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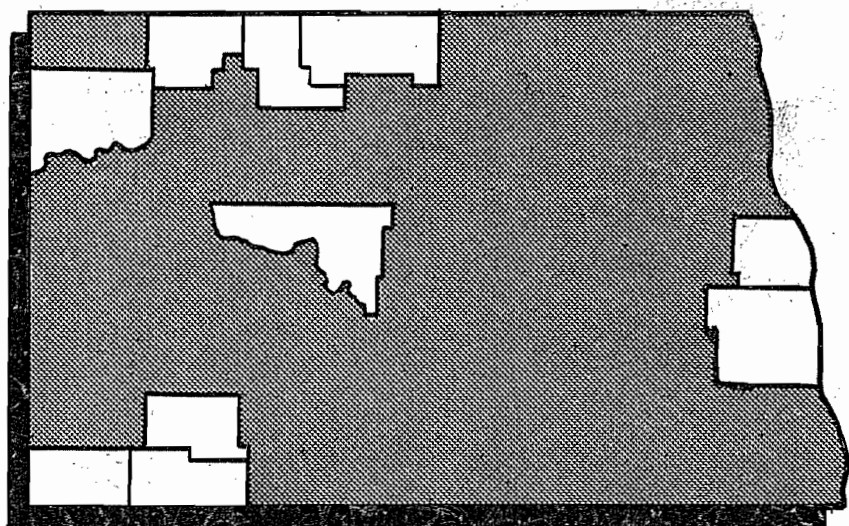
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# the 1962 REPORT

ON TEST - DEMONSTRATION FARMS

in North Dakota

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AND  
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## FOREWARD

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### North Dakota Farmers Cooperating in 1962

Ardean Aafedt,	Williston	J.P. Lorenzen,	Mohall
Bruce Anderson,	Bowbells	Paul Motzko,	Buford
Daryl Anderson,	Reeder	Earl Nelson,	Gascoyne
Howard Anderson,	Willow City	C.L. O'Keefe,	Lansford
Harold Bergman,	Bottineau	George Ott,	Reeder
Harry Benshoof,	Flaxton	Ralph Peterson,	Harwood
Melvin Bjornholt,	Emmet	Paul Pratt,	Gardner
Floyd Bryan,	Bowbells	Randolph Bros. ,	Lansford
Henry Busch,	Portal	Riedman Bros. ,	Litchville
Morten Clausen,	Norma	Denver Rosberg,	Wasburn
Alfred Cole,	Ryder	Lorry Rotvold,	Halstad, Minn.
Gene Davison,	Haynes	Norlan Rue,	Plaza
Alvin Dill,	Regent	Raymond Russell,	Burford
Fred Ehlers,	Hettinger	Marce Schaefer,	Glenburn
Arnold Funk,	Bowbells	Henry Schlichtmann,	Hillsboro
Art Grove,	Hillsboro	Delmar Schulz,	Davenport
Orlin Gunderson,	Buxton	Donald Schumacher,	Scranton
Harold Hanson,	New England	Walter Stzegura,	Gascoyne
Ervin Haux,	Kindred	Karl Vangsness,	Roseglen
Frank Kalisiak,	Scranton	Dave Witteman,	Mohall
Roy Kern,	Scranton	George Witterman Co. ,	Mohall
Kermit Kjonoos,	Maxbass	C.E. Woodruff,	Regent
Knight Farm,	Casselton	Raymond Wothe, .	Reeder
Reuben Korsmo,	Mayville	Enry Zahn, Jr. ,	New England
John Larson,	Lemmon, S.Dak.		

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THE 1962 REPORT ON TEST-DEMONSTRATION  
PROGRAM IN NORTH DAKOTA

Marvin T. Nordbo<sup>1/</sup> and Virgil Weiser<sup>2/</sup>

The Tennessee Valley Authority and the North Dakota State University of Agriculture and Applied Sciences continue cooperation in the conduct of a test-demonstration program in North Dakota. The broad objectives of this program are:

1. To introduce TVA experimental fertilizers in farm fertilizer programs in the state,
2. To determine cooperating farmers' acceptance of these fertilizer materials,
3. To demonstrate and test the effects of recommended fertilizer treatments on individual crop yields and over-all farm income,
4. To promote agricultural developments in North Dakota through improved use of fertilizer in combination with other recommended farming practices.

The North Dakota Agricultural Experiment Station and the North Dakota Extension Service cooperate in conducting this program within the state. The Agricultural Economics Department conducts its share of the program under Station Project S-3-5, which has as its main objective an economic evaluation of a recommended and balanced fertilizer program as it applies to the over-all farm. The responsibilities of various cooperating personnel are explained in the 1960 report (Agricultural Economics Report Number 18).

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Active Test-Demonstration Farms in North Dakota

Fourteen of the original test-demonstration cooperators completed their fifth year at the end of the 1961 season. Eleven active cooperators were eligible to continue through the 1962 season. Two of these, located in Morton and Stark counties, were discontinued because of inability to deliver test-demonstration fertilizer materials to them in less than carload lots. The remaining nine cooperators ( in Barnes, McLean and Williams Counties) continued through the 1962 season.

Eight new counties were selected for continuation of the test-demonstration program. These were: Adams, Bottineau, Bowman, Burke, Cass, Hettinger, Renville and Traill Counties. These counties were selected because they represent major areas in the state relative to soils, precipitation and cropping systems. The location of participating counties is shown on the map in Figure I. Five cooperators were selected in each of the eight counties, providing a total of 40 new cooperators (Table 1).

The test-demonstration farm cooperators keep complete farm records and these records are analyzed in conjunction with the North Dakota Extension Farm Account Route which has been operative for three seasons. In addition to the five test-demonstration cooperators, five other farmers in each of these counties are cooperating in the farm account route. These additional farm records allow for comparative analyses of farm records in these test-demonstration counties.

North Dakota used relatively little commercial fertilizer prior to the last decade. Only 18,969 tons were used in 1951 compared to 193,689 tons in 1961. The state has large resources of native fertility and several crops in many situations do not respond to fertilizer additions. Small grain crops generally require no additions of potash. Soils testing done by the NDSU Department of Soils indicates that 11 per cent of the soils test high in available phosphate and another 24 per cent test medium. Many of these soils require

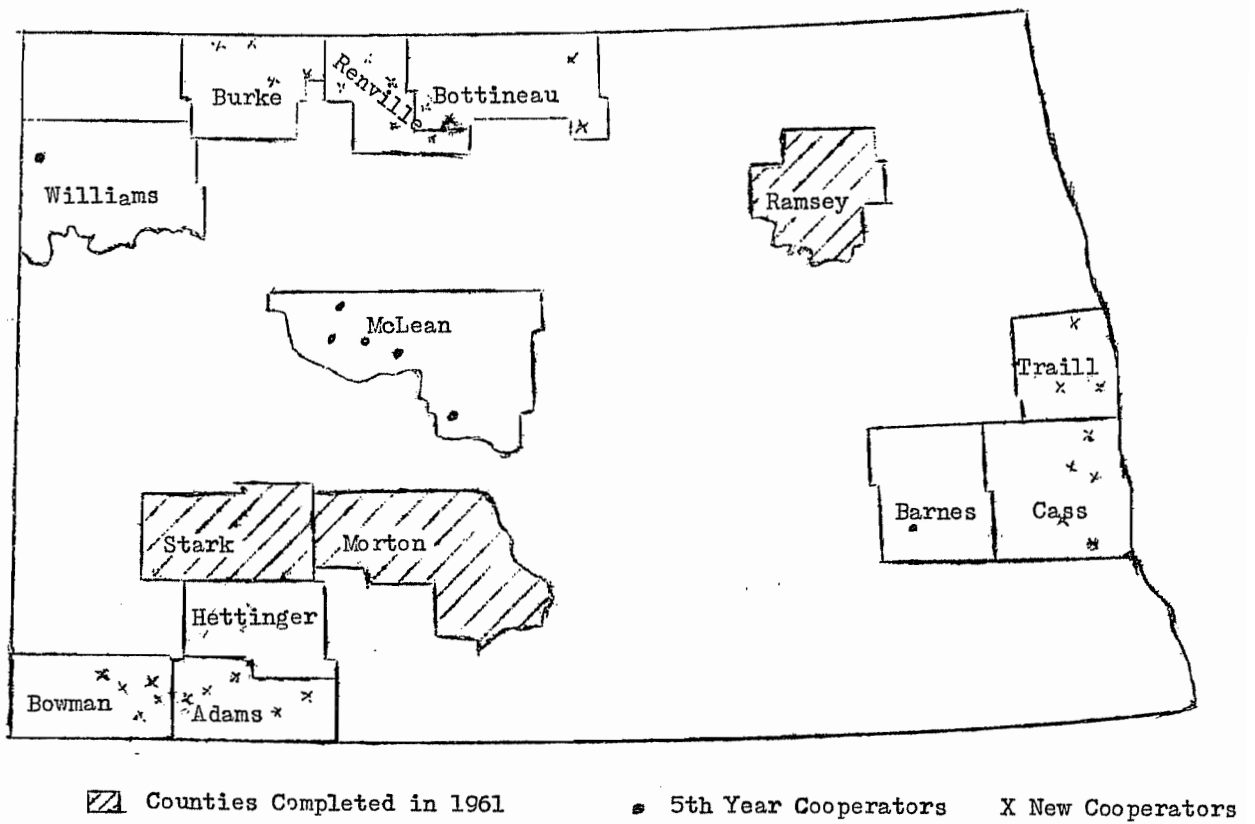


FIGURE 1. LOCATION OF TEST-DEMONSTRATION FARMS

no additional phosphate and others only modest amounts. A large portion of the major cash crops are grown on fallow (64 per cent of the wheat and 13 per cent of the barley in 1961 ) and consequently require only modest amounts, if any, of nitrogen.

Annual precipitation varies greatly from a relatively low average (ranging from 14.78 inches in the Northwestern part of the state to 18.71 inches in the Southeastern part<sup>1</sup>). Moisture rather than plant nutrients often becomes the primary limiting factor for crop production.

TABLE 1. NUMBER OF ACTIVE TEST-DEMONSTRATION COOPERATORS

County	Cooperators Active January 1, 1962	Number Added During Year	Cooperators Active at End of Year
Barnes	1	-	0
McLean	5	-	0
Williams	3	-	0
Adams	-	5	5
Bottineau	-	5	5
Bowman	-	5	5
Burke	-	5	5
Cass	-	5	5
Hettinger	-	5	5
Renville	-	5	5
Traill	-	5	5
Total	9	40	40

<sup>1</sup>Annual Summary for 1961, North Dakota Crop and Livestock Statistics. No. 8, North Dakota State University of Agriculture and Applied Science, May 1962.



Consequently the moisture situation in the soil at planting time must be considered when making fertilizer recommendations and treatments to obtain optimum returns. Normally, when moisture supplies are deficient at planting time the potentials of adequate moisture for average crop yields and yield responses to fertilizer are doubtful. This is particularly true on non-fallow land in areas of the state exclusive of the Red River Valley.

Recommendations for fertilizer use take into account the soil moisture at planting time. Good soil moisture situations suggest heavier fertilizer rates and poor moisture reserves suggest lower fertilizer rates. The test-demonstration farm cooperators and project leaders consider all these factors relative to individual fields and farms when deciding on fertilizer treatments for specific crops and fields. The primary objective of the study is to determine the economic impact of a recommended fertilizer program on the entire farm.

