.9	15.0	71	97.8				

* 5 sites - Hettinger fallow & recrop, Scranton, New Leipzig and Selfridge.
** 4 sites - Regent, Scranton, New Leipzig and Selfridge.
*** 6 sites - Hettinger fallow & recrop, Regent, Scranton, New Leipzig and Selfridge.
Yields are adjusted to 12% moisture.

Oat Variety Description

Variety*	Origin	Year Released	Color Grain	Height	Straw Strength	Maturity[2]	Reaction to Diseases: Stem rust[1]	Reaction to Diseases: Crown rust	Reaction to Diseases: Barley Yellow Dwf.[4]	Quality Factors: Rel. Yield	Quality Factors: bu/Wt	Quality Factors: Protein[3]
Hytest	SD	1986	white	tall	m.strg.	E	S	MS	S	fair	v.good	H
Prairie	WI	1991	white	short	strg.	E	S	S	T	good	good	M
Premier	MN	1990	yellow	short	med.	M	R	MS	MT	v.good	v.good	H
Jerry	ND	1994	white	tall	strg.	M	R	MS	MT	v.good	v.good	M
Newdak	ND/NY	1990	white	med.	strg.	M	R	S	T	v.good	good	M
Brawn	IL	1993	yellow	short	v.strg.	M	S	S	T	v.good	good	M
Valley	ND	1988	ivory	short	strg.	L	R	MS	MT	v.good	v.good	M
Whitestone	ND	1994	white	short	strg.	L	R	MS	MT	v.good	good	L
Otana	MT	1977	white	m.tall	m.weak	L	S	S	S	v.good	v.good	ML
Troy	SD	1991	ivory	tall	m.strg.	L	S	MS	T	good	good	M
AC Belmont	Can.	1993	naked	med.	strg.	L	R	S	MT	good	v.good	M
Paul	ND	1994	naked	v.tall	strg.	L	R	R-MR	T	v.good	good	H
Dumont	Can.	1982	white	m.tall	m.weak	L	R	S	MS	good	good	ML
Bay	WI	1993	yellow	med.	v.strg.	L	S	MR-S	T	good	fair	H
AC Marie	Can.	1992	white	tall	weak	VL	R	S	MT	fair	fair	ML
Milton	MN	1994	yellow	med.	strg.	L	S	MS	MT	v.good	v.good	M
Jim	MN	1995	yellow	med.	strg.	M	S	MS	MT	good	good	M

* Varieties listed in order of maturity.

[1] Stem rust races most prevalent now. S = susceptible; M = moderately; R = resistant; VS = very susceptible.

[2] E = early; M = medium; L = late.

[3] H = high; M = medium; L = low; V = very; VL = very low.

[4] S= susceptible; MS = moderately susceptible; MT = moderately tolerant; T = tolerant.

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

Oat - Green Fallow **Dickinson**

Variety	Days to Head	Plant Height	Lodging Score	Seeds	Test Weight
		in	0-9	lbs	lbs/bu
AC Belmont	68	29.7	0.0	18694	38.3
Bay	68	28.3	0.0	16865	31.8
Brawn	66	30.1	0.0	11926	33.4
Calibre	69	26.2	1.3	13648	38.4
Derby	70	28.7	0.5	12133	38.9
Dumont	68	31.5	1.0	14698	36.1
Hytest	65	31.9	0.5	13957	39.8
Jerry	64	31.5	0.0	15152	37.3
Jim	63	27.9	0.0	14561	36.0
Milton	67	29.3	0.0	16259	36.4
Monida	69	26.2	0.3	17653	35.3
Newdak	63	30.0	0.3	17741	33.8
Otana	68	28.1	0.8	16129	37.3
Paul	70	26.3	0.5	18439	43.0
Porter	67	28.7	1.3	15601	36.6
Prairie	65	27.4	0.3	16904	31.5
Riel	66	29.6	0.0	15097	35.6
Robert	69	27.7	0.0	12070	35.1
Troy	68	29.7	0.5	16283	37.3
Valley	66	30.3	0.0	16945	36.8
Whitestone	68	31.9	0.0	16254	34.9
Mean	67	29.1	0.3	15572	36.3
C.V. %	1.7	11.2	143.1	7.5	2.6
LSD .05	1.6	4.6	0.7	1656.5	1.3

Planting Date: April 24
Harvest Date: August 7
Lodging: 0 = No lodging, 9 = Completely flat
Previous crop: Sweet clover (plow down); Soil test results 54lbs N and 18ppm P - Applied 210lbs Urea per acre; Applied .33oz Harmony Extra + .75pt MCPA ester per acre on June 3.

Oat - Green Fallow	Dickinson

Variety	Returns	Grain Yield			Average Yield	
		1994	1995	1996	2 year	3 year
	$/ac	bu/ac				
AC Belmont	84.88	134.6	91.3	74.0	82.6	100.0
Bay	75.85	159.1	110.3	75.9	93.1	115.1
Brawn	84.09	143.5	100.6	84.1	92.3	109.4
Calibre	111.54	180.6	98.1	96.7	97.4	125.1
Derby	121.47	172.0	99.4	101.2	100.3	124.2
Dumont	78.35	163.7	80.0	73.9	76.9	105.9
Hytest	95.72	117.0	73.0	79.8	76.4	89.9
Jerry	94.41	139.4	95.4	85.3	90.4	106.7
Jim	93.94	--	71.7	91.3	81.5	--
Milton	72.36	138.9	82.3	70.1	76.2	97.1
Monida	87.63	174.5	105.9	87.6	96.8	122.7
Newdak	81.77	155.4	93.0	81.8	87.4	110.1
Otana	95.46	170.6	95.0	84.7	89.8	116.8
Paul	77.64	107.7	92.0	64.7	78.4	88.1
Porter	98.81	157.8	103.8	91.0	97.4	117.5
Prairie	93.27	157.0	100.1	93.3	96.7	116.8
Riel	59.90	154.1	79.9	59.9	69.9	98.0
Robert	86.03	148.0	95.3	86.0	90.7	109.8
Troy	100.99	139.8	100.2	90.0	95.1	110.0
Valley	74.07	143.5	91.3	70.2	80.7	101.7
Whitestone	96.24	154.0	107.1	96.2	101.7	119.1
Mean	88.78	--	--	82.7	--	--
C.V. %	16.1	--	--	14.3	--	--
LSD .05	20.23	--	--	16.7	--	--

Returns were calculated by multiplying the 1996 yield by the price paid for feed oats minus the test weight discount paid at the Southwest Grain Terminal located at Gladstone on October 4.

Oat - Fallow	Glen Ullin

Variety	Seeds	Test Weight	Returns	% of Jerry	Grain Yield 1994	1995	1996	Average Yield 2 year	3 year
	lbs	lbs/bu	$/acre				bu/ac		
Bay	15519	34.4	117.71	103	--	--	117.7	--	--
Jerry	15504	39.9	136.77	100	107.6	103.7	114.0	108.9	108.4
Jim	14061	38.5	122.64	90	--	--	102.2	--	--
Paul	20112	40.4	97.60	71	77.4	83.2	81.3	82.3	80.6
Troy	17441	39.1	136.54	100	--	--	113.8	--	--
Whitestone	16268	35.8	134.49	115	99.2	132.2	130.8	131.5	120.7
Mean	16484	38.0	124.29	--	--	--	110.0	--	--
C.V. %	7.4	2.9	5.8	--	--	--	4.8	--	--
LSD .05	1838	1.6	10.8	--	--	--	7.9	--	--

Planting Date: May 28
Harvest Date: August 27
Previous crop: Fallow; Soil test results: 86lbs N and 14ppm P - applied 130lbs Urea and 25lbs DAP per acre; Applied 1.25pt Bronate per acre on June 17.
Returns were calculated by multiplying the 1996 yield by the price paid for feed oats minus the test weight discount paid at the Southwest Grain Terminal located at Gladstone on October 4.

1996 Hettinger Oat Variety Trial on Fallow

Variety	Test weight	Days to head	Ht	Yield 1996	1995	1993	2yr	3yr
	lbs/bu		cm	bu/A				
Prairie	37.4	72	79	123.1	132.4	193.1	127.8	149.5
Milton	40.4	74	82	103.4	129.4	194.7	116.4	142.5
Porter	40.2	74	85	116.1	135.3	175.3	125.7	142.2
Bay	35.5	78	82	113.4	122.8	186.9	118.1	141.0
Robert	38.4	76	84	105.9	118.6	195.5	112.2	140.0
Valley	40.5	74	76	114.6	127.5	176.5	121.0	139.5
Whitestone	39.6	75	77	120.4	121.6	167.2	121.0	136.4
Jerry	41.6	72	88	108.9	124.9	173.8	116.9	135.9
Troy	40.3	74	88	106.4	139.4	160.6	122.9	135.5
Newdak	38.1	71	78	110.6	122.2	165.6	116.4	132.8
Monida	37.0	76	88	122.1	108.6	162.5	115.4	131.1
Riel	40.5	74	91	119.1	109.2	149.3	114.2	125.9
Otana	38.6	75	93	107.9	112.0	154.0	110.0	124.6
Hytest	43.4	72	95	92.8	102.7	143.5	97.8	113.0
Dumont	40.1	76	89	104.7	75.9	145.1	90.3	108.6
Derby	39.4	76	94	103.0	67.7	132.6	85.4	101.1
Calibre	39.2	76	92	103.0	57.1	121.8	80.0	94.0
Paul*	45.4	76	94	72.5	58.3	118.7	65.4	83.2
AC Belmont*	38.6	78	89	70.1	51.8	104.5	61.0	75.5
Brawn	38.0	74	76	117.4	127.3		122.4	
Settler	41.7	72	87	101.3	130.0		115.6	
Jim	40.7	70	80	105.5				
ND911048	39.3	74	78	128.2				
ND910779	39.4	77	94	122.3				
ND910916	38.8	77	79	119.9				
ND910569	40.6	75	78	117.8				
ND900697	39.0	76	93	115.3				
ND900779	39.3	76	85	113.8				
ND910592	39.3	74	80	113.4				
ND910117	39.5	74	93	111.5				
ND880107	39.0	75	96	108.9				
ND900117	42.6	71	78	93.2				
Trial mean	39.8	75	86	109.0	110.3	157.6		
C.V. %	4.1	1	4	7.1	9.6	10.5		
LSD 5%	2.3	1	5	10.9	14.9	23.4		
LSD 1%	3.0	2	6	14.5	19.8	30.8		

Planting date: April 22 Harvest date: August 13
Seeding rate: 750,000 live seeds/A (approx. 1.7 bu/A)
Yield goal: 100 bu/A
Herbicide application: 1.5 pt/A Buctril + 1.5 oz/A MCPE
Yields are adjusted to 12% moisture.
* Naked (hulless) type.

1996 Hettinger Oat Variety Trial on Recrop

Variety	Test weight	Days to head	Ht	Yield 1996	1995	1993	2yr	3yr
	lbs/bu		cm	bu/A				
Prairie	36.1	72	77	111.5	154.7	122.2	133.1	129.5
Newdak	37.0	71	76	107.4	150.8	107.1	129.1	121.8
Monida	32.6	76	78	95.8	140.9	112.2	118.4	116.3
Troy	38.4	73	84	91.7	134.4	111.7	113.0	112.6
Otana	37.0	75	86	92.1	134.4	105.7	113.2	110.7
Hytest	42.1	72	88	87.6	114.3	90.3	101.0	97.4
Dumont	37.6	76	88	100.5	96.7	86.2	98.6	94.5
Whitestone	37.0	75	67	103.0	147.9		125.4	
Settler	39.7	74	84	96.8	143.7		120.2	
Jerry	39.7	73	84	95.8	135.2		115.5	
Derby	36.2	75	92	91.0	93.9		92.4	
Calibre	36.5	76	87	94.9	82.7		89.3	
Paul*	42.6	76	89	58.7	95.6		77.2	
Jim	39.4	70	76	97.0				
AC Belmont*	34.3	76	78	55.2				
Trial mean	37.8	74	82	91.7	126.0	99.4		
C.V. %	1.7	1	4	12.1	5.2	14.1		
LSD 5%	0.9	1	5	15.9	11.0	20.0		
LSD 1%	1.3	2	7	21.3	14.8	26.8		

Planting date: April 23 Harvest date: August 6
Seeding rate: 750,000 live seeds/A (approx. 1.7 bu/A)
Previous crop: oat
Yield goal: 100 bu/A
Herbicide application: 1.5 pt/A Buctril + 1.5 oz/A MCPE
Yields are adjusted to 12% moisture.
* Naked (hulless) type.

