

NURSERY TRIALS WITH SMALL GRAIN

Small scale nursery trials with small grains are grown each year at the Dickinson Station. Two types of nurseries are grown, the Cooperative Regional nurseries and plantings of material developed by the North Dakota Agricultural Experiment Station at Fargo or Dickinson.

In the regional trials the same varieties and newly developed strains of small grain are grown at many stations in the upper Midwest. This permits a rapid evaluation of these varieties and potential varieties grown under a wide range of climatic and weather conditions. This work is most useful in the evaluation and development of new varieties. It is also one means of getting an early look at a large number of varieties that have been developed in other states, and Canada.

Special nurseries of material developed at North Dakota State University are grown at Dickinson from time to time to aid in the evaluation of this material under western North Dakota climatic and weather conditions.

Table 34. Uniform Regional Hard Red Spring Wheat Nursery-Dickinson, 1970.

Entry No.	Variety	Yield in bushels per acre				Test weight	Heading date	Rust*		Lodging %	Height inches
		Rep 1	Rep 2	Rep 3	Avg.			Leaf	Stem		
1	C.I. 3461	18.0	19.0	20.8	19.3	59.0	7-6	2	0	none	27
2	C.I. 13462	24.8	23.6	24.2	24.2	61.0	7-7	3	0		28
3	C.I. 13100	24.6	19.6	26.2	23.5	59.0	7-5	2	0		27
4	C.I. 13751	20.4	22.6	24.0	22.3	60.5	7-5	1	0		29
5	RL 4200	20.2	26.0	25.0	23.7	60.5	7-4	T	0		28
6	S 6579	21.2	28.4	21.8	23.8	61.0	7-4	2	0		28
7	ND 490	16.8	20.4	26.4	21.2	61.0	7-5	T	0		26
8	ND 491	20.8	25.6	23.6	23.3	61.0	7-5	T	0		27
9	ND 496	25.6	31.2	27.4	28.1	62.0	7-5	2	0		29
10	ND 487	26.2	22.4	24.6	24.4	61.0	7-5	2	1		25
11	ND 499	23.6	25.8	27.0	25.5	62.0	7-6	1	0		24
12	Wis. 271	25.4	25.6	25.6	25.5	62.0	7-4	1	0		23
13	H 678-1-6-9	20.8	20.8	24.4	22.0	60.5	7-1	1	0		25
14	MT. 6723	18.8	19.8	27.4	22.0	60.5	7-7	3	0		25
15	MT. 6830	24.0	27.6	25.2	25.6	61.0	7-4	3	0		23
16	MT. 6834	30.8	22.6	24.8	26.1	61.0	7-4	3	0		25
17	MT. 6839	29.8	18.0	23.8	23.9	60.0	7-7	3	0		24
18	MN-11-62-61	38.0	28.2	27.2	31.1	63.0	7-6	1	0		22
19	MN-11-62-2	22.4	31.0	25.2	26.2	62.0	7-6	2	0		22
20	World Seeds 1812	14.0	18.6	19.2	17.3	62.0	7-1	2	0		22
21	Bonanza	22.6	16.8	23.4	20.9	60.0	7-4	T	0		22
22	69 1157	17.4	18.8	11.0	15.7	58.5	7-1	2	0		20

* T-Trace; 1 -Light; 2-Moderate; 3-Severe; 4 - Very Severe.

Table 35. Uniform Regional Durum Nursery – Dickinson, 1970.

