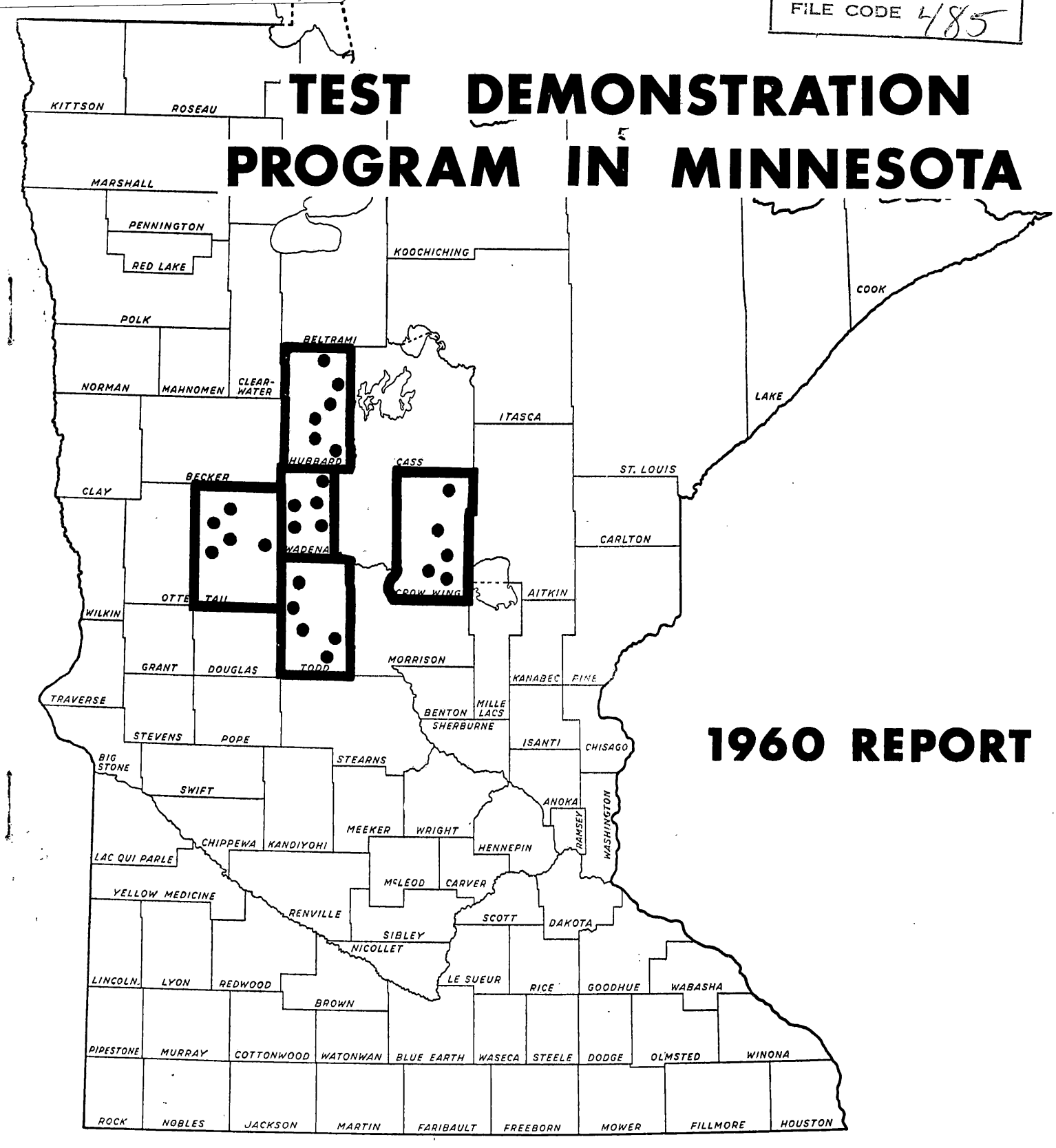
TEST DEMONSTRATION PROGRAM IN MINNESOTA



1960 REPORT

AGRICULTURAL EXTENSION SERVICE • INSTITUTE OF AGRICULTURE
UNIVERSITY OF MINNESOTA • ST. PAUL 1, MINNESOTA

THE 1960 REPORT
on the
TEST DEMONSTRATION PROGRAM
in
NORTH CENTRAL MINNESOTA

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I. NATURE AND SCOPE OF PROGRAM

A. Status of Test Demonstration Work

1. Principle Objectives

- To demonstrate adjustments in farm practices and enterprises to improve farm income.
- To show the effect of optimum fertilization as to grades and amounts.
- To determine the results of TVA experimental fertilizers as compounded into blends adapted to the area.
- To promote methods found acceptable in the program into the farming operations of the vicinity.