1996 Scranton Oat Variety Trial

Variety	Test weight	Plant height	Yield 1996	1995	1993	2yr	3yr
	lbs/bu	cm	bu/A				
Prairie	37.0	75	125.1	73.4	127.0	92.2	108.5
Troy	40.0	83	120.4	46.8	123.6	83.6	96.9
Whitestone	39.1	70	138.3	71.9		105.1	
Settler	41.4	79	109.6	69.4		89.5	
Jerry	40.5	82	111.7	55.8		83.8	
Paul*	45.4	86	87.7	25.5		56.6	
Jim	39.2	74	98.8				
Trial mean	40.4	78	113.1	61.3	146.0		
C.V. %	0.7	5	5.9	17.3	8.1		
LSD 5%	0.4	6	9.9	15.6	ns		
LSD 1%	0.6	7	12.8	21.3	ns		

Planting date: April 29 Harvest date: August 14
Seeding rate: 750,000 live seeds/A (approx. 1.7 bu/A)
Yield goal: 100 bu/A
Herbicide application: 1 pt/A Buctril
Yields are adjusted to 12% moisture.
Minor hail damage on 6/11/96.
* Naked (hulless) type.
ns = no statistical difference between varieties.

1996 New Leipzig Oat Variety Trial

Variety	Test weight	Plant height	Yield 1996	1995	1994	2yr	3yr
	lbs/bu	cm	bu/A				
Troy	40.8	76	71.6	129.3	63.4	100.4	88.1
Jerry	41.5	69	63.7	133.8	61.4	98.8	86.3
Whitestone	40.0	65	77.1	117.2	63.6	97.2	86.0
Prairie	37.8	69	66.7	123.4	60.8	95.0	83.6
Settler	41.8	76	67.0	124.9		96.0	
Paul*	46.8	72	37.0	46.7		41.8	
Jim	40.6	68	43.5				
Trial mean	41.1	71	61.8	109.6	61.9		
C.V. %	1.2	9	24.6	8.0	12.6		
LSD 5%	0.7	9	22.4	13.0	ns		
LSD 1%	1.0	ns	29.0	17.7	ns		

Planting date: April 30 Harvest date: August 19
Seeding rate: 750,000 live seeds/A (approx. 1.7 bu/A)
Yield goal: 100 bu/A
Herbicide application: 1 pt/A Buctril
Yields are adjusted to 12% moisture.
* Naked (hulless) type.
ns = no statistical difference between varieties.

1996 Selfridge Oat Variety Trial

Variety	Test weight	Plant height	Yield 1996	1994	1993	2yr	3yr
	lbs/bu	cm	bu/A				
Prairie	36.3	94	139.4	118.7	130.2	129.0	129.4
Troy	39.8	107	119.8	120.1	130.8	120.0	123.6
Settler*	40.0	104	113.2	102.7	92.6	108.0	102.9
Whitestone*	37.9	91	133.4	141.8		137.6	
Jerry	39.9	103	116.5	119.9		118.2	
Jim	38.1	98	109.8				
Paul**	43.1	111	76.9				
Trial mean	39.3	101	115.6	118.9	118.8		
C.V. %	1.3	5	11.4	6.3	8.5		
LSD 5%	0.9	8	23.3	11.1	15.1		
LSD 1%	1.2	12	32.5	15.2	20.8		

Planting date: April 30 Harvest date: August 15
Seeding rate: 750,000 live seeds/A (approx. 1.7 bu/A)
Yield goal: 100 bu/A
Herbicide application: 1 pt/A Buctril
Yields are adjusted to 12% moisture.
* Severe lodging.
** Naked (hulless) type.

1996 Hettinger Off-Station Oat Variety Trials
Combined Means - 5 Sites***

Variety	Test weight	Days to head	Plant height	Yield 1996	1995*	1994**	2yr	3yr
	lbs/bu		cm	bu/A				
Whitestone	38.9	75	76	115.5	111.5	102.7	113.4	109.9
Troy	39.9	73	86	102.2	110.2	91.8	106.2	101.4
Jerry	40.7	72	85	99.8	109.0	90.6	104.4	99.8
Prairie	37.0	72	78	77.8	117.8	89.8	97.8	95.1
Settler	41.0	73	85	97.8	112.5		105.2	
Paul	44.6	76	89	68.5	53.6		61.0	
Jim	39.7	70	78	90.9				

* 4 sites - Hettinger fallow & recrop, Scranton and New Leipzig.
** 2 sites - Selfridge and Scranton.
*** 5 sites - Hettinger fallow & recrop, Scranton, New Leipzig and Selfridge.
Yields are adjusted to 12% moisture.

Hard Red Winter Wheat Variety Description

Variety	Agent or Origin	Year	Quality	Leaf Rust[1]	Stem Rust[1]	Maturity	Straw Strength	Height	Winter Hardiness
Roughrider	ND	1975	4.0[a]	S	R[3]	med.	m.strg.	med.	good
Agassiz	ND	1983	3.0	S	R	med.	med.	med.	good
Seward	ND	1987	2.0	S	R	med.	strg.	med.	good
Norstar	Can.	1977	3.0	S	S	late	med.	tall	good
Rita	SD	1980	3.0	MS	MR[2]	early	strg.	med.	fair
Rose	SD	1981	2.0	S	MS[2]	early	v.strg.	shrt.	fair
Winridge	MT	1980	1.0	S	S	med.	strg.	med.	poor
Norwin*	MT	1983	2.0	S	MS	med.	strg.	v.shrt.	fair
Siouxland	NE	1984	2.0	MR	R	early	strg.	med.	poor
Arapahoe	NE	1989	2.5	MR	R	early	m.strg.	shrt.	good
Judith	MT	1988	3.0	S	S	med.	strg.	med.	fair
Abilene*	AgriPro	1987	2.5	S	MR	early	strg.	v.shrt.	poor
Elkhorn	ND	1995	3.0	MR	R[4]	med.	m.strg.	med.	good

[a] 1.0 = very poor quality; 2.0 = poor quality; 2.5 = poor to average quality; 3.0 = average quality; 3.5 = average to good quality; 4.0 = good quality.
Quality assessed by the Department of Cereal Science, NDSU.

[b] Varieties with less than good winter hardiness should be seeded only in tall stubble or in standing solid seeded or narrow strip flax.

* Semidwarf

[1] R = resistant; MR = moderately resistant; MS = moderately susceptible; S = susceptible.

[2] Susceptible in artificially induced epidemics.

[3] Slow rusting type of resistance to race 15.

[4] Occasionally mixed with some susceptible plants.

Hard Red Winter Wheat - Green Fallow **Dickinson**

Variety	Days to Head	Height	Seeds	Test Weight	Protein	Returns	Grain Yield
		in	lbs	lbs/bu	%	$/ac	bu/ac
Abiline	274	26.2	15818	63.0	13.6	297.22	79.3
Agassiz	279	40.7	14954	59.5	13.9	240.40	64.1
Alliance	273	28.5	15296	60.9	12.2	260.07	70.2
Arapahoe	275	32.3	14642	60.9	13.8	279.47	74.5
CDC Kestrel	278	35.8	15418	58.3	12.4	287.88	77.8
Elkhorn	279	36.8	15164	60.0	13.5	241.28	64.4
Judith	275	33.1	13803	58.0	13.1	291.69	78.7
Nekota	274	27.5	13071	62.1	13.8	260.18	69.3
Roughrider	277	37.4	13659	61.4	14.1	258.44	68.8
Seward	278	38.2	14467	60.0	12.6	280.22	75.5
Mean	276	33.6	14629	60.4	13.3	269.69	72.3
C.V. %	0.3	4.2	6.2	1.7	1.4	6.1	6.2
LSD .05	1.3	2.0	1316	1.5	0.3	23.77	6.5

Planting Date: September 15 (No-Till)
Harvest Date: July 29
Previous crop: Black lentil (burn down); Applied .33oz Express+.75pt 2,4-D per acre on May 30.
Returns were calculated by multiplying the 1996 yield by the protein premium/discount and test weight discount paid at the Southwest Grain Terminal located at Gladstone on October 4.

1996 Hettinger Hard Red Winter Wheat Variety Trial

Variety	Test weight	Grain protein	Heading date	Plant height	Winter survival	Yield				
						1996	1995	1993	2yr	3yr
	lbs/bu	%	June	cm	%	bu/A				
Arapahoe	61.0	14.2	26	85	95	71.3	93.6	34.2	82.4	66.4
Seward	61.6	12.9	28	105	96	76.0	77.4	42.8	76.7	65.4
Roughrider	62.4	14.1	28	98	96	63.9	71.1	49.8	67.5	61.6
Elkhorn	60.9	14.2	28	100	96	62.0	64.9	45.2	63.4	57.4
Longhorn	63.0	14.1	24	82	98	62.4	85.3	21.2	73.8	56.3
Siouxland	60.8	14.0	24	88	90	58.7	73.3	35.0	66.0	55.7
Tomahawk	61.3	13.9	21	73	95	57.9	93.3	12.2	75.6	54.5
Agassiz	62.0	14.4	28	101	93	63.9	55.8	40.3	59.8	53.3
TAM 107	61.4	13.9	20	73	92	56.3	83.2	16.6	69.8	52.0
CDC Kestrel	58.7	12.9	27	94	95	65.3	80.1		72.7	
Nekota	62.9	14.0	22	77	93	68.6				
Alliance	61.2	12.1	24	78	85	60.7				
ND9272	60.9	14.0	27	82	98	74.9				
ND9257	61.4	13.5	28	92	95	72.9				
S86-1523	60.1	12.6	25	84	96	71.9				
ND8955	60.2	13.2	27	93	96	71.8				
NE90625	61.5	13.2	26	83	95	68.9				
ND9274	60.8	13.7	28	87	93	68.2				
ND8889	59.8	13.9	27	98	95	65.6				
S87-90	61.0	12.2	26	90	98	65.0				
S87-101	61.7	12.9	23	88	95	61.8				
Trial mean	61.2	13.5	25	88	94	66.1	78.7	35.4		
C.V. %	0.9	3.6		4	5	8.9	8.9	22.2		
LSD 5%	0.9	0.8		5	ns	9.8	10.0	11.0		
LSD 1%	1.2	1.1		7	ns	13.0	13.3	14.8		

Planting date: September 27, 1995 Harvest date: August 6, 1996
Seeding rate: 1.1 million live seeds/A (approx. 1.6 bu/A)
Yield goal: 60 bu/A
Herbicide application: 2 pt/A Hoelon + 1 pt/A Buctril + 1.5 oz/A MCPE
Yields are adjusted to 12% moisture.
ns = no statistical difference between varieties.

Winter Rye
Variety Description

Variety	Origin	Year Released	Height	Straw Strength	Maturity	Seed Color	Seed Size	Test Weight	Winter hardiness
Dacold	ND	1989	med.	good[1]	v.late	bl-grn.	med.	low	good
Prima	Can	1984	tall	good	med.	blue	large	med.	v.good
Frederick	SD	1984	tall	fair	late	tan	med.	high	good
Musketeer	Can	1980	tall	good	m.early	blue	large	med.	v.good
Rymin	MN	1973	tall	v.good	late	grn-gray	large	high	fair[2]

[1] Under certain environments lodging has been observed.

[2] Varieties with fair winter hardiness should not be seeded on bare land.

1996 Hettinger Winter Rye Variety Trial

Variety	Test weight	Heading date	Plant height	Winter survival	Yield 1996	1995	1993	2yr	3yr
	lbs/bu	June	cm	%	bu/A				
Dacold	53.0	19	95	68	55.8	116.2	45.0	86.0	72.3
Prima	55.6	14	117	79	62.8	80.7	61.1	71.8	68.2
Fredrick	.	.	.	0	0	62.2	70.3	31.1	44.2
Pastar	55.7	14	125	92	60.3				
Puma	.	.	.	0	0				
Exp.	54.0	18	98	86	70.9				
Trial mean	54.6	17	109	54	62.4	90.7	54.2		
C.V. %	0.7		5	11	12.2	9.1	16.6		
LSD 5%	0.6		8	9	12.0	12.8	17.4		
LSD 1%	0.8		11	13	ns	18.0	ns		

Planting date: September 27, 1995 Harvest date: August 12, 1996
Seeding rate: 1.1 million live seeds/A
Herbicide application: 2 pt/A Hoelon + 1 pt/A Buctril + 1.5 oz/A MCPE
Yields are adjusted to 12% moisture.