Entry No.	C.I. or Sel. No.	Variety	Yield in bushels per acre					Test weight	Heading date	Diseases Leaf rust	Lodging %	Height inches
			Rep 1	Rep 2	Rep 3	Rep 4	Avg.					
1	5296	Mindum	21.4	27.8	26.4	25.0	25.2	64.5	7-9	T	none	26
2	13333	Wells	34.4	31.8	25.0	28.4	29.9	63.5	7-6	1		26
3	13768	Leeds	24.2	23.6	26.4	26.2	25.1	64.0	7-8	T		28
4	DT191	Hercules	24.8	24.0	33.8	27.2	27.5	65.0	7-8	T		28
5	DT317	Lk 2/Pelissier	34.2	30.6	28.0	35.6	32.1	62.5	7-9	T		26
6	D6517	5988/5962	28.0	25.6	25.4	25.2	26.1	64.5	7-8	T		27
7	D6586	Lds//Ldn/Br134	32.8	27.2	34.6	28.0	30.7	64.0	7-8	T		27
8	D6647	61130/Lds	31.4	30.0	30.2	28.4	30.0	64.0	7-8	T		22
9	D6674	6062/6142	34.0	33.0	40.0	31.6	34.7	63.0	7-8	T		22
10	D6676	6062/6142	33.6	31.0	31.4	32.4	32.1	64.0	7-8	T		26
11	D6721	6062/6142	33.0	28.4	27.8	27.8	29.3	63.5	7-7	T		28
12	D6722	6062/6142	30.4	33.8	25.6	31.0	30.2	63.5	7-10	T		28
13	D6723	6062/6142	31.0	24.4	26.8	30.2	28.1	63.0	7-8	T		29
14	D6714	Ldn 2/St464//Lds	32.2	27.2	27.8	35.0	30.6	64.5	7-7	T		29
15	D6715	Ldn 2/St464//Lds	30.0	29.6	34.0	30.0	30.9	63.5	7-11	3		35
16	D6718	Lds//Lk 2/Ldn	30.6	29.0	26.8	34.4	30.2	63.5	7-7	T		28
17	D6733	561/Lds	27.4	30.8	32.2	25.4	29.0	65.0	7-9	1		27
18	D6761	Lds/RL3601	29.6	28.0	31.8	33.2	30.7	64.5	7-7	1		27
19	D6771	Sr63/68105	30.8	23.6	28.2	31.0	28.4	60.5	7-7	1		26
20	D6780	62220/61130	31.0	32.2	22.4	35.6	30.3	64.0	7-7	1		25
21		70 - 70	28.4	21.8	34.0	26.2	27.6	64.0	7-7	1		28

Leaf rust rating; T-Trace, 1-Light, 2-Moderate, 3-Heavy, 4-Very heavy.
Entry Number 15 also showed a heavy stem rust infection.

Analysis of Variance

Source	DF	SS	MS	F	
Replication	3.	44.31	14.77	1.38	Standard error of a treatment mean = 1.6363
Treatments	20.	437.06	21.85	2.04	Standard error of a difference among treatment means = 2.3141
Error	60.	642.63	10.71		The C.V. = 11.12 P.C.
Total	83.	1124.00			

Table 36. Early Oat Performance Nursery – Dickinson, 1970.

Entry No.	Variety	Yield Bu/A.	Test weight lbs/bu	Height in inches	Lodging %	Date 50% Headed	Crown rust %	Stem rust %
1	Iowa E70	37.2	37.5	25	none	6-29	0	T
2	Iowa C237-89	42.0	38.0	23		6-29	0	0
3	Iowa C237-93-2	55.7	38.0	25		7-1	25%	25%
4	Iowa x 43411	46.5	36.0	24		6-29	0	T
5	Andrew (check)	63.3	35.0	26		7-4	0	T
6	Pettis	46.5	38.0	25		7-1	0	T
7	Nodaway 70	50.9	38.5	25		7-1	0	T
8	No. 05500	48.5	37.0	24		7-1	0	T
9	No. 05403	29.1	34.0	22		7-1	0	T
10	Mo. 05372	29.6	38.2	23		7-2	0	T
11	Mo. 0-205 (check)	74.1	35.5	26		7-4	0	25%
12	Clintford (check)	46.5	40.0	23		7-1	0	25%
13	Diana	43.5	36.0	25		7-1	0	T
14	S.D. B65PROI-I549	44.3	35.5	23		7-4	T	T
15	S.D. B65PROI-124	52.5	36.0	25		7-2	0	25%
16	Jaycee (check)	40.3	37.6	22		7-1	0	T
17	Ill. 63-1105	47.2	35.5	23		7-5	0	T
18	Ill. 66-3126	50.8	39.5	24		7-4	0	T
19	Ill. 67-1787	51.1	35.2	24		7-1	0	T
20	Ill. 66-2287A	50.4	37.5	24		7-4	0	25%
21	Ill. 62-1456	38.1	37.6	24		6-30	0	T

Table 37. Uniform Midseason Oat Performance Nursery – Dickinson, 1970.

