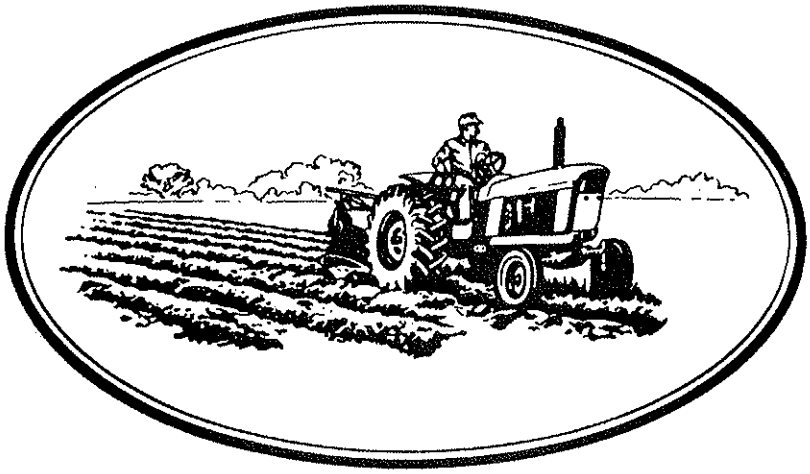
FIFTH
ANNUAL

WESTERN DAKOTA

CROPS DAY RESEARCH REPORT



HETTINGER ARMORY
DECEMBER 8, 1988

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Hettinger, ND 58639

5th ANNUAL WESTERN DAKOTA CROPS DAY

DECEMBER 8, 1988

HETTINGER ARMORY

MST

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

10:30 Welcome
Dr. J.L. Ozbun, President, North Dakota State University, Fargo.

10:45 Crop Variety Updates and Highlights of Ongoing Crop Production Research
Tom Conlon, Superintendent and Agronomist, Dickinson Experiment Station

Eric Eriksmoen, Agronomist, Hettinger Research & Extension Center

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

1:00 Director's Comments
Dr. H. R. Lund, Director of Agriculture, NDSU, Fargo. "Industrial Agriculture"

Dr. W. H. Pietsch, Director of Extension, NDSU, Fargo.

1:30 Ag Industry Update
"New Variety Releases: Corn, Sunflowers and Alfalfa". Bob Clow, Dahlgren & Co., Dickinson.

"Leif Wheat and Top Farm Corn". John Finstad, Top Farm Hybrids, Lisbon.

"Treflan: Weed Control and Concerns". Cal Thorson, Elanco, Bismarck.

2:00 Management for Moisture Conservation
Ernest French, Superintendent, Williston Experiment Station, Williston, ND.

2:30 Buckwheat Production in Southwestern North Dakota
Lee Mayer, Producer, Mott, ND.

3:00 Kochia Control and Herbicide Resistance
Marlin Hinrichs, SW District Extension Agronomist, Dickinson, ND.

3:30 Conclusion
Drawing for door prizes, coffee and opportunity to visit with sponsors.

ACKNOWLEDGEMENTS

The Hettinger Research & Extension Center and Dickinson Experiment Station 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 past and present commitment and support.

1988 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.

Darryl Birdsall, New Leipzig
Gordon Paulson, Scranton
August and Perry Kirschmann, Regent
Calvin Hepper, Selfridge
Dan Christman, Hettinger
Walter and Amos Gietzen, Glen Ullin
Ted Reich, Beulah
Pat Doll, Hannover
Golden Valley SCD, Beach

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DICKINSON EXPERIMENT STATION

GROWING CONDITIONS - 1988

Severe drought prevailed throughout the growing season of 1988.

Total precipitation for the twelve month period, September, 1987 through August, 1988 was 8.63 inches as compared to the 94 year average of 15.89 inches.

Low rainfall throughout the entire growing season was coupled with temperatures that were far above average. The month of June was the most devastating in terms of adverse weather with average temperatures 14°F higher than the 94 year norm, and with precipitation 2 inches below average. Evaporation for June, July and August was 34.9 inches compared to the norm of 21.3 inches. High temperature, low precipitation and excessive wind combined to create the worst growing conditions experienced in this region for the past fifty years.

The most severe plant disease problem in 1988 was the onset of wheat streak mosaic, which was an extremely serious problem, particularly on winter wheat, early in the season. Effects of the drought masked development of other leaf diseases.

WEATHER DATA SUMMARY

Dickinson 1987-88

Precipitation	1986-87	1987-88	94 Year Average
Sept. - Dec. 1986	6.43	1.16	3.15
Jan. - Mar. 1987	2.73	1.96	1.53
April - June	4.36	3.64	7.30
July - Aug.	7.67	1.87	3.91
Total	21.19	8.63	15.89

Average Temperature °F	1987	1988	94 Year Average
April	48	42	41
May	57	59	54
June	66	75	61
July	69	71	69
August	62	68	67

GROWING CONDITIONS

HETTINGER RESEARCH AND EXTENSION CENTER

-1988-

Total precipitation for the twelve month period, September, 1987 through August, 1988 was 10.12 inches or 37% below normal. Fall precipitation during the last four months of 1987 was 44% below normal resulting in reduced soil water recharge for the 1988 growing season. No precipitation in April contributed to delayed seed germination and severely reduced precipitation throughout the growing season (April - August) caused extreme drought conditions.

The average daily high temperature in June was 87.2 F. These high temperatures along with drought stressed plants caused a high percentage of sterility (blast) in several crops (oats, rye, winter wheat and dry edible beans).

A severe infestation of wheat streak mosaic destroyed much of the winter wheat crop throughout the area.

WEATHER DATA SUMMARY
HETTINGER, 2988

Precipitation	1987-88	30 Year Average
Sept. - Dec. 1987	1.31	2.97
Jan. - Mar. 1988	2.24	1.13
April - June	4.79	8.08
July - August	1.78	3.81
	10.12	15.99

Average Temperature F.	1988 Average	30 Year Average
April	43.4	42
May	58.0	54
June	74.8	64
July	71.4	70
August	69.9	69

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 is 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 in helping to differentiate the production variables in question so 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 use four replications or repetitions of the variable in question. For example, the variety, Stoa 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 was 35.96%. 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.% of over 10. Attempts are made to control human error and some environmental conditions such as conducting field studies on a uniform soil so variability between replicates is minimized with a resulting low value for C.V.%. 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 being meaningful unless the results differ by more than the LSD value.

1988 Dickinson Hard Red Spring Wheat Variety Trial

Variety	Bu/A Avg.	Test Wt lbs.	Heading Date	Height in.
Leif *	17.2	59.0	16-Jun	17
ALEX	12.8	61.0	18-Jun	18
AMIDON	12.1	60.5	17-Jun	19
Marshall *	11.0	60.0	17-Jun	17
Nordic *	11.0	61.5	16-Jun	18
ND 640	10.6	61.5	19-Jun	17
2375 *	10.6	60.0	15-Jun	15
Wheaton *	10.6	59.5	18-Jun	15
ND 651	10.6	61.0	19-Jun	16
W 2502 *	10.6	59.0	14-Jun	14
Laura	10.6	59.0	16-Jun	18
Pioneer 2369 *	10.6	59.0	16-Jun	16
ND 649 *	10.6	61.0	18-Jun	18
Tammy *	10.3	60.0	16-Jun	17
ND 618 *	9.9	60.5	17-Jun	16
W 2501 *	9.9	58.0	14-Jun	15
STOA	9.9	61.0	17-Jun	19
ND 652	9.5	60.5	17-Jun	17
Norak *	9.5	61.0	16-Jun	16
2385 *	9.5	57.5	13-Jun	17
ND 626 *	9.5	61.0	17-Jun	18
HS84-873 *	9.5	59.5	14-Jun	15
Success *	9.2	55.5	23-Jun	18
Rambo *	9.2	61.0	17-Jun	16
MN 82354 *	8.8	60.0	20-Jun	17
Prospect *	8.8	60.0	17-Jun	18
BUTTE 86	8.8	61.5	15-Jun	16
Telemark *	8.8	60.0	17-Jun	16
Kenyon	8.4	58.5	17-Jun	18
MN 81110 *	8.4	57.0	17-Jun	16
ND 650 *	8.4	61.5	20-Jun	16
COTEAU	8.3	60.0	21-Jun	17
Waldron	8.1	59.0	17-Jun	18
Celtic *	7.7	61.0	16-Jun	18
LEN *	7.7	60.5	18-Jun	19
Katepwa	7.0	59.0	17-Jun	19
Norseman *	7.0	59.5	18-Jun	15
Columbus	7.0	60.0	23-Jun	18
Roblin	6.6	58.5	17-Jun	14
CUTLESS *	5.5	59.5	14-Jun	17
Westbred 926 *	5.5	59.0	13-Jun	15

* semidwarf
Seeding Rate: 1,000,000 live seeds/acre, (approx. 1 Bu/A)
Seeding Date: April 22 Harvest Date: July 26
Fertilizer applied: 50 lbs/A 18-46-0
Herbicide Applied: Hoelon-Buctril tank mix
L.S.D. 5% = 3.2 Bu/A C.V. = 21.1 %
Note: Recommended varieties are capitalized.

