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Counties

In Central South Dakota

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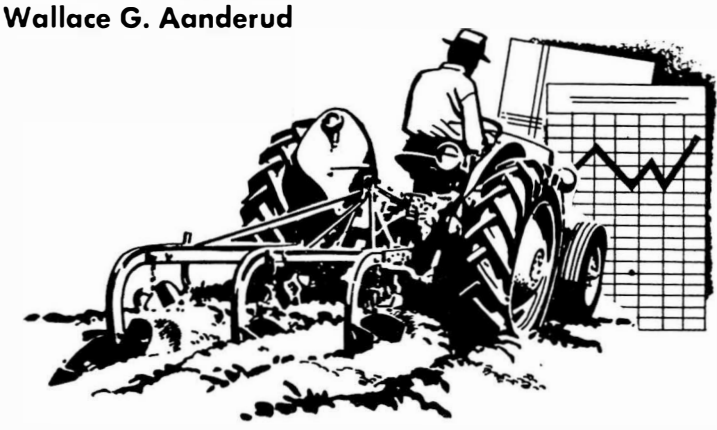
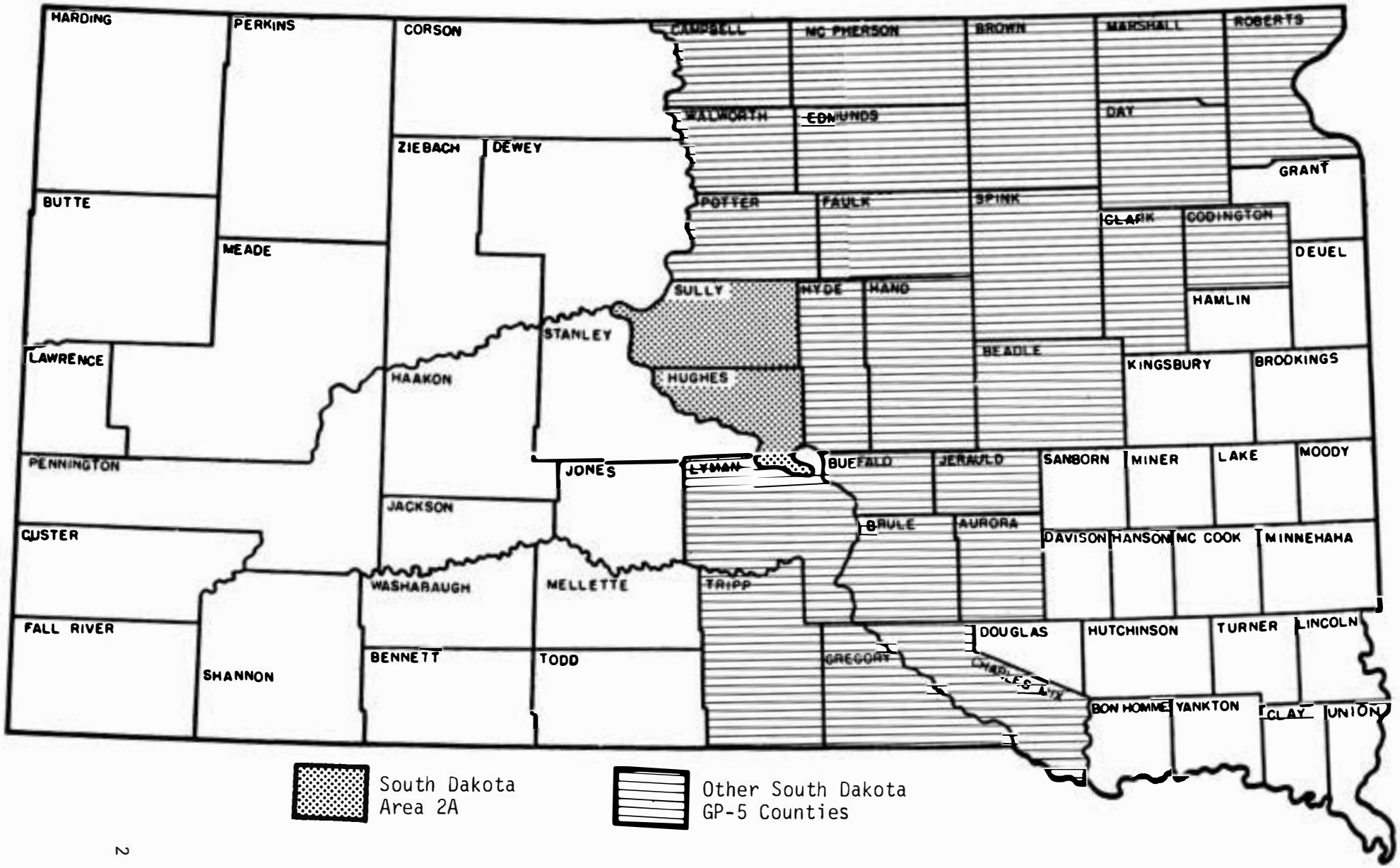