1995 HETTINGER TILLAGE/FERTILITY TRIAL

In response to the need for additional field research on systems approaches for crop production in southwestern North Dakota, this long term study was implemented to investigate production systems for hard red spring wheat.

Systems being studied involve the use of five different cropping systems and three different fertility schemes within each cropping system. Cropping systems are (1) a conventional fallow system utilizing tillage equipment for weed control, (2) a minimum tillage fallow system utilizing chemicals and tillage equipment for weed control, (3) a no-tillage fallow system utilizing chemicals for all weed control, (4) a continuous cropping system utilizing conventional tillage practices for Fall weed control and seedbed preparation, and (5) a no-tillage continuous cropping system utilizing chemicals for all weed control. Fertility schemes within each cropping system are (1) urea fertilizer (46-0-0) surface broadcast in the Spring plus an application of diammonium phosphate (18-46-0) fertilizer applied with the seed based on residual soil fertility analysis and a yield goal of 60 bushels per acre, (2) anhydrous ammonia (82-0-0) applied in the Fall plus an application of 18-46-0 fertilizer applied with the seed based on residual soil fertility analysis and a yield goal of 60 bushels per acre, and (3) an application of 50 pounds per acre of 18-46-0 fertilizer applied with the seed.

This trial was initiated in 1990 with work being conducted to get all tillage and fertilizer treatments into a workable sequence. The first complete set of data was collected in 1991. The 1994 trial was hailed out.

The 1995 trial was planted on April 24, with Grandin HRWS at a rate of 75 pounds per acre. Residual soil fertility analysis indicated between 77 and 105 pounds of available nitrogen per acre in the top 24 inches and between 18 and 24 pounds of available phosphorous per acre in the top 6 inches, depending on the tillage system.

Fertilizer rates were applied according to fertility scheme objectives stated above.

One third of an ounce per acre of Harmony Extra herbicide plus one pint per acre of Buctril herbicide plus 0.6 pint per acre of Assert herbicide were applied on May 29 to control broadleaf weeds and wildoats.

The continuous no-tillage system was destroyed due to a severe infestation of perennial cool season grassy weeds. This is a typical problem found in no-tillage systems which are continuously cropped with cool season small grain crops. Specific management techniques can be incorporated to overcome this problem, including the use of crop rotations, chemical fallow, and delayed planting with the use of pre-plant burn down products.

There was no statistical difference between fertilizer treatments for yield, test weight or grain protein content (Table 1).

Significant differences were observed for yield, test weight and protein content within cropping systems (Table 2).

Yield results of all fallow systems have been adjusted to an annual yield bases. The yield of the continuously cropped conventional tillage system was significantly higher than other tillage systems in 1995. Adjusted yields for the fallow systems were not significantly different from each other in 1995.

Averaging the yield means from the last 4 years indicate an advantage to utilizing the continuously cropped no-till system followed by the minimum tilled fallow system, the continuously cropped conventionally tilled system, the no-tilled fallow system and finally the conventionally tilled fallow system. The continuously cropped system where conventional tillage is utilized to control weeds has the highest degree of variability for yield. During wet years (1995 & 1992) this system was very effective, providing relatively high yields, however, during dryer years (1991), when moisture is a limiting factor, this system provides for very poor yields. At this time there does not appear to be any trend as to which fertility scheme may be more or less efficient however, these results must be interpreted with caution. Fertilizer treatments and cropping systems require several years of testing before meaningful conclusions may be made.

Table 1. Fertilizer treatment means.

Treatment	Test weight	Grain protein	Yield 1995	1993	1992	1991	3yr	4yr
	lbs/bu	%	bushels per acre					
Spring Urea + 18-46-0	59.2	13.9	43.7	43.4	78.5	55.3	55.2	55.2
Fall Anhydrous + 18-46-0	58.4	14.5	43.2	43.0	78.9	52.4	55.0	54.4
50 lbs/A 18-46-0	59.2	13.9	43.8	42.9	77.6	55.9	54.8	55.0
LSD 5%	ns	ns	ns	ns	ns	ns		

Table 2. Cropping system means.

System	Test weight	Grain protein	Yield* 1995	1993	1992	1991	3yr	4yr
	lbs/bu	%	bushels per acre					
Conventional Tilled Fallow	58.0	14.6	22.0	26.2	35.6	34.4	27.9	29.6
Minimum Tilled Fallow	59.3	14.0	22.6	28.9	48.9	35.4	34.5	34.8
No-tilled Fallow	59.3	13.8	22.0	28.5	47.2	35.8	32.6	33.4
Contin. Cropped Convent. Till	59.0	14.0	41.0	21.9	59.5	15.8	40.8	34.6
Contin. Cropped No-tillage**	--	--	--	26.4	68.7	49.5	48.2	
C.V. %	1.7	4.7	5.4	9.2	4.4	6.9		
LSD 5%	1.0	0.6	2.2	4.0	3.0	3.2		
LSD 1%	ns	ns	3.1	5.8	4.0	4.4		

* Yields have been adjusted to an annual yield bases.
** Continuous cropped no-tillage treatment was destroyed in 1995.
ns = no statistical difference between treatments.

HRSW Cultivar by Seeding Rate by Tillage System Trial **Dickinson**

Treatment	--- Grain protein ---		--- Test weight ---		--- Grain Yield ---		Average Yield		--- Returns ---	
	1995	1996	1995	1996	1995	1996	2 year	3 year	1995	1996
	%		lbs/bu		bu/acre				$/acre	
Tillage system										
No-tillage	14.1	14.8	54.5	60.3	37.1	51.5	44.3	----	158.0	214.0
Reduced-tillage	14.3	15.2	55.1	59.8	41.9	44.3	43.1	----	181.0	190.0
Conventional-tillage	14.5	15.2	55.3	60.6	40.9	45.9	43.4	----	179.0	198.0
LSD .05	NS	NS	NS	NS	NS	NS	----	----	NS	NS
Seeding rate (pls/acre)										
500 000	14.4	15.0	54.0	60.0	37.1	45.7	41.4	----	158.0	193.0
1 000 000	14.3	15.1	55.2	60.6	40.6	48.0	44.3	----	175.0	204.0
1 500 000	14.3	15.2	55.7	60.3	42.1	48.0	45.1	----	184.0	205.0
LSD .05	0.1	NS	0.2	NS	1.0	1.5	----	----	4.3	NS
Variety										
AC Minto	15.1	15.7	53.6	59.2	33.2	41.6	37.4	----	146.0	186.0
Amidon	14.1	15.1	55.5	60.4	42.3	46.0	44.2	----	183.0	200.0
Bergen	13.9	14.4	55.5	60.3	44.0	51.6	47.8	----	189.0	207.0
Grandin	14.5	15.7	55.2	61.3	38.8	47.2	43.0	----	170.0	211.0
Norm	14.1	14.5	54.9	60.0	41.4	49.6	45.5	----	175.0	200.0
Mean	14.3	15.1	55.0	60.3	39.9	47.2	----	----	173.0	201.0
C.V. %	1.9	1.6	1.2	1.5	6.9	8.6	----	----	7.0	8.4
LSD .05	0.1	0.1	0.3	0.4	1.2	1.9	----	----	5.7	7.8

Returns ($/acre)

Tillage system	1995			1996		
Variety	*No-till*	*Reduced-till*	*Conventional*	*No-till*	*Reduced-till*	*Conventional*
AC Minto	137.0	150.0	150.0	193.0	176.0	189.0
Amidon	166.0	192.0	191.0	207.0	186.0	207.0
Bergen	169.0	202.0	198.0	225.0	202.0	194.0
Grandin	152.0	185.0	174.0	231.0	199.0	204.0
Norm	167.0	177.0	181.0	215.0	189.0	197.0
Mean	158.2	181.2	178.8	214.2	190.4	198.2

1996 Hettinger Safflower Variety Trial

Variety	Test weight	10% bloom	Ht	Oil	Yield				
					1996	1995	1993	2yr	3yr
	lbs/bu	days	cm	%	lbs/A				
AC Stirling	39.1	92	63	31.9	2487	2863	1831	2675	2394
Centennial	36.6	97	72	37.4	2114	3527	1250	2820	2297
S-541	37.1	97	71	39.0	2196	3276	1271	2736	2248
Finch	42.0	95	73	34.6	2174	2938	1333	2556	2148
Montola 2000	36.8	95	59	37.5	2222	2870	1277	2546	2123
Morlin	37.6	98	63	35.8	1227	2552	1192	1890	1657
Montola 2001	36.9	95	66	38.0	1900	2735			
S-317	36.0	96	71	37.2	3014				
S-518	35.5	96	68	38.0	2687				
Hi Pro L	36.5	94	72	41.5	2107				
Erlin	36.4	91	59	36.0	1747				
91B6342	37.7	96	63	37.1	2127				
90B6011	36.5	98	76	36.8	1807				
91B6668	37.1	97	67	36.6	1807				
91B1126	38.0	99	76	36.2	1787				
91B1147	36.2	97	71	35.2	1769				
91B1130	35.5	97	72	37.0	1594				
91B1747	36.4	98	69	36.9	1533				
Trial mean	37.1	96	68	36.7	2013	2891	1253		
C.V. %	2.2	1	5	1.9	11	11	20		
LSD 5%	1.2	2	5	1.0	317	451	357		
LSD 1%	1.5	3	7	1.3	423	601	478		

Planting date: April 23 Harvest date: September 3
Seeding rate: 400,000 live seeds/A
Yield goal: 2000 lbs/A
Herbicides applied: 3.5 pts/A Sonalan, Fall pre-plant incorp.
Yields and oil content are adjusted to 8% moisture.

Canola - Green Fallow — **Dickinson**

Variety	Days to Flower	Flower Duration	Days to Maturity	Plant Height	Lodging Score	Seeds	Oil	Test Weight	Grain Yield
				in	0-9	Lb	%	lbs/bu	lbs/ac
BULLET	48	17	92	25.0	1.0	125889	43.1	47.1	627.0
EBONY	54	12		26.6	0.0	117466	45.0	42.6	891.5
JEWEL	50	14	93	24.5	0.0	124650	44.3	46.1	1006.2
OAC SPRINGFIELD	49	14	93	23.8	0.0	100370	43.8	47.0	762.2
PEARL	53	14	94	26.1	0.0	132286	42.7	46.1	776.5
REWARD	42	20	83	23.2	1.5	213715	41.9	49.4	709.2
TOBIN	41	21	82	24.1	1.8	210884	40.8	51.1	797.3
Mean	50	15	91	26	0	132661		46.2	895.7
C.V. %	2	7	1	6	233	13		2.4	20.9
LSD .05	1	1		2.2	0.9	23785		1.6	NS

Planting Date: May 1
Harvest Date: July 26 (Reward and Tobin); August 6 (BC 94-123, Bullet, Jewel, LG 3260, LG 3300, LG 3310, LG 3369, OAC Springfield, Pearl, PSL 121); August 7 (PSL 124); August 8 (Ebony); August 9 (PSL 9603).
Lodging: 0 = Upright, 9 = Completely flat
Previous crop: Sweet clover (plow down); Soil test results: 54 lbs N, 18 ppm P - Applied 210 lbs Urea per acre; Applied 1 pt Treflan per acre on April 26; Applied 2 oz Malathion per acre on July 13 (Blister beetle control).

Canola - Recrop — **Glen Ullin**

Variety	Seeds	Oil	Test Weight	Grain Yield
	lbs	%	lbs/bu	lbs/ac
Crusher	137882	41.2	50.4	738.6
Cyclone	140244	41.9	50.1	833.3
Hyola 308	135554	42.7	50.1	1625.4
Reward	149803	43.4	51.0	1088.8
Mean	140871	--	50.4	1071.5
C.V. %	7.4	--	1.0	8.1
LSD .05	NS	--	0.8	139.3

Planting Date: May 28
Harvest Date: August 21 (Cyclone and Reward), August 27 (Hyola 308 and Crusher)
Previous crop: Oats; Applied 130lbs Urea and 25lbs DAP per acre; Applied 1.5pt Poast + 2pt COC per acre on June 17.