Long Term Yield Comparison - Hard Red Spring Wheat- Dickinson

Variety	1984	1985	1986	1987	1988	Average
Alex	30.4	43.6	45.4	34.7	12.8	33.4
Norak	49.5	52.4	54.2	28.9	9.5	38.9
Coteau	37.4	36.5	48.0	35.2	8.3	33.1
Len	42.5	52.9	54.6	32.7	7.7	38.1
Stoa	54.3	51.6	61.6	30.8	9.9	41.6
Waldron	31.5	40.4	49.2	35.5	8.1	32.9
Leif	41.8	40.9	60.8	27.0	17.2	37.5
Columbus	36.3	40.8	51.8	37.4	7.0	34.6
Marshall	38.5	40.4	56.5	30.5	11.0	35.4
Pioneer 2369	45.1	37.2	60.6	35.5	10.6	37.8
Wheaton	50.2	45.4	63.8	25.9	10.6	39.2
Norseman	51.3	45.5	49.2	40.7	7.0	38.7
Success	34.8	47.0	52.5	43.7	9.2	37.4
Cutless	--	47.3	49.2	30.1	5.5	33.0
Amidon	--	57.8	53.3	28.3	12.1	37.9
Butte 86	--	38.2	51.8	31.1	8.8	32.5
Celtic	--	51.1	51.2	27.2	7.7	34.3
Nordic	--	--	65.5	29.7	11.0	35.4
Prospect	--	--	62.0	22.0	8.8	30.9
Telemark	--	--	58.0	27.0	8.8	31.3
LSD .05	7.4	6.9	7.9	4.0	6.2	6.6

1988 HETTINGER ON-STATION HARD RED SPRING WHEAT VARIETY TRIAL

Variety	Bushels per Acre	Test Weight lbs/bu	Grain Protein %	Plant Height cm	3 Year Average* bu/A
HS84-873	15.2	58.6	17.3	29	
ND626	13.8	58.9	18.6	38	
Butte 86	13.6	59.3	17.4	41	31.2
2375	12.9	60.6	19.1	31	
R225	12.6	59.7	18.0	--	
R162-4	12.6	59.4	17.9	--	
W2501	12.5	55.7	17.0	27	
Marshall	12.4	58.4	16.7	29	27.9
Leif	12.3	57.9	18.1	44	29.9
SD3005	11.8	58.8	18.1	--	
2385	11.7	57.6	18.7	30	
Amidon	11.3	58.6	18.6	44	22.3
Telemark	10.8	58.2	18.3	43	29.7
Len	10.8	59.6	18.7	40	26.2
W2502	10.8	57.0	17.3	32	
2369	10.7	59.3	18.6	35	
MN82354	10.5	59.5	17.8	36	
Wheaton	10.4	56.6	17.5	34	29.2
Westbred 926	10.4	58.5	18.9	25	
Roblin	10.2	55.9	19.1	35	28.8
Norak	10.2	59.0	18.4	43	27.3
Prospect	10.1	58.3	18.2	33	31.3
ND653	10.0	58.6	17.6	--	
ND640	10.0	58.5	18.4	40	
Rambo	9.9	58.6	18.6	41	29.6
Alex	9.8	58.5	18.9	35	31.0
Laura	9.7	57.9	19.3	39	27.0
Norseman	9.6	58.5	18.2	37	24.6
Kenyon	9.6	56.0	19.3	41	29.4
R229	9.6	58.8	18.5	--	
ND649	9.6	58.6	19.8	45	
Stoa	9.2	58.4	17.8	43	28.0
MN81110	9.1	56.7	20.7	36	
Tammy	9.0	58.3	18.4	37	30.2
Columbus	8.8	56.9	19.5	45	24.6
ND651	8.7	59.3	18.4	31	
Katepaw	8.5	57.0	18.9	34	26.6
Coteau	8.3	57.0	18.9	39	25.4
Cutless	8.2	57.6	18.7	37	26.6
R203-1	7.9	57.8	17.9	--	
FA982-220	7.8	58.5	19.1	--	
ND652	7.8	58.2	19.0	38	
Celtic	7.3	59.0	18.2	45	26.1
ND618	7.2	58.0	18.5	31	

Hettinger HRSW continued.

Variety	Bushels per Acre	Test Weight lbs/bu	Grain Protein %	Plant Height cm	3 Year Average* bu/A
Nordic	7.1	58.2	17.3	41	33.9
ND650	7.0	60.3	19.5	35	
ND643	7.0	54.2	21.9	--	
Success	6.3	57.8	19.4	47	24.8
Waldron	5.5	56.8	19.0	46	23.4
C.V. %	36.0	1.2	--	--	
LSD 5%	n.s.	0.9	--	--	
LSD 1%	n.s.	1.2	--	--	
# of Reps	4	4	Bulk	1	

Seeding Rate: 1,000,000 live seeds/A (approx. 1 bu/A)
Seeding Date: 4/14/88
Fertilizer Applied: 50 lbs/A 18-46-0 and 100 lbs/A 46-0-0
Yield Goal: 45 bu/A
Herbicide Applied: 4 oz/A Banvel applied 5/25/88
1 lb/A ai 2,4-D aerial applied 7/8/88
Harvest Date: 7/29/88
Notes: All data adjusted to 12% grain moisture. All plots were severely stressed by drought.
n.s. = no significant difference between varieties.
* = average of 1986-88 crop years, named varieties only.

1988 Dickinson Off-station Hard Red Spring Wheat Variety Trials

Variety	Dickinson	Beach	Beulah	Glen Ullin	Hannover	Manning	Average 6 Sites
			Bushels per Acre				
Alex	12.8		12.7	20.4	14.3	10.2	14.1
Amidon	12.1		14.6	22.8	16.8	12.9	15.8
Butte 86	8.8		12.9	24.5	15.1	10.2	14.3
Celtic *	7.7		14.0	21.7	18.4	12.1	14.8
Coteau	8.3		14.3	25.9	19.3	13.5	16.2
Cutless *	5.5		11.6	22.0	14.3	11.6	13.0
Leif *	17.2		12.9	25.6	19.5	10.2	17.1
Len *	7.7		14.3	21.7	18.7	12.4	15.0
Norak *	9.5		12.9	22.0	19.0	14.3	15.5
Nordic *	11.0		10.7	26.1	22.6	8.3	15.7
Norseman *	7.0		12.7	23.9	19.0	11.3	14.8
Pioneer 2369 *	10.6		17.9	20.4	19.0	9.9	15.5
Stoa	9.9		19.8	28.3	21.5	14.6	18.8
Success *	9.2		14.0	22.8	16.0	10.7	14.5
* semi-dwarf							
Seeding Date:	Apr. 22	Apr. 13	Apr. 15	Apr. 18	Apr. 19	Apr. 14	
Harvest Date:	July 26		July 29	Aug. 4	Aug. 5	July 25	
LSD 5% (Bu/A):	3.2		4.5	4.4	3.6	5.8	4.5
CV (%):	21.1		22.8	13.1	13.9	35.1	

Fertilizer Applied: according to soil test at each site.
Herbicide Applied: Hoelon-Buctril tank mix
Seeding Rate: 1 Bu/A

1988 Dickinson Off-station Hard Red Spring Wheat Variety Trials

Variety	Dickinson	Beach	Beulah	Glen Ullin	Hannover	Manning	Average 6 Sites
			Test Wt. lbs./bu.				
Alex	61.0		61.5	59.0	59.0	60.5	60.2
Amidon	60.5		61.0	59.5	59.5	60.0	60.1
Butte 86	61.5		61.0	60.0	59.5	59.5	60.3
Celtic *	61.0		60.0	59.5	60.0	60.5	60.2
Coteau	60.0		60.0	58.5	59.0	59.5	59.4
Cutless *	59.5		59.5	59.0	59.5	59.0	59.3
Leif *	59.0		60.5	59.5	60.0	59.0	59.6
Len *	60.5		61.5	60.0	61.0	61.0	60.8
Norak *	61.0		60.5	60.0	60.0	59.5	60.2
Nordic *	61.5		60.0	60.5	61.5	61.0	60.9
Norseman *	59.5		59.5	58.0	59.0	59.5	59.1
Pioneer 2369 *	59.0		60.5	60.0	59.5	59.0	59.6
Stoa	61.0		60.5	60.0	59.5	59.0	60.0
Success *	55.5		59.0	57.0	58.5	60.0	58.0

