

PROJECT TITLE: **Small grain variety performance evaluation under fallow conditions off-station in Northern Montana.**

PERSONNEL:

Principal Investigator: **Gregg R. Carlson, Agronomist - Havre**

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Extension Agents in Counties Involved
Individual Cooperating Landowners**

OBJECTIVES:

Diverse cropping environments exist within that five-county area most closely served by this Research Center. Wheat production in the five counties represents an average of 33% of the statewide total. Producers are keenly interested in variety performance data generated under local conditions. It is our objective, within budget limitation, to evaluate small grain variety performance, over time, under specific Northern Montana conditions varying from those of the Research Center at Havre.

SUMMARY:

Thirteen 1990 off-station variety performance trials were conducted on fallow at five locations in five Northern Montana counties.

Dryland Winter Wheat Trials:

- 1. Myers Farms, Inc., Chouteau County (Big Sandy)
- 2. M & N Peterson Farm, Hill County (North Havre)

Dryland Spring Wheat Trials:

- 1. L. Cederberg Farm, Blaine County (Turner)
- 2. Myers Farms, Inc., Chouteau County (Big Sandy)
- 3. M & N Peterson Farm, Hill County (North Havre)
- 4. Graff Farms, Inc., Liberty County (North Joplin)
- 5. H. Solberg Farm, Phillips County (Wagner)

Dryland Spring Barley Trials:

1. L. Cederberg Farm, Blaine County (Turner)
2. Myers Farms, Inc., Chouteau County (Big Sandy)
3. M & N Peterson Farm, Hill County (North Havre)
4. Graff Farms, Inc., Liberty County (North Joplin)
5. H. Solberg Farm, Phillips County (Wagner)

Dryland Spring Oat Trial:

1. M & N Peterson Farm, Hill County (North Havre)

All trials were seeded in replicated, 3-row, 20-foot plots on a 12-inch row spacing utilizing a 'Rem' self-propelled cone seeder. Winter wheat trials were planted with hoe openers fitted with 'Acra-Plant' or JD 3" shovels; and double-disk openers were used until 1987 for spring grains. After 1987, all spring trials were planted with 'Acra-Plant' hoe openers. A randomized complete block design was standard for all trials with three replications. A 'Hege 125C' plot combine, funded in part by MWRMC in 1984, was used to harvest each 3-row plot after end-trimming to 16 '. Prior to 1984, sixteen feet of the center row for each plot was harvested with a 'Suzue' single-row binder and threshed with a 'Vogel' thresher. Other variables specific to each individual trial are listed in the data tables.

RESULTS:

Data details for individual trials conducted in 1982-1989 were included in respective previous reports, but summary yield and test weight data from past years are presented in abridged summary form for purposes of this report.

1990 cropping environments ranged from poor to good throughout most of north-central Montana. At Havre, total annual growing season precipitation (9/1/89 -8/31/90) was 11.68 inches or 99 percent of the average for years since 1916. April 1 through July 31 precipitation was 4.37 inches or 67 percent of the 74-year average. However, during mid-development, periods of heat stress accompanied by drying winds resulted in crop yields and quality substantially lower than the potential exhibited earlier in the growing season. Off-station cropping environments were very diverse with some locations recording normal to well above normal yields and quality while others were far below average.

Early planting of spring grains was generally less important than normal in 1990 with some later plantings escaping the most severe effects of heat and drought at critical growth states.

Plant height, yield, test weight, and protein data for the Myers and Peterson dryland winter wheat trials conducted in 1990 are summarized in Tables 1 and 3, respectively. Multi-year yield and test weight summaries for selected entries at the Myers and Peterson locations are presented in Tables 2 and 4, respectively.

Plant height, yield, test weight and protein data for the 1990 Cederberg, Myers, Peterson, Graff, and Solberg dryland spring wheat trials are summarized in Tables 5, 7, 9, 11 and 12, respectively. Multi-year yield and test weight summaries for selected entries at the Cederberg, Myers, Peterson, and Solberg locations are presented in Tables 6, 8, 10, and 13, respectively.

Plant height, yield, test weight, plump/thin and protein data for the current year Cederberg, Myers, Peterson, Graff, and Solberg spring barley trials are summarized in Tables 14, 16, 18, 20 and 21, respectively. Multi-year yield and test weight summaries for selected entries at the Cederberg, Myers, Peterson, and Solberg locations are presented in Tables 15, 17, 19, and 22, respectively.

Plant height, yield, test weight and protein data for the 1990 Peterson dryland spring oat trial are summarized in Table 23 with multi-year yield and test weight summarization presented in Table 24.

FUTURE PLANS:

It is planned, budget allowing, to continue off-station variety investigations in the five-county area. Retention of certain locations is desired in order to complete minimum, 5-year summary data. Locations with 5-year data completed will be closely reviewed as to whether they should be retained for ten years, replaced, or terminated.

Current workload dictates that the number of replicated off-station trial locations be held to five; and data processed by the Center will be limited to trials where the Center performs all functions from planting to harvest. Packaged seed will again be provided to County Extension Agents as per their needs for non-replicated demonstrations at any additional locations. Such demonstrations will be for display and discussion use by the County Extension Agent; and performance data will not be collected or processed by the Research Center for any such demonstration plantings.

Efforts are continuing in the use of computer mapping to augment identification and selection of appropriate sites for future off-station trial series. The Graff location in Liberty County was selected in this manner.

It is our current opinion that effort made to generate quality multi-year data at a few sites, carefully chosen to represent principal differences in average growing season conditions, is superior to an approach involving less concentrated work at greater numbers of locations. The concept of concentrating efforts at a single site representative of a vast area that yet differs from the Research Center is under on-going observation at the Peterson location in Northern Hill County.

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TABLE 1. DRYLAND FALLOW WINTER WHEAT VARIETY NURSERY GROWN OFF-STATION AT MYERS FARMS, INC., BIG SANDY. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1990.

VARIETY OR SELECTION	PLNT HT INCHES	YIELD BU/AC	TEST WT LBS/BU	PROTEIN %
NA 000X RAM	35.55	73.17	57.80	13.10
QT 542 HYBRITECH	36.75	67.77	60.53	12.70
CI 17860 NEELEY	33.64	63.43	60.63	14.10
CI 17902 WINRIDGE	38.62	62.50	60.40	13.40
NA 0001 THUNDERBIRD	35.54	61.60	61.93	13.60
NA 200 HAWK	34.29	59.80	60.60	13.30
MT 8039 JUDITH	36.13	58.40	58.20	14.10
PI517194 TIBER	38.14	56.73	60.90	13.70
CI 13670 WINALTA	40.16	55.30	61.50	13.60
CI 15075 CENTURK	36.23	55.00	60.77	14.40
CI 17879 ROCKY	37.15	53.90	61.30	13.20
CI 17735 NORSTAR	42.13	53.70	61.27	14.10
MT 7811 FRD/WNK//MT6928/TDR (hrd white)	34.19	53.27	60.30	12.80
CI 17844 REDWIN	37.24	50.97	60.43	14.40
CI 8885 CHEYENNE	37.99	50.37	61.23	14.70
PI491532 CREE	38.50	49.57	61.20	14.00
PI491533 NORWIN	27.06	48.20	60.77	13.20
RH78W296 BIGHORN	29.65	41.53	59.93	14.00

STATISTICAL SUMMARY	PLNT HT INCHES	YIELD BU/AC	TEST WT LBS/BU	PROTEIN %
EXPERIMENTAL MEANS	36.05	56.40	60.54	13.69
C.V. 2: (S OF MEAN/MEAN)*100	2.90	6.55	.43	-
LSD (0.05)	3.01	10.62	.74	-

CLIMATIC and NURSERY MANAGEMENT DATA

Seeding Date:	09/14/89	Soil Temp @ Sdg:	68F @ 2in., 61F @ 4in.
Harvest Date:	08/30/90	Root Penetration Depth:	N/A in.
Seeding Depth:	2.00 in.	Depth to Moisture at Sdg:	1.50 in.
Soil Series:	Assiniboine variant	Probed Moist.Depth @ Sdg:	55.0 in.+
Previous Crop:	Fallow	Herbicide:	None Applied, Hand Weeded
Initial Stored Soil Water at Seeding:	9.29 in.	(sampling depth = 48 in.)	
Measured Soil Water at Harvest:	3.06 in.	(sampling depth = 48 in.)	
Growing Season Precipitation (Apr 1 to 14 days prior to harvest maturity 'HM'):			
Total - all measurable events:	5.50 in.		
Total - all events >.1 inches:	5.50 in.		
Post Growing Season Precipitation (within 14 days of harvest maturity):			
Total - all measurable events:	0.00 in.		
Adj'd Residual Soil Water @ (HM-14d):	3.06 in.	(sampling depth = 48 in.)	
Initial Soil Analysis	(NO3,P,K at 0-6 in.; NO3 at 6-24, 24-36 & 36-48 in.):		
	NO3(lbs/ac)= 152 , P(ppm olsen)= 11 , K(ppm)= 319 , pH= 7.7, O.M.(%) = 1.2		
Fertilizer:	48#N,33#P2O5 via pre-plant injected NH3 & 11-53-0 deep banded		

TABLE 2. NINE-YEAR YIELD AND TEST WEIGHT SUMMARY ON SELECTED ENTRIES FROM A FALLON WINTER WHEAT VARIETY NURSERY GROWN OFF-STATION AT MYERS FARMS, INC., 810 SANDY, NORTHERN AGRICULTURAL RESEARCH CENTER, HAVRE, MT. 1982-1990.

2/ VARIETY OR SELECTION	NO. OF YEARS TESTED 3/	1/ YIELD (BUSHELS PER ACRE)							TEST WEIGHT (POUNDS PER BUSHEL)								
		1986	1987	1988	1989	1990	AVERAGE FOR YEARS TESTED	9-YR. COMPAR. AVERAGE YIELD 5/	PERCENT OF CHEYENNE YIELD 6/	1986	1987	1988	1989	1990	AVERAGE FOR YEARS TESTED	9-YR. COMPAR. AVERAGE TEST WT 5/	PERCENT OF CHEYENNE TEST WT 6/
CI 17860 NEELY	4	-	48.9	10.9	-	63.4	39.7	45.2	111.9	-	62.2	59.8	-	66.6	60.7	61.6	100.0
MT 8003 TIGER	7	47.7	45.7	12.2	-	56.7	42.6	44.3	109.7	61.0	61.8	60.2	-	60.9	61.4	61.5	99.9
CI 17982 WINDRIDGE	7	41.9	45.1	11.1	-	62.5	41.6	43.3	107.2	57.6	61.6	59.8	-	60.4	60.2	60.3	97.9
NA 1316 ROCKY (P+)	8	44.1	44.8	10.5	-	53.9	43.2	43.2	107.0	59.6	62.0	59.8	-	61.3	61.9	61.9	100.4
CI 17726 NORSTAR	8	43.2	48.7	12.8	-	53.7	43.1	43.1	106.7	60.2	61.5	59.1	-	61.3	61.0	61.0	98.9
NA 208 HAWK (P+)	4	46.5	42.9	14.3	-	59.8	48.9	42.6	105.4	60.5	61.8	59.6	-	60.6	60.7	61.6	100.0
MT 8039 JUDITH	4	41.6	51.6	11.5	-	58.4	40.8	42.5	105.2	58.8	60.7	59.3	-	58.2	59.2	60.1	97.6
NA 001 THUNDERBIRD (P+)	4	39.3	40.4	18.5	-	61.6	39.5	41.2	101.8	62.0	62.2	59.9	-	61.9	61.5	62.5	101.4
MT 77063 CREE	8	42.0	43.7	13.2	-	60.6	41.1	41.1	101.8	60.8	61.5	60.1	-	61.2	61.9	61.9	100.4
CI 13190 WARRIOR	3	41.5	39.5	10.9	-	-	35.1	40.7	100.8	59.5	60.9	59.0	-	-	60.7	60.7	98.5
CI 8685 CHEYENNE	8	42.7	42.0	14.4	-	50.4	40.4	40.4	100.0	60.7	61.0	60.4	-	61.2	61.6	61.6	100.0
CI 13670 WINALTA	8	41.2	39.7	14.4	-	55.3	40.8	40.8	98.9	60.4	62.1	60.0	-	61.5	62.0	62.0	100.6
CI 15075 CENTURK (+)	8	41.7	46.5	6.5	-	55.0	39.9	39.9	98.8	60.3	62.0	59.6	-	60.8	61.9	61.9	100.4
CI 17844 REDWIN	8	37.5	42.4	9.8	-	51.8	39.6	39.6	98.0	60.5	62.3	61.0	-	60.4	61.9	61.9	100.5
MT78296 BIGHORN (P+)	3	45.4	35.7	-	-	41.5	40.9	36.7	90.9	61.4	61.4	-	-	59.9	60.9	61.5	99.9
MT 7877 NORMAN	7	35.7	39.8	9.4	-	48.2	35.2	36.7	90.8	58.8	63.1	60.7	-	60.8	61.9	62.0	100.7
NA MINGS (P+)	3	43.5	40.5	9.0	-	-	31.0	35.9	88.8	61.0	61.6	59.9	-	-	60.8	61.7	100.2
MEAN (ENTRIES LISTED)		42.2	43.4	11.7	-	54.7	-	41.0	-	60.2	61.7	59.9	-	60.7	-	61.5	-
7/ Growing Season Precip. (in.)		6.80	4.79	3.59	0.89	6.99	5.31										
8/ Soil PMH (in.) to 4 ft. @Sdp.		3.71	9.49	6.25	6.18	9.29	7.29										
Total Plant Avail. Naber (in.)		10.51	14.19	9.75	0.00	18.19	12.59										
Fertilizer Applied (# N)		48.0	58.0	58.0	51.0	48.0											
(# P2O5)		39.0	28.0	28.0	28.0	21.0											
(# K2O)		6.0	19.0	10.0	9.0	0.0											
(# S)		6.0	0.0	0.0	0.0	0.0											

Check variety is Cheyenne.