1996 Hettinger Canola Variety Trial

Variety	Test weight	Days to 10% blm	Days to 90% blm	Days to mature	Ht	Lodg.	Oil	Yield
	lbs/bu	---days from planting---			cm	*	%	lbs/A
Ebony	51.4	64	78	106	84	0	41.7	2107
PSL 121	52.2	60	78	105	74	0	39.6	2033
Topscore	52.4	63	78	106	85	0	40.3	2020
LG 3300	52.0	61	77	105	74	0	41.0	1907
LG 3310	52.4	61	78	105	75	1	40.2	1867
PSL 124	52.3	63	80	107	85	0	40.3	1827
Pearl	53.2	63	79	106	85	2	39.4	1820
LG 3260	52.7	60	76	104	62	1	41.2	1793
Jewel	52.5	60	77	105	69	4	40.4	1727
LG 3369	52.6	60	76	106	70	2	41.0	1680
Reward**	53.0	59	77	96	61	4	40.4	1647
Tobin**	53.9	59	77	96	68	2	39.5	1520
PSL 9603	49.9	64	80	108	86	0	41.2	1427
Trial mean	52.3	61	78	104	75	2	40.5	1798
C.V. %	1.1	1	1	1	7	85	1.5	11
LSD 5%	0.8	1	1	2	8	2	0.8	293
LSD 1%	1.1	1	1	2	10	2	1.1	392

Planting date: April 19 Harvest date: August 7
Seeding rate: 7.5 lbs/A, ** = 4.5 lbs/A
Yield goal: 2000 lbs/A
Herbicide applied: 3.5 pt/A Sonalan, Fall pre-plant incorporated
Insecticide applied: 5 lbs/A Furadan CR-10 with seed
* = Lodging 0 - 9; 0 = no lodging, 9 = laying flat on ground
** = Polish type (B. rapa)

1996 Hettinger Tame Mustard Variety Trial

Variety	Type*	Test weight	Days to mature	Ht	Yield 1996	Yield 1995	Yield 1993	Yield 2yr	Yield 3yr
		lbs/bu		cm	lbs/A				
Tilney	Y	57.7	91	78	1880	2248	2485	2064	2204
Gisilba	Y	57.4	90	70	1860	2006		1933	
AC Vulcan	O	55.0	92	88	1920				
Forage	O	55.6	93	89	1800				
Viscount	Y	57.4	91	78	1773				
AC Pennant	Y	57.4	91	74	1767				
Trial mean		56.8	92	79	1833	1807	2335		
C.V. %		0.3	0.6	6	8	10	15		
LSD 5%		0.3	1	7	206	257	--		
LSD 1%		0.4	1	10	ns	352	--		

* Type: O = Oriental, Y = Yellow
Planting date: April 24 Harvest date: August 7
Seeding rate: Yellow = 15 lbs/A, Oriental = 8 lbs/A
Yield goal: 2000 lbs/A
Herbicide applied: 3.5 pts/A Sonalan, Fall applied.
Yields are adjusted to 8% moisture.

1996 Hettinger Crambe Variety Trial

Variety	Test weight	Oil content	Plant height	Yield 1996	1995	1993	2yr	3yr
	lbs/bu	%	cm	lbs/A				
BelAnn	32.0	34.2	68	2160	1660	2575	1910	2132
Prophet	31.1	33.9	65	2147	1587	2390	1867	2141
Indy	32.0	34.0	64	1813	1220	2585	1516	1873
BelEnzian	31.2	33.1	69	1500	1553	2421	1526	1825
Meyer	31.1	33.9	60	1580	973	1877	1276	1477
C-22	32.2	33.7	62	2320				
NM28	32.7	35.6	68	2060				
C-29	31.8	34.0	68	2007				
NM95	33.4	34.0	66	1993				
C-37	32.2	34.0	62	1967				
NM97	32.6	33.6	61	1953				
NM15	32.1	33.0	62	1553				
NM19	31.9	34.4	65	1473				
NM09	32.6	33.5	61	1460				
NM99	32.9	34.8	58	1253				
Trial mean	32.1	34.0	64	1816	1472	2261		
C.V. %	3.4	1.7	8	16	21	15		
LSD 5%	1.6	0.8	7	404	ns	494		
LSD 1%	ns	1.1	ns	540	ns	659		

Planting date: April 23 Harvest date: August 9
Seeding rate: 16 lbs/A
Yield goal: 2000 lbs/A
Herbicide applied: 3.5 pts/A Sonalan, Fall pre-plant incorp.
ns = no statistical difference between varieties.

Crambe - Green Fallow — **Dickinson**

Variety	Days to Flower	Flower Duration	Days to Maturity	Plant Height	Lodging Score	Seeds	Oil	Test Weight	Grain Yield
				in	0-9	Lb	%	lbs/bu	lbs/ac
Belann	55	13	87	28	3	75592	34.1	29.1	2126.5
Belenzian	54	14	87	28	4	62539	34.3	28.9	1807.0
Indy	54	13	86	28	2	68880	34.2	29.0	1839.8
Meyer	54	12	85	27	1	70927	35.2	29.9	1482.8
Prophet	54	15	87	28	3	55363	35.4	27.1	2109.0
Mean	52	14	86	28	2	69767	34.9	29.3	1751.4
C.V. %	2	9	1	4	49	10	2.4	2.9	11.8
LSD .05	2	2	1	1	2	9755	1.2	1.2	295.6

Planting Date: May 1 (No-Till)
Harvest Date: July 31
Lodging: 0 = Upright, 9 = Completely flat
Previous crop: Black lentil (burn down); Soil test results: 31 lbs N, 12 ppm P - Applied 250 lbs Urea and 25 lbs DAP per acre; Applied .75pt Roundup + 1pt Class Act + .25pt 2,4-D ester per acre on April 23.

Flax - Recrop — **Glen Ullin**

Variety	Seeds	Test Weight	GrainYield
	lbs	lbs/bu	bu/ac
Linora	80031	53.4	37.6
Neche	80337	52.9	35.9
Omega	78685	53.6	35.4
Prompt	81944	54.1	31.8
Verne	85326	54.1	33.6
Mean	81265	53.6	34.9
C.V. %	4.4	1.6	9.5
LSD .05	5555	1.3	5.1

Planting Date: May 28
Harvest Date: August 27
Previous crop: Oats; Applied 130lbs Urea and 25lbs DAP per acre; Applied 1.5pt Poast + 2pt COC per acre on June 17.

Flax Variety Description

Variety*	Origin	Year Released	Relative Maturity	Seed[1] Color	Plant Height	Wilt	Relative Yield Ability
Linora	Can.	1993	late	br.	tall	R	v.good
Neche	ND	1988	mid	br.	med.	R	good
Flanders	Can.	1989	late	br.	med.	MS	good
Somme	Can.	1989	mid	br.	med.	MS	good
Omega	ND	1989	mid	yel.	med.	MS	v.good
Day	SD	1989	early	br.	med.	MR	good
Prompt	SD	1988	early	br.	med.	MR	good
Verne	MN	1987	early	br.	med.	R	v.good
Linton	ND	1985	early	br.	med.	R	v.good
NorMan	Can.	1984	mid	br.	med.	MR	good
Rahab	SD	1984	mid	br.	med.	MR	good
Clark	SD	1983	early	br.	med.	MR	good
NorLin	Can.	1982	early	br.	med.	MS	good
Flor	ND	1981	early	br.	med.	MS	v.good
McGregor	Can.	1980	late	br.	tall	R	v.good
Culbert 79	SD	1979	early	br.	med.	MR	good
Dufferin	Can.	1975	late	br.	tall	R	good

[1] bl. = Blue; br. = Brown; yel. = Yellow.

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

1996 Hettinger Flax Variety Trial

Variety	Test weight	10% bloom	Plant height	Yield				
				1996	1995	1993	2yr	3yr
	lbs/bu	days	cm	bu/A				
Flor	54.2	44	56	24.0	34.1	39.8	29.0	32.6
Norlin	54.9	45	55	17.6	32.1	43.2	24.8	31.0
Somme	54.6	45	53	20.0	34.1	38.2	27.0	30.8
Rahab 93	54.3	43	48	16.7	31.5	40.2	24.1	29.5
Linora	54.0	45	54	19.8	31.3	37.4	25.6	29.5
Norman	54.6	44	47	19.0	27.0	41.3	23.0	29.1
McDuff	54.2	45	53	17.6	32.9	36.7	25.2	29.1
McGregor	54.2	44	50	21.1	34.9	31.0	28.0	29.0
Prompt	54.6	44	54	17.8	31.3	36.4	24.6	28.5
Flanders	54.3	45	52	20.3	30.8	34.2	25.6	28.4
Omega	54.1	46	53	18.6	30.5	35.3	24.6	28.1
Neche	54.6	44	47	17.9	27.7	36.2	22.8	27.3
Linton	54.4	43	46	16.2	26.0	38.7	21.1	27.0
AC Emerson	54.2	45	51	21.4	32.8		27.1	
Verne 93	54.5	44	56	21.9	30.1		26.0	
Linott	54.7	44	56	19.7	27.8		23.8	
Culbert	54.7	44	53	16.7	30.0		23.4	
Bison	54.7	45	56	16.0	26.8		21.4	
CDC Normandy	54.8	45	53	21.2				
Trial mean	54.5	44	52	19.2	30.8	36.6		
C.V. %	0.4	2	6	13.4	14.1	9.5		
LSD 5%	0.3	1	5	4.3	ns	5.8		
LSD 1%	0.5	3	7	5.7	ns	7.8		

Planting date: May 21 Harvest date: September 3
Seeding rate: 32 lbs/A
Yield goal: 30 bu/A
Herbicide application: 3.5 pt/A Sonalan, Fall pre-plant incorp.
Sonalan herbicide is not registered on flax and caused thin stands in this trial.
ns = no statistical difference between varieties.

Field Pea - Green Fallow							Dickinson
Variety	Type	Flower Duration	Days to Flower	Days to Maturity	Plant Height	Lodging Score	Seeds
					in	0-9	lbs
ARVIKA	FG	7	51	79	15.3	7.8	2698
ASTINA	G	13	44	75	17.1	0.8	1860
AUSTRIAN WINTER	G	11	51	--	12.5	7.8	3795
CARNEVAL	Y	10	47	78	20.0	1.3	1844
CENTURY	Y	9	49	79	14.6	7.0	1984
COLUMBIAN	G	19	35	70	10.2	8.0	2379
DELTA	Y	11	46	77	16.3	1.0	1941
ESPACE	G	11	46	77	19.2	0.0	1884
EXPRESS	Y	10	48	78	13.7	5.3	1752
GRANDE	Y	9	49	78	20.1	2.0	1668
MAGDA	FG	8	49	79	13.7	7.3	2576
MAJORET	G	10	46	79	20.5	0.5	1786
MIKO	Y	10	46	78	19.1	1.8	1725
PROFI	Y	12	46	76	18.4	2.3	1841
PROMAR	MF	15	41	79	16.2	1.0	1443
RADLEY	G	11	46	77	11.3	6.0	2468
RICHMOND	Y	12	45	76	10.1	7.0	2098
SIRIUS	FD	9	47	74	13.2	7.5	1704
SWING	Y	13	44	75	19.5	1.5	1991
TENOR	FD	13	44	76	16.7	4.8	1763
TRAPPER	Y	11	50	79	13.3	7.8	3358
VOYAGEUR	Y	11	47	78	17.1	0.5	2334
WHERO	M	7	52	80	8.2	9.0	1864
YORKTON	Y	10	48	79	17.2	1.3	1900
Mean		8	46	77	15.6	4.1	2088
C.V. %		11	2	2	13.6	22.9	6
LSD .05		1	1	2	3.0	1.3	168

Planting Date: May 13
Harvest Date: August 19 (except for Arvika, Trapper, Century, Austrian Winter, Whero, which were harvested on August 5)
Type: FG = Forage, MF = Marrowfat, FD = Feed, M = Maple, G = Green, Y = Yellow

Field Pea - Green Fallow						Dickinson
		Yield			Average Yield	
Variety	Test Weight	1994	1995	1996	2 year	3 year
	lbs/bu			lbs/ac		
ARVIKA	61.4	--	--	1811.6	--	--
ASTINA	62.9	--	--	1792.4	--	--
AUSTRIAN WINTER	63.9	--	--	1559.1	--	--
CARNEVAL	63.0	--	2816.8	1723.4	2270.1	--
CENTURY	62.6	1678.1	2719.4	1349.8	2034.6	1915.8
COLUMBIAN	61.8	--	1273.5	1156.2	1214.9	--
DELTA	64.1	--	--	1914.9	--	--
ESPACE	63.3	--	--	2117.8	--	--
EXPRESS	62.8	1611.1	2586.4	1827.9	2207.2	2008.5
GRANDE	63.3	--	--	2381.2	--	--
MAGDA	61.0	--	--	1853.6	--	--
MAJORET	63.6	--	2619.7	1745.2	2182.4	--
MIKO	63.0	--	2489.1	1951.5	2220.3	--
PROFI	62.1	1699.0	2646.8	1726.9	2186.8	2024.2
PROMAR	61.9	--	--	1434.6	--	--
RADLEY	62.5	--	1607.6	1415.1	1511.3	--
RICHMOND	61.9	--	--	1498.1	--	--
SIRIUS	61.8	--	--	1726.7	--	--
SWING	64.0	--	--	1923.9	--	--
TENOR	64.3	--	--	1875.0	--	--
TRAPPER	63.1	1429.8	2214.8	1866.8	2040.8	1837.1
VOYAGEUR	63.6	--	--	1737.2	--	--
WHERO	62.0	--	--	1293.8	--	--
YORKTON	63.0	--	--	1715.7	--	--
Mean	62.8			1722.3		
C.V. %	1.6			17.1		
LSD .05	1.4			NS		

Previous crop: Rye (plow down); Soil test results 29 lbs N and 19 ppm P - No fertilizer applied; Applied 2.5 pt Sonolan per acre on April 23; Applied 2 oz Pursuit + 2 pt Scoil per acre on June 10.