1988 Dickinson Off-station Hard Red Spring Wheat Variety Trials

Variety	Dickinson	Beach	Beulah	Glen Ullin	Hannover	Manning	Average 6 Sites
			Protein @ 14% moisture				
Alex	17.9		17.6	16.8	16.7	17.4	17.3
Amidon	17.9		18.0	17.3	17.2	17.6	17.6
Butte 86	17.8		17.7	17.0	16.6	17.1	17.2
Celtic *	17.5		17.1	16.5	16.4	17.3	17.0
Coteau	18.0		17.8	16.7	16.5	17.8	17.4
Cutless *	18.7		18.2	17.8	17.5	18.4	18.1
Leif *	17.9		17.7	16.9	16.6	17.6	17.3
Len *	18.3		17.6	17.0	17.2	17.7	17.6
Norak *	18.0		17.8	16.8	16.9	17.9	17.5
Nordic *	16.5		16.8	15.5	15.0	16.1	16.0
Norseman *	18.6		18.3	16.9	17.3	17.7	17.8
Pioneer 2369 *	18.4		17.8	17.1	17.3	18.0	17.7
Stoa	17.0		16.9	16.4	16.2	17.2	16.7
Success *	17.9		17.8	16.8	17.3	18.1	17.6

1988 HETTINGER OFF-STATION HARD RED SPRING WHEAT VARIETY TRIALS

Yield bu/A

Variety	Hettinger	Regent	Scranton	New Leipzig	Selfridge	Average 5 Sites
Alex	9.8	10.8	8.9	12.4	11.7	10.7
Amidon	11.3	11.6	11.4	14.8	16.3	13.1
Butte 86	13.6	12.1	8.1	12.1	16.4	12.5
Celtic	7.3	9.6	9.1	13.6	13.5	10.6
Coteau	8.3	11.9	7.4	11.0	16.3	11.0
Cutless	8.2	10.4	6.2	11.4	16.0	10.5
Leif	12.3	11.9	8.6	13.3	11.8	11.6
Len	10.8	9.3	8.0	12.3	7.2	9.5
Norak	10.2	9.7	8.0	10.2	13.8	10.3
Nordic	7.1	10.8	9.0	10.4	21.5	11.8
Norseman	9.6	11.9	8.0	11.7	16.2	11.5
P 2369	10.7	9.3	8.4	10.7	18.7	11.6
Stoa	9.2	12.2	7.3	13.9	17.2	12.0
Success	6.3	7.3	5.3	8.5	14.4	8.4
C.V. %	36.0	11.1	23.4	18.4	23.5	
LSD 5%	n.s.	1.7	2.7	3.1	5.1	
LSD 1%	n.s.	2.2	n.s.	n.s.	7.1	
# of Reps	4	4	4	4	4	

Test Weight lbs/bu

Alex	58.5	60.6	57.8	57.6	59.2	58.7
Amidon	58.6	59.3	56.9	56.8	59.1	58.0
Butte 86	59.3	61.4	58.8	58.8	60.7	59.8
Celtic	59.0	59.6	57.8	58.0	59.2	58.7
Coteau	57.0	58.7	55.2	55.4	58.7	57.0
Cutless	57.6	58.1	54.0	55.6	58.8	56.8
Leif	57.9	59.6	56.3	56.1	58.4	57.7
Len	59.6	60.1	57.9	58.0	58.0	58.7
Norak	59.0	59.7	57.7	56.7	59.3	58.5
Nordic	58.2	60.6	57.2	57.6	60.8	58.9
Norseman	58.5	59.9	56.7	56.6	58.6	58.1
P 2369	59.3	59.5	58.0	57.3	60.2	58.8
Stoa	58.4	60.1	56.2	57.2	59.2	58.2
Success	57.8	58.2	55.5	55.0	57.8	56.9
C.V. %	1.2	1.4	1.4	1.5	1.8	
LSD 5%	0.9	1.2	1.1	1.2	1.5	
LSD 1%	1.2	1.6	1.5	1.6	n.s.	
# of Reps	4	4	4	4	4	

Hettinger Off-station HRSW continued.

	Percent Protein					
Variety	Hettinger	Regent	Scranton	New Leipzig	Selfridge	Average 5 Sites
Alex	18.9	19.0	17.6	18.6	17.2	18.3
Amidon	18.6	18.2	17.9	18.4	18.0	18.2
Butte 86	17.4	17.6	17.3	18.6	17.3	17.6
Celtic	18.2	18.2	17.8	18.0	17.8	18.0
Coteau	18.9	18.6	18.0	18.7	17.7	18.4
Cutless	18.7	18.6	18.0	19.0	17.4	18.3
Leif	18.1	18.1	17.8	18.6	18.3	18.2
Len	18.7	19.0	17.9	18.5	18.2	18.5
Norak	18.4	18.4	17.4	18.6	17.7	18.1
Nordic	17.3	16.8	16.5	17.5	15.5	16.7
Norseman	18.2	18.4	18.1	19.0	17.8	18.3
P 2369	18.6	19.2	18.8	19.3	17.9	18.8
Stoa	17.8	17.7	17.3	17.6	16.7	17.4
Success	19.4	19.2	18.6	19.2	17.6	18.8
# of Reps	----------	----------	Bulk	----------	----------	
Seeding Date:	4/14	4/12	4/12	4/13	4/13	
Harvest Date:	7/29	7/26	7/26	7/28	7/28	

Yield Goal: 45 bu/A
Fertilizer Applied: according to soil test at each site.
Herbicide Applied: Banvel and 2,4-D
Seeding Rate: 1 million live seeds per acre. (approx. 1 bu/A)
n.s. = no significant difference between varieties.

Long Term Yield Comparison - Hard Red Winter Wheat - Dickinson

Variety	1984	1985	1986	1987	1988	Average
Roughrider	44.1	52.1	46.5	20.8	0.0	32.7
Winoka	45.4	44.6	48.4	24.2	0.0	32.5
Agassiz	45.9	50.0	50.6	17.3	0.0	32.8
Siouxland	--	--	59.4	11.8	0.0	23.7
Seward	--	--	--	24.4	0.0	12.2
LSD .05	7.3	2.5	3.8	4.8		4.9

Yield averages include value of 0 for 1988.

1988 HETTINGER ON-STATION WINTER WHEAT VARIETY TRIAL

Variety	Bushels per Acre	Test Weight lbs/bu	Grain Protein %	Heading Date (June)	Plant Height cm	2 Year Average* bu/A
Siouxland	8.0	55.5		6.2	43	20.2
ND8407	6.9	54.2		7.8	40	
Rose	6.5	54.9		7.8	42	22.1
Seward	5.5	52.4		9.2	40	25.2
ND8215	5.5	50.8	not	8.0	41	
Thunderbird	5.1	57.1	available	6.0	38	15.8
Norstar	4.8	53.9		11.5	42	15.1
ND8460	4.7	54.3		8.0	42	
ND8212	4.7	52.0		7.5	39	
Agassiz	4.4	52.7		11.5	42	20.3
ND8286	4.3	53.5		9.0	40	
Roughrider	4.1	53.1		8.8	42	16.6
Bighorn	3.4	55.3		6.7	35	21.2
C.V. %	32.4	1.2		29.5	12	
LSD 5%	2.4	0.9		n.s.	n.s.	
LSD 1%	n.s.	1.2		n.s.	n.s.	
# of Reps	4	4	bulk	4	4	

Seeding Rate: 1,000,000 live seeds/A (approx. 1 bu/A)
Seeding Date: 9/10/87
Fertilizer Applied: None at planting. 50 lbs/A 18-46-0 and 100 lbs/A 46-0-0 as spring top dress.
Yield Goal: 60 bu/A
Herbicide Applied: 1 1/3 pts/A 2,4-D applied 5/18/88.
1 lb/A ai 2,4-D aerial applied 7/8/88.
Harvest Date: 7/19/88
Notes: All data adjusted to 12% grain moisture.
All plots were severely stressed by drought and WSMV.
n.s. = no significant difference between varieties.
* = average of 1987 & 1988 crop years, named varieties only.