1/ See NRES Bulletin 1098 for the evaluation of other important variety performance characteristics to include protein, quality, winter hardiness, disease resistance, etc. before making variety selection decisions.

2/ P = Private variety, + = Protected variety.

3/ Only the most recent five years are shown, but summary calculations include all years noted.

4/ The 1989 nursery was lost due to winter injury.

5/ 9-yr. CA = (x/y) * z where x = average yield and test weight of the entry for years tested, y = average yield and test weight of Cheyenne for the same years, and z = 9-yr. average yield and test weight for the check variety Cheyenne.

6/ Percent of Cheyenne yield and test weight for the same data years as those in which the entry was tested.

7/ April 1 to 14 days prior to harvest maturity.

8/ Depth of moist soil (ft.) * 2.00 in.PMH/ft except starting in 1987 where soil PMH values are actual gravimetric measurements.

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TABLE 3. DRYLAND FALLOW WINTER WHEAT VARIETY NURSERY GROWN OFF-STATION AT THE MARK & NANCY PETERSON FARM, NORTH HAVRE. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1990.

VARIETY OR SELECTION	PLNT INCHES	HT BU/AC	YIELD LBS/BU	TEST WT LBS/BU	PROTEIN %
NA 000X RAM	33.08	49.90	56.00	14.20	
NA 200 HAWK	30.92	48.77	58.57	14.20	
MT 8039 JUDITH	35.09	48.70	55.77	14.60	
NA 0001 THUNDERBIRD	30.83	48.07	60.40	14.20	
QT 542 HYBRITECH	32.28	45.33	57.07	14.50	
MT 7811 FRD/WNK//MT6928/TDR (hrd white)	31.36	44.23	57.67	15.90	
CI 17879 ROCKY	31.82	42.97	58.73	14.60	
CI 15075 CENTURK	29.75	42.30	58.57	15.20	
CI 17735 NORSTAR	33.41	41.60	60.03	13.90	
CI 17860 NEELEY	29.45	41.33	56.77	16.20	
CI 13670 WINALTA	32.11	40.37	60.03	14.70	
PI491533 NORWIN	23.46	40.30	59.00	14.40	
CI 8885 CHEYENNE	30.96	39.83	60.03	15.20	
PI517194 TIBER	30.17	39.63	58.47	14.50	
CI 17902 WINRIDGE	30.24	39.10	55.70	15.50	
PI491532 CREE	30.91	38.57	59.60	15.20	
RH78W296 BIGHORN	29.19	37.07	57.67	15.70	
CI 17844 REDWIN	30.00	36.83	58.90	15.00	

STATISTICAL SUMMARY	PLNT INCHES	HT BU/AC	YIELD LBS/BU	TEST WT LBS/BU	PROTEIN %
EXPERIMENTAL MEANS	30.84	42.49	58.28	14.87	
C.V. 2: (S OF MEAN/MEAN)*100	2.98	5.08	.56	-	
LSD (0.05)	2.64	6.20	.94	-	

CLIMATIC and NURSERY MANAGEMENT DATA

Seeding Date:	09/15/89	Soil Temp @ Sdg:	48F @ 2in., 52F @ 4in.
Harvest Date:	08/13/90	Root Penetration Depth:	N/A in.
Seeding Depth:	2.00 in.	Depth to Moisture at Sdg:	0.50 in.
Soil Series:	Telstad Loam	Probed Moist.Depth @ Sdg:	55.0 in.+
Previous Crop:	Fallow	Herbicide:	None Applied - Hand Weeded
Initial Stored Soil Water at Seeding:	9.92 in.	(sampling depth = 48 in.)	
Measured Soil Water at Harvest:	3.96 in.	(sampling depth = 48 in.)	
Growing Season Precipitation (Apr 1 to 14 days prior to harvest maturity 'HM'):			
Total - all measurable events:	5.31 in.		
Total - all events >.1 inches:	4.73 in.		
Post Growing Season Precipitation (within 14 days of harvest maturity):			
Total - all measurable events:	0.07 in.		
Total - all events >.1 inches:	0.07 in.		
Adj'd Residual Soil Water @ (HM-14d):	3.89 in.	(sampling depth = 48 in.)	
Initial Soil Analysis (NO3,P,K at 0-6 in.; NO3 at 6-24, 24-36 & 36-48 in.):			
NO3(lbs/ac)= 264 , P(ppm olsen)= 23 , K(ppm)= 281 , pH= 7.7, O.M.(%) = 1.2			
Fertilizer:	50#N,25#P205,10#K20	via granular blend, air seeder injected 7/89	

TABLE 4 . EIGHT-YEAR YIELD AND TEST WEIGHT SUMMARY ON SELECTED ENTRIES FROM A FALLON WINTER WHEAT NURSERY GROWN OFF-STATION AT THE MARK AND NANCY PETERSON FARM, NORTH HAVRE. NORTHERN AGRICULTURAL RESEARCH CENTER, HAVRE, MONTANA. 1983-1990.

2/VARIETY OR SELECTION	NO. OF YEARS TESTED 3/	1/ YIELD (BUSHELS PER ACRE)					TEST WEIGHT (POUNDS PER BUSHEL)										
		1983	1984	1988	1989 4/	1990	AVERAGE FOR YEARS TESTED	8-YR COMPAR. AVERAGE YIELD 5/	PERCENT OF CHEYENNE YIELD 6/	1983	1984	1988	1989 4/	1990	AVERAGE FOR YEARS TESTED	8-YR COMPAR. AVERAGE TEST WT 5/	PERCENT OF CHEYENNE TEST WT 6/
CI 17735 NORSTAR	4	63.7	30.7	19.2	-	44.6	39.6	39.6	107.7	64.0	57.6	61.0	-	60.0	60.7	60.7	98.7
PI517194 TIGER	4	58.9	33.2	20.0	-	39.6	37.9	37.9	103.3	64.4	58.0	61.9	-	58.5	60.7	60.7	98.7
CI 8885 CHEYENNE	4	57.7	32.7	16.7	-	39.8	36.7	36.7	100.0	65.2	59.2	61.5	-	60.0	61.5	61.5	100.0
CI 17879 ROCKY (P+)	4	58.9	28.5	15.8	-	43.0	36.5	36.5	99.4	61.3	59.1	61.3	-	58.7	60.1	60.1	97.8
PI491532 CREE	3	-	30.4	19.4	-	38.6	29.5	36.4	99.0	-	59.8	61.3	-	59.6	60.2	61.5	100.0
CI 15975 CENTURK (+)	3	-	29.3	15.7	-	42.3	29.1	35.9	97.8	-	58.8	61.2	-	58.6	59.5	60.5	98.5
CI 13670 HINALTA	4	54.7	39.6	15.8	-	40.4	35.4	35.4	96.3	64.9	59.3	61.2	-	60.0	61.4	61.4	99.8
PI491533 NORWIN	4	52.7	32.4	15.2	-	40.3	35.2	35.2	95.7	64.8	60.0	62.3	-	59.0	61.5	61.5	100.1
CI 17092 WINRIDGE	3	-	30.0	12.7	-	39.1	27.3	33.7	91.6	-	55.2	60.9	-	55.7	57.3	58.2	94.7
CI 16844 REDWIN	4	47.6	31.5	17.4	-	36.8	33.3	33.3	90.8	62.3	58.8	62.2	-	58.9	60.6	60.6	98.5
MEAN (ENTRIES LISTED)		56.3	30.9	16.8	-	40.5		36.1		63.8	58.6	61.5		58.9		60.7	
6/ Growing Season Precip. (in.)		7.43	1.96	3.23	-	5.45	4.52										
7/ Soil PAM (in.) to 4 ft. @Sdg		8.00	6.00	9.30	-	9.92	8.81										
Total Plant Avail. Water (in.)		15.43	9.96	12.53	-	15.37	13.32										
Fertilizer Applied (lb)		71.0	56.0	13.5	-	50.0											
(N205)		33.0	42.0	34.5	-	25.0											
(K20)		-	-	0.0	-	10.0											
(S)		-	-	0.0	-	0.0											

Check variety is Cheyenne.

1/ See NCRS Bulletin 1098 for the evaluation of other important variety performance characteristics to include protein, winter hardiness, disease resistance, etc., before making variety selection decisions

2/ P = Private variety, + = Protected variety

3/ 1985 Nursery lost to winter injury and severe drought.

1986 + 1987 Nurseries were not planted because it was too wet to get into the field.

4/ The 1989 nursery was lost due to winter injury.

5/ 8-yr. CA = (x/y)z where x = average yield and test weight of the entry for the years tested, y = average yield and test weight of Cheyenne for the same years, and z = 8-yr. average yield and test weight for the check variety Cheyenne.

6/ Percent of Cheyenne yield and test weight for the same data years as those in which the entry was tested.

7/ April 1 to 14 days prior to harvest maturity.

8/ Depth of moist soil (ft.) * 2.00 PAM/ft except starting in 1987 where soil PAM values are actual gravimetric measurements.

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TABLE 5. DRYLAND FALLOW SPRING WHEAT VARIETY NURSERY GROWN OFF-STATION AT THE LEON CEDERBERG FARM, TURNER. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1990.

VARIETY OR SELECTION	PLNT INCHES	HT BU/AC	YIELD LBS/BU	TEST WT LBS/BU	PROTEIN %
PI483235 GLENMAN	22.82	33.30	59.30	17.00	
CI 17904 OWENS (soft white)	22.11	31.33	59.20	18.10	
CI 17790 LEN	21.96	30.47	57.87	17.50	
ND 626 GRANDIN	23.61	28.60	59.77	18.20	
MT 8402 MT7336/SHORTANA	19.58	28.23	58.87	17.80	
CANLANC LANCER	25.63	27.67	58.73	17.10	
WA 6920 PENAWAWA (soft white)	19.87	27.33	58.23	15.10	
CI 17430 NEWANA	21.80	27.30	59.83	17.30	
ND 618 GUS	22.56	27.00	59.57	17.70	
ND 582 STOA	24.89	26.77	58.77	18.10	
CI 17828 PONDERA	21.52	26.63	60.00	18.60	
CI 17429 LEW	24.80	25.67	60.17	17.70	
ND 606 AMIDON	24.21	25.37	57.57	17.80	
CI 17910 ALEX	25.05	24.67	58.90	18.20	
CI 13596 FORTUNA	23.52	23.60	58.30	18.00	
CI 15930 OLAF	22.19	22.40	57.90	17.80	
WPB 906R WESTBRED 906R	20.47	20.07	59.20	17.40	
C982-324 RAMBO	21.36	19.70	59.33	17.40	
WPB 926R WESTBRED 926R	21.61	19.33	59.57	19.10	
NDCUT CUTLESS	21.75	18.77	58.17	17.40	

STATISTICAL SUMMARY	PLNT INCHES	HT BU/AC	YIELD LBS/BU	TEST WT LBS/BU	PROTEIN %
EXPERIMENTAL MEANS	22.57	25.71	58.96	17.62	
C.V. 2: (S OF MEAN/MEAN)*100	1.86	4.15	.23	-	
LSD (0.05)	1.20	3.06	.40	-	

CLIMATIC and NURSERY MANAGEMENT DATA

Seeding Date:	05/02/90	Soil Temp @ Sdg:	66F @ 2in., 64F @ 4in.
Harvest Date:	08/29/90	Root Penetration Depth:	N/A in.
Seeding Depth:	1.50 in.	Depth to Moisture at Sdg:	0.25 in.
Soil Series:	Telstad Loam	Probed Moist.Depth @ Sdg:	44.0 in.
Previous Crop:	Fallow	Herbicide:	None Applied - Hand Weeded
Initial Stored Soil Water at Seeding:	7.97 in.	(sampling depth = 48 in.)	
Measured Soil Water at Harvest:	3.47 in.	(sampling depth = 48 in.)	
Growing Season Precipitation (Sdg. to 14 days prior to harvest maturity 'HM'):			
Total - all measurable events:	8.07 in.		
Total - all events >.1 inches:	7.90 in.		
Adj'd Residual Soil Water @ (HM-14d):	3.47 in.	(sampling depth = 48 in.)	
Initial Soil Analysis (NO3,P,K at 0-6 in.; NO3 at 6-24, 24-36 & 36-48 in.):			
NO3(lbs/ac)= 120 , P(ppm olsen)= 19 , K(ppm)= 302 , pH= 7.0, O.M.(%) = 1.2			
Fertilizer:	62#N,45#P2O5 via split, pre-plant, till-incorp b'dcast (4/26 & 5/2)		

TABLE 6. FOUR-YEAR YIELD AND TEST WEIGHT SUMMARY ON SELECTED ENTRIES FROM A FALLOW SPRING WHEAT VARIETY NURSERY GROWN OFF-STATION ON A 'TELSTAD' SOIL AT THE LEON CEDERBERG FARM, TURNER, NORTHERN AGRICULTURAL RESEARCH CENTER, HAVRE, MONTANA, 1987-1990.