Field Pea - Recrop	Glen Ullin

Variety	Cotyledon Color	Seeds	Test Weight	Grain Yield
		lbs	lbs/bu	lbs/ac
Arvika	Forage	2421	61.5	2828.5
Carneval	Yellow	2042	63.9	2815.5
Century	Yellow	1876	63.4	2762.6
Columbian	Green	2143	63.6	1850.5
Express	Yellow	1918	62.9	3072.6
Grande	Yellow	1726	64.6	3551.9
Magda	Forage	2600	62.8	2809.2
Majoret	Green	1801	64.3	2595.5
Profi	Yellow	1931	63.6	2886.7
Radley	Green	2322	63.3	2878.3
Sirius	Feed	1914	62.9	3168.4
Trapper	Yellow	3189	63.5	2655.9
Mean		2157	63.3	2823.0
C.V. %		14.0	1.3	9.5
LSD .05		435	1.2	385.1

Planting Date: May 28
Harvest Date: August 21
Previous crop: Spring wheat; Applied 130 lbs Urea and 25 lbs DAP per acre; Applied 1.5 pt Poast + 2 pt COC per acre on June 17.

1996 Hettinger Field Pea Variety Trial

Variety	Type*	Test weight	10% bloom	90% bloom	Harvest height	100 KWT	Yield 1996	Yield 1995	Yield 2yr
		lbs/bu	days	days	cm	g	----	lbs/A	-----
Express	Y	63.1	66	79	52	21.6	3689	4400	4044
Profi	Y	63.6	64	77	59	21.3	3414	4027	3720
Radley	G	63.1	65	77	45	18.8	3600	3591	3596
Trapper	Y	64.1	66	81	35	12.3	2978	3355	3166
Carneval	Y	63.4	66	77	64	20.1	3502	2764	3133
Columbian	G	63.2	58	77	23	21.2	3094	3100	3097
Majoret	G	64.4	66	77	63	25.3	3414		
Trial mean		63.6	64	78	49	20.1	3384	3553	
C.V. %		0.6	1	1	22		9	10	
LSD 5%		0.7	1	1	19		509	608	
LSD 1%		1.0	1	1	27		ns	848	

Planting date: April 23 Harvest date: August 9
Seeding rate: 300,000 live seeds/A (approx. 150 lbs/A)
Yield goal: 3000 lbs/A
Herbicide applied: 3.5 pts/A Sonalan, Fall pre-plant incorp.
* Type: Y = Yellow cotyledon, G = Green cotyledon

Field Pea Pop-up Fertilizer Trial - Green Fallow — **Dickinson**

Variety	N Fertilizer Rate	Plant Stand	Seeds	Test Weight	Grain Yield
	lbs/ac		lbs	lbs/bu	lbs/ac
Trapper	0	288985	2887	61.1	1664.2
Trapper	10	195922	2920	60.5	1578.9
Trapper	5	253066	2680	61.5	1610.7
Mean		245991	2829	61.0	1617.9
C.V. %		9.8	11.7	1.1	7.9
LSD .05		41900	NS	NS	NS

Planting Date: May 13
Harvest Date: August 19
Previous crop: Rye (plow down); Seeding rate approx 110 lbs/ac; Soil test results 29 lbs N and 19 ppm P - No fertilizer applied; Applied 2.5 pt Sonolan per acre on April 23; Applied 2 oz Pursuit + 2 pt Scoil per acre on June 10.

Field Pea Pop-up Fertilizer Trial - Recrop — **Glen Ullin**

Variety	N Fertilizer Rate	Plant Stand	Seeds	Test Weight	Grain Yield
	lbs/ac		lbs	lbs/bu	lbs/ac
Trapper	0	190698	3167	63.1	2786.9
Trapper	10	146289	3183	62.8	2665.4
Trapper	5	156738	3135	63.1	2751.4
Mean		164357	3162	63.0	2734.6
C.V. %		14.0	6.3	1.2	8.8
LSD .05		39872	NS	NS	NS

Planting Date: May 28
Harvest Date: August 21
Previous crop: Spring wheat; Seeding rate approx 110 lbs/ac; Applied 130 lbs Urea and 25 lbs DAP per acre; Applied 1.5 pt Poast + 2 pt COC per acre on June 17.

Field Pea Seeding Rate - Recrop — **Glen Ullin**

Variety	Seeding Rate	Plant Stand	Seeds	Test Weight	Grain Yield
			lbs	lbs/bu	lbs/ac
Trapper	300000	186779	3154	63.8	2903.1
Trapper	350000	181554	3082	63.1	3011.4
Trapper	400000	227270	3074	63.6	2925.8
Mean		198643	3103	63.5	2946.8
C.V. %		11.1	2.2	0.4	2.5
LSD .05		37981	NS	0.5	NS

Planting Date: May 28
Harvest Date: August 21
Previous crop: Spring wheat; Applied 130lbs Urea and 25lbs DAP per acre; Applied 1.5pt Poast + 2pt COC per acre on June 17.

1996 Hettinger Chickpea Variety Trial

Variety	Type*	Test weight	10% bloom	90% bloom	Plant height	100 KWT	Yield 1996	Yield 1995	Yield 2yr
		lbs/bu	days	days	inches	g	----	lbs/A	-----
Myles	D	57.0	62	80	12	18.0	2489	4069	3279
UC-27	K	61.4	59	79	12	50.5	2687	3766	3226
Sanford	K	61.7	66	81	15	43.2	2347	2762	2554
Dwelley	K	61.2	67	81	14	52.6	1751	1911	1831
Trial mean		60.3	64	80	14	40.3	2347	3208	
C.V. %		1.3	1	1	4	3.7	11	7	
LSD 5%		1.2	1	1	1	2.3	420	349	
LSD 1%		1.7	1	1	1	3.3	593	497	

Planting date: April 23 Harvest date: August 20
Seeding rate: K = 180 lbs pls/A, D = 120 lbs pls/A
Yield goal: 2000 lbs/A
Herbicide applied: 3.5 pts/A Sonalan, Fall pre-plant incorp.
* Type: D = Desi, K = Kabuli

Lentils - Green Fallow — **Dickinson**

Variety	Type	Flower Duration	Days to Flower	Days to Maturity	Plant Height	Lodging Score	Seeds
					in	0-9	lbs
Brewer	C	14	43	76	9.7	5.0	6900
CDC Matador	SB	12	48	80	10.5	4.0	14568
CDC Redwing	R	14	46	78	11.1	2.3	10993
CDC Richlea	C	13	46	80	10.8	4.3	8207
Crimson	R	13	48	77	6.9	7.8	11794
Eston	P	12	45	78	10.3	2.5	12318
Laird	C	14	51	85	14.1	1.8	6655
Pardina	SB	12	44	76	8.3	6.0	10036
Red Chief	R	13	44	77	9.4	4.5	7620
Mean		13	46	78	10.1	4.2	9899
C.V. %		10	2	2	8.8	17.1	4
LSD .05		2	1	2	1.3	1.1	572

Variety	Test Weight	Yield			Average Yield	
		1994	1995	1996	2 year	3 year
	lbs/bu	lbs/ac				
Brewer	57.0	652.0	1448.0	815.0	1131.5	971.7
CDC Matador	59.9	--	--	1132.4	--	--
CDC Redwing	59.9	--	--	1128.7	--	--
CDC Richlea	57.3	846.0	2108.2	1285.1	1696.7	1413.1
Crimson	60.6	1106.0	2009.2	810.3	1409.8	1308.5
Eston	60.3	701.0	1826.6	1024.7	1425.7	1184.1
Laird	56.6	545.0	1693.2	945.4	1319.3	1061.2
Pardina	60.1	--	--	652.0	--	--
Red Chief	56.8	--	--	740.4	--	--
Mean	58.7	--	--	948.2	--	--
C.V. %	2.5	--	--	14.8	--	--
LSD .05	2.1	--	--	205.0	--	--

Planting Date: May 13
Harvest Date: August 8 (Brewer, CDC Matador, CDC Redwing, Crimson, Eston, Pardina, Red Chief) August 19 (Laird)
Type: C = Chilean, R = Red, P = Persian, SB = Spanish Brown
Previous crop: Rye (plow down); Soil test results 29 lbs N and 19 ppm P - No fertilizer applied; Applied 2.5 pt Sonolan per acre on April 23.

1996 Hettinger Lentil Variety Trial

Variety	Type*	Test weight	10% bloom	Plant height	100 KWT	Yield 1996	Yield 1995	Yield 2yr
		lbs/bu	days	inchs	g		lbs/A	
CDC Richlea	C	61.1	62	10	5.5	2093	2087	2090
Eston	P	63.2	62	8	3.4	1293	2235	1764
Pardina	S	64.0	63	8	4.2	1240	1750	1495
Crimson	R	63.1	63	7	3.7	1156	1490	1323
Brewer	C	59.5	62	10	6.3	907	1103	1005
Laird	C	58.9	66	14	7.0	942	583	762
CDC Matador	S	63.5	66	11	2.8	1673		
CDC Redwing	R	62.7	63	9	4.0	1433		
Red Chief	R	60.2	63	10	6.2	1167		
Trial mean		61.8	63	10	4.8	1339	1426	
C.V. %		0.7	1	11		25	20	
LSD 5%		0.7	1	2		490	420	
LSD 1%		0.9	2	2		664	573	

Planting date: April 23 Harvest date: September 3
Seeding rate: 550,000 live seeds/A
Yield goal: 2000 lbs/A
Herbicide applied: 3.5 pts/A Sonalan, Fall pre-plant incorp.
* Type: P = Persian, C = Chilean, S = Spanish Brown, R = Red

Lentil - Recrop — **Glen Ullin**

Variety	Seeds	Test Weight	GrainYield
	lbs	lbs/bu	lbs/ac
Brewer	7204	58.9	1466.6
Chilean	8972	54.6	1274.6
Eston	13579	62.1	1514.0
Laird	7279	55.6	1072.0
Red Chief	8031	57.1	1450.8
Rose	10049	59.8	1617.7
Mean	9185	58.0	1399.3
C.V. %	3.1	2.6	10.6
LSD .05	432	2.2	224.1

Planting Date: May 28
Harvest Date: August 21 (Brewer, Chilean, Eston, Red Chief, Rose); August 27 (Laird)
Previous crop: Durum; Applied 130 lbs Urea and 25 lbs DAP per acre; Applied 1.5 pt Poast + 2 pt COC per acre on June 17.