1988 HETTINGER OFF-STATION WINTER WHEAT VARIETY TRIALS

Yield bu/A

Variety	Hettinger	Regent	Scranton	New Leipzig	Average 4 Sites*
Agassiz	4.4	13.6	16.0	9.7	10.9
Bighorn	3.4	10.2	16.6	10.3	10.1
Norstar	4.8	13.9	16.2	7.6	10.6
Rose	6.5	11.3	15.5	17.7	12.8
Roughrider	4.1	12.0	16.6	11.1	10.9
Seward	5.5	12.7	14.8	12.2	11.3
Siouxland	8.0	14.6	16.2	15.2	13.5
C.V. %	32.4	15.6	11.2	23.7	
LSD 5%	2.4	n.s.	n.s.	4.2	
LSD 1%	n.s.	n.s.	n.s.	5.8	
# of Reps	4	4	4	4	

Test Weight lbs/bu

Agassiz	52.7	57.2	56.2	55.4	55.4
Bighorn	55.3	59.2	58.2	56.5	57.3
Norstar	53.9	57.3	56.7	54.8	55.7
Rose	54.9	58.8	58.4	56.8	57.2
Roughrider	53.1	57.6	57.7	55.4	56.0
Seward	52.4	55.4	55.4	54.2	54.4
Siouxland	55.5	59.6	59.1	57.5	57.9
C.V. %	1.2	0.9	0.8	0.8	
LSD 5%	0.9	0.8	0.7	0.6	
LSD 1%	1.2	1.0	0.9	0.9	
# of Reps	4	4	4	4	

Percent Protein

Agassiz	17.0	16.2	17.9	17.0
Bighorn	17.5	16.5	17.5	17.2
Norstar	16.7	15.9	17.1	16.6
Rose	16.7	16.1	16.6	16.5
Roughrider	17.3	16.4	17.8	17.2
Seward	16.0	14.9	16.0	15.6
Siouxland	16.2	15.6	16.4	16.1
# of Reps	-------- Bulk -------			
Seeding Date:	9/10	9/14	9/14	9/12
Harvest Date:	7/19	7/26	7/26	7/28

Yield Goal: 60 bu/A
Fertilizer Applied: according to soil test at each site.
Herbicide Applied: 2,4-D
Seeding Rate: 1 million live seeds per acre. (approx. 1 bu/A)
Notes: n.s. = no significant difference between varieties.
* = Average of 3 sites for percent protein.
All plots were severely stressed by drought and Wheat Streak Mosaic Virus.

1988 Dickinson Durum Variety Trial

Variety	Bu/A Avg.	Test Wt lbs.	Heading Date	Height in.
D 8380 *	12.4	61.0	21-Jun	15
Rugby	11.8	60.0	18-Jun	18
MEDORA	11.6	60.0	17-Jun	18
VIC	11.6	60.0	18-Jun	17
D 8458	11.3	60.5	20-Jun	13
D 8291 *	11.0	61.0	21-Jun	15
Stockholm *	10.7	62.5	21-Jun	17
FA883-323	10.5	59.0	21-Jun	17
Laker *	10.2	61.0	18-Jun	17
MONROE	9.9	61.0	15-Jun	15
D 83103 *	9.9	59.0	18-Jun	18
D 8460	9.6	62.5	19-Jun	17
LLOYD *	9.6	61.0	21-Jun	15
RENVILLE	9.6	61.0	17-Jun	18
D 8302	9.6	60.5	21-Jun	14
D 8459	9.6	62.0	20-Jun	17
D 8261 *	9.4	62.5	21-Jun	17
Fjord	9.4	61.5	17-Jun	18
Sceptre	9.4	61.0	17-Jun	17
D 84130 *	9.4	60.5	21-Jun	16
D 8475	8.8	62.5	20-Jun	18
WARD	8.5	61.5	17-Jun	19
D 8374 *	8.3	61.0	23-Jun	17
D 84134 *	8.0	62.0	21-Jun	16
D 8479	7.7	60.5	21-Jun	17
D 8434	6.6	63.0	17-Jun	15
D 8370 *	5.8	61.5	23-Jun	15

* semidwarf
Seeding Rate: 1,000,000 live seed/acre, (approx. 1 Bu/A)
Seeding Date: April 21 Harvest Date: July 27
Fertilizer Applied: 50 lbs/A 18-46-0
Herbicide Applied: Hoelon-Buctril tank mix
L.S.D. 5% = 2.8 Bu/A C.V. = 20.6 %
Note: Recommended varieties are capitalized.

Long Term Yield Comparison Durum - Dickinson

Variety	1984	1985	1986	1987	1988	Average
Lloyd	37.4	55.4	51.2	43.2	9.6	39.4
Vic	34.9	33.4	36.5	32.7	11.6	29.8
Ward	27.0	36.4	45.2	36.0	8.5	30.6
Monroe	29.4	42.0	44.1	34.4	9.9	32.0
Renville	--	38.1	44.2	41.0	9.6	33.2
Rugby	30.3	--	49.6	40.7	11.8	33.1
Laker	--	--	45.4	42.1	10.2	32.5
Medora	--	--	47.8	41.0	11.6	33.5
Fjord	--	--	--	38.0	9.4	23.7
Stockholm	--	--	--	44.8	10.7	27.8
LSD .05	4.9	1.4	1.4	4.7	2.8	3.4

1988 HETTINGER DURUM VARIETY TRIAL

Variety	Bushels per Acre	Test Weight lbs/bu	Plant Height cm	3 Year Average* bu/A
D8302	18.7	60.3	49	
Renville	18.5	60.6	40	30.2
D8261	18.4	61.1	44	
D8475	17.3	62.1	55	
FA883-323	17.1	61.8	56	
D8459	16.7	60.0	45	
D83103	16.4	60.3	49	
Lloyd	16.4	62.2	46	29.3
D8291	16.4	60.5	44	
Monroe	16.3	60.4	44	35.3
D8460	16.3	60.4	47	
D8370	16.2	61.2	47	
D8380	16.0	62.1	48	
Laker	15.6	61.4	44	31.7
Medora	15.3	60.6	44	33.0
D8458	15.2	59.3	43	
Rugby	15.1	61.3	43	27.3
D8374	15.0	62.4	45	
D8479	14.7	60.5	48	
Vic	14.6	60.6	48	30.3
Ward	13.8	61.7	45	28.3
D84134	13.6	61.2	51	
D84130	12.4	62.3	48	
C.V. %	16.2	0.8	--	
LSD 5%	n.s.	0.6	--	
LSD 1%	n.s.	0.9	--	
# of Reps	4	4	1	

Seeding Rate: 1,000,000 live seeds/A (approx. 1 bu/A)
Seeding Date: 4/14/88
Fertilizer Applied: 50 lbs/A 18-46-0 and 100 lbs/A 46-0-0
Yield Goal: 45 bu/A
Herbicide Applied: 4 oz/A Banvel applied 5/25/88
1 lb/A ai 2,4-D aerial applied 7/8/88
Harvest Date: 7/29/88
Notes: All data adjusted to 12% grain moisture. All plots were severely stressed by drought.
n.s. = no significant difference between varieties.
* = average of 1986-88 crop years, named varieties only.

1988 Dickinson Off-station Durum Variety Trials

Variety	Dickinson	Beach	Beulah	Glen Ullin	Hannover	Manning	Average 6 Sites
			Bushels per Acre				
Laker *	10.2		10.2	22.6	15.7	11.8	15.1
Lloyd *	9.6		10.2	20.9	16.0	13.2	15.1
Medora	11.6		8.5	19.3	15.1	13.5	14.1
Monroe	9.9		11.0	19.3	15.1	12.4	14.4
Renville	9.6		11.0	20.9	15.4	13.2	15.1
Ward	8.5		8.5	21.2	13.8	12.9	14.1
			Test Wt. lbs./bu.				
Laker *	61.0		63.0	59.5	62.0	62.5	61.6
Lloyd *	61.0		61.5	60.0	61.5	62.5	61.3
Medora	60.0		61.0	60.0	60.5	62.5	60.8
Monroe	61.0		61.5	60.5	60.5	61.5	61.0
Renville	61.0		62.0	59.5	60.5	62.0	61.0
Ward	61.5		61.5	60.0	61.0	62.0	61.2
* semi-dwarf							
Seeding Date:	Apr. 21	Apr. 13	Apr. 15	Apr. 18	Apr. 19	Apr. 14	
Harvest Date:	July 27		July 29	Aug. 4	Aug. 5	July 25	
LSD 5% (Bu/A):	2.8		3.7	4.5	2.1	8.0	4.7
CV (%):	20.6		24.9	14.5	9.1	41.4	

Fertilizer Applied: according to soil test at each site.
Herbicide Applied: Hoelon-Buctril tank mix
Seeding Rate: 1 Bu/A