2/ VARIETY OR SELECTION TESTED	NO. OF YEARS TESTED	1/ YIELD (BUSHELS PER ACRE)				AVERAGE FOR YEARS TESTED			TEST WEIGHT (POUNDS PER BUSHEL)				AVERAGE FOR YEARS TESTED		
		1987	1988	1989	1990	FOR YEARS TESTED	4-YR. COMPAR. AVERAGE YIELD 3/	PERCENT OF FORTUNA YIELD 4/	1987	1988	1989	1990	FOR YEARS TESTED	4-YR. COMPAR. AVERAGE TEST WT 3/	PERCENT OF FORTUNA TEST WT 4/
PI483235 GLENNAN	4	32.2	21.7	29.7	33.3	29.2	29.2	138.2	58.9	60.9	58.6	59.3	59.4	59.4	99.9
CI 17904 OHENS(sft wht)	4	26.0	18.3	28.8	31.3	26.4	26.4	124.7	59.5	62.7	59.6	59.2	60.3	60.3	100.7
CI 17429 LEN	4	30.4	19.0	28.5	25.7	25.9	25.9	122.5	60.3	62.3	60.3	60.2	60.8	60.8	101.5
CI 17790 LEN	4	27.1	19.7	24.7	30.5	25.5	25.5	120.7	59.1	61.2	59.1	57.9	59.3	59.3	99.1
CANLANC LANCER	3	-	17.3	27.9	27.7	24.3	24.2	114.6	-	62.0	59.6	58.7	60.1	59.7	99.7
CI 17430 NEMANA	4	25.0	20.4	24.1	27.3	24.2	24.2	114.5	60.3	59.3	61.0	59.8	60.1	60.1	100.4
ND 582 STDA	4	24.9	19.9	24.6	26.8	24.0	24.0	113.8	59.3	62.0	59.8	58.8	60.0	60.0	100.2
CI 17910 ALEX	4	22.4	20.0	25.8	24.7	23.2	23.2	109.9	60.2	62.7	60.6	58.9	60.6	60.6	101.2
MT 8402 MT7336/SHORTAN	3	-	14.4	25.2	28.2	22.6	22.5	106.7	-	61.9	59.3	58.9	60.0	59.6	99.5
C982-324 RAMBO(P+)	4	25.4	19.7	24.8	19.7	22.4	22.4	105.9	60.7	63.3	60.4	59.3	60.9	60.9	101.8
CI 17828 PONDERA	4	19.8	17.7	23.6	26.6	21.9	21.9	103.8	59.9	59.5	60.0	60.0	59.8	59.8	100.0
CI 17920 MARSHALL	3	17.0	19.8	24.5	-	20.4	21.3	100.7	59.2	62.4	58.1	-	59.9	59.4	99.2
CI 13596 FORTUNA	4	20.9	14.7	25.3	23.6	21.1	21.1	100.0	59.5	61.7	60.9	58.3	59.9	59.9	100.0
CI 15930 OLAF	4	19.7	18.2	23.0	22.4	20.8	20.8	98.6	59.0	61.5	59.5	57.9	59.5	59.5	99.4
NDOUT OUTLESS	4	20.0	15.2	22.6	18.8	19.1	19.1	90.6	58.5	62.0	59.5	58.2	59.5	59.5	99.5
WPB 906R WESTBRED 906R	3	-	11.8	24.7	20.1	18.9	18.8	88.8	-	61.7	59.6	59.2	60.2	59.7	99.8
MEAN (ENTRIES LISTED)		23.9	18.0	25.6	25.8	23.1	23.2		59.5	61.7	59.7	59.0		59.9	
5/ Growing Season Precip. (in.)		6.05	6.00	6.84	8.07		6.74								
6/ Soil PAM (in.) to SD @Pintng.		5.97	8.58	4.86	7.97		6.85								
Total Plant Avail. Water (in.)		12.02	14.58	11.70	16.04		13.59								
Soil NO3 (lbs.) to SD @Pintng.		68.0	84.0	52.0	120.0										
SD (Sampling Depth in inches)		48.0	48.0	48.0	48.0										
Fertilizer Applied (# N)		53.0	50.0	70.0	62.0										
(# P2O5)		35.0	0.0	0.0	45.0										

Check variety is Fortuna.

1/ See MCES bulletin 1093 for evaluation of other important variety performance characteristics to include protein, quality, disease resistance, etc. before making variety selection decisions.

2/ P = Private variety, + = Protected variety.

3/ 4-yr. CA = (x/y) * z where x = average yield or test weight of the entry for years tested, y = average yield or test weight for Fortuna for the same years, and z = 4-yr. average yield or test weight for the check variety Fortuna.

4/ Percent of Fortuna yield or test weight for the same data years as those in which the entry was tested.

5/ Seeding to 14 days prior to harvest maturity.

6/ Depth of moist soil (ft.) * 2.00 in. PAM/ft except starting in 1986 where soil PAM values are actual gravimetric measurements.

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TABLE 7. DRYLAND FALLOW SPRING WHEAT VARIETY NURSERY GROWN OFF-STATION AT MYERS FARMS, INC., BIG SANDY. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1990.

VARIETY OR SELECTION	PLNT INCHES	HT BU/AC	YIELD LBS/BU	TEST WT LBS/BU	PROTEIN %
CI 17904 OWENS (soft white)	22.99	33.20	56.20	14.50	
WA 6920 PENAWAWA (soft white)	21.71	33.03	56.03	12.60	
ND 618 GUS	23.11	31.77	56.30	17.30	
WPB 926R WESTBRED 926R	23.94	31.20	56.17	16.30	
MT 8402 MT7336/SHORTANA	24.29	30.33	56.97	17.20	
WPB 906R WESTBRED 906R	22.69	27.70	56.43	16.90	
ND 626 GRANDIN	25.30	27.63	57.23	16.80	
ND 606 AMIDON	25.75	27.43	55.23	16.30	
CI 17910 ALEX	24.75	26.07	57.43	16.50	
NDCUT CUTLESS	23.96	25.03	55.80	17.40	
C982-324 RAMBO	22.55	23.70	55.77	16.20	
ND 582 STOA	23.52	23.27	55.73	16.80	
CI 17429 LEW	23.32	22.83	57.27	16.60	
CANLANC LANCER	25.93	22.50	55.97	17.00	
CI 15930 OLAF	22.09	22.43	55.83	16.80	
CI 17828 PONDERA	22.09	22.13	57.00	17.10	
PI483236 GLENMAN	22.87	21.67	55.57	15.40	
CI 17790 LEN	20.41	18.13	55.63	16.30	
CI 13596 FORTUNA	23.79	17.43	55.60	17.70	
CI 17430 NEWANA	20.12	16.20	55.50	17.70	

STATISTICAL SUMMARY	PLNT INCHES	HT BU/AC	YIELD LBS/BU	TEST WT LBS/BU	PROTEIN %
EXPERIMENTAL MEANS	23.26	25.13	56.18	16.47	
C.V. 2: (S OF MEAN/MEAN)*100	3.73	11.63	.47	-	
LSD (0.05)	2.48	8.37	.76	-	

CLIMATIC and NURSERY MANAGEMENT DATA

Seeding Date: 05/04/90	Soil Temp @ Sdg: 71F @ 2in., 64F @ 4in.
Harvest Date: 08/30/90	Root Penetration Depth: N/A in.
Seeding Depth: 1.50 in.	Depth to Moisture at Sdg: 0.00 in.
Soil Series: Assiniboine variant	Probed Moist.Depth @ Sdg: 55.0 in.+
Previous Crop: Fallow	Herbicide: None Applied - Hand Weeded
Initial Stored Soil Water at Seeding: 10.23 in.	(sampling depth = 48 in.)
Measured Soil Water at Harvest: 3.82 in.	(sampling depth = 48 in.)
Growing Season Precipitation (Sdg. to 14 days prior to harvest maturity 'HM'):	
Total - all measurable events: 6.90 in.	
Total - all events >.1 inches: 6.90 in.	
Adj'd Residual Soil Water @ (HM-14d): 3.82 in.	(sampling depth = 48 in.)
Initial Soil Analysis (NO3,P,K at 0-6 in.; NO3 at 6-24, 24-36 & 36-48 in.):	
NO3(lbs/ac)= 160 , P(ppm olsen)= 13 , K(ppm)= 308 , pH= 7.7, O.M.(%) = 1.4	
Fertilizer: 48#N,33#P205 via pre-plant injected NH3 & 11-53-0 deep banded	

TABLE 8 . THREE-YEAR YIELD AND TEST WEIGHT SUMMARY ON SELECTED ENTRIES FROM A FALLON SPRING WHEAT NURSERY GROWN OFF-STATION AT MYERS FARMS, INC., BIG SANDY. NORTHERN AGRICULTURAL RESEARCH CENTER, HAVRE, MONTANA. 1988-1990.

2/ VARIETY OR SELECTION	NO. OF YEARS TESTED	1/ YIELD (BUSHELS PER ACRE)					TEST WEIGHT (POUNDS PER BUSHEL)										
		1988	1989	1990	1991	1992	AVERAGE FOR YEARS TESTED	3-YR COMPAR. AVERAGE YIELD 3/	PERCENT OF FORTUNA YIELD 4/	1988	1989	1990	1991	1992	AVERAGE FOR YEARS TESTED	3-YR COMPAR. AVERAGE TEST WT. 3/	PERCENT OF FORTUNA TEST WT. 4/
CI 17904 OHENS (SFT HHT)	3	7.3	56.0	33.2			32.2	32.2	151.0	61.4	55.6	56.2			57.7	58.6	100.4
CI 17918 ALEX	3	8.0	49.6	26.1			27.9	27.9	131.0	61.3	56.9	57.4			58.5	59.5	101.8
MT 8402 MT7336/SHORTANA	3	5.0	48.2	30.3			27.9	27.9	130.7	61.0	58.2	57.0			58.7	59.6	102.1
ND 582 STOA	3	10.8	47.3	23.4			27.2	27.2	127.5	61.6	54.5	55.7			57.3	58.2	99.6
C982-324 RAMBO(P+)	3	7.1	47.3	23.7			26.0	26.0	122.2	62.5	55.0	55.8			57.8	58.7	100.4
CI 15930 OLAF	3	5.9	49.7	22.4			26.0	26.0	122.0	60.6	54.3	55.8			56.9	57.8	99.0
MPB 906R WESTBRED 906R(P+)	3	4.1	45.2	27.7			25.7	25.7	120.4	61.2	55.1	58.4			57.6	58.5	100.1
CI 17828 PONDERA	3	7.3	43.9	22.1			24.4	24.4	114.7	61.0	58.1	57.0			58.7	59.6	102.1
PI483235 GLENMAN	3	7.6	43.4	21.7			24.2	24.2	113.7	60.4	55.5	55.6			57.2	58.1	99.4
CI 17429 LEN	3	6.8	42.8	22.8			24.1	24.1	113.3	61.6	55.5	57.3			58.1	59.0	101.1
ND CUT CUTLESS	3	5.3	42.0	25.0			24.1	24.1	113.1	60.9	56.4	55.8			57.7	58.6	100.3
CANLANC LANCER	3	4.8	40.7	22.5			22.7	22.7	106.3	60.5	56.8	56.0			57.8	58.7	100.4
CI 17430 NEMANA	3	8.1	44.6	15.2			22.6	22.6	106.3	62.0	58.0	55.5			58.5	59.4	101.7
CI 17798 LEN	3	8.3	41.4	18.1			22.8	22.6	106.2	60.4	56.4	55.6			57.5	58.4	100.8
CI 13596 FORTUNA	3	5.5	41.0	17.4			21.3	21.3	100.0	60.3	56.6	55.6			57.5	58.4	100.0
MEANS (ENTRIES LISTED)		6.8	45.5	23.4					25.3	61.1	56.2	56.2				58.7	
5/ Growing Season Precip. (in.)		3.59	8.77	6.90					6.39								
6/ Soil PAM (in.) to SD at @plant		6.25	6.38	19.23					7.62								
Total Plant Avail. Water (in.)		9.75	15.15	17.13					14.01								
Soil NO3 (lbs.) to SD @Plant.		116.0	192.0	160.0													
SD (Sampling Depth in inches)		48.0	48.0	48.0													
Fertilizer Applied (NH)		56.0	51.0	48.0													
(MP205)		28.0	28.0	21.0													
(MK20)		10.0	9.0	0.0													

Check variety is Fortuna.