1996 Hettinger Lupin Variety Trial

Variety	Type*	Test weight	10% bloom	90% bloom	Plant height	100 KWT	Yield 1996	Yield 1995	Yield 2yr
		lbs/bu	days	days	inches	g	---- lbs/A ----		
Primorski	W	58.2	60	80	11	35.7	773	1808	1290
Gungurru	B	59.4	62	77	9	16.6	524	1931	1228
Merrit	B	59.5	62	77	9	17.8	427	1713	1070
Progress	W	57.0	61	79	11	29.1	436	1363	900
Danja	B	59.4	62	78	11	19.7	560		
Ultra	W	58.7	61	78	11	34.3	347		
Trial mean		58.8	61	78	10	25.5	511	1386	
C.V. %		0.4	1	1	9		29	17	
LSD 5%		0.4	1	2	2		263	425	
LSD 1%		0.6	1	2	2		371	ns	

Planting date: April 23 Harvest date: September 3
Seeding rate: 250,000 live seeds/A
Yield goal: 2000 lbs/A
Herbicide applied: 3.5 pts/A Sonalan, Fall pre-plant incorp.
* Type: B = Blue, W = White
Moderate blister beetle infestation caused reduced yields.

1996 Hettinger Pinto Bean Variety Trial

Variety	Test weight	Yield 1996	Yield 1995	Yield 1994	Yield 2yr	Yield 3yr
	lbs/bu	----------	lbs/A	----------		
Topaz	53.8	1193	941	953	1067	1029
Fiesta	57.5	1027	830	993	928	950
Othello	55.0	809	1190	827	1000	942
Bill Z	53.0	631	954	793	792	793
Chase	54.4	676	889	560	782	708
Hatton	57.0	947	994		970	
Trial mean	55.3	905	966	832		
C.V. %	1.1	13	9	23		
LSD 5%	0.9	184	130	281		
LSD 1%	1.3	255	178	386		

Planting date: May 22 Harvest date: September 24
Seeding rate: 65 lbs live seeds/A
Yield goal: 2000 lbs/A
Herbicide application: 3.5 pts/A Sonalan, Fall PPI
2 pts/A Basagran

1996 Hybrid Corn - Recrop — **Dickinson**

Brand	Hybrid	RM	Grain	Tst Wt	Harvest Moisture	Silage Yield 70%	1996	1995	1994	3 year
		days	bu/a	lb/bu	%	Tons/acre				
Dekalb	343	84	79	54.8	57	19.6	5.9	5.5	3.6	5.0
Dekalb	385	85	70	52.4	64	18.3	5.5	6.5	--	--
Dekalb	412	91	71	51.0	61	19.1	5.7	--	--	--
Dekalb	442	94	72	50.6	60	19.4	5.8	--	--	--
Pioneer	3878	90	70	52.2	62	19.7	5.9	--	--	--
Pioneer	3893	89	99	54.0	61	20.4	6.1	--	--	--
Pioneer	3963	79	88	55.6	60	16.7	5.0	5.7	3.7	4.8
Pioneer	3970	76	82	58.9	59	16.8	5.0	--	--	--
Pioneer	3979	76	83	56.6	53	20.8	6.2	--	--	--
Mean			79	54	60	19.0	5.7			
C.V. %			16.2	2.3	7.0	14.7	14.6			
LSD .05			NS	1.8	6.1	4.1	1.2			

Planting Date: May 29
Harvest Date: Sept 11 for corn silage; Sept 17 for corn grain
Previous crop:Oat hay; Soil test resuls 12 lbs N, 9 ppm P - Applied 250 lbs Urea and 50 lbs DAP per acre
Applied 1pt Roundup + 1pt Class Act per acre May 29; Applied .66oz Accent + 1qt Scoil per acre June 12
Bushel per acre and Test weight are at 12% moisture.

1996 Hettinger Canary Seed Variety Trial

Variety	Test weight	Days to head	Plant height	Lodging	Grain Yield 1996	1995	2yr
	lbs/bu	days	cm	0-9	----- lbs/A		----
Keet	52.9	65	69	0	1787	808	1298
Elias	52.8	65	69	0	1700	611	1156
Trial mean	52.8	65	69	0	1743	709	
C.V. %	0.9	0	0	0	6	12	
LSD 5%	ns	ns	ns	ns	ns	ns	

Planting date: April 24 Harvest date: August 20
Seeding rate: 30 lbs live seeds/A
Yield goal: 2000 lbs/A
Herbicide application: 1.5 pts/A Buctril + 1.5 oz/A MCPE
ns = no statistical difference between varieties.

1996 Hettinger Grain Millet Variety Trial

Variety	Type	Test weight	Days to head	Grain yield 1996	1995	2yr
		lbs/bu	days	----- lbs/A		----
Dawn	Proso	55.3	64	1035	3434	2234
Rise	Proso	53.6	64	707	3246	1976
Earlybird	Proso	53.7	65	919	2994	1956
Sunrise	Proso	52.9	65	528	3362	1945
Minsum	Proso	55.0	63	1200	2445	1822
Huntsman	Proso	51.1	66	487	3138	1812
Sunup	Proso	53.8	64	613	2778	1696
Siberian	Foxtail	51.6	64	1019	2275	1647
Manta	Foxtail	51.8	63	789	2427	1608
Snowbird	Proso	53.9	63	734	2185	1460
Turghai	Proso	57.9	62	701	2185	1443
Cerise	Proso	56.3	63	693	1996	1344
Golden German	Foxtail	--	--	0	944	472
Trial mean		53.9	64	783	2344	
C.V. %		2.6	1	20	13	
LSD 5%		2.4	1	267	498	
LSD 1%		3.3	1	365	672	

Planting date: May 21 Harvest date: September 3
Seeding rate: 25 lbs live seeds/A
Yield goal: 2000 lbs/A
Poor stand establishment, dry soil conditions and grasshopper damage all contributed to reduced yields.

1996 Hettinger Spring Triticale Variety Trial

Variety	Test weight	1000 KWT	Days to head	Ht	Yield 1996	1995	2yr
	lbs/bu	g		cm		bu/A	
Companion	57.1	53	69	112	83.7	75.8	79.8
Wapiti	57.2	51	69	110	83.1	73.7	78.4
Frank	55.0	39	72	90	88.9	62.4	75.6
Norico	55.6	46	71	104	89.8	54.7	72.2
Trical 2700	52.0	45	72	115	69.4	56.9	63.2
RSI 301	56.4	43	72	84	75.7		
Trial mean	55.6	46	71	102	81.8	67.7	
C.V. %	0.7		1	3	5.7	15.9	
LSD 5%	0.5		1	5	6.9	16.1	
LSD 1%	0.7		2	7	9.5	ns	

Planting date: April 23 Harvest date: August 20
Seeding rate: 1 million live seeds/A
Yield goal: 60 bu/A
Herbicide application: 1.5 pts/A Buctril + 1.5 oz/A MCPE
ns = no statistical difference between varieties.

1996 Forage Barley and Oat - Recrop — **Dickinson**

Crop	Variety	Harvest Moisture	Hay Yield, DM Basis, 12%	1996	1995	1994	3 year
		%	Tons/acre				
oat	Bay	63	3.6	3.2	3.3	--	--
oat	Dumont	64	3.8	3.3	3.2	2.4	3.0
oat	Mammoth	67	3.3	2.9	3.4	--	--
oat	Paul	67	2.9	2.5	--	--	--
oat/pea	Dumont/Trap 5/5[1]	70	2.7	2.4	2.9	2.2	2.5
oat/pea	Dumont/Trap 10/15[2]	65	3.1	2.8	3.4	2.5	2.9
barley	B 7518	64	3.8	3.3	3.8	--	--
barley	Chopper	56	4.1	3.6	3.4	--	--
barley	Haybet	60	3.7	3.3	4.0	--	--
barley	Horsford	62	3.0	2.7	3.2	4.6	3.5
barley	Stark	64	3.2	2.8	3.7	--	--
barley	Weal	67	2.4	2.2	3.3	--	--
Mean		64	3.3	2.9			
C.V. %		4.6	11.6	11.6			
LSD .05		4.0	0.6	0.5			

Planting Date: May 14; planted at 800,000 Pure Live Seed (PLS) per acre, except for oat/pea mixtures were sown at 750,000 oat plus 487,000 pea PLS per acre([2]) and 375,000 oat plus 162,500 PLS per acre([1]); no herbicide applied.
Previous crop: Black lentil (plow down);Soil test results 70 lbs N, 12 ppm P - no fertilizer applied
Harvest Date: reps 1-4 of Stark and Weal harvested July 11; reps 1-4 of Horsford, Chopper, Haybet harvested July 16; all other varieties in reps 1&2 harvested July 22; all other varieties in reps 3&4 harvested July 24.

1996 Hettinger Oat Hay Variety Trial

Variety	Plant height	Moisture at harvest	Yield* 1996	1995	1993	2yr	3yr
	cm	%	-------Tons per acre--------				
Porter	85	50	5.82	4.74	7.64	5.28	6.07
Otana	97	58	5.67	4.78	7.39	5.22	5.95
Robert	88	55	5.28	3.92	8.52	4.60	5.91
Newdak	80	52	6.09	4.31	6.77	5.20	5.72
Monida	88	57	5.64	4.33	6.76	4.98	5.58
Dumont	93	60	5.08	3.53	6.35	4.29	4.98
Whitestone	74	46	6.63	4.89		5.76	
Paul	92	54	5.69	3.74		4.72	
Settler	89	37	7.13				
Riel	92	48	6.25				
Derby	98	55	6.23				
Troy	90	52	6.07				
Jerry	89	48	5.61				
Hytest	95	52	5.45				
Bay	75	54	5.39				
Calibre	95	59	5.06				
Trial mean	89	52	5.82	4.26	6.63		
C.V. %	4		8.09	11.49	15.18		
LSD 5%	5		0.67	0.71	1.44		
LSD 1%	6		0.89	0.95	1.94		

Planting date: April 22
Harvest date: July 24 (soft dough growth stage)
Seeding rate: 750,000 live seeds/A
Yield goal: 5 Tons/A
Herbicide used: 1.5 pt/A Buctril + 1.5 oz/A MCPE
* Yields are adjusted to 0% moisture content.

1996 Hettinger Millet Hay Variety Trial

Variety	Type	Plant height	Yield* 1996	Yield* 1995	Yield* 2yr
		cm	---- tons/A ----		
Manta	Foxtail	82	3.00	5.47	4.23
Earlybird	Proso	84	3.69	4.72	4.20
Rise	Proso	84	3.78	4.55	4.16
Siberian	Foxtail	83	2.89	4.81	3.85
Huntsman	Proso	83	3.45	4.22	3.84
Minsum	Proso	83	3.57	4.09	3.83
Dawn	Proso	83	3.20	3.90	3.55
Sunrise	Proso	88	2.94	4.16	3.55
Sunup	Proso	93	2.78	4.21	3.50
Snowbird	Proso	87	2.73	4.19	3.46
Cerise	Proso	91	2.51	4.34	3.42
Turghai	Proso	92	2.58	3.89	3.24
Trial mean		86	3.09	4.26	
C.V. %		9	13.30	7.31	
LSD 5%		ns	0.59	0.44	
LSD 1%		ns	0.79	0.59	

Planting date: May 21 Harvest date: August 27
Seeding rate: 25 lbs live seeds/A
Yield goal: 4 tons/A
*Yields are on a dry weight bases.
ns = no statistical difference between varieties.
Poor stand establishment, dry soil conditions and grasshopper damage contributed to reduced yields.

1996 Cereal/Pea Cutting Date Trial - Recrop — **Dickinson**

		Seeding rate		Harvest moisture				
Crop	Variety	Cereal	Pea	1st cut	2nd cut	3rd cut	4th cut	5th cut
barley/pea	Horsford/Trapper	1125000	487000	73	66	62	44	63
barley/pea	Horsford/Trapper	750000	325000	75	67	62	45	64
barley/pea	Horsford/Trapper	375000	162500	74	68	65	43	64
barley	Horsford	750000	0	74	65	62	43	65
oat/pea	Dumont/Trapper	1125000	487000	72	69	65	48	--
oat/pea	Dumont/Trapper	750000	325000	72	68	65	49	--
oat/pea	Dumont/Trapper	375000	162500	73	70	68	54	--
oat	Dumont	750000	0	74	68	67	54	--
oat/lentil	Dumont/Indian head	750000	350000	71	68	66	49	--
lentil	Indian head	0	350000	73	70	72	66	--
Mean				73	68	65	49	64
CV(%)				3.6	2.6	2.6	8.6	2.6
LSD .05				3.8	2.6	2.4	6.2	2.7

Planting date: May 14
Previous crop: Sweet clover; soil test results 47 lbs N, 15 lbs P - no fertilizer applied
Harvest date: all the plots were harvested 4 times; each time at a different growth stage; 1st cut was on July 11 at the early heading stage, 2nd cut was on July 16 at the milk stage, 3rd cut was on July 22 at the soft dough stage, 4th cut was on Aug 8 at the hard dough stage; the 5th cut was a cut of the regrowth from cut 1 of the barley/pea plots.