#### Crops Fertilized

Wheat is the highest value small grain and the most dependable for profitable yield responses to fertilizer treatments in North Dakota. Over 70 per cent of the acreage fertilized on test-demonstration farms in 1962 was wheat and durum, about 11,319 acres out of 15,851 (Table 2).

About 47 per cent of the fertilized acreage was checked for yield responses at harvest time, 7,407 acres as shown in Table 3. A total of 224 fields were checked for yield responses at harvest time, 166 of these were wheat, 52 were barley and 6 were oats.

TABLE 2. ACREAGE FERTILIZED IN 1962

Crop	COUNTIES				
	Cass Traill	Barnes McLean Williams	Adams Bowman Hettinger	Bottineau Burke Renville	All Counties
Wheat on Fallow	655	1,579	2,684	4,237	9,155
Wheat on Nonfallow	525	336	1,098	205	2,164
All Wheat	1,180	1,915	3,782	4,442	11,319
Barley on Fallow	-	199	80	458	734
Barley on Nonfallow	1,102	281	413	528	2,324
All Barley	1,102	480	493	986	3,061
Oats	147	-	186	150	483
Corn	306	119	116		541
Alfalfa	-	30	-	10	40
Pasture	-	43			43
Sugar Beets	197	127			324
Soybeans	40				40
All Crops	2,972	2,714	4,577	5,588	15,851

TABLE 3. FERTILIZED ACREAGE CHECKED AT HARVEST TIME

Crop	COUNTIES				
	Cass Traill	Barnes McLean Williams	Adams Bowman Hettinger	Bottineau Burke Renville	All Counties
Wheat on Fallow	231	988	685	2,313	4,217
Wheat on Nonfallow	358	268	470	25	1,121
All Wheat	589	1,256	1,155	2,338	5,338
Barley on Fallow	--	43	10	319	372
Barley on Nonfallow	475	330	160	565	1,530
All Barley	475	373	170	884	1,902
Oats on Fallow	-	-	-	37	37
Oats on Nonfallow	18	-	12	100	130
All Oats	18	-	12	137	167
Total of All Crops	1,082	1,629	1,337	3,359	7,407

Amount of Fertilizer Material Used

The test-demonstration cooperators used 435.265 tons of Tennessee Valley Authority fertilizer material for the 1962 crop. Concentrated super phosphate and diammonium phosphate were the materials in greatest demand (Table 4).

TABLE 4. FERTILIZER MATERIALS PURCHASED FROM TVA, 1962

County	Tons of Material					Total
	0-53-0	0-63-0	20-52-0	30-10-0	33-0-0	
Adams	13.40	-	22.175	-	-	35.575
Barnes	1.96	-	11.825	-	-	13.785
Bottineau	16.24	-	15.75	3.5	-	35.49
Bowman	6.24	-	23.075	-	-	29.315
Burke	45.36	-	5.725	0.5	-	51.585
Cass	4.52	-	48.70	26.725	-	79.945
Hettinger	12.32	-	13.225	4.225	-	29.77
McLean	34.28	-	1.55	-	-	35.83
Renville	15.96	-	14.350	.825	-	31.135
Traill	19.04	8.0	20.45	2.65	-	50.14
Williams	10.52	4.2	12.05	9.775	6.15	42.695
Total	179.84	12.2	188.875	48.2	6.15	435.265

Test-demonstration cooperators purchased 88.3 tons of fertilizer from local dealers (Table 5). The largest portion of fertilizer purchased locally, was ammonium nitrate. This material was used for bulk spreading on nonfallow fields in Cass and Traill counties. Other materials were also purchased by cooperators in various counties supplement the fertilizers ordered from the Tennessee Valley Authority.

TABLE 5. COMMERCIAL FERTILIZER PURCHASED IN 1962 BY NEW TVA COOPERATORS

County	Grade of Fertilizer Purchased						Total
	0-43-0	0-45-0	11-48-0	27-14-0	33-0-0	28-0-0	
	(Tons of Material)						
Cass				9.35	26.5	3.95	39.8
Traill		2.0			35.5		37.5
Adams							None
Bowman							None
Hettinger	8.0		2.0				10.0
Bottineau		1.0					1.0
Burke							None
Renville							None
All Counties	8.0	3.0	2.0	9.35	62.0	3.95	88.3

Fertilizer Use Prior to Becoming Test-Demonstration  
Farm Cooperators

Most of the cooperators added to the test-demonstration program were using fertilizer prior to entry in this program. Only two out of the 40 new cooperators used fertilizer for the first time in 1962. Cooperation in the test-demonstration program did not increase fertilizer use appreciably on these 40 farms. They had used about 412 tons of fertilizer (Table 6) in 1961 and this was increased to 431.255 tons in 1962. Only 247 additional acres of crops were fertilized (Table 7). The moisture situation at planting time and crop diversion programs had some influence on the amount of fertilizer used in 1962. The majority of the state lacked moisture at planting time and the Red River Valley was so wet that desired amounts of fertilizer could not be applied.

TABLE 6. FERTILIZER USED BY FARMERS IN 1961, YEAR PRIOR TO BECOMING TEST-DEMONSTRATION FARM COOPERATORS

Fertilizer Ratio	COUNTIES									
	Cass	Traill	Adams	Bowman	Hettinger	Bowman	Burke	Renville	All Counties	
	(Tons of Fertilizer Used in Each County)									
0-1-0	15.9	8.5	3.25	9.35	12.95	39.8	22.325	112.075		
1-4-0	1.75	18.1	19.8	26.8	14.6	25.95	7.1	3.95	118.05	
1-3-0	7.75	14.12	4.5					26.37		
1-2-0	3.08							3.08		
1-1-0	83.125	10.92	6.0	15.1	15.8	3.6		134.545		
2-1-0	4.4							4.4		
1-0-0	10.3	2.65					.75	13.7		
All Fertilizers	107.325	64.77	34.3	34.55	39.05	54.7	50.5	27.025	412.22	

TABLE 7. ACREAGE FERTILIZED IN 1961 AND 1962 ON NEW TEST-DEMONSTRATION FARMS

Crop	Cass		Adams, Bowman		Böttineau, Burke		All	
	Traill		Hettinger		Renville		Counties	
	1961	1962	1961	1962	1961	1962	1961	1962
	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)	(acres)
Wheat	1,134	1,180	4,644	3,782	4,030	4,442	9,808	9,404
Barley	1,111	1,102	180	493	775	986	2,066	2,581
Oats	182	147	35	186	25	150	242	483
Corn	306	306	125	116	-	-	431	422
Alfalfa	-	-	-	-	-	10	-	10
Pasture	-	-	-	-	-	-	-	-
Sugar Beets	191	197	-	-	-	-	191	197
Soybeans	40	40	-	-	-	-	40	40
Flax	22	-	-	-	-	-	22	-
Rye	-	-	-	-	90	-	90	-
All Crops	2,986	2,972	4,984	4,577	4,920	5,588	12,890	13,137

Fertilizer Responses in 1962

Following a very droughty season in 1961 most soils were very deficient in moisture at the outset of the 1962 planting season. Past experience and research work suggested that the outlook for crop yields and responses to fertilizer was poor. Consequently, recommendations for fertilizer treatments on test-demonstration farms outside the Red River Valley were held to minimum rates. However, rains came in May and continued throughout the growing season in adequate amounts to produce record yields in spite of the severe moisture shortage at the outset.

Crop yield responses to fertilizer treatments were erratic but generally good, particularly outside the Red River Valley where severe crop losses were caused by excessive moisture. The average return to fertilizer investment on 7,571 acres checked at harvest time was 117 per cent. An average fertilizer investment of \$3.48 produced additional crop worth \$7.55 per acre (Table 8).

The southwestern portion of the state experienced the largest returns to the fertilizer investments. Adams, Bowman and Hettinger counties received \$11.53 of additional grain from an average fertilizer investment of \$2.88 per acre (Table 9).

Results in Bottineau, Burke and Renville counties averaged a 114 per cent return (Table 10). Wheat and durum produced profitable yield responses. Barley and oats, on the other hand, responded poorly to fertilizer even though the overall yields were very high.

Cass and Traill counties, located in the Red River Valley produced the lowest returns to fertilizer in 1962 (Table 11). Wheat and durum responded favorably in these counties also but barley and oats were very poor. The barley crop suffered from excessive moisture and was plagued with many diseases.

TABLE 8. AVERAGE COSTS AND RETURNS TO FERTILIZER BY CROP ON ALL TEST-DEMONSTRATION FARMS, 1962

Crop	Acres Checked	Ave. Fert. Treat./A.	Ave. Fert. Yld./A.	Ave. Yld.Inc. Per A.	Ave. Fert. Cost/A. <sup>1/</sup>	Ave. Returns Per A. <sup>2/</sup>
Crops Grown on Fallow						
HRS Wht.	1,841	3+24+0	35.3	3.1	\$2.76	\$3.91
Durum	2,192	2+22+0	45.0	4.4	2.46	7.18
Winter Wht.	250	0+21+0	34.8	4.7	2.10	6.30
Barley	372	0+24+0	72.9	2.7	2.62	-.50
Oats	37	0+21+0	88.8	3.3	2.10	-.48
All Small Grains	1,692	0+23+0	-	-	2.61	5.30
Crops Grown on Nonfallow						
HRS Wht.	962	19+24+0	32.0	5.1	5.03	5.51
Durum	133	15+26+0	36.9	8.1	4.72	13.37
Barley	1,616	18+25+0	45.5	5.5	5.05	-.65
Oats	138	12+20+0	64.8	8.0	3.68	.22
Flax	30	30+0+0	18.7	2.8	4.20	3.53
All Small Grains	2,879	18+24+0	-	-	4.93	2.14
Total <sup>3/</sup>	7,571	8+23+0	-	-	3.48	4.07

<sup>1/</sup>Cost of fertilizer = 14 cents per pound of nitrogen and 10¢ per pound of P<sub>2</sub>O<sub>5</sub>.

<sup>2/</sup>Returns beyond cost of fertilizer

Based on Mid-October 1962 average prices of grain.

HRS Wheat	= \$2.10	Barley	= .78
Winter Wheat	= \$1.80	Oats	= .49
Durum	= \$2.23	Flax	= \$2.76

<sup>3/</sup>Does not include irrigated acreage

TABLE 9. AVERAGE COSTS AND RETURNS TO FERTILIZER BY CROP IN ADAMS, BOWMAN AND HETTINGER COUNTIES, 1962

Crop	Acreage Checked	Ave. Fert. Treat/A.	Ave. Yld./A. Fert.	Ave. Yld./Inc. Per A.	Ave. Fert. Cost/A. <sup>1/</sup>	Ave. Returns Per A. <sup>2/</sup>
Crops Grown on Fallowed Land						
			(Bu.)	(Bu.)	(\$)	(\$)
HRS Wheat	516	3+19+0	29.5	4.7	2.31	7.61
Durum	169	7+21+0	33.2	4.3	3.08	6.46
Barley	10	0+21+0	46.7	6.7	2.10	3.13
All Crops	695	4+20+0	-	-	2.49	7.27
Crops Grown on Nonfallowed Land						
HRS Wheat	404	8+22+0	36.7	7.3	3.14	11.50
Durum	36	8+21+0	27.0	5.7	3.22	9.49
Barley	160	8+21+0	48.3	12.3	3.24	6.64
Oats	11	10+26+0	81.2	15.6	4.00	3.64
All Crops	611	8+22+0	-	-	3.19	9.97
Total	1,306	6+21+0	-	-	2.88	8.65

<sup>1/</sup>Cost of fertilizer = 14 cents per pound of nitrogen and 10 cents per pound of P<sub>2</sub>O<sub>5</sub>.