Figure 1. South Dakota GP-5 Study Area



PREFACE

The data presented in this report were gathered and compiled in a cooperative research project between the South Dakota Agricultural Experiment Station and the Farm Production Economics Division, Economic Research Service, U.S. Department of Agriculture. This research contributes to a larger project--GP-5, "Economic Problems in the Production and Marketing of Great Plains Wheat."

The general objectives of the research undertaken in South Dakota were (1) to provide economic data needed by farmers and to make adjustments in their farming systems and production practices and (2) to develop a research background for evaluating government farm programs under varying assumptions.

Similar contributing projects to GP-5 are simultaneously being conducted in most of the other Great Plains States. Specific objectives as stated in the regional research project are:

1. To develop information on technical production relationships and opportunities for grain farms in the Great Plains.

2. To determine the nature and magnitude of adjustments needed in specific farm situations which will achieve the most profitable systems of farming under a range of conditions with respect to prices of major products and quantities of available resources such as land, labor and capital and to determine the quantities of resources required to provide selected levels of farm income.

3. To determine the effect upon total agricultural production, farm income, farm organization and resources employed in the Great Plains if selected percentages of all farmers adjust to their most profitable farming systems for various assumed product demand conditions, factor supply conditions and specific agricultural programs and institutional arrangements.

4. To estimate wheat supply potentials for non-domestic wheat producers under varying economic and political conditions in international areas.

The South Dakota study area included 26 counties in Central South Dakota (Figure 1). This area normally accounts for about 68 per cent of the state's wheat acreage, 43 per cent of the feed grain acreage, 60 per cent of the flax acreage and about 55 per cent of the total tame and native hay acreage. For analytical purposes, the GP-5 study area was divided into eight sub-areas on the basis of selected farm and soil characteristics and cropping practices.

The analysis of this study was based on possible adjustments on individual farming units. Thus, model farms were developed to represent a significant number, group or segment of farms within a defined geographic area. Model

farms were grouped on the basis of similar characteristics, plus similar alternative production opportunities.

Determining characteristics for grouping farms into model or typical farms included: Farm size, proportion of cropland to native hay and rangeland, soil characteristics, land use and tillage practices, farm organization and enterprise, labor use and labor availability.

In all, 14 model farms were developed in the eight sub-areas of the 26 county study--characteristics were so similar in four sub-areas that only one model farm was needed in each, but in the remaining areas there existed enough diversity to require three model farms in each of two sub-areas and two model farms in each of the other two.

Data used to develop model farms for each South Dakota study area and costs for crop and livestock enterprises for each model farm were derived from a variety of sources, which included: Farm surveys, Agricultural Stabilization and Conservation Service county office records, county assessor's records, U.S. Agricultural Census, S.D. State-Federal Crop and Livestock Reporting Service statistics, from the South Dakota State University Economics Department, and actual cost data from machine dealers and insurance agents.

HOW THIS DATA MAY BE USED

Information gathered on machine costs for the model farm in Area 2A (Figure 1) for this publication should prove useful in planning and budgeting work and should be helpful in other production and farm management studies.