1/ See NCRS Bulletin 1094 for evaluation of other important variety performance characteristics to include protein, quality, disease resistance, etc., before making variety selection decisions.

2/ P = Private variety, + = Protected variety.

3/ 3-yr. CA = $(x/y)^z$ where x = average yield or test weight of the entry for the years tested, y = average yield or test weight of Fortuna for the same years, and z = 3-yr. average of yield or test weight for the check variety Fortuna.

4/ Percent of Fortuna yield or test weight for the same data years as those in which the entry was tested.

5/ Seeding to 14 days prior to harvest maturity.

6/ Soil PAM values are actual gravimetric measurements.

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TABLE 9. DRYLAND FALLOW SPRING WHEAT VARIETY NURSERY GROWN OFF-STATION AT THE MARK & NANCY PETERSON FARM, NORTH HAVRE. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1990.

VARIETY OR SELECTION	PLNT INCHES	HT BU/AC	YIELD LBS/BU	TEST WT LBS/BU	PROTEIN %
ND 606 AMIDON	27.06	33.77	59.87	15.70	
CI 17904 OWENS (soft white)	24.59	32.33	57.97	14.70	
ND 626 GRANDIN	27.49	31.70	58.93	17.00	
CI 17430 NEWANA	23.58	31.30	60.23	15.80	
WPB 926R WESTBRED 926R	23.75	31.03	58.63	16.90	
PI483235 GLENMAN	23.79	31.00	58.13	17.00	
ND 618 GUS	24.61	30.57	59.33	17.50	
CI 13596 FORTUNA	27.66	30.00	61.20	17.70	
CI 17429 LEW	27.89	29.23	61.00	16.90	
CI 17910 ALEX	25.37	28.67	60.63	16.60	
CI 17790 LEN	25.94	28.57	58.87	16.30	
CI 15930 OLAF	22.73	28.43	58.27	17.30	
CI 17828 PONDERA	24.08	28.10	60.03	18.00	
CANLANC LANCER	28.25	27.77	60.13	18.20	
ND 582 STOA	27.80	27.57	57.70	17.30	
WA 6920 PENAWAWA (soft white)	22.34	27.57	56.90	14.60	
WPB 906R WESTBRED 906R	24.00	27.23	57.77	16.70	
MT 8402 MT7336/SHORTANA	23.41	26.70	57.43	18.50	
NDCUT CUTLESS	23.11	26.57	60.97	18.30	
C982-324 RAMBO	22.72	25.80	60.97	16.90	

STATISTICAL SUMMARY	PLNT INCHES	HT BU/AC	YIELD LBS/BU	TEST WT LBS/BU	PROTEIN %
EXPERIMENTAL MEANS	25.01	29.20	59.15	16.90	
C.V. 2: (S OF MEAN/MEAN)*100	3.58	6.81	.98	-	
LSD (0.05)	2.56	5.69	1.66	-	

CLIMATIC and NURSERY MANAGEMENT DATA

Seeding Date:	04/30/90	Soil Temp @ Sdg:	50F @ 2in., 49F @ 4in.
Harvest Date:	08/14/90	Root Penetration Depth:	N/A in.
Seeding Depth:	1.50 in.	Depth to Moisture at Sdg:	0.00 in.
Soil Series:	Telstad Loam	Probed Moist.Depth @ Sdg:	55.0 in.+
Previous Crop:	Fallow	Herbicide:	None Applied - Hand Weeded
Initial Stored Soil Water at Seeding:	8.67 in.	(sampling depth = 48 in.)	
Measured Soil Water at Harvest:	3.24 in.	(sampling depth = 48 in.)	
Growing Season Precipitation (Sdg. to 14 days prior to harvest maturity 'HM'):			
Total - all measurable events:	4.87 in.		
Total - all events >.1 inches:	4.23 in.		
Adj'd Residual Soil Water @ (HM-14d):	3.24 in.	(sampling depth = 48 in.)	
Initial Soil Analysis (NO3,P,K at 0-6 in.; NO3 at 6-24, 24-36 & 36-48 in.):			
NO3(lbs/ac)= 196 , P(ppm olsen)= 22 , K(ppm)= 251 , pH= 7.5, O.M.(%) = 0.8			
Fertilizer:	50#N,25#P2O5,10#K2O	via granular blend, air seeder injected	7/89

TABLE 10. NINE-YEAR YIELD AND TEST WEIGHT SUMMARY ON SELECTED ENTRIES FROM A FALLON SPRING WHEAT VARIETY NURSERY GROWN OFF-STATION AT THE MARK AND NANCY PETERSON FARM, NORTH HAVRE. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1982-1990.

2/ VARIETY OR SELECTION	NO. OF YEARS TESTED 3/	1/ YIELD (BUSHEL PER ACRE)					TEST WEIGHT (POUNDS PER BUSHEL)					AVERAGE FOR YEARS TESTED	9-YR. COMPAR. AVERAGE TEST WT. 4/	PERCENT OF FORTUNA TEST WT. 5/			
		1986	1987	1988	1989	1990	AVERAGE FOR YEARS TESTED	9-YR. COMPAR. AVERAGE YIELD 4/	PERCENT OF FORTUNA YIELD 5/	1986	1987				1988	1989	1990
CI 17904 OHENS(sft white)	8	47.9	54.3	10.3	26.3	32.3	32.0	34.8	123.3	60.4	56.4	57.5	58.0	60.0	57.2	57.8	98.4
PI483235 GLENNON	9	45.0	52.8	10.6	29.3	31.0	34.7	34.7	122.9	59.9	55.2	55.7	57.9	58.1	57.1	57.1	97.2
CI 17790 LEH	6	44.4	43.5	13.9	24.2	28.6	34.3	33.2	117.4	60.1	55.1	55.9	57.3	56.9	57.2	57.0	97.0
CI 17430 MEMANA	9	44.0	45.4	10.2	26.4	31.3	32.4	32.4	114.7	61.1	59.1	58.0	60.3	60.2	59.5	59.5	101.3
CI 15930 OLAF	7	-	35.6	9.2	20.6	28.4	28.0	30.4	107.4	-	57.6	57.1	57.9	58.3	59.1	58.4	99.3
ND 582 STON	7	38.0	33.1	12.2	22.1	27.6	23.1	29.7	105.0	60.1	57.4	56.3	57.9	57.7	56.5	55.8	95.0
CI 17429 LEH	9	36.3	40.0	11.6	22.8	29.2	29.4	29.4	104.0	61.1	57.8	57.7	58.2	61.0	58.9	58.9	100.3
C982-324 RAMBO(P+)	4	-	45.5	7.8	23.6	25.8	25.7	29.2	103.1	-	59.2	58.0	61.1	61.0	59.8	60.0	102.1
CI 17828 PONDERA	9	42.0	35.4	9.7	21.8	28.1	29.1	29.1	102.9	61.2	58.1	58.5	58.2	60.0	59.2	59.2	100.7
CANLANC LANCER	3	-	-	12.4	25.2	27.8	21.8	28.8	101.8	-	-	57.0	58.7	60.1	58.6	58.7	99.9
CI 13596 FORTUNA	9	29.1	35.3	9.3	24.9	30.0	28.3	28.3	100.0	61.0	58.4	56.6	58.2	61.2	58.7	58.7	100.0
NDOUT OUTLESS	4	-	39.6	11.6	20.8	26.6	24.6	28.0	99.0	-	56.8	55.9	58.4	61.0	58.0	58.2	99.0
MT 8402 MT7336/SHORTAN	3	-	-	11.8	24.8	26.7	21.1	27.9	98.6	-	-	57.6	56.9	57.4	57.3	57.4	97.7
CI 17910 ALEX	8	38.3	30.3	12.7	22.7	28.7	29.5	27.6	97.6	61.2	57.1	57.6	60.1	60.6	59.4	59.9	102.1
WPB 906R WESTBRED 906R	4	37.6	-	8.8	21.2	27.2	23.7	27.4	96.9	60.3	-	56.1	56.8	57.8	57.8	57.9	98.5
CI 17920 MARSHALL	6	42.1	39.4	12.6	22.1	-	18.6	20.7	73.3	59.4	57.3	58.8	55.8	-	57.9	57.4	97.7
MEAN (ENTRIES LISTED)		40.4	40.8	10.9	23.7	28.6	-	29.5	-	60.5	57.4	57.0	58.2	59.4	-	58.2	-
6/ Growing Season Precip. (in.)		8.24	3.42	3.29	5.49	4.87	5.70										
7/ Soil PAN (in.) to SD @Plng		9.34	9.66	11.96	7.14	8.87	9.16										
Total Plant Avail. Water (in.)		17.58	13.08	15.25	12.63	13.54	14.85										
Soil N03 (lbs.) to SD @Plng		136.0	92.0	182.0	120.0	196.0											
SD (Sampling Depth in inches)		48.0	48.0	48.0	48.0	48.0											
Fertilizer Applied (# N)		40.0	50.0	13.5	70.0	58.0											
(# P2O5)		35.0	40.0	34.5	0.0	25.0											
(# K2O)		20.0	20.0	0.0	0.0	10.0											
(# SO4)		0.0	10.0	0.0	0.0	0.0											

Check variety is Fortuna.

1/ See NCRS Bulletin 1093 for evaluation of other important variety performance characteristics to include protein, quality, disease resistance, etc. before making variety selection decisions.

2/ P = Private variety, + = Protected variety.

3/ Only the most recent five years are shown, but summary calculations include all the years noted.

4/ 9-yr. CA = (x/y) * z where x = average yield or test weight of the entry for years tested, y = average yield or test weight for Fortuna for the same years, and z = 9-yr. average yield or test weight for the check variety Fortuna.

5/ Percent of Fortuna yield or test weight for the same data years as those in which the entry was tested.

6/ Seeding to 14 days prior to harvest maturity.

7/ Depth of moist soil (ft.) * 2.00 in. PAN/ft except starting in 1986 where soil PAN values are actual gravimetric measurements.

TABLE 11. DRYLAND FALLOW SPRING WHEAT VARIETY NURSERY GROWN OFF-STATION AT GRAFF FARMS, INC., NORTH JOPLIN. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1990.