1988 HETTINGER OFF-STATION DURUM VARIETY TRIALS

Yield bu/A

Variety	Hettinger	Regent	Scranton	New Leipzig	Selfridge	Average 5 Sites
Laker	15.6	12.7	15.4	11.7	14.4	14.0
Lloyd	16.4	13.0	17.8	13.0	14.9	15.0
Medora	15.3	15.3	14.1	17.5	17.2	15.9
Monroe	16.3	14.3	17.3	18.1	15.3	16.3
Renville	18.5	18.2	20.4	17.5	19.3	18.8
Vic	14.6	14.1	15.2	15.5	12.8	14.4
Ward	13.8	14.7	17.6	15.5	17.6	15.8
C.V. %	16.2	12.4	12.8	12.5	13.8	
LSD 5%	n.s.	2.7	3.2	2.9	3.3	
LSD 1%	n.s.	3.7	n.s.	3.9	4.5	
# of Reps	4	4	4	4	4	

Test Weight lbs/bu

Laker	61.4	59.7	59.5	58.2	61.9	60.1
Lloyd	62.2	60.5	59.5	58.5	61.6	60.5
Medora	60.6	61.0	58.7	58.1	62.0	60.1
Monroe	60.4	61.5	59.1	58.3	61.7	60.2
Renville	60.6	60.9	59.2	57.9	61.6	60.0
Vic	60.6	60.6	59.3	58.3	60.5	59.8
Ward	61.7	61.3	59.6	59.4	62.1	60.8
C.V. %	0.8	1.4	1.0	0.6	0.6	
LSD 5%	0.6	n.s.	n.s.	0.5	0.5	
LSD 1%	0.9	n.s.	n.s.	0.7	0.7	
# of Reps	4	4	4	4	4	
Seeding Date:	4/14	4/12	4/12	4/13	4/13	
Harvest Date:	7/29	7/26	7/26	7/28	7/28	

Yield Goal: 45 bu/A
Fertilizer Applied: according to soil test at each site.
Herbicide Applied: Banvel and 2,4-D
Seeding Rate: 1 million live seeds per acre. (approx. 1 bu/A)
n.s. = no significant difference between varieties.

1988 Dickinson Barley Variety Trial

Variety	Bu/A Avg.	Test Wt lbs.	Heading Date	Height in.
HECTOR	19.3	47.5	25-Jun	20
GALLATIN	15.5	46.5	22-Jun	20
BOWMAN	14.8	46.0	21-Jun	19
Lewis	14.4	46.5	25-Jun	17
B 1602 *	12.0	45.5	21-Jun	18
MOREX *	11.7	46.5	20-Jun	18
B 1603 *	11.0	45.0	18-Jun	17
ND 9256 *	10.7	43.0	19-Jun	16
Hazen *	10.3	45.5	21-Jun	19
Robust *	8.9	46.5	20-Jun	17
ND 7309 *	8.6	44.0	21-Jun	16
ND 8671	7.6	46.0	20-Jun	20
ND 7691	7.6	45.0	22-Jun	19
AZURE *	7.2	43.0	18-Jun	18
Ellice	4.5	42.0	25-Jun	17

* 6-row variety
Seeding Rate: 1.3 Bu/A
Seeding Date: April 21 Harvest Date: August 1
Fertilizer Applied: 50 lbs/A 18-46-0
Herbicide Applied: Hoelon-Buctril tank mix
L.S.D. 5% = 4.2 Bu/A C.V. = 27.0 %
Note: Recommended varieties are capitalized.

Long Term Yield Comparison - Barley - Dickinson

Variety	1984	1985	1986	1987	1988	Average
Azure	77.0	66.4	76.0	61.9	7.2	57.7
Bowman	84.9	73.6	82.2	52.3	14.8	61.5
Morex	62.2	77.4	85.6	56.4	11.7	58.7
Robust	65.7	75.3	79.8	61.5	8.9	58.2
Hazen	78.4	64.7	86.6	61.2	10.3	60.2
Hector	66.2	68.3	80.8	70.5	19.3	61.0
Lewis	--	77.5	95.9	63.3	14.4	62.8
Gallatin	80.8	--	99.3	72.5	15.5	67.0
Ellice	71.2	--	96.3	64.6	4.5	59.1
LSD .05	6.1	10.7	7.3	4.5	4.2	7.0

1988 HETTINGER ON-STATION BARLEY VARIETY TRIAL

Variety	Bushels per Acre	Test Weight lbs/bu	Grain Protein %	Plant Height cm	3 Year Average* bu/A
Bowman	28.4	53.3	18.5	47	64.6
Gallatin	24.5	51.8	19.9	48	57.3
B1603	23.1	50.0	17.0	40	
Hector	21.4	51.8	20.4	50	59.3
ND9256	21.3	47.8	16.2	43	
B1602	20.9	51.3	16.0	44	
Azure	19.9	49.0	15.9	48	55.7
ND9334	18.2	48.3	17.9	--	
Lewis	18.1	51.7	20.7	46	55.5
ND9390	17.7	49.0	16.7	45	
ND7309	17.3	47.2	16.8	46	
Hazen	15.6	49.3	18.6	47	52.1
ND7691	14.5	49.4	18.9	45	
ND8671	14.4	51.0	21.2	49	
Robust	14.2	50.2	19.0	41	48.3
Morex	12.6	48.2	18.1	44	54.5
M47	12.6	49.4	18.0	40	
Ellice	5.5	47.5	21.6	48	42.9
C.V. %	16.4	1.2	--	--	
LSD 5%	4.1	0.8	--	--	
LSD 1%	5.5	1.1	--	--	
# of Reps	4	4	Bulk	1	

Seeding Rate: 750,000 live seeds/acre (approx. 1.3 bu/A)
Seeding Date: 4/14/88
Fertilizer Applied: 50 lbs/A 18-46-0 plus 100 lbs/A 46-0-0
Yield Goal: 65 bu/A
Herbicide applied: 4 oz/A Banvel applied 5/25/88.
1 lb/A ai 2,4-D aerial applied 7/8/88.
Harvest Date: 7/29/88
Notes: All data adjusted to 12% grain moisture. All plots were severely stressed by drought.
* = average of 1986-88 crop years, named varieties only.

1988 Dickinson Off-station Barley Variety Trials

Variety	Dickinson	Beach	Beulah	Glen Ullin	Hannover	Manning	Average 6 Sites
			Bushels per Acre				
Azure *	7.2		13.8	20.6	13.1	11.0	13.1
Bowman	14.8		18.2	25.8	18.9	15.5	18.6
Gallatin	15.5		24.8	34.0	21.7	17.5	22.7
Hector	19.3		24.4	31.6	24.8	18.2	23.7
Morex *	11.7		19.9	21.3	17.5	14.4	17.0
Robust *	8.9		14.4	19.9	13.8	12.4	13.9
			Test Wt. lbs./bu.				
Azure *	43.0		45.0	45.0	43.5	44.5	44.2
Bowman	46.0		48.0	49.0	47.5	48.0	47.7
Gallatin	46.5		47.0	48.5	48.0	46.0	47.2
Hector	47.5		47.0	49.0	48.5	48.5	48.1
Morex *	46.5		44.0	46.5	42.5	46.0	45.1
Robust *	46.5		46.0	47.0	45.0	45.5	46.0
* 6-row							
Seeding Date:	Apr. 21	Apr. 13	Apr. 15	Apr. 18	Apr. 19	Apr. 14	
Harvest Date:	Aug. 1		July 29	Aug. 4	Aug. 5	July 25	
LSD 5% (Bu/A)	4.2		7.4	3.0	2.7	6.4	5.1
CV (%):	27.0		25.5	7.7	9.9	28.6	

Fertilizer Applied: according to soil test at each site.
Herbicide Applied: Hoelon-Buctril tank mix
Seeding Rate: 1 Bu/A

1988 HETTINGER OFF-STATION BARLEY VARIETY TRIALS

Yield bu/A

Variety	Hettinger	Regent	Scranton	New Leipzig	Selfridge	Average 5 Sites
Azure	19.9	13.4	18.5	13.2	18.6	16.7
Bowman	28.4	27.3	37.3	25.2	39.6	31.6
Gallatin	24.5	19.8	31.0	20.2	34.4	26.0
Hector	21.4	23.7	32.7	18.4	30.6	25.4
Morex	12.6	13.5	17.0	11.2	21.0	15.0
Robust	14.2	12.8	17.3	14.4	21.2	16.0
C.V. %	16.4	8.1	9.6	14.6	11.4	
LSD 5%	4.1	2.2	3.7	3.8	4.8	
LSD 1%	5.5	3.1	5.1	5.2	6.6	
# of Reps	4	4	4	4	4	