Entry No.	Variety	Yield Bu/A.	Test weight lbs/bu	Height in inches	Lodging %	Date 50% Headed	Crown rust %	Stem rust %
1	Gopher (check)	41.2	34.0	21	none	7-6	25%	T
2	Minn. 67201	42.5	32.8	25		7-6	0	T
3	Minn. 67231	46.3	34.8	24		7-5	0	0
4	Orbit (check)	43.9	33.0	23		7-8	0	0
5	Diana	39.2	33.0	24		7-4	0	T
6	Pur. 5939B1-3-9-3-5	46.7	36.0	23		7-5	0	T
7	Pur. 6316A2-4-1	52.9	36.2	29		7-5	0	0
8	Clintland 64 (check)	50.1	34.4	25		7-4	0	T
9	S.D. B64PROI-178	49.1	35.2	25		7-8	0	25%
10	S.D. B65PROI-469	53.2	35.0	26		7-4	0	T
11	S.D. B65PROI-955	46.5	39.0	25		7-4	0	25%
12	S.D. B65PROI-1541	46.1	35.0	24		7-4	0	T
13	S.D. B65PROI-1596	42.9	33.0	23		7-4	0	0
14	Lodi (check)	37.7	32.8	25		7-10	0	T
15	Wisc. X995-4-1	48.1	35.0	26		7-11	0	T
16	Froker	47.5	34.5	24		7-11	0	T
17	Wisc. X1137-5	40.9	35.5	24		7-4	0	T
18	Wisc. X1289-3	28.8	35.5	23		7-9	0	0
19	Mich. 60-101-1-20	45.9	34.8	23		7-9	0	50%
20	Mich. 60-106-1-78	40.9	36.2	24		7-8	0	0
21	Mich. 64-151-5-110	53.7	35.0	23		7-12	T	T
22	Mich. 60-104-1-34	51.3	35.5	26		7-10	T	T
23	Mich. 64-132-12-20	56.3	33.8	25		7-12	25%	25%
24	N.Y. 5279-105	51.2	31.6	24		7-8	T	0
25	N.Y. 5832-4	54.5	34.0	20		7-12	T	T
26	N.Y. 6083-1	50.5	33.0	21		7-8	T	T
27	N.Y. 6503	44.6	32.5	23		7-8	T	T
28	Pa. 68A13	43.7	35.0	27		7-6	T	T
29	Pa. 68A24	43.9	35.0	26		7-10	T	T
30	Jaycee (check)	41.2	36.0	25		7-2	0	0
31	Ill. 63-1668-1	46.5	34.2	24		7-8	0	T
32	Ill. 63-1105	44.3	33.2	24		7-4	0	T
33	Ill. 66-2287A	43.2	35.5	24		7-4	T	T
34	Ill. 67-1890	47.3	34.0	22		7-5	0	T
35	Canada OA 123-33	40.3	35.5	23		7-7	0	T

Table 38. Uniform Great Plains Barley Nursery – Dickinson, 1970.