<sup>2/</sup>Returns beyond costs of fertilizer

Based on Mid-October 1962 prices of grain

HRS Wheat = \$2.10  
 Durum = 2.23  
 Barley = .78  
 Oats = .49



TABLE 10. AVERAGE COSTS AND RETURNS TO FERTILIZER BY CROPS IN BOTTINEAU, BURKE AND RENVILLE COUNTIES, 1962

Crop	Acreage Checked	Ave. Fert. Treat./A.	Ave. Yld./A. Fert.	Ave. Yld. Inc. Per A.	Ave. Fert. Cost/A. <sup>1/</sup>	Ave. Returns Per A. <sup>2/</sup>
Crops Grown on Fallowed Land						
HRS Wheat	989	2+25+0	38.6	2.3	\$2.73	\$2.11
Durum	1,350	1+21+0	44.8	3.9	2.34	6.28
Barley	319	2+23+0	75.6	2.1	2.64	-.97
Oats	37	0+21+0	88.8	3.3	2.10	-.48
All Crops	2,695	1+23+0	-	--	2.52	3.80
Crops Grown on Nonfallowed Land						
HRS Wheat	25	0+26+0	38.3	2.8	2.60	3.28
Barley	565	9+22+0	53.2	3.9	3.37	-.31
Oats		6+18+0	66.7	7.1	2.70	.78
All Crops	690	8+22+0	-	-	3.25	-.02
Total	3,385	3+22+0	-	-	2.61	2.98

<sup>1/</sup>Cost of fertilizer = 14 cents per pound of nitrogen and 10 cents per pound of P<sub>2</sub>O<sub>5</sub>.

<sup>2/</sup>Returns beyond cost of fertilizer

Based on Mid-October, 1962 average grain prices

HRS Wheat = \$2.10 per bushel  
 Durum = \$2.23 per bushel  
 Barley = \$ .78 per bushel  
 Oats = \$ .49 per bushel

TABLE 11. AVERAGE COSTS AND RETURNS TO FERTILIZER BY CROP IN CASS AND TRAILL COUNTIES, 1962

Crop	Acreage checked	Ave. Fert. Treat./A.	Ave. Yld./A. Fert.	Ave. Yld. Inc. Per A.	Ave. Fert. Cost/A. <sup>1/</sup>	Ave. Returns Per A. <sup>2/</sup>
Crops Grown on Fallowed Land						
HRS Wheat	200	9+27+0	34.8	3.5	\$3.90	\$ 3.37
Durum	71	4+26+0	35.2	8.1	3.16	14.80
HRS Wheat + Durum	271	7+27+0	34.9	4.7	3.71	6.36
Crops Grown on Nonfallowed Land						
HRS Wheat	344	26+28+0	24.7	3.5	6.41	1.00
Durum	97	18+28+0	40.7	9.0	5.27	14.82
Barley	591	26+27+0	37.7	4.1	6.42	-3.04
Oats	27	34+25+0	52.0	8.0	7.27	-3.34
Flax	30	26+27+0	18.7	2.8	4.20	3.53
All Crops	1,089	26+27+0	-	-	6.27	00
Total	1,360	22+27+0	-	-	5.72	1.26

<sup>1/</sup> Cost of fertilizer = 14 cents per pound on nitrogen and 10 cents per pound of P<sub>2</sub>O<sub>5</sub>.

<sup>2/</sup> Returns beyond cost of fertilizer

Based on Mid-October 1962 average prices of grain

HRS Wheat = \$2.10 per bushel  
 Durum = \$2.23 per bushel  
 Barley = \$ .78 per bushel  
 Oats = \$ .49 per bushel  
 Flax = \$2.76 per bushel

Results obtained in Barnes, McLean and Williams counties are summarized separately in Table 12 because this was the fifth year of participation for these cooperators and the other just completed their first year. Cooperators in McLean county produced additional grain worth \$11.00 per acre by spending \$2.56 for fertilizer. This is 330 per cent return on their investment. Barnes county on the other hand experienced a small average return because a large portion of the fertilizer was applied to barley which responded very poorly. The responses on individual fields are reported in Appendix A, and the costs and returns of specific crops and cooperators are shown in Appendix B.

TABLE 12. AVERAGE COSTS AND RETURNS TO FERTILIZER BY CROP IN BARNES, MCLEAN AND WILLIAMS COUNTIES, 1962

Crop	Acreage Checked	Ave. Fert. Treat./A.	Ave. Yld/A. Fert.	Ave. Yld. Inc. Per A.	Ave. Fert. Cost/A. <sup>1/</sup>	Ave. Return Per A. <sup>2/</sup>
BARNES COUNTY						
HRS Wht. on Fallow	65	0+32+0	30.1	1.7	\$3.20	\$ .37
HRS Wht. on Nonfallow	189	34+21+0	34.4	3.8	6.86	2.24
Barley on Nonfallow	300	26+28+0	45.1	8.2	6.42	-.02
All Crops	554	26+26+0	-	-	6.19	.46
MCLEAN COUNTY						
HRS Wht. on Fallow	71	2+26+0	38.3	4.6	2.82	6.89
Durum on Fallow	562	0+24+0	50.4	5.2	2.52	9.12
Barley on Fallow	43	0+26+0	59.2	6.0	2.60	2.11
All Crops	676	0+24+0	-	-	2.56	8.44
WILLIAMS COUNTY						
Durum on Fallow	40	0+21+0	41.3	1.6	2.10	1.47
Winter Wht. on Fallow	250	0+21+0	34.8	4.7	2.10	6.30
All Crops	290	0+21+0	35.7	4.2	2.10	5.64
WILLIAMS COUNTY (IRRIGATED)						
Durum on Nonfallow	79	27+44+0	49.7	4.4	8.15	1.63
Barley on Nonfallow	30	16+42+0	63.5	10.5	6.44	1.75
All Crops	109	24+44+0	-	-	7.67	1.67

<sup>1/</sup>Cost of fertilizer = 14 cents per pound of nitrogen and 10 cents per pound of P<sub>2</sub>O<sub>5</sub>.

<sup>2/</sup>Returns beyond cost of fertilizer

Based on Mid-October, 1962 grain prices

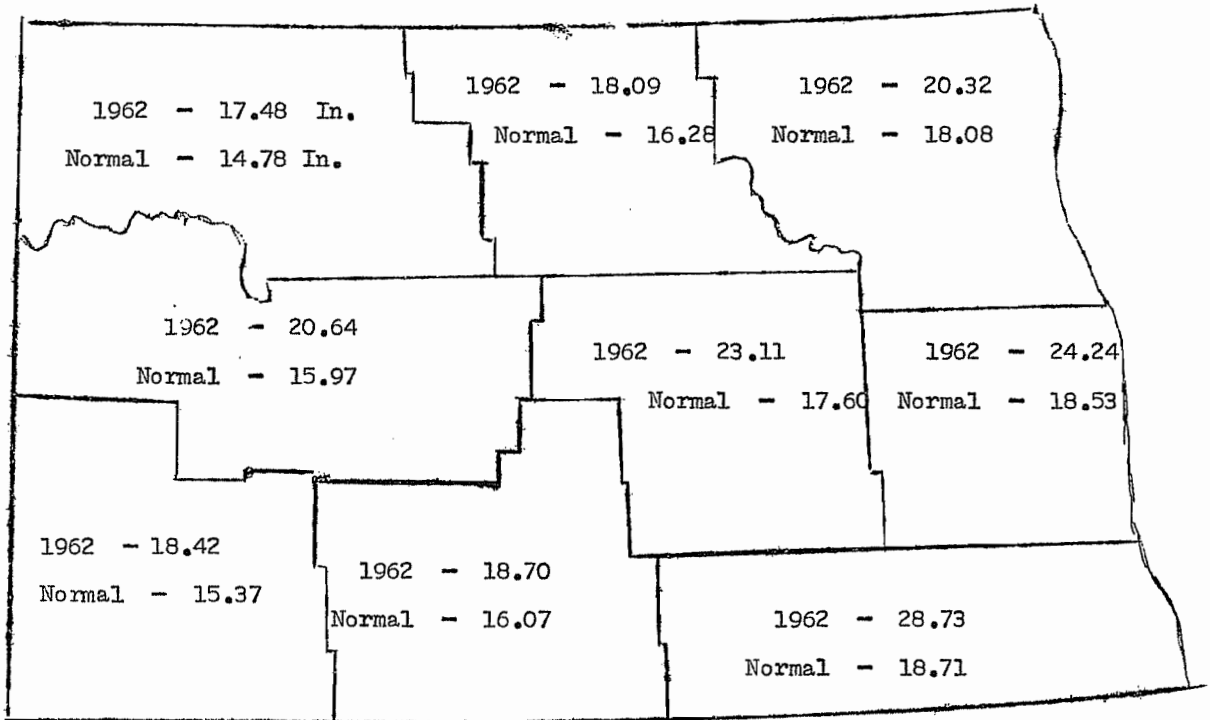
HRS Wheat = \$2.10 per bushel  
 Durum = \$2.23 per bushel  
 Winter Wht. = \$1.80 per bushel  
 Barley = \$ .78 per bushel

TABLE 13. FIVE YEAR AVERAGE FERTILIZER RESULTS IN BARNES, MCLEAN & WILLIAMS COUNTIES (1958-1962)

Crop	Acres Checked	Average Fert. Treat/A.	Ave. Yld. Per Acre Fert. (Bu.)	Ave. Yld. Increase Per Acre (Bu.)	Average Fert. Cost/A. <sup>1/</sup> (\$)	Average Return Per Acre <sup>2/</sup> (\$)
BARNES COUNTY (1 Cooperator)						
All Wheat on Fallow	269	9+32+0	26.8	5.2	4.52	5.51
All Wheat on Nonfallow	713	27+25+0	27.5	5.1	6.25	3.61
Barley on Fallow	110	3+25+0	47.5	4.0	2.98	.21
Barley on Nonfallow	1,169	23+27+0	36.0	9.3	5.86	1.53
All Small Grains	2,261	22+27+0	---	---	5.69	2.61
MCLEAN COUNTY (5 Cooperators)						
All Wheat on Fallow	2,398	0+26+0	29.0	3.9	2.66	5.43
All Wheat on Nonfallow	245	23+29+0	19.7	2.1	6.13	-2.17
Barley on Fallow	236	0+27+0	45.5	8.1	2.65	3.64
Barley on Nonfallow	453	22+28+0	31.2	5.4	5.94	-.29
All Small Grains	3,332	5+27+0	---	---	3.36	3.77
WILLIAMS COUNTY (1 Cooperator)						
All Wheat on Fallow	360	0+22+0	30.0	3.6	2.22	4.33
WILLIAMS COUNTY (Irrigated) (2 Cooperators)						
Durum on Nonfallow	534	21+38+0	50.6	8.3	6.71	12.59
Winter Wheat	113	19+35+0	38.8	3.8	6.11	.40
Barley	147	16+42+0	63.6	12.2	6.44	3.21
Oats	26	16+42+0	93.0	10.2	6.44	-1.79
All Small Grains	820	20+38+0	---	---	6.57	8.77

<sup>1/</sup> Commercial Cost

<sup>2/</sup> Returns above cost of fertilizer



SOURCE: USDA Statistical Reporting Service, Agricultural Statistician, Fargo, North Dakota

FIGURE 2. NORTH DAKOTA PRECIPITATION IN 1962 AND 1931-60 AVERAGE

Five Year Summary

The nine cooperators in Barnes, McLean and Williams counties completed five years of cooperation in the test-demonstration program in 1962. A summary of the fertilizer responses obtained on these farms during the five year period is presented in Table 13. The average returns ranged from 46 per cent in Barnes county to 133 per cent on irrigated crops in Williams county and 195 per cent for one dryland cooperator in Williams county.