Test Weight lbs/bu

Azure	49.0	48.9	45.8	47.5	49.3	48.1
Bowman	53.3	53.9	51.0	51.3	53.8	52.7
Gallatin	51.8	53.0	49.8	50.5	52.1	51.4
Hector	51.8	53.0	50.0	48.5	51.2	50.9
Morex	48.2	50.3	47.9	49.2	49.7	49.1
Robust	50.2	51.7	47.8	49.4	49.3	49.7
C.V. %	1.2	1.1	2.6	1.5	1.2	
LSD 5%	0.8	0.8	1.9	1.1	0.9	
LSD 1%	1.1	1.2	2.6	1.5	1.2	
# of Reps	4	4	4	4	4	

% Protein

Azure	15.9	14.6	16.5	16.8	16.7	16.1
Bowman	18.5	16.6	16.4	16.9	15.8	16.8
Gallatin	19.9	19.0	17.5	19.4	16.0	18.4
Hector	20.4	18.3	18.7	19.8	16.6	18.8
Morex	18.1	16.8	17.8	19.1	16.9	17.7
Robust	19.0	16.9	17.5	18.8	17.0	17.8
# of Reps	Bulk	Bulk	Bulk	Bulk	Bulk	

Seeding Date:	4/14	4/12	4/12	4/13	4/13
Harvest Date:	7/29	7/26	7/26	7/28	7/28

Yield Goal: 65 bu/A
Fertilizer Applied: according to soil test at each site.
Herbicide Applied: Banvel and 2,4-D
Seeding Rate: 750,000 live seeds per acre. (approx. 1.3 bu/A)
Notes: All data adjusted to 12% moisture.

1988 Dickinson Oats Variety Trial

Variety	Bu/A Avg.	Test Wt lbs.	Heading Date	Height in.
MONIDA	24.8	26.0	20-Jun	19
Porter	23.4	21.5	20-Jun	21
STEELE	20.8	22.0	18-Jun	21
ND 830646	20.4	21.5	20-Jun	19
ND 830775	20.0	28.0	21-Jun	19
ND 820294	19.5	28.0	17-Jun	22
VALLEY	19.5	25.0	17-Jun	19
ND 821742	17.4	29.5	19-Jun	18
Hytest	14.8	30.5	16-Jun	24
RIEL	14.3	34.5	16-Jun	23
ND 831122	13.5	28.0	15-Jun	19
ND 820559	13.0	22.5	18-Jun	21
Robert	12.6	27.5	20-Jun	19
ND 840413	12.6	24.0	18-Jun	23
OTANA	12.2	23.5	18-Jun	24
ND 820744	11.3	25.5	18-Jun	21
ND 830185	10.9	22.5	17-Jun	23
Trucker	10.4	35.0	16-Jun	21
DUMONT	9.1	24.0	19-Jun	22
ND 810104	6.5	26.5	16-Jun	20
Tibor	3.9	38.5	16-Jun	23

Seeding Rate: 1.5 Bu/A
Seeding Date: April 20 Harvest Date: July 27
Fertilizer Applied: 50 lbs/A 18-46-0
Herbicide Applied: Buctril
L.S.D. 5% = 4.9 Bu/A C.V. = 23.4 %
Note: Recommended varieties are capitalized.

Long Term Yield Comparison - Oats - Dickinson

Variety	1984	1985	1986	1987	1988	Average
Otana	56.8	81.3	101.6	77.0	12.2	65.8
Dumont	65.6	82.9	116.5	84.5	9.1	71.7
Steele	56.8	76.4	106.2	73.5	20.8	66.8
Monida	--	85.0	126.8	86.8	24.8	80.9
ND 810104	--	98.5	124.8	50.4	6.5	70.0
Porter	--	81.2	114.0	78.7	23.4	74.3
Valley	--	91.5	126.3	61.4	19.5	74.7
Hytest	--	--	99.5	55.0	14.8	56.4
Riel	--	--	112.4	67.7	14.3	64.8
Border	71.2	88.8	100.0	78.2	--	84.5
LSD .05	6.9	7.3	15.5	6.9	4.9	9.1

1988 HETTINGER ON-STATION OAT VARIETY TRIAL

Variety	Bushels per Acre	Test Weight lbs/bu	Grain Protein %	Plant Height cm	3 Year Average* bu/A
Border	32.1	30.2		44	77.9
Riel	31.8	32.7		50	75.8
Monida	29.5	29.3		48	80.1
Otana	28.3	29.0		52	69.3
Robert	23.6	27.2		51	--
Pierce	22.6	25.6		46	--
ND820559	22.4	27.2	not	48	
Trucker	22.1	33.0	available	50	--
ND821742	21.6	28.5		46	
Valley	21.1	31.8		47	62.6
ND830646	19.8	29.8		45	
ND830775	19.0	28.0		46	
ND820744	18.5	29.1		48	
Hytest	18.3	32.4		54	58.0
ND840413	18.0	26.2		53	
MN81229	17.0	32.2		48	
ND831122	16.7	28.3		43	
Moore	16.6	29.3		52	--
Porter	16.5	26.5		47	67.5
ND840341	16.3	26.7		52	
ND840876	16.3	25.3		49	
ND820294	15.0	25.0		50	
Sandy	13.9	29.2		52	62.3
MN84231	13.7	25.6		49	
Steele	13.8	27.9		53	65.2
ND830185	13.5	24.3		50	
Proat	13.3	22.3		46	69.2
Kelsey	13.2	29.4		46	68.1
Dumont	12.0	24.5		48	61.1
ND810104	10.6	26.4		49	
ND840769	9.8	21.4		50	
ND841974	8.2	22.2		54	
C.V. %	21.6	4.9		7	
LSD 5%	5.6	1.9		5	
LSD 1%	7.4	2.5		6	
# of Reps	4	4	Bulk	4	

Seeding Rate: 750,000 live seeds/A (approx. 1 1/2 bu/A)
Seeding Date: 4/14/88
Fertilizer Applied: 50 lbs/A 18-46-0 and 100 lbs/A 46-0-0
Yield Goal: 80 bu/A
Herbicide Applied: 1 1/3 pt/A 2,4-D applied 5/18/88 and
1 lb/A a.i. 2,4-D applied 7/8/88
Harvest Date: 8/1/88
Notes: All data adjusted to 12% grain moisture. All plots were severely stressed by heat and drought.
* = average of 1986-88 crop years, named varieties only.

1988 Dickinson Off-station Oats Variety Trials

Variety	Dickinson	Beach	Beulah	Glen Ullin	Hannover	Manning	Average 6 Sites
			Bushels per Acre				
Dumont	9.1		15.7	38.2	16.1	14.8	18.8
Hytest	14.8		15.6	30.8	13.9	12.6	17.5
Monida	24.8		22.6	48.2	26.9	22.6	29.0
Riel	14.3		20.4	41.7	20.8	22.1	23.9
Valley	19.5		17.4	35.6	13.0	16.1	20.3
			Test Wt. lbs./bu.				
Dumont	24.0		31.0	31.0	30.5	24.0	28.1
Hytest	30.5		36.0	35.0	32.5	33.5	33.5
Monida	26.0		27.0	32.5	30.0	30.5	29.2
Riel	34.5		34.0	33.5	34.0	34.5	34.1
Valley	25.0		29.5	33.0	31.5	32.0	30.2
Seeding Date:	Apr. 20	Apr. 13	Apr. 15	Apr. 18	Apr. 19	Apr. 14	
Harvest Date:	July 27		July 29	Aug. 4	Aug. 5	July 25	
LSD 5% (Bu/A):	4.9		8.9	3.0	2.0	4.7	5.3
CV (%):	23.4		31.4	5.0	7.3	17.1	

Fertilizer Applied: according to soil test at each site.
Herbicide Applied: Buctril
Seeding Rate: 1 Bu/A

1988 HETTINGER OFF-STATION OAT VARIETY TRIALS

Yield bu/A

Variety	Hettinger	Regent	Scranton	New Leipzig	Average 4 Sites
Border	32.1	35.8	32.2	21.2	30.3
Monida	29.5	34.8	29.1	20.1	28.4
ND810104	10.6	11.2	15.7	4.9	10.6
Otana	28.3	24.0	29.0	10.2	22.9
Proat	13.3	14.0	18.7	4.3	12.6
Riel	31.8	36.1	27.6	16.4	28.0
Steele	13.6	12.7	16.1	4.9	11.8
Valley	21.1	18.7	19.6	9.9	17.3
C.V. %	21.6	15.4	22.4	26.6	
LSD 5%	5.6	5.3	7.7	4.5	
LSD 1%	7.4	7.2	10.5	6.1	
# of Reps	4	4	4	4	