Variety	Yield in bushels per acre				Test weight	Heading date	Rust *		Lodging %	Height inches
	Rep 1	Rep 2	Rep 3	Avg.			Leaf	Stem		
Munsing	24.8	30.5	16.0	23.8	47.6	7-4	T	T	none	21
Unitan	28.4	32.3	31.3	30.7	47.0	7-5	0	T		20
Larker	28.1	35.0	33.5	32.2	50.1	7-5	0	T		22
Galt	35.5	28.5	24.9	29.6	48.6	7-7	T	T		20
62Ab3722	25.5	30.3	23.0	26.3	50.2	6-29	0	T		19
62Ab1434	25.0	23.5	33.1	27.2	51.4	7-5	0	3		20
S.D. 67278	45.5	27.0	29.1	33.9	49.2	7-7	0	T		22
S.D. 67640	33.3	31.3	43.0	35.9	49.0	7-3	0	T		22
Betzes	29.5	30.0	33.0	30.8	49.5	7-8	0	1		21
Erbet	21.8	22.3	26.0	23.4	50.5	6-29	0	T		19
Shabet	26.5	19.0	23.3	22.9	43.6	7-8	0	1		21
Primus II	32.0	34.3	34.0	33.4	48.6	6-30	0	T		23
62Ab3722-T	27.9	23.3	26.5	25.9	48.5	6-30	0	1		18
Compana	30.0	25.0	22.8	25.9	48.0	7-4	0	1		18
Mt. 8423	26.0	24.9	25.6	25.5	48.4	7-4	0	T		19
Mt. 84295	30.0	28.8	27.0	28.6	55.6	7-4	0	1		20
Mt. 842144	32.5	33.0	27.3	30.9	47.0	7-6	0	3		19
Mt. 842148	32.8	21.5	24.3	26.2	54.6	7-6	0	3		19
S.D. 69-1780	20.0	23.0	7.5	16.8	46.0	7-6	0	T		23
S.D. 69-1781	35.5	31.3	41.3	36.0	47.2	7-7	0	1		24
S.D. 69-1782	39.8	23.8	36.0	33.2	48.6	7-7	0	T	26	
S.D. 69-1785	20.3	10.3	42.8	24.5	46.5	7-7	0	T	24	

* T-Trace; 1- Light; 2 – Moderate; 3- Severe; 4 – Very Severe.

**NORTHERN REGIONAL HARD RED WINTER
WHEAT PERFORMANCE NURSERY – 1970**

Twenty six varieties and strains of winter wheat seeded in the Northern Regional Performance nursery produced fair yields despite the unfavorable conditions under which they were seeded.

Data from this planting are summarized in Table 39.

Table 39. Northern Regional Hard Winter Wheat Performance Nursery – Dickinson, 1970.

Variety	Yield in bushels per acre				Test weight	Heading date	Diseases	Lodging %
	Rep 1	Rep 2	Rep 3	Avg.				
Kharkof	21.6	22.0	16.8	20.1	60.2	6-24	none	none
Warrior	15.8	23.4	16.0	18.4	60.6	6-24		
Winoka	12.2	12.8	12.8	15.3	60.5	6-24		
Trader	25.0	19.8	20.0	21.6	62.0	6-23		
Trapper	16.2	15.0	16.6	15.9	59.5	6-24		
NB66403	12.0	21.0	20.2	17.7	60.0	6-23		
NB66408	16.2	20.2	20.0	18.8	60.6	6-23		
NB68513	11.6	19.8	9.9	13.8	61.0	6-22		
SD66117-1	17.2	11.6	21.0	16.6	60.5	6-24		
SD66171	21.6	17.4	22.6	20.5	59.5	6-24		
SD6710	7.0	16.8	18.6	14.1	58.0	6-24		
SD6712	9.2	24.4	10.8	14.8	59.8	6-23		
SD6713	21.4	27.2	24.2	24.3	60.0	6-22		
SD6716	27.8	20.0	25.8	24.5	58.8	6-22		
SD6717	10.8	19.6	18.2	16.2	60.2	6-22		
SD6718	19.4	17.0	26.6	21.0	59.0	6-22		
SD6745	12.2	20.4	17.4	16.7	58.0	6-22		
SD6753	28.4	12.8	21.6	20.9	60.0	6-22		
SD6755	11.0	17.2	18.0	15.4	59.5	6-22		
NB66497	19.2	16.6	19.2	18.3	59.5	6-22		
NK70-1	13.6	16.4	15.2	15.1	58.5	6-22		
NK70-2	12.4	21.4	16.8	16.9	58.6	6-22		
NK70-3	17.2	29.2	28.0	24.8	59.5	6-22		
NK70-4	22.6	24.0	12.0	19.5	58.4	6-22		
MT639	15.0	17.0	15.0	15.7	59.0	6-26		
Minter	13.8	29.2	19.8	20.9	60.0	6-26		

Table 40. Cooperative Regional Flax Nursery – Dickinson, 1970.