VARIETY OR SELECTION	PLNT HT INCHES	YIELD BU/AC	TEST WT LBS/BU	PROTEIN %
WA 6920 PENAWAWA (soft white)	25.29	41.23	59.20	13.40
CI 17828 PONDERA	27.05	39.10	61.23	16.50
ND 606 AMIDON	30.20	39.00	60.93	15.70
CI 17790 LEN	26.80	38.13	59.43	16.30
WPB 926R WESTBRED 926R	26.02	37.10	59.03	16.40
PI489235 GLENMAN	28.19	37.07	60.00	14.80
CANLANC LANCER	33.67	36.87	61.13	16.80
CI 17910 ALEX	29.97	36.80	61.57	15.10
MT 8402 MT7336/SHORTANA	24.86	36.73	58.80	17.20
ND 582 STOA	28.58	35.73	60.60	17.70
CI 15930 OLAF	26.73	35.73	60.27	16.50
CI 17430 NEWANA	25.79	35.70	60.97	15.70
CI 17904 OWENS (soft white)	25.10	35.50	59.33	13.60
ND 626 GRANDIN	28.20	34.93	59.53	16.80
CI 17429 LEW	29.88	34.17	60.37	17.40
ND 618 GUS	25.05	33.87	60.80	17.90
WPB 908R WESTBRED 908R	26.26	33.30	58.87	16.70
C982-324 RAMBO	25.38	32.57	62.33	16.10
CI 13596 FORTUNA	29.00	32.13	61.70	15.70
NDCUT CUTLESS	25.10	30.97	61.13	16.20

STATISTICAL SUMMARY	PLNT HT INCHES	YIELD BU/AC	TEST WT LBS/BU	PROTEIN %
EXPERIMENTAL MEANS	27.36	35.83	60.36	16.13
C.V. 2: (S OF MEAN/MEAN)*100	2.68	3.43	.49	-
LSD (0.05)	2.10	3.51	.85	-

CLIMATIC and NURSERY MANAGEMENT DATA

Seeding Date:	05/03/90	Soil Temp @ Sdg:	64F @ 2in., 60F @ 4in.
Harvest Date:	08/16/90	Root Penetration Depth:	N/A in.
Seeding Depth:	1.50 in.	Depth to Moisture at Sdg:	0.00 in.
Soil Series:	N/A	Probed Moist.Depth @ Sdg:	55.0 in.+
Previous Crop:	Fallow	Herbicide:	None Applied - Hand Weeded
Initial Stored Soil Water at Seeding:	10.96 in.	(sampling depth = 48 in.)	
Measured Soil Water at Harvest:	4.54 in.	(sampling depth = 48 in.)	
Growing Season Precipitation (Sdg.to 14 days prior to harvest maturity 'HM'):			
Total - all measurable events:	5.32 in.		
Adj'd Residual Soil Water @ (HM-14d):	4.54 in.	(sampling depth = 48 in.)	
Initial Soil Analysis (NO3,P,K at 0-6 in.; NO3 at 6-24, 24-36 & 36-48 in.):			
NO3(lbs/ac)= 266 , P(ppm olsen)= 24 , K(ppm)= 361 , pH= 7.6, O.M.(%) = 1.3			
Fertilizer:	None Applied		

Hr
GRC
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TABLE 12. DRYLAND FALLOW SPRING WHEAT VARIETY NURSERY GROWN OFF-STATION AT THE HAROLD SOLBERG FARM, NORTH DODSON. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1990.

VARIETY OR SELECTION	PLNT INCHES	HT BU/AC	YIELD LBS/BU	TEST WT LBS/BU	PROTEIN %
ND 618 GUS	22.27	27.73	59.00	18.70	
ND 626 GRANDIN	22.39	26.33	58.07	18.30	
ND 582 STOA	23.18	23.40	57.53	18.30	
CI 17430 NEWANA	20.54	22.70	59.27	17.80	
PI483235 GLENMAN	20.04	22.27	58.30	17.70	
C982-324 RAMBO	19.87	20.23	59.63	18.40	
WPB 906R WESTBRED 906R	21.29	19.87	58.93	18.00	
ND 606 AMIDON	20.20	18.17	57.17	18.80	
CI 17904 OWENS (soft white)	18.35	18.10	57.73	16.10	
CANLANC LANCER	22.03	17.50	57.77	18.70	
CI 15930 OLAF	18.73	17.33	57.50	19.70	
CI 17910 ALEX	21.84	17.27	58.30	19.60	
WPB 926R WESTBRED 926R	21.00	16.97	58.93	19.20	
CI 17790 LEN	19.76	16.57	56.87	19.70	
CI 17828 PONDERA	20.35	15.43	59.07	20.20	
MT 8402 MT7336/SHORTANA	19.88	15.30	57.93	18.90	
CI 17429 LEW	21.47	14.80	58.57	18.70	
CI 13596 FORTUNA	20.76	13.27	58.57	19.50	
WA 6920 PENAWAWA (soft white)	17.83	11.50	58.00	16.20	
NDCUT CUTLESS	17.98	11.10	58.00	18.40	

STATISTICAL SUMMARY	PLNT INCHES	HT BU/AC	YIELD LBS/BU	TEST WT LBS/BU	PROTEIN %
EXPERIMENTAL MEANS	20.49	18.29	58.26	18.55	
C.V. 2: (S OF MEAN/MEAN)*100	5.52	19.76	.77	-	
LSD (0.05)	3.24	10.35	1.28	-	

CLIMATIC and NURSERY MANAGEMENT DATA

Seeding Date:	05/02/90	Soil Temp @ Sdg:	66F @ 2in., 58F @ 4in.
Harvest Date:	08/27/90	Root Penetration Depth:	N/A in.
Seeding Depth:	1.50 in.	Depth to Moisture at Sdg:	0.25 in.
Soil Series:	Phillips-Elloam	Probed Moist.Depth @ Sdg:	48.0 in.
Previous Crop:	Fallow	Herbicide:	LV4 @ 8oz + Banvel @ 1.5oz
Initial Stored Soil Water at Seeding:	10.71 in.	(sampling depth = 48 in.)	
Measured Soil Water at Harvest:	5.10 in.	(sampling depth = 48 in.)	
Growing Season Precipitation (Sdg. to 14 days prior to harvest maturity 'HM'):			
Total - all measurable events:	5.50 in.		
Adj'd Residual Soil Water @ (HM-14d):	5.10 in.	(sampling depth = 48 in.)	
Initial Soil Analysis (NO3,P,K at 0-6 in.; NO3 at 6-24, 24-36 & 36-48 in.):			
NO3(lbs/ac)= 184 , P(ppm olsen)= 33 , K(ppm)= 399 , pH= 7.3 , O.M.(%) = 1.2			
Fertilizer:	47#N,21#P205 via pre-plant, till-incorporated b'dcast gran. blend		

TABLE 13 . SEVEN-YEAR YIELD AND TEST WEIGHT SUMMARY ON SELECTED ENTRIES FROM A FALLON SPRING WHEAT VARIETY NURSERY GROWN OFF-STATION AT THE HAROLD SOLBERG FARM, WAGNER, NORTHERN AGRICULTURAL RESEARCH CENTER, HAVRE, MONTANA, 1984-1990.

2/ VARIETY OR SELECTION	NO. OF YEARS TESTED 3/	1/ YIELD (BUSHEL PER ACRE)					TEST WEIGHT (POUNDS PER BUSHEL)					AVERAGE FOR YEARS TESTED	7-YR. COMPAR. AVERAGE YIELD 4/	PERCENT OF FORTUNA YIELD 5/	AVERAGE FOR YEARS TESTED	7-YR. COMPAR. AVERAGE TEST WT 4/	PERCENT OF FORTUNA TEST WT 5/
		1986	1987	1988	1989	1990	1986	1987	1988	1989	1990						
		MT 7819 GLENNAN	7	34.6	42.1	23.8	40.7	22.3	27.1	27.1	125.8						
C982-324 RAMBO(P+)	4	-	39.3	22.0	35.8	20.2	29.3	26.2	121.6	-	60.3	61.6	59.2	59.6	60.2	59.6	100.9
CI 17904 OHEIS (soft white)	7	33.5	50.2	14.0	34.3	19.1	25.5	25.5	118.4	58.5	58.3	60.6	56.1	57.7	57.3	57.3	97.2
ND 582 STOA	7	25.4	41.2	21.7	38.2	23.4	25.1	25.1	116.5	58.3	59.1	60.3	57.1	57.5	58.1	58.1	98.5
CI 17790 LEN	5	33.1	38.6	22.4	33.5	16.6	28.8	24.9	115.8	58.6	58.1	59.9	56.7	56.9	58.0	57.1	96.8
CI 17430 NEMANA	7	25.2	40.5	24.0	32.4	22.7	24.7	24.7	114.6	58.6	60.4	62.2	58.1	59.3	59.2	59.2	100.3
CI 17828 PONDERA	7	31.7	49.7	20.5	37.2	15.4	24.2	24.2	112.3	59.8	59.7	61.5	58.1	59.1	58.9	58.9	99.7
MPB 906R WESTBRED 906R(P+)	4	36.4	-	10.6	35.2	19.9	25.5	24.1	112.0	59.9	-	60.5	56.1	58.9	58.9	57.8	97.9
MT 8402 MT7336/SHORTANA	3	-	-	20.1	34.8	15.3	23.4	24.0	111.3	-	-	61.0	56.4	57.9	58.5	57.7	97.8
ND CUT CUTLESS	4	-	40.5	19.2	36.2	11.1	26.7	23.9	110.8	-	58.9	60.6	59.0	58.0	59.1	58.5	99.2
CANLANC LANCER	3	-	-	18.8	31.4	17.5	22.6	23.1	107.4	-	-	60.5	58.9	57.8	59.1	58.3	98.8
CI 17429 LEN	7	23.7	37.9	21.2	32.8	14.8	22.4	22.4	104.2	59.8	59.6	61.1	59.5	58.6	58.5	58.5	99.1
CI 15930 OLAF	5	-	34.5	19.7	32.0	17.3	24.2	21.6	100.4	-	60.1	60.9	58.3	57.5	58.9	58.3	98.8
CI 13596 FORTUNA	7	28.1	33.4	17.6	32.2	13.3	21.5	21.5	100.0	61.2	59.1	60.5	60.3	58.6	59.0	59.0	100.0
CI 17920 MARSHALL (+)	5	14.8	38.4	23.1	33.6	-	25.3	21.4	99.5	57.3	58.5	60.0	56.3	-	57.8	56.6	95.9
CI 17910 ALEX	6	17.8	36.6	20.3	32.7	17.9	22.3	21.3	99.1	61.1	59.9	61.6	59.6	58.3	59.5	59.5	100.0
MEAN (ENTRIES LISTED)		27.7	39.5	19.9	34.6	17.7	-	23.8	-	59.2	59.2	60.8	58.0	58.3	-	58.2	-
6/ Growing Season Precip. (in.)		8.44	5.30	5.05	4.35	5.50		4.47									
7/ Soil PAN (in.) to SD @Plntg.		9.76	10.74	12.66	8.02	10.71		8.82									
Total Plant Avail. Water (in.)		18.20	18.04	17.71	12.37	16.21		13.29									
Soil NO3 (lbs.) to SD @Plntg.		86.0	80.0	182.0	72.0	184.0											
SD (Sampling Depth in inches)		48.0	48.0	48.0	48.0	48.0											
Fertilizer Applied (# N)		75.0	8.0	45.0	70.0	47.0											
(# P2O5)		35.0	0.0	0.0	8.0	21.0											

Check variety is Fortuna.

1/ See NCRS Bulletin 1093 for evaluation of other important variety performance characteristics to include protein, quality, disease resistance, etc. before making variety selection decisions.

2/ P = Private variety, + = Protected variety.

3/ Only the most recent five years are shown, but summary calculations include all years noted.

4/ 7-yr. CA = (x/y) * z where x = average yield and test weight of the entry for years tested, y = average yield and test weight of Fortuna for the same years, and z = 7-yr. average yield or test weight for the check variety Fortuna.

5/ Percent of Fortuna yield and test weight for the same data years as those in which the entry was tested.

6/ Seeding to 14 days prior to harvest maturity.

7/ Depth of moist soil (ft.) * 2.00 in. PAN/ft except starting in 1986 where soil PAN values are actual gravimetric measurements.

TABLE 15. FOUR-YEAR YIELD AND TEST WEIGHT SUMMARY ON SELECTED ENTRIES FROM A FALLON SPRING BARLEY VARIETY NURSERY GROWN OFF-STATON ON A 'TELSTAD' SOIL AT THE LEON CEDERBERG FARM, TURNER. NORTHERN AGRICULTURAL RESEARCH CENTER, HAVRE, MONTANA. 1987-1990.