Test Weight lbs/bu

Border	30.2	35.4	33.1	31.9	32.6
Monida	29.3	36.0	35.4	31.7	33.1
ND810104	26.4	32.3	34.0	28.9	30.4
Otana	29.0	36.6	36.6	30.3	33.1
Proat	22.3	32.2	34.8	27.7	29.2
Riel	32.7	37.3	36.6	34.7	35.3
Steele	27.9	33.4	35.6	26.7	30.9
Valley	31.8	36.9	37.1	32.8	34.6
C.V. %	4.9	2.0	2.2	2.7	
LSD 5%	1.9	1.0	1.2	1.2	
LSD 1%	2.5	1.4	1.6	1.6	
# of Reps	4	4	4	4	

Seeding Date:	4/14	4/12	4/12	4/13
Harvest Date:	7/29	7/26	7/26	7/28

Yield Goal: 80 bu/A
Fertilizer Applied: according to soil test at each site.
Herbicide Applied: 2,4-D
Seeding Rate: 750,000 live seeds per acre. (approx. 1.5 bu/A)

1988 Dickinson Winter Rye Variety Trial

Variety	Bu/A Avg.	Test Wt lbs.	Heading Date	Height in.
ND 1	17.5	49.5	22-May	30
CHAUPON	15.9	50.0	22-May	30
ND 2	15.6	50.0	22-May	29
MUSKETEER	15.2	51.5	23-May	30
Frederick	15.0	52.5	25-May	30
PUMA	8.5	53.0	24-May	30

Seeding Rate: 60 lbs/A
Seeding Date: September 1 Harvest Date: July 20
Fertilizer applied: 50 lbs/A 18-46-0
Herbicide Applied: Hoelon-Buctril tank mix
L.S.D. 5% = 3.2 Bu/A C.V. = 14.5 %
Note: Recommended varieties are capitalized.

Long Term Yield Comparison - Winter Rye - Dickinson

Variety	1984	1985	1986	1987	1988	Average
Chaupon	62.8	72.7	49.1	53.9*	15.9	50.9
Musketeer	48.4	65.4	35.4	37.6	15.2	40.4
Puma	49.9	62.5	43.2	33.9	8.5	39.6
Frederick	--	--	33.0	35.1	15.0	27.7
LSD .05	10.4	7.5	4.8	3.6	3.2	6.5

* Chaupon II

1988 HETTINGER WINTER RYE VARIETY TRIAL

Variety	Bushels per Acre	Test Weight lbs/bu	Plant Height cm	3 Year Average* bu/A
Fredrick	13.2	49.0	69	37.1
Puma	10.9	49.0	79	19.4
Chaupon	10.5	45.7	69	47.6
Prima	9.8	47.4	82	33.6
Musketeer	9.5	48.8	79	24.3
ND1	9.0	44.2	66	
ND2	7.9	44.8	69	
C.V. %	24.1	2.2	6	
LSD 5%	n.s.	1.5	7	
LSD 1%	n.s.	2.1	10	
# of Reps	4	4	4	

Notes: High percentage of sterility caused by high temps during anthesis (blast).
* = average of 1986-88 crop years, named varieties only.
n.s. = no significant difference between varieties.

1988 HETTINGER TRITICALE VARIETY TRIAL

Variety	Bushels per Acre	Test Weight lbs/bu	Plant Height cm	2 Year Average* bu/A
Double Crop	6.2	48.4	64	15.4
239	4.6	46.8	58	22.9
I18**	--	--	--	--
C.V. %	12.0	1.0	7	
LSD 5%	1.5	1.1	n.s.	
LSD 1%	n.s.	n.s.	n.s.	
# of Reps	4	4	4	

Notes: Bushel weight used = 56 lbs/bu.
* = average of 1987 & 1988 crop years.
** = not harvested due to extremely poor stand.
n.s. = no significant difference between varieties.

Seeding Rate: 1,000,000 live seeds/A (approx. 1 bu/A)
Seeding Date: 9/10/87
Fertilizer Applied: None at planting. 50 lbs/A 18-46-0 and 100 lbs/A 46-0-0 as spring top dress.
Yield Goal: 60 bu/A
Herbicide Applied: 1 1/3 pt/A 2,4-D applied 5/18/88.
1 lb/A ai 2,4-D aerial applied 7/8/88.
Harvest Date: 7/19/88
All data adjusted to 12% grain moisture.

1988 Dickinson Miscellaneous Small Grains Variety Trial

Variety	Lbs/A Avg.	Test Wt lbs.
Bowman Barley	247.4	51.0
Speltz *	159.7	38.0
Gazelle Spring Rye	144.9	52.0
Kramer Triticale *	13.2	47.0

Seeding Date: April 22 Harvest Date: August 9
Fertilizer: 50 lbs/A 18-46-0
L.S.D. 5% = 95.4 Bu/A C.V. = 42.2 %

1986-88 Dickinson Miscellaneous Small Grains Variety Trial

Variety	Pounds/Acre 1988	1987	1986	Avg.
Bowman Barley	247	1699	3946	1964
Speltz	160	908	3268	1445
Gazelle Spring Rye	145	1338	2705	1396
Kramer Triticale	13	662	3168	1281
Otana Oats		1303	3861	2582

1988 Dickinson Flax Variety Trial

Variety	Lbs/A Avg.	Test Wt lbs.
FLOR	775.5	52.5
Culbert 79	660.0	53.0
CLARK	643.5	53.5
MACGREGOR	561.0	52.5

Seeding Rate: 40 lbs/A
Seeding Date: May 12 Harvest Date: Sept. 1
L.S.D. 5% = 316.7 Bu/A C.V. = 30.0 %
Fertilizer: 50 lbs/A 18-46-0, drill
Note: Recommended varieties are capitalized.

1988 Dickinson Safflower Variety Trial

Variety	Lbs/A Avg.	Test Wt lbs.
Finch	809.0	42.5
S-541	788.2	40.0
Girard	746.7	40.5
819-1-2	746.7	39.5
S-208	746.7	39.0
MT 3697	497.8	39.5

Seeding Rate:
Seeding Date: Apr. 29 Harvest Date: Sept. 23
L.S.D. 5% = 251.2 Bu/A C.V. = 19.1 %
Fertilizer: 50 lbs/A 18-46-0, drill

1988 Dickinson Buckwheat Variety Trial

Variety	Lbs/A Avg.	Test Wt lbs.
Common	636.5	43.0
Manor	387.9	38.5
Mancan	338.1	38.5

Seeding Rate: 50 lbs/A
Seeding Date: May 27 Harvest Date: September 1
L.S.D. 5% = 218.6 Bu/A C.V. = 21.2 %
Fertilizer: 50 lbs/A 18-46-0, drill

Long Term Yield Comparison - Buckwheat - Dickinson

Variety	1986	1987	1988	Average
Mancan	30.0	43.1	8.1	27.1
Manor	35.0	43.1	9.2	29.1
Windsor Royal	27.9	45.1	---	
Common		71.8	15.2	

1988 Dickinson Millet Variety Trial

Variety	Hay Yield Tons/A*
White Proso	2.1
Red Proso	2.2
German Foxtail	1.8
Siberian	1.9
Monida Oats	0.8

* at 12 % moisture
Seeding Rate: 25 lbs/A (Oats, 48 lbs/A)
Seeding Date: May 27
Harvest Date: July 19
L.S.D. 5% = 0.2 Tons/A C.V. = 6.3 %

1988 Dickinson Misc. Dry Bean Trial

Variety	Lbs/A Avg.	Test Wt lbs.
Othello Pinto	743	58.5
Hyden Navy	717	59.0
Nodak Pinto	495	58.5
Wyoming 167 Pinto	0	NA

Seeding Date: May 25 Harvest Date: Aug. 26
Fertilizer: 50 lbs/A 18-46-0
L.S.D. 5% = 191.4 lbs/A C.V. = 24.5 %

1988 HETTINGER DRY EDIBLE BEAN VARIETY TRIAL

Variety	Type	Yield lbs/A	Test Weight lbs/bu	2 Year Average* lbs/A
NX-041	Navy	437	61.0	920
NX-040	Navy	283	--	
Hyden	Navy	203	--	646
C-20	Navy	177	--	718
Agri-1 #2	Navy	no yield		
Fleetwood	Navy	no yield		
Upland	Navy	no yield		
Othello	Pinto	689	54.2	938
Bill Z	Pinto	563	52.9	970
Nodak	Pinto	550	57.2	910
Midnight	Pinto	543	56.3	
Topaz	Pinto	428	51.4	729
Fiesta	Pinto	303	55.4	786
UI-114	Pinto	278	48.5	786
C.V. %		78	51.7	
LSD 5%		n.s.	n.s.	
LSD 1%		n.s.	n.s.	
# of Reps		4	4	

Seeding Rate: Navy beans (45 lbs/A pure live seed)
Pinto beans (61 lbs/A pure live seed)
Seeding Date: 5/12/88
Row Spacing: 30"
Fertilizer Applied: 60 lbs/A 29-28-0
Yield Goal: 1,800 lbs/A
Herbicide Applied: 1 1/4 pts/A Treflan
Harvest Date: 9/2/88
n.s. = no significant difference between varieties.
* = average of 1987 & 1988 crop years.