Variety	C.I. No.	Yield in bushels per acre				Test weight	Heading Date	Diseases	Lodging %	Height inches
		Rep 1	Rep 2	Rep 3	Avg.					
Bison	389	11.6	19.0	16.8	15.8	55.5	7-9	none	none	22
Redwood	1130	18.8	15.6	18.6	17.7	56.0	7-10			20
Bolley	1478	15.8	13.2	8.6	12.5	54.0	7-6			21
Windom	1823	7.6	21.8	15.6	15.0	56.5	7-6			19
Summit	1914	12.5	29.0	23.5	21.7	56.5	7-7			19
Nored	2292	18.2	22.3	19.2	19.9	56.0	7-12			23
Linott	2522	13.5	17.9	16.0	15.8	57.0	7-6			20
Foster	2523	11.5	9.5	9.0	10.0	56.5	7-10			19
Valuta x Raja	2535	18.8	14.0	15.2	16.0	56.5	7-11			24
Windom x 2138	2538	14.2	13.0	16.4	14.5	55.5	7-7			22
Birio x Bison M 3	2539	16.0	21.2	19.2	18.8	56.5	7-12			23
B 5128 x Birio	2540	18.0	14.4	16.6	16.3	57.0	7-7			19
Birio x Bison M 3	2541	16.0	4.0	17.2	12.4	56.5	7-7			22
Birio x Bolley	2542	16.0	13.6	10.8	13.5	56.0	7-7			22
Birio x Bolley	2543	18.6	14.6	8.6	13.9	55.5	7-7			21
Birio x Bolley	2544	15.2	12.0	13.0	13.4	55.5	7-6			21
Birio x Bolley	2545	16.4	20.0	12.0	16.1	56.5	7-7			20
B 5128 x Rocket	2546	12.4	13.6	10.3	12.1	55.0	7-12	20		

**COMPARISON OF RATES AND FORMULATIONS OF COMMERCIAL
FERTILIZER APPLICATION OF SUMMERFALLOW IN WESTERN
NORTH DAKOTA**

This is a companion trial designed to make dual use of the plot layout involved in the Maintenance of Summerfallow Trial. Fertilizer is applied at planting time by drill attachment according to the plot layout shown in the following table. Yield data for 1970 are recorded in Tables 42, 43 and 44.

EVEN NUMBERED YEARS Table 41.

167 5 wk.	100# 11-48-0	15	Rep. 4	138	137	100# 18-46-0	10	Rep. 2	108	
	check	14				50# 23-23-0	9			
	50# 18-46-0	13				100# 23-23-0	8			
	100# 18-46-0	12				check	7			
	50# 11-48-0	11				50# 18-46-0	6			
166 4 wk.	100# 0-46-0	15		139	136	100# 18-46-0	10		109	
	check	14				50# 0-46-0	9			
	50# 18-46-0	13				100# 0-46-0	8			
	100# 18-46-0	12				check	7			
	50# 0-46-0	11				50# 18-46-0	6			
165 6 wk.	100# 23-23-0	15		140	135	100# 18-46-0	10		110	
	check	14				75# 10-30-10	9			
	50# 18-46-0	13				150# 10-30-10	8			
	100# 18-46-0	12				check	7			
	50# 23-23-0	11				50# 18-46-0	6			
164 7 wk.	150# 10-30-10	15	141	134	100# 18-46-0	10	111			
	check	14			50# 11-48-0	9				
	50# 18-46-0	13			100# 11-48-0	8				
	100# 18-46-0	12			check	7				
	75# 10-30-10	11			50# 18-46-0	6				
163 4 wk.	50# 0-46-0	15	142	133	100# 0-46-0	5	112			
	100# 0-46-0	14			50# 0-46-0	4				
	check	13			check	3				
	100# 18-46-0	12			100# 18-46-0	2				
	50# 18-46-0	11			50# 18-46-0	1				
162 6 wk.	50# 23-23-0	15	143	132	150# 10-30-10	5	113			
	100# 23-23-0	14			75# 10-30-10	4				
	check	13			check	3				
	100# 18-46-0	12			100# 18-46-0	2				
	50# 18-46-0	11			50# 18-46-0	1				
161 5 wk.	50# 11-48-0	15	144	131	100# 11-48-0	5	114			
	100# 11-48-0	14			50# 11-48-0	4				
	check	13			check	3				
	100# 18-46-0	12			100# 18-46-0	2				
	50# 18-46-0	11			50# 18-46-0	1				
160 7 wk.	75# 10-30-10	15	145	130	100# 23-23-0	5	115			
	150# 10-30-10	14			50# 23-23-0	4				
	check	13			Check	3				
	100# 18-46-0	12			100# 18-46-0	2				
	50# 18-46-0	11			50# 18-46-0	1				
Rep. 3			Rep. 3					Rep. 1		

Table 42. Grain Yields Recorded in the Trial Comparing Rates and Fertilizer Formulation on the Summerfallow Management Trial – 1970.