2. Activities Emphasized in 1960

- Continued attention to the keeping of farm and home records and the analysis of them. (See "1960 Annual Report" #256).
- As far as possible, crop yield data were obtained from cooperating farms.
- Cooperators' annual meeting held for farm operators, wives, and University personnel working in program.
- Re-organization of farm field layouts for efficiency and soil and water conservation.
- Improvement in hay and pasture enterprises.

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3. Changes in Program Emphasis

- The only change involved is the use of blended fertilizers to more nearly satisfy the plant food needs of the farms. The incorporation of higher percentage of potassium in the materials applied was the principal change.

4. Major Problems Encountered

- Due to the fact that several farms are now changing layouts in line with farm conservation plans, the change-overs pose a fertilizer usage problem.
- We again experienced a droughty situation in 1960. Even where precipitation was near normal the moisture time distribution was faulty.
- Table 1. Seasonal Precipitation - January through July 1960.

Station	Years of Record	Average Inches Jan.-July	1960 Inches Jan.-July	1960 Difference in Inches	1960 Per Cent of Average
Brainerd	30	15.28	15.79	+ .51	103.3
Long Prairie	12	17.70	8.95	-8.85	56.2
Park Rapids	30	16.78	13.66	-3.12	81.4
Wadena	22	15.69	14.16	-1.53	90.2

Using these station reports, we find that the average precipitation was about 3.27 inches below normal which is a 20 per cent deficiency. During 1958 and 1959 the precipitation was 27 to 29 per cent deficient from long-time records.

- We had the fertilizer ingredients blended so that the high potassium requirements could be met. The difficulty which developed was the highly hygroscopic character of some of the mixed goods.

B. Table 2. Active T-D Farms in 1960.

County	Started	Dropped	Added	End
Crow Wing	5	0*	0	5
Hubbard	6	0	0	6
Otter Tail	4	0	0**	4
Todd	5	0***	0	5
Wadena	5	0	0	5

* One cooperator is leaving the area in 1961.
** One cooperator is being added in 1961.
***One cooperator did not turn in his business records for analysis.

II. ACTIVITIES AND ACCOMPLISHMENTS

A. Introduction of New Fertilizers and/or Practices

1. Farmer Experience with TVA Fertilizers

- Very little damage to plants due to faulty fertilizer placement.
- Bags satisfactory.
- Condition of blends good upon arrival at farms, but moisture absorption was high - even with usually satisfactory storage. Trouble was greater with poor storage.
- Lumpishness, i. e. poor spreadibility, resulted from moisture pickup.

2. Results from Fertilizer Use

- Refer to Table 19 on pages 30 and 31 of 1960 Farm Business Report, attached. Note that check areas in most instances had only the benefit
- of residual fertility.
- Table 3. Cooperators' 1960 Reports on Yield Responses (by individual fields).

County	Good	Fair	Poor
Crow Wing	5	2	1
Hubbard	*		
Otter Tail	1	4	5

Table 3. (Continued)

Todd	1	8	5
Wadena	1	4	6

*No report, but precipitation may have allowed similarity with Crow Wing.

Table 4. Average Yield Gains and Return over Fertilizer Cost Per Acre (1960). (Simple average of fields sampled).

Crop	Increase	Return over Fert. Cost/Acre
Hay	.43 ton	$ .27
Corn, silage	1.14 ton	1.63
Corn, grain	11.3 bushels	5.17*
Oats	11.5 bushels	- .93

*Deleted irrigated fields.

3. New or Improved Practices

The only item in this category is the use of blended material. With only one year of experience no conclusions can be drawn.

4. Effects of Fertilizer on Yields, Livestock Production, and Farm Management Items

This program has had little over-all effect on crop yields to date. On the average, crop yields were almost identical with 1959 yields and somewhat higher than 1958. Variation in rainfall remained the most important factor affecting crop yields in 1960. However, increased yields are beginning to show up on farms that have had adequate rainfall.

The average productivity of dairy herds, as measured by average butterfat production per cow, has been moving up slightly. Twelve of the original 17 farms that still had dairy herds in 1960 had an average production

of 353 pounds of butterfat compared with 317 pounds in 1958.

No significant changes in land use have become apparent although some of the farmers are utilizing their nontillable pastures more effectively as a result of fertilization and rotational grazing.

As for changes in organization, in the past three years 6 of the dairy farmers have increased their cow numbers by an average of 5.6 cows per farm. Three farmers have shifted out of dairying - one into cattle feeding, one into sheep, and one into feeder pig production. One farmer discontinued farming and went into the resort business in 1960. Another cooperator plans to go to Alaska this year and may or may not return.