1988 Dickinson Hybrid Corn Trial

Hybrid	Silage Tons/A	Harvest Moisture	Grain Bu/A	Test Wt. Lbs/Bu
Dahlgren DC 405	9.4	70.5%	34.9	53.0
Cargill 1927	9.1	67.1%	29.9	54.6
Top Farm TFSX 1181	8.4	68.1%	36.7	57.1
Interstate IS 201	8.1	66.4%	37.5	55.6
Jacques J 2750	8.1	67.4%	40.3	56.2
Interstate IS 313A	8.0	67.1%	41.2	57.3
Jacques J 4170	7.9	70.7%	30.9	56.1
Top Farm TFSX 1185	7.3	68.4%	44.1	56.6
Jacques J 2950	7.2	68.5%	34.3	51.3
Dahlgren DC 430	7.1	71.0%	29.4	55.6
Jacques J 4100	7.1	66.0%	33.2	53.3
King Agro K 2204	6.8	67.8%	39.0	54.6
Cargill 809	6.7	70.3%	40.8	53.6
King Agro K 237	6.4	70.1%	38.4	53.7
King Agro K 228	6.0	71.7%	29.6	52.1
King Agro K 127	7.2	63.7%		

Moisture basis:	70 %	12 %
Seeding Date:	May 10	May 10
Harvest Date	Aug. 12	Aug. 25
L.S.D. 5% =	1.7 Tons/A	11.3 Bu/A
C.V. =	16.4 %	13.6 %

Seeding Rate: 18,000 seeds/A
Row Width: 36 inches
Harvest Population: 14,933 plants/A
Herbicide Applied: Prowl, preemergence; Bladex, postemergence

1988 HETTINGER CORN HYBRID SILAGE TRIAL

Variety	Percent Moisture at Harvest	Silage Tons/A
Agripro AP 270	36.5	4.2
Cargill 809	35.0	4.4
Cargill 1927	35.5	4.8
ContiSeeds 8220	39.5	3.3
ContiSeeds 8304	38.5	4.7
Dahlgren DC 405	36.0	5.4
Dahlgren DC 430	37.0	5.0
Dekalb/Pfizer DK 397	37.5	5.0
Interstate IS 201	36.5	4.2
Interstate IS 353	38.5	3.7
Pioneer 3902	34.5	3.7
Pioneer 3963	38.5	3.6
Jacques J 2750	34.5	3.9
Jacques J 2950	39.0	4.8
Jacques J 4100	39.5	5.5
Jacques J 4170	38.5	5.1
King Grain K 237	37.0	3.5
King Grain K 2204	37.0	4.9
Top Farm TFSX 1181	39.0	3.2
Top Farm TFSX 1185	36.0	4.5
C.V. %		26.8
LSD 5%		n.s.
# of Reps	1	4

Seeding Rate: 18,000 plants per acre
Seeding Date: 5/17/88
Harvest Date: 8/26/88
Row Width: 30"
Fertilizer Applied: 150 lbs/A 29-28-0
Yield Goal: 13 tons/A
Herbicide Applied: 2 1/2 qt/A Bladex and 1 qt/A Atrazine
Notes: Yields are based on 70% moisture.
n.s. = no significant difference between hybrids.
All hybrids were severely stressed by drought.

1988 REGENT CORN HYBRID SILAGE TRIAL

Variety	Percent Moisture at Harvest	Silage Tons/A
Cargill 809	40.0	4.98
Cargill 1927	41.5	4.85
Dahlgren DC 405	42.5	5.55
Dahlgren DC 430	41.0	5.87
Interstate IS 201	43.0	4.67
Interstate IS 353	41.0	6.24
King Grain K 237	44.5	6.04
King Grain K 2204	43.0	5.97
Pioneer 3963	39.5	6.84
Pioneer 3902	42.5	5.67
C.V. %		20.08
LSD 5%		n.s.
# of Reps	1	4

Seeding Rate: 18,000 plants per acre
Seeding Date: 5/17/88
Harvest Date: 8/25/88
Row Width: 30"
Fertilizer Applied: 55 lbs/A 18-46-0 and 20 lbs/A 46-0-0
Yield Goal: 13 tons/A
Herbicide Applied: 2 1/2 qt/A Bladex and 1 qt/A Atrazine
Notes: Yields are based on 70% moisture.
n.s. = no significant difference between hybrids.
All hybrids were severely stressed by drought.

1988 REGENT GRAIN CORN HYBRID TRIAL

Variety	Relative Maturity Days	Bushels per Acre	Test Weight lbs/bu
Cargill 809	80	43.9	57.4
Cargill 1927	80	40.7	57.4
Dahlgren DC 405	78	38.2	56.0
Dahlgren DC 430	86	43.6	59.6
Interstate IS 201	84	42.5	57.9
Interstate IS 353	82	47.8	57.8
King Grain K 127	80	35.8	57.9
King Grain K 228	87	40.1	55.6
King Grain K 237	87	45.2	58.5
King Grain K 2204	92	49.0	57.7
Pioneer 3963	80	42.6	57.5
Pioneer 3902	90	47.8	57.2
C.V. %		15.9	1.3
LSD 5%		n.s.	1.1
LSD 1%		n.s.	1.5
# of Reps		4	4

Seeding Rate: 18,000 plants per acre
Seeding Date: 5/17/88
Harvest Date: 10/13/88
Row Width: 30"
Fertilizer Applied: 55 lbs/A 18-46-0 and 20 lbs/A 46-0-0
Yield Goal: 80 bu/A
Herbicide Applied: 2 1/2 qt/A Bladex and 1 qt/A Atrazine
Notes: Yields are based on 13.5% moisture.
n.s. = no significant difference between hybrids.
All hybrids were severely stressed by drought.

1988 HETTINGER OIL SUNFLOWER VARIETY TRIAL

Variety	Lbs/A at 10% Moisture	Test Weight lbs/bu	Percent Oil	% Moisture at Harvest
Cargill 208	1497	30.4	44.8	5.7
Cargill 207	1381	31.6	47.7	6.2
Agripro 2057	1203	27.8	46.1	4.5
Cargill SF 100	1136	29.9	40.0	5.6
Seedtec ST 317	1071	30.5	52.0	4.8
Cargill SF 187	1065	30.1	46.4	5.3
ContiSeed Hysun 354	1047	31.8	47.5	3.8
Jacques Capri	1022	29.5	50.3	5.9
Dahlgren 827	1013	28.9	42.9	5.0
Seedtec ST 330	911	30.8	47.6	5.1
Pioneer 6440	877	29.7	46.3	4.8
Cenex 6101	863	27.1	46.7	4.3
Cenex 8101	743*	27.8	48.2	4.4
Jacques Exp. 8713	694	30.3	45.1	7.1
Dahlgren 855	583	29.8	43.8	4.8
Interstate 3001	547	29.1	51.4	4.7
Interstate 7111	428*	27.6	48.9	4.4
C.V. %	32	3.3		7.9
LSD 5%	436	1.4		0.6
LSD 1%	581	1.8		0.8
# of Reps	4	4	Bulk Bulk	2

Plant Population: 18,000 plants/A
Seeding Date: 5/17/88
Row Spacing: 30"
Herbicide Applied: 1 1/4 pts/A Treflan and 2 1/2 pts/A Eptam
Fertilizer Applied: 150 lbs/A 29-28-0
Harvest Date: 9/26/88
* = severe lodging

1988 HETTINGER GRAIN SORGHUM VARIETY TRIAL

Variety	Bushels per Acre	Test Weight lbs/bu
Seedtec 203	39.3	59.7
Dekalb DK-18	35.6	58.9
Dekalb DK-818	38.3	58.8
Jacques J 101	48.9	59.4
Cargill 22	37.8	59.1
Sigco X 1061	44.8	58.8
C.V. %	27.2	1.2
LSD 5%	n.s.	n.s.
# of Reps	4	4

Seeding Rate: 45,000 live seeds/A
Seeding Date: 5/27/88
Fertilizer Applied: 50 lbs/A 18-46-0 and 100 lbs/A 46-0-0
Yield Goal: 80 bu/A
Herbicide Applied: 1 1/3 pt/A 2,4-D preplant
Harvest Date: 10/10/88
Notes: All data adjusted to 13% grain moisture.