1996 Cereal/Pea Cutting Date Trial - Recrop — **Dickinson**

	Seeding rate		Yield DM Basis				
			Tons/acre				
Variety	Cereal	Pea	1st cut	2nd cut	3rd cut	4th cut	5th cut
Horsford/Trapper	1125000	487000	1.8	2.6	2.9	1.9	0.7
Horsford/Trapper	750000	325000	1.5	2.4	2.8	2.5	0.7
Horsford/Trapper	375000	162500	1.4	2.2	2.5	2.4	0.6
Horsford	750000	0	1.6	2.7	2.9	2.6	0.7
Dumont/Trapper	1125000	487000	2.2	2.6	2.8	2.9	--
Dumont/Trapper	750000	325000	2.1	2.4	2.8	2.6	--
Dumont/Trapper	375000	162500	1.9	2.2	2.3	2.7	--
Dumont	750000	0	2.0	2.4	2.6	2.9	--
Dumont/Indian head	750000	350000	2.0	2.4	2.6	2.9	--
Indian head	0	350000	0.4	0.9	1.2	2.1	--
Mean			1.7	2.3	2.5	2.6	0.7
CV(%)			11.1	7.1	10.9	15.0	12.0
LSD .05			0.3	0.2	0.4	0.6	0.1

1996 Cool Season Annual Forages - Recrop							Dickinson
			Hay Yield				
		Harvest	---------- DM Basis ----------				
Crop	Variety	Moisture	12%	1996	1995	1994	2 year
		%	---------- Tons/acre ----------				
barley	Azure	65	3.2	2.8	4.4	--	3.6
triticale	Frank	56	4.0	3.5	3.2	--	3.4
triticale	2700	52	4.7	4.2	--	--	--
triticale/pea	Frank/Trapper	54	3.5	3.0	2.7	--	2.8
triticale/pea	2700/Trapper	54	3.9	3.4	--	--	--
oat	Paul	66	2.6	2.2	--	--	--
oat	Whitestone	64	3.1	2.7	3.3	--	3.0
oat/pea	Paul/Trapper	67	2.4	2.1	--	--	--
oat/pea	Whitestone/Trapper	66	2.9	2.6	2.6	--	2.6
oat/pea	Whitestone/Carneval	65	3.0	2.7	--	--	--
oat/pea	CLOL 1	67	2.8	2.4	--	--	--
oat/pea	CLOL 2	66	2.8	2.4	--	--	--
pea	Arvika	67	2.7	2.4	--	--	--
Mean		62	3.2	2.8			
C.V.%		2.6	9.2	9.2			
LSD .05		2.0	0.4	0.4			

Planting Date: May 14; planted at 100 lbs (Azure), 75 lbs (Frank), 130 lbs (Frank[50] + Trapper[80]), 65 lbs (Whitestone), 115 lbs (Whitestone[35] + Trapper[80]), 115 lbs (Whitestone[35] + Carneval[80]), 70 lbs (Paul), 105 lbs (Paul[45] + Trapper[60]), 75 lbs (2700), 130 lbs (2700[50] + Trapper[80]), 100 lbs (Arvika), 110 lbs both (CLOL 1 & 2).
Harvest Date: Azure harvested July 11, Frank, Trical/Trapper, Trical 2700, Frank/Trapper, harvested Aug 8, other varieties harvested July 24.
Previous crop: Black lentil (plow down); Soil test results 70 lbs N, 12 ppm P - no fertilizer applied.

1996 Hettinger Alternative Forage/Hay Trial

Crop	Variety/Type	Yield 1996	1995	1993	2yr	3yr
		tons/A				
Triticale/Pea	Frank/Trapper	2.37	5.34		3.86	
Oat/Pea	Paul/Trapper	1.90				
Oat/Pea	Whitestone/Trapper	2.98	5.66		4.32	
Field Pea	Trapper	2.16				
Forage Pea	Arvika	1.43				
HRSW	Amidon	3.31	4.32	2.22	3.82	3.28
Barley	Azure	3.83	5.86		4.84	
Oat	Paul	3.32				
Oat	Whitestone	3.14	4.29		4.32	
Triticale	Frank	3.37	4.80	4.16	4.08	4.11
Foxtail Dalea	Common	0.00				
Millet	Golden German	2.96	5.33		4.14	
Millet	Siberian	1.35	5.42		3.38	
Millet	Hybrid Pearl	2.26	4.48	3.59	3.75	3.69
Sorghum/Sudan	Sudax	4.52	5.69	4.84	5.10	5.02
Corn	Pioneer 3963	2.84	4.66	3.57	3.75	3.69
Sudangrass	Piper	2.03	3.87	3.65	2.95	3.18
Trial Mean		2.75	4.97	3.84		
C.V. %		18.34	11.00	15.86		
LSD 5%		0.72	0.78	0.93		
LSD 1%		0.95	1.03	1.25		

Yields are adjusted to 12% moisture.
Grasshopper damage reduced yields.

1996 Warm Season Annual Forages — **Dickinson**

Crop	Variety	Harvest Moisture	DM Basis 12%	1996	1995	1992	3 year
		%	Tons/acre				
millet	German	56	5.4	4.8	4.3	4.7	4.6
millet	Siberian	64	4.1	3.6	2.9	4.3	3.6
sudangrass	Piper	52	3.1	2.8	2.9	--	--
foxtail	Dalea	60	1.8	1.6	--	--	--
sorghum x sudan	Sudax ST6E	65	5.2	4.6	--	--	--
sorghum x sudan	Greentreat 3	60	4.5	4.0	--	--	--
millet	Millex 32	62	4.0	3.5	--	--	--
Mean		60	4.0	3.6			
C.V. %		3.0	12.6	12.6			
LSD .05		2.6	0.8	0.7			

Planting Date: May 28
Harvest Date: Aug 29
Previous crop: Black lentil (plow down);Soil test results 70 lbs N, 12 ppm P - no fertilizer applied planted at 20 lbs (millets) and 25 lbs (Sudangrass and Sorghum x Sudan cross); no herbicide applied.

HETTINGER ALFALFA VARIETY DEMONSTRATION

Planting date: 4/28/92

Source	Variety	Plants/ft^2 8/28/92	6/30/93	5/4/94	5/4/95	5/21/96
AgriPro	9750	17	13	13	8	2
AgriPro	Dart	24	14	7	7	5
Northrup King	MultiKing 1	16	13	9	6	5
Northrup King	Spredor 2	10	16	13	9	6
Garst	636	8	12	14	11	5
Garst	645	11	13	11	8	4
Dekalb	120	28	16	12	7	4
Dekalb	122	9	17	9	8	4
Pioneer	5364	30	17	15	9	3
Pioneer	5262	25	12	11	6	5
public	Ladak	35	13	11	8	6
public	Travois	36	10	8	7	5
public	Vernal	22	18	9	7	5
Interstate	Clipper	33	22	10	7	3
Interstate	WL225	18	13	10	7	4
Cenex LOL	Blazer	27	19	11	7	4
Cenex LOL	Legend	29	12	12	8	4
Cargill	Trident II	11	14	9	10	5
Cargill	Crown II	30	14	12	7	2
Jacques	Multi-plier	12	11	11	6	4
Jacques	Chief	31	20	9	7	5
Planting date:	7/8/93		8/17/93			
ARS-Mandan	Rangelander		24	14	10	3
Ag. Canada	Anik		17	10	7	4
ARS-Mandan	Heinricks		19	9	7	3

Planting rate: 10 lbs/A

Nurse crop: Oats @ 25 lbs/A

Herbicides applied:
4/1/92 1.5 pt/A Treflan EC (PPI)
6/6/92 1.5 pt/A Poast + 2 pt/A Dash
5/3/93 1.5 pt/A Poast + 2 pt/A Dash
5/29/95 1.0 pt/A Buctril
5/30/96 1.5 pt/A Buctril

1996 Alfalfa Establishment Trial - Recrop					Dickinson
		Plant count		Yield DM Basis	
Year	Estabilishment method	Oat	Alfalfa	1st cut	2nd cut
1	Clear seeded into notill	--	--	1.2	--
	With an oat nurse crop	--	--	1.1	--
Mean		--	--	1.1	--
CV(%)		--	--	9.0	--
LSD .05		--	--	0.2	--
2	Clear seeded into notill	--	--	1.2	--
	With an oat nurse crop	--	--	1.1	--
Mean		--	--	1.1	--
CV(%)		--	--	21.2	--
LSD .05		--	--	0.5	--
3	Clear seeded into notill	--	523591	--	--
	With an oat nurse crop	610711	692604	1.8	--
Mean		--	608097	--	--
CV(%)		--	51.2	--	--
LSD .05		--	700886	--	--

Planting date: April 17; 10 lbs PLS/acre of alfalfa with a John Deere 750 drill
Harvest date: June 26 for year 1 & year 2 alfalfa; July 11 for year 3 with nurse crop
Year 1 established 1994, year 2 established 1995, year 3 established 1996
Previous crop: Black lentil (plow down); Soil test results 20 lbs N, 6 ppm P - Applied 100 lbs 0-44-0
Herbicide: Applied 1.25pt Post + 1qt Scoil + 1.5qt Am.Sulfate in 1996 notill plots on June 27 applied 1.5lbs/acre of Kerb 50W on Oct 9 to year 1 and 2 seedings.

1996 Alfalfa Plant Density Trial- Fallow				Dickinson
			------ Hay Yield ------	
Seeds per acre	PPA	Harvest moisture	12%	--- DM basis---
		%	--------- Tons/ac----------	
4 lbs PLS/ac	60708	68	1.0	0.8
Hand 2 lbs/ac	--	70	0.5	0.4
Hand 3 lbs/ac	--	70	0.6	0.5
Hand 1 lbs /ac	--	70	0.3	0.3
32 lbs PLS/ac	302568	66	0.8	0.7
16 lbs PLS/ac	207917	68	0.9	0.8
Hand 4 lbs/ac	--	70	0.6	0.5
0.58 lbs PLS/ac	102661	67	0.9	0.8
1 lbs PLS/ac	15732	70	0.8	0.7
2 lbs PLS/ac	34417	67	0.9	0.8
Mean	120667	69	0.7	0.6
C.V. %	13.0	2.5	13.9	13.9
LSD .05	23608.0	1.0	0.1	0.1

Planting Date: May 21
Previous crop: fallow
Harvest Date: Aug 2nd
Hebicide applied: 1pt Poust + 2pt Scoil on June 20; 4oz Pursuit + 2pt Scoil June 20.

1995 REDUCED RATES OF WILD OAT HERBICIDES ON SMALL GRAINS AT HETTINGER

Product	Rate	Weed control 1992	1993	1994*	1995	1995 Yield
	oz/A	----------%----------				bu/A
Hoelon + POC	32 + .25%	68	84	65	82	33.0
Hoelon + POC	24 + .25%	23	79	53	65	30.9
Hoelon + POC	16 + .25%	16	64	37	56	25.0
Hoelon + POC	8 + .25%	15	64	28		
Tiller	24	--	87	50	74	29.8
Tiller	18	--	82	50	67	27.7
Tiller	12	--	75	20	42	23.5
Tiller	6	--	48	35		
Assert + MVO	16 + 1%	89	82	86	76	28.2
Assert + MVO	12 + 1%	82	74	65	70	27.1
Assert + MVO	8 + 1%	66	62	70	70	23.5
Assert + MVO	4 + 1%	64	57	63		
Avenge + NIS	40 + .25%	45	42	78	58	21.8
Avenge + NIS	30 + .25%	43	46	54	56	24.9
Avenge + NIS	20 + .25%	37	32	50	22	21.2
Avenge + NIS	10 + .25%	42	9	28		
Achieve + AMS	7.2 + 1%	--	--	--	79	31.8
Achieve + AMS	5.4 + 1%	--	--	--	80	34.2
Achieve + AMS	3.6 + 1%	--	--	--	80	26.6
Untreated	0	0	0	0	0	11.3
C.V. %		55	38	47	21	26.0
LSD 5%		29	22	23	18	9.8

* % wild oat control for 1994 is a combined average of 2 trials consisting of an early application and a late application.