Average farm earning were up over last year since both hog and dairy incomes increased. Hog income was up because of higher prices; dairy income was up due to increases in production per cow and number of cows.

5. Trends in Fertilizer Use on T-D Farms

- Table 5. Pounds of Nutrients Used Per Acre. (Average of T-D goods used).

Crop	1959	1960
Corn	116 lbs.	83 lbs.*
Small grain	89 lbs.	88 lbs.
Hay and pasture	91 lbs.	86 lbs.

*The small amount used per acre was a result of doubt on the part of the cooperators that sidedressing would pay on corn with moisture lacking.

- Table 6. Ratios Used. (Average of all T-D goods used).

Crop	1959 N	1959 P	1959 K	1960 N	1960 P	1960 K
Corn	2	1	3	1	1.2	1.8
Oats	2	1	3	2.3	1	4.6
Hay and pasture	3	1	2	0	1	2.7

- Table 7. Tons of T-D Fertilizer Used in Minnesota (by grades).

County	LZF (15-15-15)			DP (21-53-0)			APN (30-10-0)		
	'58	'59	'60	'58	'59	'60	'58	'59	'60
Crow Wing		14.28					13.74	7.15	8.90
Hubbard		4.16					7.15	7.90	.50
Otter Tail		15.00		.60			9.45	14.49	11.03
Todd		8.28		.84			8.75	6.93	1.38
Wadena	-	5.16		-			-	6.85	8.45
TOTAL	0	46.88	0	1.44	0	0	39.10	43.32	30.26

County	10-20-30			15-5-30			0-15-45		
	'58	'59	'60	'58	'59	'60	'58	'59	'60
Crow Wing			7.48			11.56			
Hubbard			8.00			6.92			2.52
Otter Tail			10.32			6.28			6.56
Todd			11.92			8.12			6.88
Wadena	-		16.56	-		5.88	-		.84
TOTAL	0	0	54.28	0	0	38.76	0	0	16.80

NOTE: .16 tons CMP used in Otter Tail County in 1958.

- Table 8. Tons T-D Fertilizer Used in Minnesota (totals).

County	1958	1959	1960
Crow Wing	13.75	21.43	27.94
Hubbard	7.15	12.06	17.94
Otter Tail	10.21	29.49	34.19
Todd	9.59	15.21	28.10
Wadena		12.01	31.73
TOTALS	40.70	90.20	139.90

B. Use of Test Demonstration Farms for Educational Purposes

1. Cooperators' Annual Meeting

Early in April the T-D group met for the first annual meeting. The program included a "dinner type" lunch, policy and aims statement by Assistant Extension Director Roland Abraham, and a review of 1959 farm accounts by Truman Nodland of the College Farm Management Department. The discussion period was profitable.

The fact that cooperators had the first opportunity to meet each other and develop a sense of belonging was valuable.

The attendance was as follows:

22 farm operators (out of 25)
13 wives
12 Agricultural and Home Extension Agents
7 State and District Extension personnel

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2. Fertilizer Demonstrations Completed

- On 74 fields demonstration actions were completed and made a matter of record. They were divided as follows: 11 hay, 16 corn silage, 18 corn grain, 17 oats, 1 wheat, and 1 barley.

3. Other T-D Demonstrations

Over half of the cooperating farms have set up farm conservation plans since 1958. This has entailed considerable field change to apply the mechanical practices for soil and water conservation. A drainage project involved only one farm where a ditch brought swampland into pasture. One cooperator is now using an overhead irrigation system on part of his acreage. Another cooperator constructed a large modern hog house and another installed a barn hay dryer.

4. An attempt is being made to spread the sphere of influence of the T-D program throughout each county and into similar areas in the state. The climatic cycle which we have experienced for the past three years is delaying positive recommendations.

   The Extension educational programs and the Soil Conservation District planning work will incorporate our findings into their schemes.

5. Fertilizerwise, we are attempting to develop an efficient and practical method of satisfying nitrogen and potassium deficiencies on a predominantly sand land area.

C. Program Analysis and Appraisal

1. Annual Farm Business Report is attached.

2. Some factors which have tended to retard the progress may be listed as follows:

   - Shortness of cooperators' operating capital.
   - Lack of proper fertilizer applicators.
   - Moisture deficiency since inception of the program.
   - Insufficiency of attention to program details with individual cooperators.

3. More encouragement and guidance may be needed to get some of the county agents to give the cooperators more assistance in planning improvements in crop and livestock practices other than fertility practices. Some areas of needed improvement are pasture management, quality hay production, weed control, livestock rations, and calf feeding practices. Improvements in these and other areas must go hand in hand with an improved fertility program if farm income is to be improved.