Treatment		Yields in bushels per acre				Avg.
		1	2	3	4	
Check		24.2	22.6	13.2	17.8	19.5
50 lbs.	0-46-0	25.5	24.9	15.1	19.4	21.2
100 lbs.	0-46-0	27.3	22.2	14.1	18.9	20.6
50 lbs.	18-46-0	26.5	28.4	13.0	15.7	20.9
100 lbs.	18-46-0	26.8	20.2	15.0	17.1	19.8
The above yields are from the 4-week cultivation interval.						
Check		21.6	19.8	18.3	16.7	19.1
50 lbs.	11-48-0	22.7	19.5	14.5	17.5	18.6
100 lbs.	11-48-0	19.0	18.2	15.8	14.3	16.8
50 lbs.	18-46-0	23.3	20.5	16.5	18.0	19.6
100 lbs.	18-46-0	24.4	18.8	18.5	16.0	19.4
The above yields are from the 5-week cultivation interval.						

Table 43. Grain Yields Recorded in the Trial Comparing Rates and Fertilizer Formulation on the Summerfallow Management Trial – 1970.

Treatment		Yields in bushels per acre				Avg.
		1	2	3	4	
Check		18.7	23.5	13.6	17.9	18.4
50 lbs.	23-23-0	21.6	22.0	13.9	14.3	18.0
100 lbs.	23-23-0	21.8	22.0	13.8	18.2	19.0
50 lbs.	18-46-0	20.0	24.5	15.2	15.8	18.9
100 lbs.	18-46-0	21.6	23.8	13.0	15.0	18.4
The above yields are from the 6-week cultivation interval.						
Check		16.9	19.4	16.8	14.1	16.8
75 lbs.	10-30-10	18.0	21.3	15.2	14.5	17.2
150 lbs.	10-30-10	24.9	21.3	15.7	14.1	19.0
50 lbs.	18-46-0	18.5	23.2	16.5	11.9	17.5
100 lbs.	18-46-0	21.6	21.8	16.7	15.2	18.8
The above yields are from the 7-week cultivation interval.						

Table 44. Record of Grain Yields From Check Plots Compared to the 18-46-0 Formulation in the Fertilizer Use on Summerfallow Management Trial – 1970.

Treatment		Grain yields in bushels per acre								Avg.	1968 Avg.	1969 Avg.	3-Yr. Avg.
Check		24.2	22.6	13.2	17.8	21.6	19.8	18.3	16.7				
Check		18.7	23.5	13.6	17.9	16.9	19.4	16.8	14.1	18.4	38.6	41.1	32.7
50 lbs.	18-46-0	26.5	28.4	13.0	15.7	23.3	20.5	16.5	18.0				
50 lbs.	18-46-0	20.0	24.5	15.2	15.8	18.5	23.2	16.5	11.9	19.2	42.1	43.3	34.9
100 lbs.	18-46-0	26.8	20.2	15.0	17.1	24.4	18.8	18.5	16.0				
100 lbs.	18-46-0	21.6	23.8	13.0	15.0	21.6	21.8	16.7	15.2	19.1	39.6	45.4	34.7

Table 45. Fertilizer Rate and Formulation Trial – Dickinson, 1968-1970.

Fertilizer Treatment	Pounds applied	Yield in bushels per acre			3-Yr. Avg.
		1968	1969	1970	
18-46-0	100#	39.6	45.4	19.1	34.7
18-46-0	50#	42.1	43.3	19.2	34.9
11-48-0	100#	39.8	46.0	16.8	34.2
11-48-0	50#	45.6	43.8	18.6	36.0
0-46-0	100#	39.3	44.8	20.6	34.9
0-46-0	50#	39.9	44.3	21.2	35.1
23-23-0	100#	40.3	43.5	19.0	34.3
23-23-0	50#	39.1	43.3	18.0	33.5
10-30-10	150#	40.2	40.3	19.0	33.2
10-30-10	75#	38.4	38.0	17.3	31.2
Check	0	38.6	41.1	18.4	32.7

Table 46. Fertilizer Rate and Formulation Trial – Beach, 1970.