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DESCRIPTION OF AREA 2A

HUGHES AND SULLY COUNTIES

SOILS

The soils of this two-county area are mainly Chestnut. Chestnut soils in the northern Great Plains area have darker soil surface colors than those in southern areas, because in the north oxidation of organic matter is slower.

Three major soil associations are found in the Hughes and Sully County area. The Agar-Williams Association, in the western part, occurs in undulating or sloping landscapes, formed in glacial till and loess. Agar-Williams Association soils are well-drained soils with grayish brown silt loam and loam surface layers. The major problems associated with the Agar-Williams Association soils are: (1) maintenance of organic matter and nitrogen, (2) moisture conservation, and (3) control of run-off. Livestock and general types of farming are performed in the Agar-Williams soils area.

Williams-Zahl soils are undulating to steep and are well to excessively drained. These grayish-brown loams are developed from calcareous glacial till with areas of mixed outwash sediments being common. The major management problems

of these soils are similar to those of the Agar-Williams series, namely: (1) maintenance of organic matter and nitrogen, (2) moisture conservation, (3) control of run-off or water erosion, and (4) maintenance of stock water. The land use depends mainly upon topography and includes cash grain, livestock and general farms as well as ranches.

The third major soil series, found mainly in Hughes County, are the Raber-Eakin soils. These soils are undulating, well-drained, grayish-brown loams, clay loams and silt loams. Raber soils developed from clay loam till and Eakin soils developed from loess over till. The major problems in soil and water management associated with Raber-Eakin soils are: (1) maintenance of organic matter and supply of nitrogen, (2) maintenance of soil fertility, (3) moisture conservation, and (4) control of run-off and water erosion. Cash grain farming and ranching are best suited to the Raber-Eakin soils with specific land use restricted by land topography.

TYPE OF FARMING CHARACTERISTICS

The average farm in Hughes County was 1,733 acres, compared with 1,831 acres in Sully County, according to the 1964 census. There were 634 farms in the two counties in 1964 of which 23.3 per cent were classified as cash grain and 62.5 per cent as livestock (including ranches). The remaining 14.2 per cent were general, dairy, poultry, and miscellaneous farms.

Wheat, corn for all purposes and oats accounted for 91.2 per cent of the grain acreage harvested in 1964. The remaining acreage included sorghum, barley, flax, rye, millet, emmer and speltz. In addition to the wheat, rye and flax raised as cash crops, farms in the Sully and Hughes County area sold substantial amounts of corn grain, grain sorghum, and oats. About 63 per cent of the corn acreage was harvested as grain with 52 per cent of this crop sold off the farm. About 87 per cent of the grain sorghum and over 56 per cent of the oats harvested also were sold in 1964.

Table 1 shows the number and per cent of farms in the two-county area that raised and harvested major crops in 1964.

Livestock were found on about 90 per cent of the area's farms. Beef cow herds, kept on about 75 per cent of the farms, were fairly large--50 per cent or more of the herds were larger than 50 cows. Dairy enterprises were relatively small. Less than half of the farms with dairy cattle sold dairy products--either as whole milk or cream.

Relatively large hog enterprises were found on about a third of the area's farms. Nearly 2 out of 3 hog producers in Sully and Hughes Counties had more than 10 farrowed sows per year.

Most area ewe flocks numbered less than 200 head. Only about 1 in 5 farmers had sheep of some type.

MODEL WHEAT FARMS AND BASIS FOR MACHINERY COSTS

Two farms were selected as typical wheat farms in this the Sully and Hughes

Table 1. Number and Per Cent of Farms That Raised and Harvested Major Grain Crops in 1964 in Hughes and Sully Counties

	No. of Farms	Percentage of Farms	Number of Acres Harvested	Percentage of Acres Harvested
Corn[1/]	450	71.0	80,507	29.1
All Wheat[2/]	432	68.1	121,477	43.9
Oats	436	68.8	50,465	18.2
Rye	42	7.1	8,638	3.1
Sorghum[3/]	142	22.4	9,503	3.4
Other[4/]	---	----	6,292	2.3

1/ Includes corn harvested for grain, silage and other purposes.
2/ Includes 40,125 acres of winter wheat and 7,498 acres of durum.
3/ Includes sorghum harvested for grain, silage and other purposes.
4/ Includes barley, flax and proso.
Source: U.S. Census of Agriculture, 1964.