A more extensive five year summary was presented in the 1961 annual report (Agricultural Economics Report No. 22) and in an article, "5 Year Look at Fertilizer Inputs and Returns," published in the November-December, 1962 issue of North Dakota Farm Research. The summaries presented in Table 13 do not cover an adequate number of fields or period of time to conclude normal fertilizer responses. These data should merely supplement the two other reports.

Moisture Situation in 1962

The general moisture situation throughout the state in 1962 is summarized in Figure II. The normal annual precipitation for the state from 1931-60 is 16.82 inches<sup>1/</sup>. The average precipitation for the state in 1962 was about 23 per cent above normal, or 20.75 inches.

Handling, Storing and Spreading Characteristics of  
Test-Demonstration Fertilizer Materials

The physical qualities of all material received were good. Only a few relatively minor problems were encountered by cooperators using materials obtained through the test-demonstration program. A few cooperators complained about the irregular particle sizes and amount of fine materials. This caused spreading problems in some fertilizer attachments. Some cooperators mentioned finding a few large particles or lumps in some bags. Much of the fertilizer was applied in relatively damp and wet weather with very few problems of stickiness except when using 30-10-0 .

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<sup>1/</sup>Annual Summary for 1961, North Dakota Crop and Livestock Statistics, Ag. Statistics No. 8, North Dakota State University of Agriculture and Applied Science, May 1962.

The majority of the cooperators were well pleased with the quality of bags used for packaging the materials. The 50 pound size was generally well received. One cooperator thought the bags were too brittle and one suggested that they were tough and difficult to open.

Educational Uses Made of Test-Demonstration Farms

The fertilizer test-demonstration program provides an effective educational tool through the use of data obtained from the program. The comparison of crop yields on fertilized and unfertilized fields of various crops shows the returns from fertilizer use. As use of fertilizer increases more and more people are concerned about the actual results obtained from fertilizer treatments under various cropping, soil and moisture situations.

Test-demonstration cooperators fertilized a total of 15,851 acres in 1962, they left check strips and made harvest yield comparisons on 224 different fields representing 7,407 acres. Crop yield results and income effects from fertilizer use on these farms is used by extension service people and others in farm meetings, news stories, radio and television programs.

No exact records have been kept on how extensively these demonstrations and results were used in the extension program within each county. These demonstrations and results were generally included as a part of other extension programs rather than as separate programs. However, an estimate of uses made during 1962 was as follows.

Number of people who visited fertilizer demonstrations (Including tour groups and individual visits).	425
Number of tour groups who saw fertilizer demonstrations.	7
Number of news articles mentioning one or more of these demonstrations and/or results of these demonstrations.	45
Number of radio and television programs in which reference was made to these demonstrations and results obtained.	36
Number of people attending meetings where results of these demonstrations were discussed.	250

About 250 copies of last year's report have been distributed. A summary of five year's test-demonstration experience was published in the November, December 1962 issue of the North Dakota Farm Research Bulletin. This bimonthly bulletin has a circulation of about 7,000 readers.

The test-demonstration cooperators in the eight new counties completed 39 farm records and 22 additional farmers completed farm record books which are analyzed in the farm account route. This record analysis will be attached to this report. These comparative analyses will be used rather extensively by extension people in the cooperating counties in their extension programs.



APPENDIX A

CROP YIELD RESPONSES TO FERTILIZER TREATMENT ON  
TVA TEST-DEMONSTRATION FARMS IN NORTH DAKOTA, 1962

APPENDIX TABLE A-1. CROP YIELD RESULTS ON TVA TEST-DEMONSTRATION FARMS IN ADAMS COUNTY, 1962

Cooperator	Field No.	1961 Crop	1962 Crop	Nutrients Per Acre	Yield - Bushels/Acre		
					Fert.	Check	Diff.
Fred Ehlers	14-0	Corn	Wheat	8+21+0	42.7	40.0	2.7
	24-N	Fallow	Wheat	0+21+0	42.7	34.7	8.0
	24-T	Corn	Wheat	8+21+0	41.3	36.0	5.3
	35-G	Fallow	Wheat	0+21+0	29.3	28.0	1.3
	3-I	Fallow	Wheat	0+21+0	33.3	32.6	.7
	3-D	Fallow	Wheat	0+21+0	34.6	33.3	1.3
	13-F	Corn	Wheat	8+21+0	34.0	32.0	2.0
	24-V	Corn	Barley	8+21+0	58.3	53.3	5.0
	26-F	Fallow	Barley	0+21+0	46.7	40.0	6.7
3-S	Corn	Barley	8+21+0	80.0	70.0	10.0	
Gene Davison	B-3	Corn	S. Wht.	8+21+0	40.7	34.0	6.7
	C-6	Corn	S. Wht.	8+21+0	43.8	35.8	8.0
	D-5	Corn	S. Wht.	8+21+0	36.2	33.0	3.2
	E-4	Wheat	S. Wht.	10+26+0	48.9	30.8	18.1
	E-10	Wheat	S. Wht.	10+26+0	28.9	25.8	3.1
	M-3	Wheat	S. Wht.	8+21+0	24.2	21.0	3.2
Daryl Anderson	8	Fallow	Wheat	0+24+0	35.0	28.0	7.0
	5	Corn	Wheat	7+18+0	26.0	21.0	5.0
		Corn	Barley	8+21+0	27.0	21.0	6.0
		Corn	Barley	7+18+0	49.0	41.0	8.0
Raymond Wothe	4-L	Corn	Wheat	10+26+0	48.4	43.4	5.0
	4-I	Corn	Wheat	10+26+0	43.3	28.3	15.0
	4-C	Corn	Wheat	10+26+0	41.6	23.3	18.3
	5-G	Corn	Wheat	10+26+0	43.3	36.6	6.7
	3-J	Fallow	Wheat	0+26+0	28.3	16.6	11.7
	3-J	Fallow	Wheat	0+26+0	36.7	35.0	1.7
	1-0	Stubble	Barley	10+26+0	68.8	36.3	32.5
	8-H	Stubble	Oats	10+26+0	81.2	65.6	15.6
John Larson		Fallow	Wheat	0+19+0	32.5	27.7	4.8
		Fallow	Wheat	0+19+0	19.4	15.9	3.5
Adams County	Ave.	Fallow	Wheat	0+22+0	30.9	26.4	4.5
		Nonfallow	Wheat	9+22+0	38.7	30.9	7.8
		Fallow	Barley	0+21+0	46.7	40.0	6.7
		Nonfallow	Barley	8+21+0	53.1	43.0	10.1
		Nonfallow	Oats	10+26+0	81.2	65.6	15.6

APPENDIX TABLE A-2. CROP YIELD RESULTS ON TVA TEST-DEMONSTRATION FARMS IN BOWMAN COUNTY, 1962

Cooperator	Field No.	1961 Crop	1962 Crop	Nutrients Per Acre	Yield -Bushels/Acre		
					Fert.	Check	Diff.
Donald Schumacher		Fallow	HRS Wheat	0+21+0	37.3	29.3	8.0 12% Hail
		Fallow	HRS Wheat	0+21+0	21.3	18.6	2.7 12% Hail
		Fallow	HRS Wheat	0+21+0	24.0	24.0	--- 12% Hail
Earl Nelson	G	Corn	HRS Wheat	8+21+0	30.9	23.1	7.8
	I	Sudan	HRS Wheat	8+21+0	20.9	18.0	2.9
	C	Corn	Durum	8+21+0	27.7	21.8	5.9
	E	Corn	Durum	8+21+0	26.2	20.7	5.5
	N	Oats	Barley	8+21+0	45.0	30.2	14.8
Walter Stzegura	19g	Fallow	Durum	8+21+0	29.3	30.1	-.8
	30j	Fallow	Durum	0+21+0	42.1	39.4	2.7
	30n	Fallow	Durum	0+21+0	49.3	47.4	1.9
	26j	Fallow	Durum	8+21+0	20.2	18.1	2.1
	26n	Fallow	Durum	8+21+0	28.8	28.5	.3
	26z	Fallow	Durum	8+21+0	32.3	29.6	2.7
	26a	Fallow	Durum	8+21+0	27.7	18.9	8.8
	31d	Fallow	Durum	8+21+0	30.6	26.9	3.7
	31j	Fallow	Durum	8+21+0	40.8	32.8	8.0
	31L	Fallow	Durum	8+21+0	36.8	29.1	7.7
29f	Corn	Barley	8+21+0	26.9	18.1	8.7	
Roy Kern		Fallow	HRS Wheat	10+26+0	26.1	21.4	4.7
Bowman County	Ave.	Fallow	Durum	7+21+0	33.2	28.9	4.3
		Fallow	HRS Wheat	2+22+0	27.3	23.5	3.8
		Nonfallow	Durum	8+21+0	27.0	21.3	5.7
		Nonfallow	HRS Wheat	8+21+0	26.4	20.8	5.6
		Nonfallow	Barley	8+21+0	43.8	29.4	14.4

APPENDIX TABLE A-3. CROP YIELD RESULTS ON TVA TEST-DEMONSTRATION FARMS IN HETTINGER COUNTY, 1962

Cooperator	Field No.	1961 Crop	1962 Crop	Nutrients Per Acre	Yield - Bushels/Acre			
					Fert.	Check	Diff.	
Alvin Dill		Fallow	HRS Wheat	0+16+0	34.7	29.3	5.4	
		Fallow	HRS Wheat	0+16+0	32.0	25.6	6.4	
		Fallow	HRS Wheat	0+16+0	35.2	27.7	7.5	
Henry Zahn		Corn	HRS Wheat	8+21+0	24.0	16.0	8.0	
George Ott	2-B	Fallow	HRS Wheat	12+15+0	20.8	16.5	4.3	70% Hail
	2-J	Corn	HRS Wheat	12+15+0	11.7	7.4	4.3	70% Hail
	6-A	Fallow	HRS Wheat	12+15+0	27.2	17.1	10.1	55% Hail
	6-A	Fallow	HRS Wheat	12+15+0	32.0	31.5	.5	55% Hail
	6-A	Fallow	HRS Wheat	0+26+0	21.4	17.1	4.3	55% Hail
	6-A	Fallow	HRS Wheat	0+26+0	27.7	31.4	-3.7	55% Hail
	9-F	Fallow	HRS Wheat	0+26+0	17.1	18.1	-1.0	33% Hail
	9-F	Fallow	HRS Wheat	12+15+0	23.4	18.1	5.3	33% Hail
	9-I	Fallow	HRS Wheat	12+15+0	26.1	25.6	.5	30% Hail
	9-J	Fallow	HRS Wheat	12+15+0	24.5	20.8	3.7	30% Hail
	2	Corn	HRS Wheat	12+15+0	29.3	26.7	2.6	30% Hail
	9	2nd Crop	Barley	12+15+0	77.3	61.3	16.0	17% Hail
Harold Hanson	7-B	Corn	HRS Wheat	6+16+0	40.0	37.3	2.7	
	1-Q	Fallow	HRS Wheat	0+16+0	45.7	36.6	9.1	
	1-G	Fallow	HRS Wheat	0+16+0	45.7	32.0	13.7	
	10-H	Fallow	HRS Wheat	6+16+0	16.0	13.7	2.3	
Hettinger County	Ave.	Fallow	HRS Wheat	4+17+0	30.3	25.0	5.3	
		Nonfallow	HRS Wheat	7+19+0	32.0	26.7	5.3	
		Nonfallow	Barley	13+16+0	77.3	61.3	16.0	