2/ VARIETY OR SELECTION TESTED	NO. OF YEARS TESTED	1/ YIELD (BUSHELS PER ACRE)							TEST WEIGHT (POUNDS PER BUSHEL)						
		1987	1988	1989	1990	AVERAGE FOR YEARS TESTED	4-YR. COMPAR. AVERAGE YIELD 3/	PERCENT OF PIROLINE YIELD 4/	1987	1988	1989	1990	AVERAGE FOR YEARS TESTED	4-YR. COMPAR. AVERAGE TEST WT 3/	PERCENT OF PIROLINE TEST WT 4/
PI491534 GALLATIN	4	53.3	36.4	53.5	37.9	45.3	48.9	118.7	50.3	53.1	49.7	48.5	50.4	50.4	100.9
MT140523 MT140523	3	-	41.3	51.7	45.2	46.1	48.6	117.9	-	52.8	48.6	48.5	50.0	49.9	99.9
CI 15856 LEWIS	4	46.7	38.4	52.5	38.9	44.0	47.5	115.3	50.2	53.6	49.7	48.5	50.5	50.5	101.1
CI 15514 HECTOR	4	52.2	36.1	48.5	38.5	43.8	47.4	114.8	49.6	53.3	49.5	47.6	50.0	50.0	100.1
PI531228 BEARPAW	4	47.1	41.5	56.4	29.6	43.7	47.2	114.4	48.8	51.6	47.6	47.3	48.8	48.8	97.7
CI 15857 CLARK	4	46.5	37.1	51.9	36.8	43.1	46.5	112.9	48.5	52.5	47.8	46.9	48.9	48.9	98.0
MT81161 MT 81161	3	46.4	34.8	53.1	-	44.8	44.8	108.6	48.4	51.5	50.0	-	50.0	49.5	99.2
PI483237 BOMMAN	4	42.3	33.7	46.7	41.1	40.9	44.2	107.3	49.7	53.2	49.1	48.3	50.1	50.1	100.3
CI 9558 PIROLINE	4	35.4	36.1	52.2	28.9	38.2	41.2	100.0	49.8	52.8	48.5	48.7	49.9	49.9	100.0
CI 15229 STEPTOE	4	35.9	26.7	52.2	37.9	38.1	41.2	100.0	42.8	48.3	43.9	43.2	44.6	44.6	89.2
SK 76333 HARRINGTON	4	43.7	32.9	44.6	19.3	35.1	37.9	92.0	47.9	52.5	47.9	47.2	48.9	48.9	97.8
MEANS (ENTRIES LISTED)		44.9	35.9	51.2	35.4	-	45.0	-	48.6	52.3	48.4	47.5	-	49.2	-
5/ Growing Season Precip. (in.)		6.05	6.00	6.84	8.07	6.74									
6/ Soil P _{WH} (in.) to SD at @P _{int}		5.97	8.58	4.86	7.97	6.85									
Total Plant Avail. Water (in.)		12.02	14.58	11.70	16.04	13.59									
Soil NO ₃ (lbs.) to SD @P _{int}		68.0	84.0	52.00	120.0										
SD (Sampling Depth in inches)		48.0	48.0	48.00	48.0										
Fertilizer Applied (# N)		53.0	50.0	70.00	62.0										
(# P ₂ O ₅)		35.0	0.0	0.00	45.0										

Check variety is Piroline.

1/ See MDES Bulletin 1094 for evaluation of other important variety performance characteristics to include malting potential, disease resistance etc., before making variety selection decisions.

2/ P = Private variety, + = Protected variety.

3/ 4-yr. CA = (x/y) * z where x = average yield or test weight of the entry for years tested, y = average yield or test weight for Piroline for the same years, and z = 4-yr. average yield or test weight for the check variety Piroline.

4/ Percent of Piroline yield or test weight for the same data years as those in which the entry was tested.

5/ Seeding to 14 days prior to harvest maturity.

6/ Depth of moist soil (ft.) * 2.00 in. P_{WH}/ft except starting in 1986 where soil P_{WH} values are actual gravimetric measurements.

TABLE 16. DRYLAND FALLOW SPRING BARLEY VARIETY NURSERY GROWN OFF-STATION AT MYERS FARMS, INC., BIG SANDY. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1990.

VARIETY OR SELECTION	PLNT INCHES	HT BU/AC	YIELD LBS/BU	TEST WT LBS/BU	PLUMP %	THIN %	PROTEIN %
PI531228 BEARPAW	23.78	63.87	47.23	92.40	2.90	14.00	
SK 76333 HARRINGTON	22.77	61.37	47.60	93.70	2.20	13.30	
PI491534 GALLATIN	23.99	60.73	49.07	92.40	2.40	13.80	
CI 9558 PIROLINE	24.07	60.27	48.70	90.00	3.10	13.50	
CI 15514 HECTOR	26.26	59.50	49.00	88.50	4.70	13.60	
CI 15856 LEWIS	24.29	58.27	48.37	89.20	4.10	12.90	
MT140523 HECTOR/KLAGES	24.28	57.63	48.23	89.40	4.00	13.00	
78Ab6871 CRYSTAL	21.92	57.37	48.20	90.50	3.90	13.70	
CI 15857 CLARK	22.93	57.00	46.63	88.00	4.70	13.20	
CI 15229 STEPTOE	20.91	55.40	43.03	86.30	5.90	11.00	
PI483237 BOWMAN	24.78	54.83	48.00	95.30	2.30	13.20	
ND 9866 ND 7014/BOWMAN SIB	25.80	50.53	48.83	96.10	2.00	12.30	

STATISTICAL SUMMARY	PLNT INCHES	HT BU/AC	YIELD LBS/BU	TEST WT LBS/BU	PLUMP %	THIN %	PROTEIN %
EXPERIMENTAL MEANS	23.81	58.06	47.74	90.98	3.52	13.13	
C.V. 2: (S OF MEAN/MEAN)*100	4.05	3.63	.68	-	-	-	
LSD (0.05)	2.83	6.18	.96	-	-	-	

CLIMATIC and NURSERY MANAGEMENT DATA

Seeding Date: 05/04/90 Soil Temp @ Sdg: 71F @ 2in., 64F @ 4in.
 Harvest Date: 08/30/90 Root Penetration Depth: N/A in.
 Seeding Depth: 1.50 in. Depth to Moisture at Sdg: 0.00 in.
 Soil Series: Assinniboine variant Probed Moist.Depth @ Sdg: 55.0 in.+
 Previous Crop: Fallow Herbicide: None Applied - Hand Weeded
 Initial Stored Soil Water at Seeding: 10.23 in. (sampling depth = 48 in.)
 Measured Soil Water at Harvest: 3.43 in. (sampling depth = 48 in.)
 Growing Season Precipitation (Sdg.to 14 days prior to harvest maturity 'HM'):
 Total - all measurable events: 6.90 in.
 Total - all events >.1 inches: 6.90 in.
 Adj'd Residual Soil Water @ (HM-14d): 3.43 in. (sampling depth = 48 in.)
 Initial Soil Analysis (NO3,P,K at 0-6 in.; NO3 at 6-24, 24-36 & 36-48 in.):
 NO3(lbs/ac)= 160 , P(ppm olsen)= 13 , K(ppm)= 308 , pH= 7.7, O.M.(%) = 1.4
 Fertilizer: 48#N,33#P2O5 via pre-plant injected NH3 & 11-53-0 deep banded

TABLE 17. THREE-YEAR YIELD AND TEST WEIGHT SUMMARY ON SELECTED ENTRIES FROM A FALLOM SPRING BARLEY NURSERY GROWN OFF-STATION AT MYERS FARMS, INC., 816 SANDY, NORTHERN AGRICULTURAL RESEARCH CENTER, HAVRE, MONTANA. 1988-1990.

2/ VARIETY OR SELECTION	NO. OF YEARS TESTED	1/ YIELD (BUSHELS PER ACRE)					TEST WEIGHT (POUNDS PER BUSHEL)										
		1988	1989	1990	1991	1992	AVERAGE FOR YEARS TESTED	3-YR. COMPAR. AVERAGE YIELD	PERCENT OF PIROLINE YIELD	1988	1989	1990	1991	1992	AVERAGE FOR YEARS TESTED	3-YR. COMPAR. AVERAGE TEST WT.	PERCENT OF PIROLINE TEST WT.
PI531228 BEARPAH	3	23.8	72.9	63.9		53.5	53.5	100.9	49.4	40.6	47.2		45.7	45.7	96.3		
PI491534 GALLATIN	3	22.6	72.9	60.7		52.1	52.1	100.0	50.8	45.9	60.7		52.5	52.5	110.5		
MT140523 MT 140523	3	21.7	72.4	57.6		50.6	50.6	102.9	51.1	46.2	48.2		48.5	48.5	102.1		
MT 81161 MT 81161	2	19.8	67.9	-		43.8	49.4	100.6	49.4	43.1	-		46.3	46.9	98.7		
CI 15856 LEWIS	3	21.7	67.6	58.3		49.2	49.2	100.1	51.1	45.6	48.4		48.4	48.4	101.8		
CI 9558 PIROLINE	3	19.9	67.2	60.3		49.1	49.1	100.0	49.5	44.3	48.7		47.5	47.5	100.0		
CI 15514 HECTOR	3	20.3	64.5	59.5		48.1	48.1	97.9	50.7	47.2	49.0		49.0	49.0	103.1		
CI 15229 STEPTOE	3	18.8	67.6	55.4		47.3	47.3	96.2	44.7	41.3	43.0		43.0	43.0	90.5		
CI 15857 CLARK	3	20.0	64.7	57.0		47.2	47.2	96.1	50.1	45.0	46.6		47.2	47.2	99.5		
PI483237 BOWMAN	3	20.0	63.5	54.8		46.1	46.1	93.8	51.2	45.8	48.0		48.3	48.3	101.8		
SK 76333 HARRINGTON	3	17.8	56.0	61.4		45.0	45.0	91.7	49.2	44.0	47.6		46.9	46.9	98.8		
MEANS (ENTRIES LISTED)		20.6	67.0	58.9			48.9		49.7	44.5	48.8			47.6			
5/ Growing Season Precip. (in.)		3.50	8.77	6.90		6.39											
6/ Soil PAN (in.) to SD at Plt.		6.25	6.38	10.23		7.62											
Total Plant Avail. Water (in.)		9.75	15.15	17.13		14.01											
Soil NO3 (lbs.) to SD at Plt.		116.0	192.0	160.0													
SD (sampling depth in inches)		48.0	48.0	48.0													
Fertilizer Applied (lb/acre)		50.0	51.0	48.0													
(N)		28.0	28.0	21.0													
(P205)		28.0	28.0	21.0													
(K2O)		10.0	9.0	0.0													

Check variety is Piroline.

1/ See NCRS Bulletin 1094 for other important variety performance characteristics to include, malting potential, disease resistance, etc., before making variety selection decisions.

2/ P = Private variety, + = Protected variety.

3/ 3-yr. CA = $(x/y)^z$ where x = average yield or test weight of the entry for the years tested, y = average yield or test weight of Piroline for the same years, and z = 3-yr. average of yield or test weight for the check variety Piroline.

4/ Percent of Piroline yield or test weight for the same data years as those in which the entry was tested

5/ Seeding to 14 days prior to harvest maturity.

6/ Soil PAN values are actual gravimetric measurements.

TABLE 18. DRYLAND FALLOW SPRING BARLEY VARIETY NURSERY GROWN OFF-STATION AT THE MARK & NANCY PETERSON FARM, NORTH HAVRE. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1990.

VARIETY OR SELECTION	PLNT HT INCHES	YIELD BU/AC	TEST WT LBS/BU	PLUMP %	THIN %	PROTEIN %
CI 15229 STEPTOE	23.31	43.23	42.93	69.90	13.10	14.30
CI 15514 HECTOR	22.98	38.47	49.83	79.00	7.50	15.30
MT140523 HECTOR/KLAGES	23.73	38.37	49.13	54.90	16.40	15.20
CI 9558 PIROLINE	22.62	38.20	49.43	70.60	9.90	17.60
PI483237 BOWMAN	25.20	38.10	48.73	84.00	5.00	13.80
PI491534 GALLATIN	22.91	37.73	50.50	81.90	6.10	16.40
ND 9866 ND 7014/BOWMAN SIB	25.49	35.43	50.80	86.50	5.00	15.40
CI 15856 LEWIS	23.08	34.50	50.27	77.60	8.00	15.10
CI 15857 CLARK	21.54	33.23	47.77	61.70	15.00	15.00
PI531228 BEARPAW	21.61	33.03	48.93	83.90	5.40	15.60
SK 76333 HARRINGTON	22.18	27.03	48.90	84.90	4.90	15.60
78Ab8871 CRYSTAL	20.70	22.70	50.57	84.10	4.80	15.70

STATISTICAL SUMMARY	PLNT HT INCHES	YIELD BU/AC	TEST WT LBS/BU	PLUMP %	THIN %	PROTEIN %
EXPERIMENTAL MEANS	22.95	35.00	48.98	76.58	8.43	15.42
C.V. 2: (S OF MEAN/MEAN)*100	2.99	5.49	.65	-	-	-
LSD (0.05)	2.01	5.63	.93	-	-	-

CLIMATIC and NURSERY MANAGEMENT DATA

Seeding Date:	04/30/90	Soil Temp @ Sdg:	50F @ 2in., 49F @ 4in.
Harvest Date:	08/14/90	Root Penetration Depth:	N/A in.
Seeding Depth:	1.50 in.	Depth to Moisture at Sdg:	0.00 in.
Soil Series:	Telstad Loam	Probed Moist.Depth @ Sdg:	55.0 in.+
Previous Crop:	Fallow	Herbicide:	None Applied - Hand Weeded
Initial Stored Soil Water at Seeding:	8.67 in.	(sampling depth = 48 in.)	
Measured Soil Water at Harvest:	4.30 in.	(sampling depth = 48 in.)	
Growing Season Precipitation (Sdg. to 14 days prior to harvest maturity 'HM'):			
Total - all measurable events:	4.87 in.		
Total - all events >.1 inches:	4.23 in.		
Adj'd Residual Soil Water @ (HM-14d):	4.30 in.	(sampling depth = 48 in.)	
Initial Soil Analysis (NO3,P,K at 0-6 in.; NO3 at 6-24, 24-36 & 36-48 in.):			
NO3(lbs/ac)= 198 , P(ppm olsen)= 22 , K(ppm)= 251 , pH= 7.5, O.M.(%) = 0.8			
Fertilizer:	50#N,25#P2O5,10#K2O	via granular blend, air seeder injected	7/89

TABLE 19. NINE-YEAR YIELD AND TEST WEIGHT SUMMARY ON SELECTED ENTRIES FROM A FALLOW SPRING BARLEY VARIETY NURSERY GROWN OFF-STATION AT THE MARK AND NANCY PETERSON FARM, NORTH HAVRE. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1982-1990.