County area. One was a 640-acre farm with 439 acres of cropland and 193 acres of native hay and pasture. The other, a 1,600-acre farm, had 729 acres of cropland and 770 acres of native hay and pasture. The average farm size for this two-county area (which includes ranches) was calculated at 1,787 acres. The 1964 Census of Agriculture showed 19.9 per cent of the area's farms were below 500 acres in size, 18.4 per cent were between 500 and 999 acres, 34.9 per cent were between 1,000 and 1,999 acres, and 26.8 per cent were over 2,000 acres.

The model farms, serving as the basis for determining machine costs and labor use, had the following crops:

	Model Farm			Model Farm	
	640	1600		640	1600
Crop	Acres		Crop	Acres	
All Wheat	170	175	Other Crops	18	40
Oats	74	139	Summer Fallow	57	60
Corn Grain	38	96	Alfalfa	35	92
Corn Silage	47	69	Other Tame Hay		
Sorghum Grain	---	17	and Pasture	---	22
Sorghum Silage	---	19	Native Hay	68	308
			Native Pasture	125	462

The machinery and implements, listed in Tables 2 and 3 represent those most frequently found on the group of farms from which the models or representative farms were determined. Occasionally, in this study, an arbitrary judgment was necessary in selecting the size or type of machinery or implement.

PURCHASE PRICE

The purchase price of machinery (in Tables 2 and 3) represents the "average" price of major models of the particular implement or machine listed. The price listed assumes only standard equipment was used. Extras or optional features such as power steering on tractors were not included.

USEFUL LIFE

The standard depreciation schedule (see 1964 Agricultural Engineers Yearbook), widely used as a guide by agricultural engineers and others, served as a base in determining depreciation costs.

Since depreciation is a function of use, obsolescence, or a combination of both, depreciation costs were determined either on the hours of use or the useful life in years, whichever was least.

MACHINE COSTS

Farm operators and others concerned with the development of farm budgets must consider two important aspects of machine costs: (1) total annual machine costs and, (2) machine costs per unit of production of the various individual crop enterprises.

Total annual machine costs represent a major portion of the total annual farm expenses, and thus are of primary importance in determining net farm income. Annual machine costs include fixed costs (often termed ownership costs) and variable costs. Fixed costs are those which remain relatively constant from year to year, regardless of the amount of use of the machine; variable costs depend directly upon the amount of use.

The allocation of machine costs to individual enterprises requires that these costs be expressed in terms of costs per hour or per acre for the types of machine operations used. Machine costs per unit of individual enterprises are necessary considerations in determining the most profitable organization of the farm business.

Total annual costs for each machine assumed to be used on the 640-acre model farm, as well as per-acre and per-hour machine operations costs are presented in Tables 4 through 9. The costs shown in these tables were determined on the basis of the model farm having 262 acres of small grain, 85 acres of row crops, 57 acres of summer fallow, two cuttings of hay from 35 acres of alfalfa, and one cutting on 66 acres of native hay.

The costs presented in Tables 10 through 15, on the 1,600-acre model farm were determined on the basis of 354 acres of small grain, 201 acres of row crops, 60 acres of summer fallow, two cuttings of hay from 92 acres of alfalfa, and one cutting from 279 acres of native hay.

Table 2. Size, Purchase Price, Expected Useful Life, and Annual Use of Machinery on a Hypothetical 640-Acre Model Farm in the Hughes and Sully County Area[1/]