APPENDIX TABLE A-4. CROP YIELD RESULTS ON TVA TEST-DEMONSTRATION FARMS IN BOTTINEAU COUNTY, 1962

Cooperator	Field No.	1961 Crop	1962 Crop	Nutrients Per Acre	Yield-Bushels/Acre		
					Fert.	Check	Diff.
Kermit Kjonoos	33-D	Fallow	HRS Wheat	0+21+0	46.0	44.0	2.0
	3-B	Fallow	Durum	0+21+0	60.0	53.3	6.7
	33-D	Fallow	Barley	0+21+0	72.3	71.3	1.0
	3-F	Fallow	Barley	0+21+0	82.3	86.0	-3.7
Howard L. Anderson	19	Soil Bank	HRS Wht.	0+26+0	38.3	35.5	2.8
	10	Fallow	HRS Wht.	0+26+0	30.0	30.5	-.5
	33	Fallow	Durum	0+26+0	22.1	21.7	.4
	11	Stubble	Barley	10+26+0	51.7	51.7	0
George Witteaman	5	Fallow	Durum	4+21+0	50.8	45.6	5.2
	21	Fallow	Barley	8+21+0	83.2	80.5	2.7
	11	Fallow	Oats	0+21+0	88.8	85.5	3.3
C. L. O'Keefe	1-B	Fallow	HRS Wheat	0+26+0	38.1	32.4	5.7
	3-H	Fallow	HRS Wheat	0+26+0	37.7	36.7	1.0
	2-G	Fallow	Durum	0+26+0	48.8	44.5	4.3
	3-K	Fallow	Durum	0+26+0	52.5	50.7	12.1
	1-C	Wheat	Barley	8+21+0	63.3	58.7	4.6
	2-F	Wheat	Barley	8+21+0	68.7	65.7	3.0
	3-B	Wht. & Bly.	Barley	8+21+0	66.3	64.8	1.5
	3-F	Wheat	Barley	8+21+0	72.8	64.8	8.0
	3-J	Wheat	Barley	8+21+0	71.5	67.0	4.5
Harold Bergman		Fallow	Durum	0+53+0	39.2	41.7	-2.5
		Fallow	Durum	20+52+0	40.0	41.7	-1.7
		Fallow	Durum	0+21+0	46.4	46.9	-.5
		Fallow	Durum	8+21+0	40.4	37.6	2.8
		Wheat	Barley	8+21+0	64.0	60.0	4.0
		Wheat	Barley	8+21+0	54.0	49.5	4.5
		Barley	Oats	0+21+0	65.0	50.0	15.0
Bottineau County	Ave.	Fallow	Durum	1+24+0	48.1	43.0	5.1
		Fallow	HRS Wheat	0+25+0	37.8	35.9	1.9
		Nonfallow	HRS Wheat	0+26+0	38.3	35.5	2.8
		Fallow	Barley	5+21+0	81.5	80.6	.9
		Nonfallow	Barley	8+21+0	63.9	59.7	4.2
		Fallow	Oats	0+21+0	88.8	85.5	3.3
	Nonfallow	Oats	0+21+0	65.0	50.0	15.0	

APPENDIX TABLE A-5. CROP YIELD RESULTS ON TVA TEST-DEMONSTRATION FARMS IN BURKE COUNTY, 1962

Cooperator	Field No.	1961 Crop	1962 Crop	Nutrients Per Acre	Yield - Bushels/Acre		
					Fert.	Check	Diff.
Bruce E. Anderson	13A	Fallow	Durum	0+21+0	41.3	38.8	2.5
	23A	Fallow	Durum	0+21+0	40.0	39.1	.9
	24C	Fallow	Durum	0+21+0	44.1	36.1	8.0
Floyd Bryan Jr.	IB	Fallow	HRS Wheat	0+21+0	44.0	42.7	1.3
	IF	Fallow	HRS Wheat	0+21+0	42.7	42.7	0
	IIIF	Fallow	HRS Wheat	0+21+0	41.1	41.1	0
	IID	Fallow	Durum	0+21+0	48.9	44.9	4.0
	III I	Fallow	Durum	0+21+0	48.0	43.6	4.4
Harry Benschhoof	2	Fallow	HRS Wheat	0+32+0	40.5	37.3	3.2
	3	Fallow	HRS Wheat	0+32+0	38.9	36.5	2.4
	4	Fallow	HRS Wheat	0+32+0	49.3	45.4	3.9
	6	Fallow	HRS Wheat	0+32+0	30.3	29.1	1.2
	1	Fallow	Durum	0+32+0	48.7	42.7	6.0
	5	Fallow	Durum	0+32+0	45.8	40.1	5.7
	8	Wheat	Barley	10+12+0	59.5	58.2	1.3
7	Rye Pasture	Oats	10+12+0	80.5	69.2	11.3	
Henry Busch	2(Sec.5)	Fallow	HRS Wheat	10+26+0	42.6	39.2	3.4
	2(Sec.5)	Fallow	HRS Wheat	0+26+0	40.6	39.2	1.4
	1(Sec.5)	Fallow	HRS Wheat	0+19+0	38.5	38.5	---
	2(Sec.5)	Fallow	Barley	10+26+0	90.2	74.8	15.4
	2(Sec.5)	Fallow	Barley	0+26+0	82.5	74.8	7.7
Arnold Funk		Fallow	HRS Wheat	0+28+0	49.9	47.2	2.7
		Fallow	HRS Wheat	11+28+0	48.4	47.2	1.2
		Fallow	Durum	0+28+0	42.0	39.6	2.4
		Fallow	Durum	11+28+0	41.7	39.6	2.1
		Fallow	Barley	0+28+0	58.8	57.5	2.3
		Fallow	Barley	6+25+0	59.6	57.5	2.1
Burke County	Ave.	Fallow	Durum	1+24+0	43.8	39.9	3.9
		Fallow	HRS Wheat	2+27+0	40.2	38.2	2.0
		Fallow	Barley	1+26+0	72.6	67.3	5.3
		Nonfallow	Barley	10+12+0	59.5	58.2	1.3
		Nonfallow	Oats	10+12+0	80.5	69.2	11.3

APPENDIX TABLE A-6. CROP YIELD RESULTS ON TVA TEST-DEMONSTRATION FARMS IN RENVILLE COUNTY, 1962

Cooperator	Field No.	1961 Crop	1962 Crop	Nutrients Per Acre	Yield - Bushels/Acre		
					Fert.	Check	Diff.
J. P. Lorenzen		Fallow	Durum	8+21+0	48.4	38.4	10.0
		Fallow	Durum	0+21+0	39.3	36.3	3.0
		Fallow	Durum	0+21+0	46.4	42.7	3.7
Morten Clausen	2-D	Fallow	Wheat	0+13+0	36.0	36.0	0
	34G	Fallow	Durum	0+13+0	52.0	40.0	12.0
	*34E	Fallow	Durum	0+13+0	37.3	41.3	-4.0
	34F	Fallow	Durum	0+13+0	40.0	34.7	5.3
	*11C	Fallow	Barley	0+21+0	63.3	70.0	-6.7

\* Low spots that normally do not hold water were very wet this year and may have partially drowned out parts of the strips.

M.W. Schaefer	N	Fallow	Wheat	0+21+0	43.1	36.3	6.8
	B	Fallow	Wheat	0+21+0	34.0	31.7	2.3
	K	Fallow	Durum	0+21+0	36.7	29.0	7.7
	I	Fallow	Barley	0+21+0	82.2	77.1	5.1
David Witteman	I	Fallow	Durum	0+21+0	49.8	46.9	2.9
	F	Fallow	Durum	0+21+0	47.7	47.3	.4
	D	Fallow	Durum	0+21+0	41.9	41.1	.8
	D	Fallow	Durum	8+21+0	54.4	41.1	13.3
	L	Fallow	Durum	0+21+0	49.1	48.4	.7

Cooperator	Field No.	1961 Crop	1962 Crop	Soil Test	Nutrients Per Acre	Yield-Bushels/Acre		
						Fert.	Check	Diff.
Randolph Bros.	16R	Fallow	Wheat	M-H	5+13+0	25.8	21.3	4.5
	21R	Fallow	Durum	M-H	5+13+0	40.2	36.8	3.4
	15A	Fallow	Durum	M	7+18+0	36.0	34.9	1.1
	22D	Fallow	Durum	M-H	5+13+0	38.7	37.6	1.1
	22F	Fallow	Durum	M	7+18+0	44.5	39.2	5.3
	20A	Fallow	Durum	M-H	5+13+0	56.8	52.3	4.5
*Fall Plowed	20BX	*Soilbank	Barley	M	8+21+0	37.7	34.0	3.7
	19A	*Soilbank	Barley	L	10+26+0	24.3	20.3	4.0
	20BX	*Soilbank	Oats	M	8+21+0	57.5	59.5	-2.0
Renville County	Ave.	Fallow	Durum		2+19+0	44.7	41.2	3.5
		Fallow	Wheat		2+17+0	34.2	30.6	3.6
	Comb. Ave.	Fallow	Wht. & Dur.		2+19+0	43.3	38.8	3.5
		Fallow	Barley		0+21+0	70.7	72.8	- 2.1
		Nonfallow	Barley		9+25+0	27.8	23.9	3.9
		Nonfallow	Oats		8+21+0	57.5	59.5	-2.0

APPENDIX TABLE A-7. CROP YIELD RESULTS ON TVA TEST-DEMONSTRATION FARMS IN CASS COUNTY, 1962

Cooperator	Field No.	1961 Crop	1962 Crop	Nutrient Per Acre	Yield-Bushels/Acre		
					Fert.	Check	Diff.
Ervin Haux	11	Clover	HRS Wheat	7+18+0	16.3	18.5	-2.2
	15 & 16	Oats	HRS Wheat	33+11+0	17.3	20.6	-3.3
	8	Barley	Barley	33+11+0	15.7	16.0	-.3
Knight Farm	4	Fallow	Durum	0+32+0	34.9	26.9	8.0
	13	Alfalfa	Durum	13+34+0	45.7	41.2	4.5
	2	Durum	Barley	25+31+0	34.2	40.7	-6.5
	4	Durum	Barley	14+29+0	36.5	31.3	5.2
	8	Corn	Barley	11+29+0	40.8	59.5	-18.7
	9	Wheat	Oats	17+22+0	31.5	39.0	-9.8
Ralph Peterson		Grain	HRS Wheat	30+37+0	13.8	15.7	8.1
		Grain	Barley	25+31+0	32.8	19.9	12.9
Paul & Parke Pratt	5	Fallow	HRS Wheat	8+21+0	30.4	26.2	4.2
	25	Fallow	HRS Wheat	8+21+0	34.6	33.8	.8
	15	Soybean	HRS Wheat	12+19+0*	40.3	36.1	4.2
	20	Soybean	HRS Wheat	8+21+0	38.7	37.2	1.5
	9	Crop	Barley	8+21+0	40.5	39.7	.8
	21	Wheat	Barley	6+15+0*	32.4	32.4	---
Delmar Schulz	17	Grain	HRS Wheat	20+52+0*	15.2	12.3	2.9
	3	Grain	Barley	22+57+0*	27.3	18.7	8.6
Cass County	Ave.	Fallow	Durum	0+32+0	34.9	26.9	8.0
		Fallow	HRS Wheat	8+21+0	32.4	29.9	2.5
		Nonfallow	Durum	13+34+0	45.7	41.2	4.5
		Nonfallow	HRS Wheat	20+29+0	21.6	18.7	2.9
		Nonfallow		19+28+0	32.5	31.2	1.3
		Nonfallow	Oats	17+22+0	31.5	39.0	-7.5

\* 33 pounds of nitrogen had been applied in the fall of 1961, no check strips were left in nitrogen application. Response is to spring treatment.