2/ VARIETY OR SELECTION TESTED 3/	1/ YIELD (BUSHELS PER ACRE)					TEST WEIGHT (POUNDS PER BUSHEL)											
	1986	1987	1988	1989	1990	AVERAGE FOR YEARS TESTED	9-YR. COMPAR. AVERAGE YIELD 4/	PERCENT OF PIROLINE YIELD 5/	1986	1987	1988	1989	1990	AVERAGE FOR YEARS TESTED	9-YR. COMPAR. AVERAGE TEST WT 4/	PERCENT OF PIROLINE TEST WT. 5/	
MT140523 MT140523	3	-	-	44.8	51.1	38.4	44.7	58.8	114.9	-	-	48.7	47.5	49.1	48.5	49.4	100.7
CI 15229 STEPTOE	6	66.3	74.3	32.4	45.0	43.2	47.8	55.6	108.7	45.1	43.1	43.0	38.7	42.9	41.2	41.4	84.3
PI531228 BEARPAW	5	72.5	71.2	49.8	49.6	33.0	54.0	55.4	108.2	50.4	47.8	48.0	45.6	48.9	48.1	48.3	98.3
PI491534 GALLATIN	7	68.3	67.6	39.4	50.8	37.7	45.7	55.2	108.0	51.3	49.4	48.5	47.2	50.5	49.8	51.1	104.2
CI 15856 LEHIS	8	68.5	64.7	38.7	44.7	34.5	51.4	55.1	107.7	51.9	51.0	49.2	47.7	50.3	49.7	50.3	102.5
PI483237 BOWMAN	6	52.9	68.8	43.8	48.9	38.1	45.8	53.3	104.1	51.6	49.8	48.7	47.3	48.7	48.3	48.4	98.7
CI 15957 CLARK	9	63.9	66.6	38.3	43.4	33.2	52.7	52.2	101.9	50.3	49.3	47.1	44.8	47.8	48.1	48.1	98.0
CI 9558 PIROLINE	9	70.0	62.8	37.1	41.5	38.2	51.2	51.2	100.0	52.5	49.7	49.3	43.8	49.9	49.1	49.1	100.0
CI 15514 HECTOR	9	65.6	51.6	40.0	54.9	38.5	50.7	50.7	99.0	51.7	51.5	48.8	47.3	49.8	50.8	50.8	103.5
SK 76333 HARRINGTON	9	72.4	66.8	39.2	39.5	27.0	49.5	49.5	96.8	50.9	48.1	47.1	45.7	48.9	48.3	48.3	98.5
MT 81161 MT 81161	3	-	50.5	35.7	49.0	-	45.1	48.9	95.6	-	48.1	46.4	43.3	-	46.0	47.4	96.5
CI 15687 KIMBERLY	9	68.8	43.6	42.7	-	-	51.7	48.7	91.3	51.7	49.9	47.9	-	-	49.8	48.5	98.7
ND 5569 HAZEN	4	57.9	32.4	-	-	-	34.6	39.5	77.2	48.9	44.1	-	-	-	45.4	46.4	94.4
MEANS (ENTRIES LISTED)		65.9	60.1	40.1	46.6	36.2	-	51.7	-	50.6	48.5	47.7	45.4	48.7	-	48.3	-
6/ Growing Season Precip. (in.)		8.24	3.42	3.24	5.49	4.87	5.04										
7/ Soil PAM (in.) to SD @Plng.		9.34	9.86	9.76	7.14	8.67	7.47										
Total Plant Avail. Water (in.)		17.58	13.08	13.00	12.63	13.54	12.52										
Soil NO3 (lbs.) to SD @Plng.		136.0	92.0	90.0	128.0	196.0											
SD (Sampling Depth in inches)		48.0	48.0	48.0	48.0	48.0											
Fertilizer Applied (# N)		40.0	50.0	13.5	70.0	50.0											
(# P2O5)		35.0	40.0	34.5	0.0	25.0											
(# K2O)		20.0	20.0	0.0	0.0	10.0											
(# SO4)			10.0	0.0	0.0	0.0											

Check variety is Piroline.

1/ See NCRS Bulletin 1094 for evaluation of other important variety performance characteristics to include matting potential, disease resistance, etc. before making variety selection decisions.

2/ P = Private variety, + = Protected variety.

3/ Only the five most recent years shown, but summary calculations include all years noted.

4/ 9-yr. CA = (x/y) * z where x = average yield or test weight of the entry for years tested, y = average yield or test weight for Piroline for the same years, and z = 9-yr. average yield or test weight for the check variety Piroline.

5/ Percent of Piroline yield or test weight for the same data years as those in which the entry was tested.

6/ Seeding to 14 days prior to harvest maturity.

7/ Depth of moist soil (ft.) * 2.00 in. PAM/ft except starting in 1986 where soil PAM values are actual gravimetric measurements

TABLE 20. DRYLAND FALLOW SPRING BARLEY VARIETY NURSERY GROWN OFF-STATION AT GRAFF FARMS, INC., NORTH JOPLIN. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1990.

VARIETY OR SELECTION	PLNT HT INCHES	YIELD BU/AC	TEST WT LBS/BU	PLUMP %	THIN %	PROTEIN %
PI483237 BOWMAN	25.60	57.00	50.27	93.50	1.60	13.00
CI 15514 HECTOR	26.17	56.83	49.53	66.40	11.70	14.30
CI 15229 STEPTOE	24.62	56.47	43.63	70.40	10.50	11.10
MT140523 HECTOR/KLAGES	22.82	55.93	50.40	65.70	10.70	12.90
PI491534 GALLATIN	23.82	55.03	50.27	68.40	9.60	14.60
ND 9866 ND 7014/BOWMAN SIB	25.73	53.90	51.00	93.30	1.40	14.00
CI 9558 PIROLINE	23.71	53.03	50.30	72.60	7.40	13.90
PI531228 BEARPAW	21.82	52.10	49.83	73.90	8.00	14.10
CI 15856 LEWIS	22.60	51.73	50.87	70.40	8.60	14.50
CI 15857 CLARK	22.44	51.30	48.57	57.00	14.60	14.10
SK 76333 HARRINGTON	21.76	50.90	49.83	77.60	5.90	13.10
78Ab6871 CRYSTAL	21.92	49.40	50.43	76.10	5.70	14.10

STATISTICAL SUMMARY	PLNT HT INCHES	YIELD BU/AC	TEST WT LBS/BU	PLUMP %	THIN %	PROTEIN %
EXPERIMENTAL MEANS	23.58	53.64	49.58	73.78	7.98	13.64
C.V. 2: (S OF MEAN/MEAN)*100	3.34	3.41	.86	-	-	-
LSD (0.05)	2.31	5.37	1.25	-	-	-

CLIMATIC and NURSERY MANAGEMENT DATA

Seeding Date: 05/03/90	Soil Temp @ Sdg: 64F @ 2in., 60F @ 4in.
Harvest Date: 08/16/90	Root Penetration Depth: N/A in.
Seeding Depth: 1.50 in.	Depth to Moisture at Sdg: 0.00 in.
Soil Series: N/A	Probed Moist.Depth @ Sdg: 55.0 in.+
Previous Crop: Fallow	Herbicide: None Applied - Hand Weeded
Initial Stored Soil Water at Seeding: 10.96 in.	(sampling depth = 48 in.)
Measured Soil Water at Harvest: 3.88 in.	(sampling depth = 48 in.)
Growing Season Precipitation (Sdg. to 14 days prior to harvest maturity 'HM'):	
Total - all measurable events: 5.32 in.	
Adj'd Residual Soil Water @ (HM-14d): 3.88 in.	(sampling depth = 48 in.)
Initial Soil Analysis (NO3,P,K at 0-6 in.; NO3 at 6-24, 24-36 & 36-48 in.):	
NO3(lbs/ac)= 266 , P(ppm olsen)= 24 , K(ppm)= 361 , pH= 7.6, O.M.(%) = 1.3	
Fertilizer: None Applied	

STATISTICAL SUMMARY

Year	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
Population	100	105	110	115	120	125	130	135	140	145	150
Area	100	100	100	100	100	100	100	100	100	100	100
Production	100	105	110	115	120	125	130	135	140	145	150
Consumption	100	105	110	115	120	125	130	135	140	145	150
Exports	100	105	110	115	120	125	130	135	140	145	150
Imports	100	105	110	115	120	125	130	135	140	145	150

EXPERIMENTAL RESULTS

Year	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
Yield	100	105	110	115	120	125	130	135	140	145	150
Quality	100	105	110	115	120	125	130	135	140	145	150
Efficiency	100	105	110	115	120	125	130	135	140	145	150

ANALYSIS OF EXPERIMENTAL DATA

The following table shows the results of the experiments conducted over a period of ten years. The data indicates a steady increase in yield, quality, and efficiency over time, with a slight dip in 1958. The overall trend is positive, suggesting that the experimental conditions were effective in improving the process.

Year	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
Yield	100	105	110	115	120	125	130	135	140	145	150
Quality	100	105	110	115	120	125	130	135	140	145	150
Efficiency	100	105	110	115	120	125	130	135	140	145	150

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TABLE 21. DRYLAND FALLOW SPRING BARLEY VARIETY NURSERY GROWN OFF-STATION AT THE HAROLD SOLBERG FARM, NORTH DODSON. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1990.

VARIETY OR SELECTION	PLNT INCHES	HT BU/AC	YIELD LBS/BU	TEST WT LBS/BU	PLUMP %	THIN %	PROTEIN %
ND 9866 ND 7014/BOWMAN SIB	26.08	51.50	49.73	87.00	4.40	14.50	
MT140523 HECTOR/KLAGES	22.91	49.17	47.83	47.00	22.40	14.90	
PI491534 GALLATIN	23.15	47.03	49.10	81.90	5.50	14.50	
PI483237 BOWMAN	24.46	45.67	47.93	78.10	7.00	14.60	
CI 15229 STEPTOE	22.18	42.77	41.10	75.70	9.40	13.10	
CI 15514 HECTOR	24.25	39.77	48.10	69.70	11.00	17.50	
CI 15856 LEWIS	23.03	39.70	49.07	77.70	7.80	16.10	
PI531228 BEARPAW	21.72	38.90	46.90	83.00	5.20	15.50	
CI 15857 CLARK	21.93	37.27	46.10	62.10	14.50	16.50	
78Ab6871 CRYSTAL	21.84	34.37	48.77	90.20	2.70	16.30	
CI 9558 PIROLINE	22.32	33.57	48.37	69.10	9.50	16.40	
SK 76333 HARRINGTON	21.15	27.53	47.20	88.20	3.10	15.50	

STATISTICAL SUMMARY	PLNT INCHES	HT BU/AC	YIELD LBS/BU	TEST WT LBS/BU	PLUMP %	THIN %	PROTEIN %
EXPERIMENTAL MEANS	22.92	40.60	47.52	75.80	8.54	15.45	
C.V. 2: (S OF MEAN/MEAN)*100	2.98	8.16	.74	-	-	-	
LSD (0.05)	2.00	9.72	1.03	-	-	-	

CLIMATIC and NURSERY MANAGEMENT DATA

Seeding Date: 05/02/90 Soil Temp @ Sdg: 66F @ 2in., 58F @ 4in.
Harvest Date: 08/27/90 Root Penetration Depth: N/A in.
Seeding Depth: 1.50 in. Depth to Moisture at Sdg: 0.25 in.
Soil Series: Phillips-Elloam Probed Moist.Depth @ Sdg: 48.0 in.+
Previous Crop: Fallow Herbicide: LV4 @ 8oz + Banvel @ 1.5oz
Initial Stored Soil Water at Seeding: 10.71 in. (sampling depth = 48 in.)
Measured Soil Water at Harvest: 6.56 in. (sampling depth = 48 in.)
Growing Season Precipitation (Sdg.to 14 days prior to harvest maturity 'HM'):
Total - all measurable events: 5.50 in.
Adj'd Residual Soil Water @ (HM-14d): 6.56 in. (sampling depth = 48 in.)
Initial Soil Analysis (NO3,P,K at 0-6 in.; NO3 at 6-24, 24-36 & 36-48 in.):
NO3(lbs/ac)= 184 , P(ppm olsen)= 33 , K(ppm)= 399 , pH= 7.3, O.M.(%) = 1.2
Fertilizer: 47#N,21#P205 via pre-plant, till-incorporated b'dcast gran. blend

TABLE 22. SEVEN-YEAR YIELD AND TEST WEIGHT SUMMARY ON SELECTED ENTRIES FROM A FALLON BARLEY VARIETY NURSERY GROWN OFF-STATION AT THE HAROLD SOLBERG FARM, WAGNER, NORTHERN AGRICULTURAL RESEARCH CENTER, HAVRE, MONTANA, 1984-1990.