Machine	Size	Purchase Price[2/]	Useful Life[3/]		Annual Use	
		Dollars	Years	Hours	Acres	Hours
Tractor	2-Plow	$2,915	25	12,000	1,335	218
Tractor	3-Plow	3,579	17	12,000	1,986	709
Moldboard Plow	3-14-Inch	495	12	2,500	313	203
Tandem Disc	10-Foot	772	21	2,500	389	117
Field Cultivator	12-Foot	515	20	2,000	215	43
Drag Harrow	6-Sect.	180	30	2,500	450	36
Press Drill	12-Foot	1,955	20	1,200	262	60
Swather PTO	12-Foot	1,107	20	1,200	262	52
Combine	12-Foot	6,067	15	2,000	262	84
Lister	2-Row	623	25	1,200	85	38
Corn Tender	2-Row	257	20	2,500	85	28
Corn Cultivator	2-Row	257	20	2,500	170	56
Forage Harvester	1-Row	2,523	15	2,000	47	49
Mower	7-Foot	490	20	2,000	134	40
Dump Rake	10-Foot	278	30	2,500	134	25
Farmhand & Attachments		824	25	-----	112	34
Two Trailers or Wagons		618	25	-----	54	27
Sprayer	30-Foot	465	30	1,500	347	35

1/ Representative farm size is 640 acres with 439 acres of cropland.
2/ Approximate new cost in 1964.
3/ Agricultural Engineers Yearbook.

FIXED COSTS

Fixed machine costs include depreciation, interest on investment, insurance, and taxes. Total annual fixed costs are constant for any given year, without regard to the amount of use during that year. However, when this fixed sum is charged as a cost against crops, the cost per hour, per acre, or unit of output may show a variation with the amount of use.

Depreciation--Depreciation in this study is recognized as a cost since "wear and tear" due to use necessitates eventual replacement. New innovations and methods of tillage, planting, or harvesting also necessitate replacement of outmoded or obsolete machinery.

Interest--Interest often is not easily recognized or understood as a cost, unless funds are borrowed and an interest rate actually is charged for the use of borrowed money. In this study, a 7 per cent interest rate was charged on the "average annual investment" as a cost of machine ownership. Even if a farm operator has full equity in an implement or machine, and thus pays no direct interest charge, his capital is frozen. Normally, there are alternative uses for these funds, either in other farm enterprises or in non-farm investments, which may yield an even greater rate of return. This could be especially true with respect to harvesting equipment, particularly if the harvested acreage is relatively small and custom harvesting can be obtained when needed. For example, the investment in the forage harvester assumed for the model farm (Table 2) freezes the purchase cost of $2,000. If placed in a savings account, this would return about

$90 per year at an interest rate of 4½ per cent. Perhaps, after adding up the earned interest and costs of the forage harvest operation (including the prorated tractor costs) the farm operator will find it more economical to hire the job done.

Insurance and Taxes--Insurance and personal property taxes are cash costs which do not vary with the amount a machine is used during the year, and thus are considered fixed costs. Insurance, as such, is not a required expenditure. However, since losses do occasionally occur, and if insurance is not actually carried, an amount sufficient to cover the expected annual rate of loss must be included as a cost.

Allocation of Fixed Costs--Each category of fixed costs can be allocated to individual enterprises in the same manner. The allocation of annual depreciation costs, for example, among individual enterprises requires a conversion of the annual cost to an hourly depreciation cost, which is based upon the expected number of hours of use of the machine during the year. Hourly depreciation charges, coupled with machine time requirements per acre, are then used to establish depreciation charges per acre for each crop enterprise.

Fixed Costs on the Model Farm--Fixed costs, with few exceptions, are considerably higher than variable costs for individual machines and implements. This may be illustrated by the examples in the following tabulation:

FIXED COST EXAMPLES

Implement	Purchase Price	Number of Acres Covered	Per Cent of Total Costs Per Acre	
			Fixed	Variable
Moldboard Plow	$ 824	475	32.2%	67.8%
Drag Harrow	180	415	45.1	54.9
Press Drill, 12-Foot	1,955	262	80.3	19.7
Press Drill, 14-Foot	2,160	354	79.5	20.5
Combine	6,067	262	74.8	25.2
Forage Harvester	2,837	88	79.6	20.4
Cornpicker	2,755	96	81.7	18.3
Mower	490	134	70.3	29.7
Mower	490	463	44.8	55.2

Recovering fixed machine costs to insure a profitable long run operation is not important over the short-run. It is important in the long run, however, that fixed costs be covered from the standpoint of replacing worn-out and obsolete machinery. In an era of increasing costs and rapidly changing technology it becomes increasingly important to reduce machine costs as much as possible; particularly so, for machine items which have a high original cost such as tractors and harvesting equipment. Since total annual fixed costs remain the same, fixed-machine costs can effectively be reduced per acre or per unit of production by spreading these costs over as many acres as possible.