Fertilizer Treatment	Pounds applied	Yield in bushels per acre				Avg.
		Rep 1	Rep 2	Rep 3	Rep 4	
18-46-0	200#	30.5	38.3	32.5	34.9	34.1
18-46-0	100#	35.4	35.1	36.6	36.9	36.0
18-46-0	50#	33.7	38.3	38.3	36.6	36.7
11-48-0	100#	36.9	35.7	40.0	36.6	37.3
11-48-0	50#	37.1	35.1	38.0	35.7	36.5
0-46-0	100#	35.1	40.0	38.9	37.1	37.8
0-46-0	50#	36.0	37.4	36.6	35.4	36.4
23-23-0	200#	31.9	37.4	36.8	31.6	34.4
23-23-0	100#	33.7	35.7	34.6	34.9	34.7
10-30-10	200#	33.4	36.3	36.9	35.1	35.4
10-30-10	100#	32.5	40.7	38.1	32.0	35.8
Check		32.2	36.9	37.8	33.1	35.0

Analysis of Variance

Source	DF	SS	MS	F
Replications	3.	90.19	30.06	9.24
Treatments	11.	58.81	5.35	1.64
Error	33.	107.36	3.25	
Total	47.	256.36		

Standard error of a treatment mean = 0.9019

Standard error of a difference among treatment means = 1.2754

The C.V. = 5.03 P.C. The L.S.D. at 5% is 2.59 bushels per acre.

Table 47. Fertilizer Rate and Formulation Trial – Glen Ullin, 1970.

Fertilizer Treatment	Pounds applied	Yield in bushels per acre				
		Rep 1	Rep 2	Rep 3	Rep 4	Avg.
18-46-0	200#	30.9	29.7	25.9	24.5	27.8
18-46-0	100#	31.4	26.8	29.8	22.7	27.7
18-46-0	50#	27.6	27.2	28.2	21.6	26.2
11-48-0	100#	29.3	31.5	30.1	20.6	27.9
11-48-0	50#	26.4	28.6	24.6	22.9	25.6
0-46-0	100#	28.6	29.2	27.9	20.4	26.5
0-46-0	50#	28.5	29.0	25.0	19.6	25.5
23-23-0	200#	27.8	29.0	24.5	21.1	25.6
23-23-0	100#	25.9	27.9	22.7	19.6	24.0
10-30-10	200#	27.3	26.7	24.3	20.0	24.6
10-30-10	100#	25.4	26.7	19.1	18.8	22.5
Check		28.5	24.4	28.6	23.9	26.4
<u>Analysis of Variance</u>						
Source	DF	SS	MS	F		
Replication	3.	368.64	122.88	36.64		
Treatments	11.	112.98	10.27	3.06		
Error	33.	110.67	3.35			
Total	47.	592.29				
Standard error of a treatment mean = 0.9156						
Standard error of a difference among treatment means = 1.2949						
The C.V. = 7.08 P.C. The L.S.D. at 5% is 2.63 bushels per acre.						

Table 48. Fertilizer Rate and Formulation Trial – Off Station Sites 1969-1970.

Fertilizer Treatment	Pounds applied	Beach		2 Yr. Avg.	Glen Ullin		2-Yr. Avg.
		1969	1970		1969	1970	
18-46-0	200#	41.6	34.1	37.9	49.2	27.8	38.5
18-46-0	100#	38.2	36.0	37.1	43.8	27.7	35.8
18-46-0	50#	36.5	36.7	36.6	40.4	26.2	33.3
11-48-0	100#	37.3	37.3	37.3	42.5	27.9	35.2
11-48-0	50#	36.7	36.5	36.6	38.3	25.6	32.0
0-46-0	100#	39.5	37.8	38.7	37.5	26.5	32.0
0-46-0	50#	36.5	36.4	36.5	37.5	25.5	31.5
23-23-0	200#	40.8	34.4	37.6	38.9	25.6	32.3
23-23-0	100#	35.8	34.7	35.3	32.9	24.0	28.5
10-30-10	200#	38.2	35.4	36.8	39.2	24.6	31.9
10-30-10	100#	35.1	35.8	35.6	34.6	22.5	28.6
Check	0	28.5	35.0	31.8	24.2	26.4	25.3
L.S.D. @ 5%		6.08	2.59		4.57	2.63	