APPENDIX TABLE A-8. CROP YIELD RESULTS ON TVA TEST-DEMONSTRATION FARMS IN TRAILL COUNTY, 1962

Cooperator	Field No.	1961	1962	Nutrients Per Acre	Yield - Bushels/Acre		
		Crop	Crop		Fert.	Check	Diff.
Orlin Gunderson	3	Durum	Durum	20+25+0*	39.0	29.3	9.7
	5	Barley	Durum	20+25+0*	39.5	28.6	10.9
	8	Durum	Durum	20+25+0*	37.1	24.7	12.4
	7	Fallow	Durum	8+20+0	35.4	27.3	8.1
	10	Durum	Barley	45+20+0	51.0	32.0	19.0
	2	Barley	Flax	30+0+0	18.7	15.9	2.8
	4	Flax	Proso	8+12+0	39.5	38.6	.9
*40 pounds of nitrogen had been applied in fall of 1961, no check strips were left in nitrogen application. Response is to spring treatment.							
Reuben Korsmo	7	Fallow	HRS Wheat	10+26+0	44.0	37.3	6.7
	13	Fallow	HRS Wheat	12+31+0	30.7	26.7	4.0
	5	Wheat	Barley	8+21+0	48.3	46.6	1.7
	9	Wheat	Barley	10+26+0	47.5	45.8	1.7
Lorry Rotvold	5	Beets	HRS Wheat	43+26+0	31.8	27.3	4.5
	3	Beets	HRS Wheat	43+26+0	34.2	28.1	6.1
	15	Beets	Barley	43+26+0	48.0	41.7	6.3
	7	Wheat	Barley	43+26+0	42.2	32.3	9.9
Henry Schlichtmann	9	Fallow	HRS Wheat(15% Hail)	0+32+0	35.7	33.3	2.4
	12	Alfalfa	HRS Wheat(18% Hail)	14+36+0	34.6	31.3	3.3
	6	Wheat	Barley (10% Hail)	43+26+0	35.0	39.2	-4.2
	11	Wheat	Barley (20% Hail)	45+31+0	32.8	22.8	10.0
	2	Barley	Oats	43+26+0	62.3	46.5	15.8
Art Grove	Sec.31	Beets	HRS Wheat	43+26+0	41.9	35.6	6.3
	Sec.16	Beets	Barley	43+26+0	46.7	33.9	12.8
	Sec.31	Beets	Barley	43+26+0	38.9	35.2	3.7
Traill County	Ave.	Fallow	Durum	8+20+0	35.4	27.3	8.1
		Fallow	HRS Wheat	9+31+0	36.3	32.2	4.1
		Nonfallow	Durum	20+25+0	38.2	27.0	11.2
		Nonfallow	HRS Wheat	43+26+0	34.9	29.3	5.6
		Nonfallow	Barley	36+25+0	43.7	36.4	7.3
		Nonfallow	Oats	43+26+0	62.3	46.5	15.8
		Nonfallow	Flax	30+0+0	18.7	15.9	2.8

APPENDIX TABLE A-9. CROP YIELD RESULTS ON TVA TEST-DEMONSTRATION FARM IN MCLEAN COUNTY, 1962

Cooperator	Field No.	1961 Crop	1962 Crop	Nutrients Per Acre	Yield - Bushels/Acre		
					Fert.	Check	Diff.
Alfred E. Cole	11	Fallow	Durum	0+21+0	42.8	37.9	4.9
	14	Fallow	Durum	0+21+0	39.6	36.8	2.8
Denver Rosberg	16-B	Fallow	Durum	10+26+0	51.0	46.1	4.9
	16-0	Fallow	Durum	0+26+0	58.0	55.7	2.3
	21-H	Fallow	Durum	0+26+0	57.2	50.0	7.2
	21-D	Fallow	Durum	0+26+0	56.7	46.0	10.7
	21-F	Fallow	Durum	0+26+0	59.5	52.0	7.5
	30-B	Fallow	Durum	0+26+0	58.7	52.7	6.0
	17-A	Fallow	HRS Wheat	0+26+0	46.0	40.7	5.3
	17-B	Fallow	HRS Wheat	10+26+0	41.9	32.3	9.6
Norlan Rue	16-B	Fallow	Durum	0+21+0	43.3	36.0	7.3
	16-D	Fallow	Durum	0+21+0	44.7	33.1	11.6
	15-A	Fallow	Durum	0+21+0	47.3	46.6	.7
	6-C	Fallow	Durum	0+21+0	51.2	49.2	2.0
	6-A	Fallow	Durum	0+21+0	49.6	42.9	6.7
	I-A	Fallow	Durum	0+21+0	43.6	39.6	4.0
Karl Vangsness	33	Fallow	Durum	0+26+0	35.3	32.0	3.3
	23-B	Fallow	Durum	0+26+0	43.6	41.1	2.5
	36	Fallow	HRS Wheat	0+26+0	29.3	27.3	2.0
	29	Fallow	Barley	0+26+0	65.5	60.8	4.7
Melvin Bjornholt	6-G	Fallow	Durum	0+26+0	53.7	47.2	6.5
	7-C	Fallow	Durum	0+26+0	34.9	31.6	3.3
	1-K	Fallow	Durum	0+26+0	59.1	58.3	.8
	11-B	Fallow	Barley	0+26+0	53.7	46.5	7.2
McLean County	Ave.	Fallow	Durum	0+24+0	50.4	45.2	5.2
		Fallow	HRS Wheat	2+26+0	38.3	33.7	4.6
		Fallow	Barley	0+26+0	59.2	53.2	6.0

APPENDIX TABLE A-10. CROP YIELD RESULTS ON TVA TEST-DEMONSTRATION FARMS IN BARNES COUNTY, 1962

Cooperator	Field No.	1961 Crop	1962 Crop	Nutrients Per Acre	Yield-Bushels/Acre		
					Fert.	Check	Diff.
Riedman Bros.	6	Fallow	HRS Wheat	0+32+0	30.1	28.4	1.7
	4	Corn	HRS Wheat	34+21+0	33.4	28.0	5.4
	12 & 13	Corn	HRS Wheat	34+21+0	38.2	35.2	3.0
	20	Corn	HRS Wheat	34+21+0	31.2	28.1	3.1
	14	Wheat	Barley	28+21+0	45.4	36.1	9.3
	3	Wheat	Barley	28+21+0	40.1	33.1	7.0
	7	Oats	Barley	32+31+0	65.4	57.2	8.2
	17	Wheat	Barley	32+31+0	50.4	43.3	7.1
	19	Wheat	Barley	13+34+0	30.2	21.1	9.1
Barnes County	Ave.	Fallow	HRS Wheat	0+32+0	30.1	28.4	1.7
		Nonfallow	HRS Wheat	34+21+0	34.4	30.6	3.8
		Nonfallow	Barley	26+28+0	45.1	36.9	8.2

APPENDIX TABLE A-11. CROP YIELD RESULTS ON TVA TEST DEMONSTRATION FARMS IN WILLIAMS COUNTY, 1962

Cooperator	Field No.	1961 Crop	1962 Crop	Nutrients Per Acre	Yield-Bushels/Acre		
					Fert.	Check	Diff.
Ardean Aafedt	16	Fallow	Durum	0+21+0	41.3	39.7	1.6
	29	Fallow	W. Wheat	0+21+0	33.7	29.5	4.2
	32	Fallow	W. Wheat	0+21+0	35.7	30.4	5.3
	5	Fallow	W. Wheat	0+21+0	38.9	33.0	5.9
Williams County	Ave.	Fallow	Durum	0+21+0	41.3	39.7	1.6
		Fallow	W. Wheat	0+21+0	34.8	30.1	4.7

APPENDIX TABLE A-12. CROP YIELD RESULTS ON TEST-DEMONSTRATION FARMS  
IN WILLIAMS COUNTY, 1962 (IRRIGATED)

Cooperator	Field No.	1961 Crop	1962 Crop	Nutrients Per Acre	Yield Bushels/Acre		
					Fert.	Check	Diff.
Paul Motzko	3	Durum	Barley	16+42+0	63.5	53.0	10.5
	1	Corn	Durum	20+52+0	49.2	43.5	5.7
	6	Hay	Durum	20+52+0	41.1	33.6	7.5
Raymond Russell	6	Beets	Durum	42+26+0	58.0	58.2	-.2
Williams County (Irrigated)	Ave.	Nonfallow	Durum	27+44+0	49.7	45.3	4.4
		Nonfallow	Barley	16+42+0	63.5	53.0	10.5

APPENDIX B

AVERAGE COSTS AND RETURNS TO FERTILIZER, 1962

APPENDIX TABLE B-1. AVERAGE COST AND RETURNS TO FERTILIZER, ADAMS COUNTY, 1962<sup>1/</sup>

Cooperator	Crop	Acres Checked	Commercial Cost of Fert./Acre <sup>2/</sup> (\$)	Added Return From Fert./A. <sup>3/</sup> (\$)	Net Return From Fert./A. (\$)
Daryl Anderson	HRS Wheat on Fallow	8	2.40	14.70	12.30
	HRS Wheat on Nonfallow	35	2.78	10.50	7.72
	Barley on Nonfallow	30	3.07	5.20	2.13
	All Small Grains	73	2.86	8.78	5.92
Gene Davison	HRS Wheat on Nonfallow	183	3.52	18.62	15.10
Fred Ehlers	HRS Wheat on Fallow	32	2.10	6.37	4.27
	HRS Wheat on Nonfallow	53	3.22	7.35	4.13
	Barley on Fallow	10	2.10	5.23	3.13
	Barley on Nonfallow	31	3.22	5.41	2.19
	All Small Grains	126	2.85	6.46	3.61
John Larson	HRS Wheat on Fallow	35	1.90	8.52	6.62
Raymond Wothe	HRS Wheat on Fallow	20.8	2.60	14.07	11.47
	HRS Wheat on Nonfallow	39.7	4.00	23.70	19.70
	Barley on Nonfallow	9.0	4.00	25.35	21.35
	Oats on Nonfallow	11.5	4.00	7.64	3.64
	All Small Grains	81.0	3.64	19.13	15.49
Adams County	HRS Wheat on Fallow	95.8	2.16	9.52	7.36
	HRS Wheat on Nonfallow	310.7	3.20	15.63	12.43
	Barley on Fallow	10.0	2.10	5.23	3.13
	Barley on Nonfallow	70.0	3.26	7.88	4.62
	Oats on Nonfallow	11.5	4.00	7.64	3.64
	All Small Grains	498.0	3.16	13.47	10.31

<sup>1/</sup>Results on acreage checked at harvest time.