Due to the small acreage involved in corn grain, it was assumed custom harvest was used on our model farm. The costs of owning and operating a corn-picker and forage harvester would have been more than double than that of custom hire.

To own and use machinery with a capacity greater than is actually needed, on a given acreage, will needlessly raise both the fixed and variable costs. Whether or not the reduction in the amount of labor and machine time will offset the increase in machine costs is questionable. To illustrate the increase in per acre machine costs which results when larger machines are used without an increase in acreage, the following tabulation contains machine costs for selected sizes of tractors and combines:

EXAMPLES

Machine	Acres Covered	Machine Costs 1/ Annual	Machine Costs 1/ Per Acre	Per Cent Increase
Tractor, 3-Plow	1,256	$ 563.74	$0.45	----
Tractor, 4-Plow	1,256	715.89	.57	26.7%
Tractor, 5-Plow	1,256	890.92	.71	57.8
Combine, 6-Foot	187	350.98	1.88	----
Combine, 9-Foot	187	483.09	2.58	37.2
Combine, 12-Foot	187	790.01	4.22	124.5
Combine, 14-Foot S.P.	187	1,158.76	6.20	229.8

1/ Includes depreciation, interest, taxes, insurance and repairs.

VARIABLE COSTS

In contrast to fixed costs, annual variable costs depend directly upon the amount of use during the year. When machine use increases from, 800 acres to 1,000 acres, the variable costs per acre will remain the same but total annual variable costs will increase by 25 per cent. This is in contrast to fixed costs which are reduced 20 per cent on the per acre basis while total annual fixed costs remain the same.

Variable machine costs include repairs, fuel, oil, and lubricants. These costs have been first expressed as hourly costs for each machine or type of operation. Time requirements for each operation and machine are then used to convert the variable costs of each enterprise into per acre costs and total annual variable costs.

MACHINE COSTS BY CROPS

The cost-data and machine-time requirements can be used to determine the costs per acre (or unit of production) for each crop.

The costs for the 640-acre farm (Tables 5 through 9) and those for the 1,600-acre farm (Tables 11 through 15) were used in preparation of Tables 16 and 17. These costs are subject to change as the acreage of small grains, row crops,

summer fallow and hay changes. With only a small change in acreage, there will only be a negligible increase or decrease in the fixed costs, hence the cost data will still be reasonably accurate.

Tables 16 and 17 were produced using specific assumptions with regard to tillage practices. A governing assumption was one of "minimum tillage," which included fall or spring plowing and a tandem discing for small grains and row crops, and two cultivations on row crops. Other assumptions included a discing for row crops harvested for grain and fall plowing of alfalfa.

SUMMARY

Machine costs for these "representative wheat farms" were developed under assumptions which included specific crop acreages, tillage practices, and purchase costs of new machinery. Significant changes in fixed costs per acre will result from a significant change in cropland acreage, number of tillage operations, or machinery prices. Consequently, the machine costs presented cannot be construed as being representative of all 640-acre or 1,600-acre farms in this two-county area, although they should be somewhat similar. However, the usefulness of these costs need not be impaired since they provide a basis for estimating machine costs and, also, offer a basis for comparing costs of operating varying sizes and types of machines and implements.

Table 3. Size, Purchase Price, Expected Useful Life, and Annual Use of Machinery on a Hypothetical 1,600 Acre Model Farm in the Hughes and Sully County Area[1/]