Table 49. Summary of Wheat Yields on Continuous Cropping, Cornland and Fallow, Fertilized and Unfertilized for the Period 1959-1970.

Year	Spring plowed continuous cropping	Spring plowed continuous cropping fertilized	Summerfallow	Summerfallow fertilized	Disked cornland	cornland fertilized
Yields in bushel per acre						
1959	6.7	8.1	11.1	12.9	7.3	8.6
1960	10.8	12.5	15.3	22.0*	10.6	13.6*
1961	4.8	3.9	6.2	8.1	-	-
1962	-	-	-	-	-	-
1963	17.8	19.4	28.1	33.8*	18.7	25.7*
1964	8.6	10.7*	13.0	16.1*	10.6	11.8
1965	17.3	22.3*	31.4	34.0*	24.6	31.4*
1966	-	-	-	-	-	-
1967	15.4	14.0	25.8	23.6	17.2	21.4*
1968	11.6	10.0	22.8	33.6*	20.7	24.5*
1969	18.1	22.8*	33.7	45.1*	16.2	23.6*
1970	9.4	10.6	21.0	21.9	14.5	15.9
10 Year						
Avg.	12.1	13.4	20.8	25.1*	14.0	17.7*
Crop destroyed by hail in 1962 and 1966.						
* Years when fertilizer application increased yields to or in excess of the breakeven point.						

SUMMERFALLOW MANAGEMENT STUDY

The objective of this trial is to determine the optimum number of cultivations required on summerfallow in western North Dakota as related to yield and cost of operation.

Previous work on summerfallow at this station has determined the best average date for first tillage of fallow as May 15.

Results of similar trials at two other western North Dakota stations support the observations made at Dickinson. In trials at the North Central Agricultural Experiment Station at Minot, Geiszler found that wheat on fallow which received the first tillage of the fallow year on July 1 produced only about 91 per cent as much grain as when the first tillage was on June 1. At the Northern Great Plains Field Station at Mandan, wheat yields were reduced about 6 bushels per acre on the average when the first tillage of the fallow year was delayed until July 1 as compared to June 1 according to Sarvis and Thysell.

In 1968 a trial was begun at Dickinson which compares grain production from summerfallow where the cultivations have been at 4 week, 5 week, 6 week and 7 week intervals, starting with the first tillage operation as close to May 15 as possible. When the first tillage can be applied on or about May 15, the average number of cultivations required for the 4 week treatment is 6, the 5 week treatment requires 5 and the 6 and 7 week intervals require 4 tillage operations during the season.

Fifty cents per acre can be considered a very conservative cost for one cultivating operation on summerfallow. To get the cost down this low an operator would have to be covering approximately 2000 acres. On this basis the 4 week cultivation interval costs a dollar per acre more and the 5 week cultivation fifty cents per acre per season more than does the 6 and 7 week cultivation method.

Table 50. Yields from the Summerfallow Management Study -1970.

Treatment	Yield in bushels per acre				Avg.
	1	2	3	4	
4 week cultivation	24.2	22.6	13.2	17.8	19.5
5 week cultivation	21.6	19.8	18.3	16.7	19.1
6 week cultivation	18.7	23.5	13.6	17.9	18.4
7 week cultivation	16.9	19.4	16.8	14.1	16.8

Table 51. Yields from the Summerfallow Management Study – 1968-1970.

Cultivation interval	Average yield in bushels per acre			
	1968	1969	1970	3-Year Avg.
4 weeks	38.8	43.0	19.5	33.8
5 weeks	37.4	43.0	19.1	33.2
6 weeks	38.6	40.3	18.4	32.4
7 weeks	39.5	38.0	16.8	31.4