<sup>2/</sup>Cost of fertilizer = 14 cents per pound of nitrogen and 10 cents per pound of P<sub>2</sub>O<sub>5</sub>.

<sup>3/</sup>Mid-October average grain prices:

HRS Wheat	=	\$2.10
Durum	=	2.23
Barley	=	.78
Oats	=	.49

APPENDIX TABLE B-2. AVERAGE COST AND RETURNS TO FERTILIZER, BOWMAN COUNTY, 1962<sup>1/</sup>

Cooperator	Crop	Acres Checked	Commercial Cost of Fert./A. <sup>2/</sup> (\$)	Added Return From Fert./A. <sup>3/</sup> (\$)	Net Return From Fert./A. (\$)
Roy Kern	HRS Wheat on Fallow	30	4.00	9.87	5.87
Earl Nelson	Durum on Nonfallow	36	3.22	12.71	9.49
	HRS Wheat on Nonfallow	33	3.22	11.70	8.48
	Barley on Nonfallow	70	3.22	11.54	8.32
	All Small Grains	139	3.22	11.88	8.66
Donald Schumacher	HRS Wheat on Fallow	120*	2.10	7.49	5.39
	*12% Hail loss of these checks				
Walter Stzegura	Durum on Fallow	169	3.08	9.54	6.46
	Barley on Nonfallow	5	3.22	6.79	3.57
	All Small Grains	174	3.09	9.46	6.37
Bowman County	Durum on Fallow	169	3.08	9.54	6.46
	HRS Wheat on Fallow	150	2.48	7.96	5.49
	Durum on Nonfallow	36	3.22	12.71	9.49
	HRS Wheat on Nonfallow	33	3.22	11.70	8.48
	Barley on Nonfallow	75	3.22	11.22	8.00
	All Small Grains	463	2.93	9.70	6.77

<sup>1/</sup> Results on acreage checked at harvest time.

<sup>2/</sup> Cost of fertilizer = 14 cents per pound of nitrogen and 10 cents per pound of P<sub>2</sub>O<sub>5</sub>.

<sup>3/</sup> Mid-October average grain prices:

HRS Wheat	=	\$2.10
Durum	=	2.23
Barley	=	.78
Oats	=	.49

APPENDIX TABLE B-3. AVERAGE COST AND RETURNS TO FERTILIZER, HETTINGER COUNTY, 1962<sup>1/</sup>

Cooperator	Crop	Acres Checked	Commercial Cost of Fert./A. <sup>2/</sup> (\$)	Added Return From Fert./A. <sup>3/</sup> (\$)	Net Return From Fert./A. (\$)
Alvin Dill	HRS Wheat on Fallow	92	1.60	12.95	11.35
Harold Hanson	HRS Wheat on Fallow	71	1.88	17.28	15.40
	Wheat on Nonfallow	30	2.44	5.67	3.23
	All Small Grains	101	2.05	13.83	11.78
George Ott	HRS Wheat on Fallow	107	3.10	5.53	2.43
	Barley on Nonfallow	15	3.30	12.48	9.18
	All Small Grains	122	3.12	6.38	3.26
Henry Zahn	HRS Wheat on Nonfallow	30	3.22	16.80	13.58
Hettinger County	HRS Wheat on Fallow	270	2.27	11.15	8.88
	Wheat on Nonfallow	60	2.83	11.24	8.41
	Barley on Nonfallow	15	3.30	12.48	9.18
	All Small Grains	345	2.41	11.22	8.81

<sup>1/</sup>Results on acreage checked at harvest time.

<sup>2/</sup>Cost of fertilizer = 14 cents per pound of nitrogen and 10 cents per pound of P<sub>2</sub>O<sub>5</sub>.

<sup>3/</sup>Mid-October average grain prices:

HRS Wheat	=	\$2.10
Durum	=	2.23
Barley	=	.78
Oats	=	.49



APPENDIX TABLE B-4. AVERAGE COST AND RETURNS TO FERTILIZER, BOTTINEAU COUNTY, 1962<sup>1/</sup>

Cooperator	Crop	Acres Checked	Commercial Cost of Fert./A. <sup>2/</sup> (\$)	Added Return From Fert./A. <sup>3/</sup> (\$)	Net Return From Fert./A. (\$)
Howard Anderson	Durum on Fallow	18	2.60	.89	-1.71
	HRS Wheat on Fallow	19	2.60	-1.05	-3.65
	HRS Wheat on Nonfallow	25	2.60	5.88	3.28
	Barley on Nonfallow	19	4.00	----	4.00
	All Small Grains	81	2.93	1.77	-1.16
Harold Bergman	Durum on Fallow	30	2.47	1.34	-1.13
	Barley on Nonfallow	155	3.22	3.32	.10
	Oats on Nonfallow	30	2.10	7.35	5.25
	All Small Grains	215	3.03	3.69	.66
Kermit Kjoroos	Durum on Fallow	25	2.10	14.94	12.84
	HRS Wheat on Fallow	18	2.10	4.20	2.10
	Barley on Fallow	47	2.10	-1.56	-3.66
	All Small Grains	90	2.10	4.17	2.07
C.L. O'Keefe	Durum on Fallow	84	2.60	16.21	13.61
	HRS Wheat on Fallow	75	2.60	5.13	2.53
	Barley on Nonfallow	189	3.22	3.58	.36
	All Small Grains	348	2.94	6.96	4.02
George Witteman	Durum on Fallow	37	2.66	11.60	8.94
	Barley on Fallow	75	3.22	2.11	-1.11
	Oats on Fallow	37	2.10	1.62	-.48
	All Small Grains	149	2.80	4.34	1.54
Bottineau County	Durum on Fallow	194	2.53	11.45	8.92
	HRS Wheat on Fallow	112	1.52	3.93	1.41
	HRS Wheat on Nonfallow	25	2.60	5.88	3.28
	Barley on Fallow	122	2.79	.70	-2.09
	Barley on Nonfallow	363	3.26	3.28	.02
	Oats on Fallow	37	2.10	1.62	-.48
	Oats on Nonfallow	30	2.10	7.35	5.25
	All Small Grains	883	2.83	4.94	2.11

<sup>1/</sup>Results on acreage checked at harvest time.

<sup>2/</sup>Cost of fertilizer = 14 cents per pound of nitrogen and 10 cents per pound of P<sub>2</sub>O<sub>5</sub>:

<sup>3/</sup>Mid-October average grain prices:

HRS Wheat	=	\$2.10
Durum	=	2.23
Barley	=	.78
Oats	=	.49

APPENDIX TABLE B-5. AVERAGE COST AND RETURNS TO FERTILIZER, BURKE COUNTY, 1962<sup>1/</sup>

Cooperator	Crop	Checked	Commercial Cost of Fert./A. <sup>2/</sup> (\$)	Added Returns From Fert./A. <sup>3/</sup> (\$)	Net Returns From Fert/A. (\$)
Bruce E. Anderson	Durum on Fallow	285	2.10	5.58	3.48
Harry Benshoof	Durum on Fallow	88	3.20	13.01	9.81
	HRS Wheat on Fallow	300	3.20	5.48	2.28
	Barley on Nonfallow	40	2.60	1.01	-1.59
	Oats on Nonfallow	30	2.60	5.54	2.94
	All Small Grains	458	3.11	6.54	3.43
Floyd, Bryan, Jr.	Durum on Fallow	85	2.10	9.29	7.19
	HRS Wheat on Fallow	86	2.10	.79	-1.31
	All Small Grains	171	2.10	5.02	2.92
Henry Busch	HRS Wheat on Fallow	210	2.95	3.57	.62
	Barley on Fallow	75	2.60	6.01	3.41
	All Small Grains	285	2.86	4.21	1.35
Arnold Funk	Durum on Fallow	65	3.63	4.99	1.36
	HRS Wheat on Fallow	72	3.57	4.10	.53
	Barley on Fallow	58	2.97	1.74	-1.23
	All Small Grains	195	3.41	3.69	.28
Burke County	Durum on Fallow	523	2.48	8.69	6.21
	HRS Wheat on Fallow	668	3.02	4.13	1.11
	Barley on Fallow	133	2.76	4.15	1.39
	Barley on Nonfallow	40	2.60	1.01	-1.59
	Oats on Nonfallow	30	2.60	5.54	2.94
	All Small Grains	1,394	2.77	5.78	3.01

<sup>1/</sup> Results on acreage checked at harvest time.

<sup>2/</sup> Cost of fertilizer = 14 cents per pound of nitrogen and 10 cents per pound of P<sub>2</sub>O<sub>5</sub>.

<sup>3/</sup> Mid-October average grain prices:

HRS Wheat	=	\$2.10
Durum	=	2.23
Barley	=	.78
Oats	=	.49

APPENDIX TABLE B-5. AVERAGE COST AND RETURNS TO FERTILIZER, BURKE COUNTY, 1962<sup>1/</sup>

Cooperator	Crop	Checked	Commercial Cost of Fert./A. <sup>2/</sup> (\$)	Added Returns From Fert./A. <sup>3/</sup> (\$)	Net Returns From Fert/A. (\$)
Bruce E. Anderson	Durum on Fallow	285	2.10	5.58	3.48
Harry Benshoof	Durum on Fallow	88	3.20	13.01	9.81
	HRS Wheat on Fallow	300	3.20	5.48	2.28
	Barley on Nonfallow	40	2.60	1.01	-1.59
	Oats on Nonfallow	30	2.60	5.54	2.94
	All Small Grains	458	3.11	6.54	3.43
Floyd, Bryan, Jr.	Durum on Fallow	85	2.10	9.29	7.19
	HRS Wheat on Fallow	86	2.10	.79	-1.31
	All Small Grains	171	2.10	5.02	2.92
Henry Busch	HRS Wheat on Fallow	210	2.95	3.57	.62
	Barley on Fallow	75	2.60	6.01	3.41
	All Small Grains	285	2.86	4.21	1.35
Arnold Funk	Durum on Fallow	65	3.63	4.99	1.36
	HRS Wheat on Fallow	72	3.57	4.10	.53
	Barley on Fallow	58	2.97	1.74	-1.23
	All Small Grains	195	3.41	3.69	.28
Burke County	Durum on Fallow	523	2.48	8.69	6.21
	HRS Wheat on Fallow	668	3.02	4.13	1.11
	Barley on Fallow	133	2.76	4.15	1.39
	Barley on Nonfallow	40	2.60	1.01	-1.59
	Oats on Nonfallow	30	2.60	5.54	2.94
	All Small Grains	1,394	2.77	5.78	3.01

<sup>1/</sup> Results on acreage checked at harvest time.

<sup>2/</sup> Cost of fertilizer = 14 cents per pound of nitrogen and 10 cents per pound of P<sub>2</sub>O<sub>5</sub>.