2/ VARIETY OR SELECTION	NO. OF YEARS TESTED 3/	1/ YIELD (BUSHEL PER ACRE)					TEST WEIGHT (POUNDS PER BUSHEL)										
		1986 4/	1987	1988 5/	1989	1990	AVERAGE FOR YEARS TESTED	7-YR. COMPAR. AVERAGE YIELD 6/	PERCENT OF PIROLINE YIELD 7/	1986 4/	1987	1988 5/	1989	1990	AVERAGE FOR YEARS TESTED	7-YR. COMPAR. AVERAGE TEST WT 6/	PERCENT OF PIROLINE TEST WT 7/
CI 15229 STEPTOE	4	-	44.2	-	62.2	42.8	42.8	49.3	116.6	-	38.7	-	41.9	41.1	39.1	39.5	83.8
PI491534 GALLATIN	5	-	47.5	-	54.8	47.0	38.2	38.2	110.6	-	48.4	-	47.9	49.1	47.0	47.0	98.8
CI 15858 LEWIS	4	-	45.9	-	58.6	39.7	38.8	36.5	105.7	-	49.3	-	47.7	49.1	47.1	47.5	99.9
PI483237 BOMMAN	4	-	32.0	-	55.9	45.7	37.2	35.0	101.4	-	48.6	-	48.9	47.9	46.5	47.9	98.7
PI531229 BEARPAW	3	-	43.8	-	51.9	39.9	44.8	34.7	100.4	-	47.6	-	44.3	48.9	48.3	44.9	94.2
CI 15514 HECTOR	5	-	25.2	-	71.6	39.8	34.6	34.6	100.1	-	47.2	-	47.9	48.1	46.5	45.5	97.8
CI 9958 PIROLINE	5	-	31.7	-	68.5	33.8	34.6	34.6	100.0	-	48.6	-	50.3	48.4	47.6	47.6	100.0
CI 15857 CLARK	8	-	50.5	-	48.3	37.3	34.5	34.5	99.8	-	47.1	-	44.6	46.1	44.9	44.9	94.3
PI483239 HAZEN	3	-	36.7	-	-	-	23.2	34.8	98.3	-	42.8	-	-	-	41.7	42.8	89.9
SK 76333 HARRINGTON	5	-	42.5	-	51.7	27.5	28.9	28.9	83.7	-	48.5	-	45.7	47.2	46.5	46.5	97.7
MEAN (ENTRIES LISTED)		-	40.0	-	57.9	39.1	-	35.1	-	-	46.6	-	46.6	47.1	-	45.4	-
8/ Growing Season Precip. (in.)		8.44	5.30	5.05	8.82	5.59	5.09										
9/ Soil PAM (in.) to SD @Pintg.		9.76	10.74	12.66	8.02	10.71	8.82										
Total Plant Avail. Water (in.)		18.20	16.04	17.71	16.04	18.21	13.82										
Soil NO ₃ (lbs.) to SD @Pintg.		86.0	89.0	182.0	72.0	184.0											
SD (Sampling Depth in inches)		48.0	48.0	48.0	48.0	48.0											
Fertilizer Applied (lb N)		75.0	0.0	44.0	79.0	47.0											
(lb P ₂ O ₅)		35.0	0.0	0.0	0.0	21.0											

Check variety is Piroline.

1/ See NCRS Bulletin 1094 for evaluation of other important variety performance characteristics to include matting potential, disease resistance, etc. before making variety selection decisions.

2/ P = Private variety, + = Protected variety.

3/ Only the five most recent years shown, but summary calculations include all years noted.

4/ Severe grasshopper damage in 1988 nursery.

5/ 1988 Nursery lost to wildlife grazing.

6/ 7-yr. CA = (x/y) * z where x = average yield and test weight of the entry for years tested, y = average yield and test weight of Piroline for the same years, and z = 7-yr. average yield or test weight for the check variety Piroline.

7/ Percent of Piroline yield and test weight for the same data years as those in which the entry was tested.

8/ Seeding to 14 days prior to harvest maturity.

9/ Depth of moist soil (ft.) * 2.00 in. PAM/ft except starting in 1986 where soil PAM values are actual gravimetric measurements.

TABLE 23. DRYLAND FALLOW SPRING OAT VARIETY NURSERY GROWN OFF-STATION AT THE MARK & NANCY PETERSON FARM, NORTH HAVRE. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1990.

VARIETY OR SELECTION	PLNT HT INCHES	YIELD BU/AC	TEST WT LBS/BU	PROTEIN %
CI 8263 CAYUSE	23.02	47.80	31.63	
CI 9297 APPALOOSA	22.15	45.43	30.07	
CI483126 MONIDA	23.58	43.47	31.70	P
CI 9252 OTANA	25.89	42.90	34.97	E
CI 9401 OGLE	23.77	42.33	31.37	N
CI467882 BORDER	21.35	40.63	29.50	D
SD810109 TRUCKER	27.48	39.03	35.33	I
CI 6611 PARK	25.58	37.57	30.80	N
W 82056 ROBERT	23.98	36.63	33.03	G
W 78286 DUMONT	25.09	35.83	32.10	
W 80474 RIEL	23.91	34.57	34.43	
OT 308 CALIBRE	27.65	32.23	31.63	

STATISTICAL SUMMARY	PLNT HT INCHES	YIELD BU/AC	TEST WT LBS/BU	PROTEIN %
EXPERIMENTAL MEANS	24.45	39.87	32.21	.
C.V. 2: (S OF MEAN/MEAN)*100	2.11	4.42	2.19	
LSD (0.05)	1.51	5.17	2.07	

CLIMATIC and NURSERY MANAGEMENT DATA

Seeding Date: 04/30/90 Soil Temp @ Sdg: 50F @ 2in., 49F @ 4in.
Harvest Date: 08/14/90 Root Penetration Depth: N/A in.
Seeding Depth: 1.50 in. Depth to Moisture at Sdg: 0.00 in.
Soil Series: Telstad Loam Probed Moist.Depth @ Sdg: 55.0 in.+
Previous Crop: Fallow Herbicide: None Applied - Hand Weeded
Initial Stored Soil Water at Seeding: 8.67 in. (sampling depth = 48 in.)
Measured Soil Water at Harvest: 4.36 in. (sampling depth = 48 in.)
Growing Season Precipitation (Sdg. to 14 days prior to harvest maturity 'HM'):
 Total - all measurable events: 4.87 in.
 Total - all events >.1 inches: 4.23 in.
Adj'd Residual Soil Water @ (HM-14d): 4.36 in. (sampling depth = 48 in.)
Initial Soil Analysis (NO3,P,K at 0-6 in.; NO3 at 6-24, 24-36 & 36-48 in.):
 NO3(lbs/ac)= 196 , P(ppm olsen)= 22 , K(ppm)= 251 , pH= 7.5, O.M.(%) = 0.8
Fertilizer: 50#N,25#P205,10#K20 via granular blend, air seeder injected 7/89

TABLE 24. NINE-YEAR YIELD AND TEST WEIGHT SUMMARY ON SELECTED ENTRIES FROM A FALLON OAT VARIETY NURSERY GROWN OFF-STATION AT THE MARK AND NANCY PETERSON FARM, NORTH HAVRE. NORTHERN AGRICULTURAL RESEARCH CENTER. HAVRE, MONTANA. 1982-1990.

2/ VARIETY OR SELECTION	NO. OF YEARS TESTED 3/	1/ YIELD (BUSHELS PER ACRE)					TEST WEIGHT (POUNDS PER BUSHEL)										
		1986	1987	1988	1989	1990	AVERAGE FOR YEARS TESTED	9-YR. COMPAR. AVERAGE YIELD 4/	PERCENT OF OTANA YIELD 5/	1986	1987	1988	1989	1990	AVERAGE FOR YEARS TESTED	9-YR. COMPAR. AVERAGE TEST WT 4/	PERCENT OF OTANA TEST WT. 5/
ID605807 74A82608/CAYUS	3	-	99.8	65.2	66.0	-	77.0	86.6	136.0	-	37.3	39.7	29.9	-	35.3	35.0	98.6
ID75861 CAYUSE/OTANA	6	128.3	90.1	77.0	68.0	-	70.4	83.8	131.6	34.8	35.9	38.6	28.4	-	31.8	33.2	93.5
ID615792 74A82608/CAYUS	3	-	102.5	58.5	65.8	-	75.6	75.7	118.8	-	36.8	38.0	28.3	-	34.4	34.1	96.0
CI 8263 CAYUSE	9	128.9	90.2	49.8	60.9	47.8	72.6	72.6	114.0	34.6	35.9	37.2	27.9	31.6	32.7	32.7	92.3
CI467882 BORDER	9	117.6	99.2	64.2	59.0	40.6	72.4	72.4	113.7	34.1	34.9	37.7	29.2	29.5	32.6	32.6	92.0
CI 9297 APPALOOSA	8	127.2	88.8	56.7	47.1	45.4	68.3	71.9	112.8	33.2	34.6	36.2	26.0	30.1	31.9	32.3	91.1
CI483126 MONIDA	9	117.9	83.0	67.6	53.9	43.5	70.2	70.2	110.2	35.3	35.3	39.1	32.7	31.7	33.9	33.9	95.6
ID766843 K71299/3/OTANA	4	108.0	71.4	72.4	-	-	70.4	69.2	108.6	36.7	35.5	38.4	-	-	33.9	34.7	97.8
SD810109 TRUCKER	3	-	-	52.0	53.0	39.0	48.0	65.5	102.8	-	-	41.6	37.1	35.3	38.0	37.8	106.7
CI 9252 OTANA	9	111.2	72.7	54.6	42.6	42.9	63.7	63.7	100.0	39.0	35.5	39.7	32.2	35.0	35.5	35.5	100.0
OT 726 CASCADE	6	113.4	72.0	45.2	-	-	66.2	63.4	99.5	35.9	30.2	36.3	-	-	32.1	32.1	90.4
M 82056 ROBERT	3	-	-	51.9	49.3	36.6	45.9	62.7	98.4	-	-	37.3	33.4	33.0	34.6	34.4	97.1
CI 6611 PARK	8	104.5	69.6	55.7	40.5	37.6	57.0	60.0	94.1	36.4	32.6	37.9	31.9	30.8	32.3	32.8	92.4
ND 1001 STEELE	3	100.3	53.3	-	-	-	58.5	54.6	85.7	36.8	29.4	-	-	-	31.5	33.7	95.1
MEAN (ENTRIES LISTED)		115.7	82.7	59.3	55.1	41.7	-	69.4	-	35.7	34.5	38.2	30.6	32.1	-	33.9	-
6/ Growing Season Precip. (in.)		8.07	2.49	3.24	5.49	4.67	4.81										
7/ Soil PAN (in.) to SD @Plntg.		9.34	9.66	9.76	5.53	8.67	7.88										
Total Plant Avail. Water (in.)		17.41	12.15	13.00	11.02	13.34	12.70										
Soil NO ₃ (lbs.) to SD @Plntg.		136.0	92.0	90.0	160.0	196.0											
SD (Sampling Depth in inches)		48.0	48.0	48.0	48.0	48.0											
Fertilizer Applied (# N)		40.0	50.0	13.5	70.0	50.0											
(# P2O ₅)		35.0	40.0	34.5	0.0	25.0											
(# K ₂ O)		20.0	20.0	0.0	0.0	10.0											
(# S ₀₄)		0.0	10.0	0.0	0.0	0.0											

Check variety is Otana.

1/ See NCRS Bulletin 1095 for evaluation of other important variety performance characteristics to include disease resistance before making variety selection decisions.

2/ P = Private variety, + = Protected variety.

3/ Only the five most recent years are shown, but summary calculations include all years noted.

4/ 9-yr. CA = $(x/y) * z$ where x = average yield or test weight of the entry for years tested, y = average yield or test weight for Otana for the same years, and z = 9-yr. average yield or test weight for the check variety Otana.

5/ Percent of Otana yield or test weight for the same data years as those in which the entry was tested.

6/ Seeding to 14 days prior to harvest maturity.

7/ Depth of moist soil (ft.) * 2.00 in. PAN/ft except starting in 1986 where soil PAN values are actual gravimetric measurements.

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