1995 Weed Control in Spring Barley at Hettinger, ND Bowman spring barley was seeded on May 5. Treatments were applied to 4 leaf barley and to 1/2" - 1" kochia, seedling to 2 leaf wild buckwheat, 2 - 3 1/2 leaf wild oats and 2 - 5 leaf foxtail on June 1 with 63 F, 81% RH, sunny sky and 2 mph wind. Weed density was 7 kochia, 16 wild buckwheat, 5 wild oat and 15 foxtail plants per square foot. Treatments were applied with a tractor mounted CO_2 propelled plot sprayer delivering 17 gpa at 40 psi through 8001 flat fan nozzles to a 5 foot wide area the length of 10 by 28 ft plots. A light rain fell on the trial beginning 13 hours after application. The experiment was a randomized complete block design with four replications. Evaluations were on June 16 and June 28 for crop injury and on June 28 and August 1 for weed control. Harvest for yield was on August 1.

		6/16	6/28				8/1				
Treatment	Product Rate	Bar inj	Bar inj	KOCZ	Wibw	Fxtl	KOCZ	Wibw	Fxtl	Wiot	Grain Yield
	oz/A	---------- % ----------									bu/A
Tough	16	0	0	99	70	12	97	71	12	0	37.4
Tough + Tiller	16 + 16	0	0	99	91	88	97	59	56	0	37.1
Tough + Assert + NIS	16 + 16 +.5%	0	0	84	71	28	92	61	40	82	38.7
Tough	32	1	0	99	65	49	98	46	25	24	35.2
Finesse+Banvel+2,4-D (LV4)+NIS	0.2+2+8+.5%	0	0	99	94	15	96	92	5	20	36.7
Finesse + Banvel + LV4 + NIS	0.3+2+8+.5%	0	0	99	94	62	99	97	34	21	34.6
Amber + Banvel + LV4 + NIS	0.14+2+8+.5%	0	0	99	97	0	97	87	0	0	34.8
Ally + Banvel + LV4 + NIS	0.3+2+8+.5%	0	0	99	95	40	97	91	0	0	33.2
Peak + Banvel + LV4 + NIS	0.4+2+8+.5%	1	0	99	94	18	99	97	0	0	34.6
Banvel + LV4	2 + 8	0	0	99	91	0	97	92	0	0	34.3
Untreated	0	0	0	0	0	0	0	0	0	0	34.6
C.V. %		254		9	25	95	4	37	139	162	13.7
LSD 5%		ns		11	28	42	6	37	41	35	ns
# of Reps		4	4	4	4	4	4	4	4	4	4

Summary

Crop injury caused by treatments were negligible. All treatments exhibited excellent season long kochia control and all treatments containing Banvel + LV4 also exhibited excellent season long control of wild buckwheat. Tough alone does not adequately control wild buckwheat. Several treatments exhibited activity on foxtail, however, adequate season long control was not achieved. Treatments containing Tough tended to be slightly higher yielding although not significantly.

1995 Peak EUP on Spring Barley at Hettinger, ND Bowman spring barley was seeded on May 5. Treatments were applied to 4 leaf barley and to 1/2" - 1" kochia and to seedling to 2 leaf wild buckwheat on June 1 with 51 F, 97% RH, sunny sky and 2 mph wind. Weed density was 7 kochia and 16 wild buckwheat plants per square foot. A non-ionic surfactant (Class Preference) at 0.25% v/v was added to each treatment. Treatments were applied with a tractor mounted CO_2 propelled plot sprayer delivering 17 gpa at 40 psi through 8001 flat fan nozzles to a 5 foot wide area the length of 10 by 28 ft plots. A light rain fell on the trial beginning 15 hours after application. The experiment was a randomized complete block design with four replications. Evaluations were on June 16 and June 27 for crop injury and on June 27 and August 1 for weed control. Harvest for yield was on August 1.

		6/16	6/27			8/1		
Treatment	Product Rate	Bar inj	Bar inj	KOCZ	Wibw	KOCZ	Wibw	Grain Yield
	oz/A			%				bu/A
Untreated		0	0	0	0	0	0	33.2
Harmony Extra + LV6	0.4 + 6	3	6	98	97	99	99	31.3
Harmony Extra + Banvel	0.4 + 2	0	0	99	96	99	98	33.8
Harmony Extra + Bronate	0.4 + 12	0	1	99	97	99	99	35.2
Peak	0.25	0	0	99	97	91	99	32.6
Peak + LV6	0.25 + 6	3	6	99	98	99	99	27.1
Peak + Banvel	0.25 + 2	0	0	99	92	99	97	30.9
Peak + Bronate	0.25 + 12	0	0	99	98	99	99	29.7
Peak	0.38	1	0	94	94	96	99	34.6
Peak + LV6	0.38 + 6	1	5	98	97	99	99	31.2
Peak + Banvel	0.38 + 2	0	0	99	94	99	99	31.5
Peak + Bronate	0.38 + 12	0	0	99	99	99	99	32.0
Peak	0.5	0	0	99	91	97	98	31.6
Peak + LV6	0.5 + 6	8	9	99	98	99	99	32.5
Peak + Banvel	0.5 + 2	0	0	99	97	99	99	34.6
Peak + Bronate	0.5 + 12	0	0	99	99	99	99	38.1
Peak + Amber	0.25+0.088	2	0	92	94	96	99	36.2
Peak + Amber + LV6	0.25+0.088+6	1	2	99	97	97	99	32.5
Peak + Amber + Banvel	0.25+0.088+2	0	0	99	97	99	99	32.2
Peak + Amber + Bronate	0.25+0.088+12	0	0	99	98	99	99	36.1
C.V. %		140	133	3	3	3	1	18.3
LSD 5%		2	3	3	4	4	2	8.5
# of Reps		4	4	4	4	4	4	4

Summary

Crop injury tended to be associated with treatments containing 2,4-D (LV6). Wild buckwheat and kochia control were excellent for all herbicide treatments regardless of rate or tank mix combination. Yields were generally poor due to adverse growing conditions.

1995 POST Applied Corn Herbicides at Hettinger Golden Harvest 1316 LF corn was seeded on May 15. Treatments were applied to 5 leaf corn and to 3 - 5 leaf wild oats and to 3 leaf - 4 inch wild buckwheat on June 14 with 77 F, 86% RH, sunny sky and 7 mph wind. Weed density was >20 wild oat plants and 1 wild buckwheat plant per square foot. Treatments were applied with a tractor mounted CO_2 propelled plot sprayer delivering 17 gpa at 40 psi through 8001 flat fan nozzles to a 5 foot wide area the length of 10 by 28 ft plots. The experiment was a randomized complete block design with three replications. Evaluations were on June 27 and July 5 for crop injury and on July 5 and July 17 for weed control. Plots were not harvest.

Treatment	Product Rate	6/27 Corn inj	7/5 Corn inj	7/5 Wiot	7/5 Wibw	7/17 Wiot	7/17 Wibw
	oz/A			%			
Tough	16	2	0	43	73	55	72
Accent + Tough	0.5 + 16	0	0	87	75	87	85
Accent + Fronteer	0.5 + 8	5	0	90	87	88	88
Accent + Banvel + NIS	0.5 + 8 + .5%	0	0	87	91	90	93
Accent + 2,4-D (LV4) + MVO	0.5 + 8 + 1%	0	0	87	15	90	58
Accent + Stinger + NIS	0.5 + 5.3 + .5%	0	0	90	62	92	58
Basis + MVO	0.33 + 1%	0	0	82	90	90	90
Basis+Banvel+NIS+AMS	0.33+4+.5%+1%	0	0	77	87	87	92
Basis + Tough	0.33 + 16	0	0	80	90	83	55
Permit + NIS	0.67 + .5%	0	0	13	93	17	83
Untreated	0	0	0	0	0	0	0
C.V. %		284		24	23	25	39
LSD 5%		3		27	27	30	46
# of Reps		3	3	3	3	3	3

Summary

Crop injury caused by treatments were minor or negligible. Tough alone did not provide adequate wild oat or wild buckwheat control, however, when tank mixed with Accent, both weeds were adequately controlled. The addition of Fronteer or Banvel to Accent provided excellent wild oat and wild buckwheat control. The addition of 2,4-D or Stinger to Accent did not provide adequate wild buckwheat control, however, wild oat control was not adversely affected. Basis alone provided excellent wild oat and wild buckwheat control. The addition of Tough to Basis may be antagonistic for weed control. Permit provided good wild buckwheat control.

PPI Corn Herbicides at Hettinger 1995. An experiment was conducted to evaluate grassy weed control from PPI applied herbicides in corn. Treatments were applied on June 14 with 77 F, 86% RH, clear and sunny sky, and 7 mph wind. Treatments were applied with a tractor mounted CO_2 propelled plot sprayer delivering 17 gpa at 40 psi through 8001 flat fan nozzles to a 5 foot wide area the length of 10 by 28 ft plots. Treatments were incorporated with a light field cultivator (Vibri-shank) and seeded on June 14 with Golden Harvest 1316 LF corn. The experiment was a randomized complete block design with three replications. Evaluations were on July 17 and on July 27.

Treatment	Product Rate	7/17 WIOT	7/27 WIOT
	oz/A	---- %	----
Harness Plus	16	75	75
Eradicane	80	88	90
Fronteer	13	55	60
Broadstrike/Dual	28	77	88
Untreated	0	0	0
C.V. %		42	38
LSD 5%		60	58

Summary

Varying degrees of foxtail control were observed but were not rated due to heavy wild oat pressure and a lack of a uniform foxtail population. Eradicane and Broadstrike/Dual treatments provided excellent season long wild oat control. Harness Plus and Fronteer treatments were active on wild oats, however, total control was not adequate. These 2 products should not be used as "stand alone" treatments in this area.

1995 Basis Herbicide with Commercial Adjuvants at Hettinger

Golden Harvest 1316 LF corn was seeded on May 15. Treatments were applied to 5 leaf corn, to 1 - 3 leaf foxtail and to 3 - 5 leaf wild oats on June 14 with 80 F, 78% RH, sunny sky and 7 mph wind. Weed density was 4 foxtail and 5 wild oat plants per square foot. Treatments were applied with a tractor mounted CO_2 propelled plot sprayer delivering 17 gpa at 40 psi through 8001 flat fan nozzles to a 5 foot wide area the length of 10 by 28 ft plots. The experiment was a randomized complete block design with four replications. Evaluations were on June 27 and July 5 for crop injury and on July 5 and July 17 for weed control. Plots were not harvest.

		6/27	7/5		7/17	
Treatment	Product Rate	Corn Inj.	Corn Inj.	Fxtl	Fxtl	Wiot
	oz/A			%		
Basis	0.33	0	0	60	27	99
Surfactants						
Basis + Preference	0.33 + .5%	6	4	87	74	99
Basis + R-11	0.33 + .5%	6	0	85	80	99
Basis + Spray Booster S	0.33 + .5%	1	0	82	65	99
Basis + Activator 90	0.33 + .5%	12	2	80	84	99
Surfactant with Silicone						
Basis + Kenetic	0.33 + .1%	1	0	88	74	99
Vegetable Oil Concentrate						
Basis + Class EV Conc.	0.33 + .5%	1	0	60	56	74
Petroleum Oil Concentrate						
Basis + Class 17% Conc.	0.33 + .5%	2	0	65	32	99
Methylated Seed Oils						
Basis + Scoil	0.33 + 1%	1	0	91	88	99
Basis + Sun-it II	0.33 + 1%	12	5	88	82	99
Surfactant + Water Conditioning Agent						
Basis + Optima	0.33 + .5%	20	8	89	90	99
Surfactant + Fertilizer						
Basis + Class APM 28	0.33 + .75%	4	1	85	78	99
Basis + Class Act	0.33 + 2%	9	5	90	85	99
Basis + Destiny	0.33 + 1%	6	2	90	88	99
Basis + AMS + Preference	0.33 + 2% + .5%	16	6	90	80	99
Miscellaneous						
Basis + Ammonium Sulfate	0.33 + 2%	9	2	80	62	99
Untreated		0	0	0	0	0
C.V. %		146	168	18	29	13
LSD 5%		13	5	20	29	17
# of Reps		4	4	4	4	4

Summary

Significant crop injury was noted on treatments containing Basis + Optima and Basis + ammonium sulfate (AMS) + Preference. Foxtail control was generally adequate for all treatments early on with the exception of Basis + Class EV Concentrate and Basis + Class 17% Concentrate. Treatments containing Basis + Scoil, Basis + Optima, Basis + Class Act and Basis + Destiny provided adequate season long foxtail control. All treatments provided excellent wild oat control except for Class EV Concentrate.

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