<sup>3/</sup> Mid-October average grain prices:

HRS Wheat	=	\$2.10
Durum	=	2.23
Barley	=	.78
Oats	=	.49

APPENDIX TABLE B-6. AVERAGE COST AND RETURNS TO FERTILIZER, RENVILLE COUNTY, 1962<sup>1/</sup>

Cooperator	Crop	Acres Checked	Commercial Cost of Fert./A. <sup>2/</sup> (\$)	Added Return From Fert./A. <sup>3/</sup> (\$)	Net Return From Fert./A. (\$)
Morten	Durum on Fallow	56	1.30	10.62	9.32
Clausen	HRS Wheat on Fallow	42	1.30	-----	-1.30
	Barley on Fallow	39	2.10	-5.23	-7.33
	All Small Grains	137	1.53	2.85	1.32
J. P. Lorenzen	Durum on Fallow	130	2.53	13.17	10.64
Randolph Bros.	Durum on Fallow	180	2.36	7.25	4.85
	HRS Wheat on Fallow	63	2.00	9.45	7.45
	Barley on Nonfallow	162	3.80	3.06	-.74
	Oats on Nonfallow	40	3.22	-.98	-4.20
	All Small Grains	445	2.91	5.30	2.39
M.W. Schaefer	Durum on Fallow	25	2.10	17.17	15.07
	HRS Wheat on Fallow	104	2.10	9.56	7.46
	Barley on Fallow	25	2.10	3.98	1.88
	All Small Grains	154	2.10	9.90	7.80
David Wittean	Durum on Fallow	242	2.12	3.92	1.80
Renville County	Durum on Fallow	633	2.20	7.88	5.68
	HRS Wheat on Fallow	209	1.91	7.60	5.69
	Barley on Fallow	64	2.10	-1.63	-3.73
	Barley on Nonfallow	162	3.80	3.06	-.74
	Oats on Nonfallow	40	3.22	-.98	-4.20
	All Small Grains	1,108	41	6.26	3.85

<sup>1/</sup>Results on acreage checked at harvest time,

<sup>2/</sup>Cost of fertilizer = 14 cents per pound of nitrogen and 10 cents per pound of P<sub>2</sub>O<sub>5</sub>.

<sup>3/</sup>Mid-October average grain prices;

HRS Wheat	=	\$2.10
Durum	=	2.23
Barley	=	.78
Oats	=	.49

APPENDIX TABLE B-7. AVERAGE COST AND RETURNS TO FERTILIZER, CASS COUNTY, 1962<sup>1/</sup>

Cooperator	Crop	Acres Checked	Commercial Cost of Fert./A. <sup>2/</sup> (\$)	Added Return From Fert./A. <sup>3/</sup> (\$)	Net Return From Fert./A. (\$)
Ervin	HRS Wheat on Nonfallow	71	4.27	-5.79	-10.06
Haux	Barley on Nonfallow	34	5.72	-.23	-5.95
	All Small Grains	105	4.74	-3.99	-8.83
Knight	Durum on Fallow	32	3.20	17.84	14.64
Farm	Barley on Nonfallow	95	5.12	- 7.66	-12.78
	Oats on Nonfallow	9	4.58	- 3.68	-8.26
	Durum on Nonfallow	32	5.22	10.04	4.82
	All Small Grains	168	4.75	.78	-3.97
Ralph	HRS Wheat on Nonfallow	80	7.90	17.01	9.11
Peterson	Barley on Nonfallow	80	6.60	10.06	3.46
	All Small Grains	160	7.25	13.54	6.29
Paul & Parke	HRS Wheat on Fallow	82	3.22	5.34	2.12
Pratt	HRS Wheat on Nonfallow	70	3.37	5.58	2.21
	Barley on Nonfallow	70	2.72	.27	-2.45
	All Small Grains	222	3.11	3.81	.70
Delmar	HRS Wheat on Nonfallow	43	8.00	6.09	-1.91
Schulz	Barley on Nonfallow	36	8.78	10.11	1.33
	All Small Grains	79	8.36	7.92	-.44
Cass	Durum on Fallow	32	3.20	17.84	14.64
County	HRS Wheat on Fallow	82	3.22	5.34	2.12
	Durum on Nonfallow	32	5.22	10.04	4.82
	HRS Wheat on Nonfallow	264	5.74	6.07	.33
	Barley on Nonfallow	315	5.45	1.44	-4.01
	Oats on Nonfallow	9	4.58	-3.68	-8.26
	All Small Grains	734	5.11	4.50	-.61

<sup>1/</sup>Results on acreage checked at harvest time.

<sup>2/</sup>Cost of fertilizer = 14 cents per pound of nitrogen and 10 cents per pound of P<sub>2</sub>O<sub>5</sub>.

<sup>3/</sup>Mid-October average grain prices:

HRS Wheat	=	\$2.10
Durum	=	2.23
Barley	=	.78
Oats	=	.49

APPENDIX TABLE B-8. AVERAGE COST AND RETURNS TO FERTILIZER, TRAILL COUNTY, 1962<sup>1/</sup>

Cooperator	Crop	Acres Checked	Commercial Cost of Fert./A. <sup>2/</sup> (\$)	Added Return From Fert./A. <sup>3/</sup> (\$)	Net Return From Fert./A. (\$)
Art	HRS Wheat on Nonfallow	15	8.62	13.23	4.61
Grove	Barley on Nonfallow	63	8.62	7.17	-1.45
	All Small Grains	78	8.62	8.33	-.29
Orlin	Durum on Fallow	39	3.12	18.06	14.94
Gunderson	Durum on Nonfallow	65	5.30	25.04	19.74
	Barley on Nonfallow	25	8.30	14.82	6.52
	Flax on Nonfallow	30	4.20	7.73	3.53
	All Small Grains	159	5.03	18.45	13.42
Reuben	HRS Wheat on Fallow	58	4.38	11.33	6.95
Korsmo	Barley on Nonfallow	63	3.59	1.33	-2.26
	All Small Grains	121	3.97	6.13	2.16
Larry	HRS Wheat on Nonfallow	65	8.62	11.52	2.90
Rotvold	Barley on Nonfallow	75	8.62	6.30	-2.32
	All Small Grains	140	8.62	8.72	.10
Henry	HRS Wheat on Fallow	60	4.38	5.99	1.61
Schlichtmann	Barley on Nonfallow	50	9.09	3.37	-5.72
	Oats on Nonfallow	18	8.62	7.74	-.88
	All Small Grains	128	6.82	5.21	-1.61
Traill County	Durum on Fallow	39	3.12	18.06	14.94
	HRS Wheat on Fallow	118	4.38	8.61	4.23
	Durum on Nonfallow	65	5.30	25.04	19.74
	HRS Wheat on Nonfallow	80	8.62	11.84	3.22
	Barley on Nonfallow	276	7.53	5.60	-1.93
	Oats on Nonfallow	18	8.62	7.74	-.88
	Flax on Nonfallow	30	4.20	7.73	3.53
	All Small Grains	626	6.44	9.92	3.48

<sup>1/</sup> Results on acreage checked at harvest time.

<sup>2/</sup> Cost of fertilizer = 14 cents per pound of nitrogen and 10 cents per pound of P<sub>2</sub>O<sub>5</sub>.

<sup>3/</sup> Mid-October average grain prices:

HRS Wheat	=	\$2.10
Durum	=	2.23
Barley	=	.78
Oats	=	.49

APPENDIX TABLE B-9. AVERAGE COST AND RETURNS TO FERTILIZER, MCLEAN COUNTY, 1962<sup>1/</sup>

Cooperator	Crop	Acres Checked	Commercial Cost of Fert./A. <sup>2/</sup> (\$)	Added Return From Fert./A. <sup>3/</sup> (\$)	Net Return From Fert./A. (\$)
Melvin	Durum on Fallow	55.5	2.60	7.92	5.32
Bjornholt	Barley on Fallow	23.	2.60	5.62	3.02
	All Small Grains	78.5	2.60	7.25	4.65
Alfred E. Cole	Durum on Fallow	30.5	2.10	7.55	5.45
Denver	Durum on Fallow	244.0	2.83	13.95	11.12
Rosberg	HRS Wheat on Fallow	41.0	2.98	13.55	10.57
	All Small Grains	285.0	2.85	13.89	11.04
Norlan Rue	Durum on Fallow	169.0	2.10	12.33	10.23
Karl	Durum on Fallow	63.0	2.60	6.17	3.57
Vangsness	HRS Wheat on Fallow	30.0	2.60	4.46	1.86
	Barley on Fallow	20.0	2.60	3.67	1.07
	All Small Grains	113.0	2.60	5.28	2.68
McLean County	Durum on Fallow	562.0	2.52	11.64	9.12
	HRS Wheat on Fallow	71.0	2.82	9.71	6.89
	Barley on Fallow	43.0	2.60	4.71	2.11
	All Small Grains	676.0	2.56	11.00	8.44

<sup>1/</sup>Results on acreage checked at harvest time.

<sup>2/</sup> Cost of fertilizer = 14 cents per pound of nitrogen and 10 cents per pound of P<sub>2</sub>O<sub>5</sub>.

<sup>3/</sup>Mid-October average grain prices:

HRS Wheat	=	\$2.10
Durum	=	2.23
Barley	=	.78
Oats	=	.49

APPENDIX TABLE B-10. AVERAGE COST AND RETURNS TO FERTILIZER, BARNES COUNTY, 1962<sup>1/</sup>

Cooperator	Crop	Acres Checked	Commercial Cost of Fert./A. <sup>2/</sup> (\$)	Added Return From Fert./A. <sup>3/</sup> (\$)	Net Return From Fert./A. (\$)
Riedman	HRS Wheat on Fallow	65	3.20	3.57	.37
Bros.	HRS Wheat on Nonfallow	189	6.86	8.10	2.24
	Barley on Nonfallow	300	6.42	6.40	-.02
	All Small Grains	554	6.19	6.65	.46

APPENDIX TABLE B-11. AVERAGE COST AND RETURNS TO FERTILIZER, WILLIAMS COUNTY, 1962<sup>1/</sup>

Cooperator	Crop	Acres Checked	Commercial Cost of Fert./A. <sup>2/</sup> (\$)	Added Return From Fert./A. <sup>3/</sup> (\$)	Net Return From Fert./A. (\$)
		(Dryland)			
Ardean	Durum on Fallow	40	2.10	3.57	1.47
Aafedt	W. Wheat on Fallow	250	2.10	8.40	6.30
	All Small Grains	290	2.10	7.74	5.64
	<u>Irrigated</u>				
Paul	Barley on Nonfallow	30	6.44	8.19	1.75
Motzko	Durum on Nonfallow	55	8.00	14.24	6.24
	All Small Grains	85	7.45	12.11	4.66
Raymond Russell	Durum on Nonfallow	24	8.48	-.45	8.93
Williams County (Irrigated)	Barley on Nonfallow	30	6.44	8.19	1.75
	Durum on Nonfallow	79	8.15	9.78	1.63
	All Small Grains	109	7.68	9.34	1.66

<sup>1/</sup>Results on acreage checked at harvest time.

<sup>2/</sup>Cost of fertilizer = 14 cents per pound of nitrogen and 10 cents per pound of P<sub>2</sub>O<sub>5</sub>.

<sup>3/</sup>Mid-October average grain prices:

HRS Wheat	=	\$2.10
Durum	=	2.23
Barley	=	.78
Oats	=	.49