Machine	Size	Purchase Price[2/]	Useful Life[3/]		Annual Use	
		Dollars	Years	Hours	Acres	Hours
Tractor	2-Plow	$2,915	25	12,000	1,339	227
Tractor	3-Plow	3,579	25	12,000	2,145	471
Tractor	4-Plow	4,635	13	12,000	2,654	824
Moldboard Plow	4-14-Inch	824	12	2,500	475	209
Tandem Disc	10-Foot	772	14	2,500	605	182
Field Cultivator	14-Foot	900	20	2,000	239	38
Drag Harrow	6-Sect.	180	30	2,500	666	53
Press Drill	14-Foot	2,160	17	1,200	354	71
Swather	15-Foot	1,205	20	1,200	354	57
Combine	12-Foot	6,067	15	2,000	371	119
Lister	4-Row	1,360	21	1,200	201	56
Corn Tender	2-Row	257	18	2,500	201	66
Corn Cultivator	4-Row	463	20	2,500	402	80
Cornpicker	2-Row	2,755	15	2,000	96	57
Forage Harvester	2-Row	2,837	15	2,000	88	48
Mower	7-Foot	490	14	2,000	463	139
Dump Rake	12-Foot	310	30	2,500	463	69
Farmhand & Attachments		824	25	-----	406	122
Two Trailers or Wagons		618	25	-----	199	100
Sprayer	30-Foot	465	27	1,500	555	56

1/ Representative farm size is 1,600 acres with 729 acres of cropland.
2/ Approximate new cost in 1964.
3/ Agricultural Engineers Yearbook.

Table 4. Annual Machine Costs by Machine or Implement Used on the 640-Acre Model Farm; Hughes and Sully Counties

Machine	Size	Annual Use Acres	Annual Use Hours	Depreciation	Insurance & Taxes	Interest	Repairs	Fuel, Oil, & Lubricant	Total
Tractor	2-Plow	1,335	218	$ 104.92	$ 49.03	$112.25	$ 56.26	$ 18.53[1]	$ 340.99
Tractor	3-Plow	1,986	709	189.47	59.84	137.80	254.88	49.63[1]	691.62
Moldboard Plow	3-14-Inch	313	203	37.08	8.31	19.06	41.00	131.20	236.65
Tandem Disc	10-Foot	389	117	33.10	12.96	29.72	14.04	54.99	144.81
Field Cultivator	12-Foot	215	43	23.15	8.69	19.83	3.44	36.55	91.66
Drag Harrow[2]	6-Sect.	450	36	5.40	3.03	6.93	.72	18.00	34.08
Press Drill[2]	12-Foot	262	60	87.95	32.91	75.27	24.60	23.40	244.13
Swather PTO[2]	12-Foot	262	52	49.85	18.64	42.62	11.86	26.00	148.97
Combine	12-Foot	262	84	364.00	102.10	233.58	101.64	134.40	935.72
Lister	2-Row	85	38	22.44	10.46	23.99	8.36	21.28	86.53
Corn Tender	2-Row	85	28	11.60	4.87	9.89	1.12	15.40	42.88
Corn Cultivator	2-Row	170	56	11.60	4.87	9.89	2.24	30.80	59.40
Forage Harvester	1-Row	47	49	151.40	42.48	97.14	37.24	32.34	360.60
Mower	7-Foot	134	40	22.05	8.25	18.87	7.60	13.20	69.97
Dump Rake[2]	10-Foot	134	25	8.33	4.67	10.70	1.25	6.50	31.45
Frontend Loader & Attachments		112	34	29.68	13.86	31.72	5.44	20.40	101.10
Two Trailers or Wagons[2]		54	27	22.24	10.40	23.80	3.00	14.47	73.91
Sprayer (trailer)[3]	30-Foot	347	35	13.94	7.81	17.90	3.15	14.00	56.80
Total Costs				$1,188.20	$403.18	$920.96	$577.84	$661.09	$3,751.27

[1] Overhead maintenance.
[2] Used with a 2-plow tractor.
[3] Used jointly with a 2- and 3-plow tractor.

Table 5. Machine Costs Per Hour of Use by Machine and Implement Used, 640-Acre Model Farm; Hughes and Sully Counties

Machine or Implement	Size	Annual Use Hours	Dollar Cost Per Hour[1] Depreciation	Insurance & Taxes	Int.	Repairs	Total
Moldboard Plow	3-14-Inch	203	$0.18	$0.04	$0.10	$0.20	$0.52
Tandem Disc	10-Foot	117	.29	.11	.25	.12	.77
Field Cultivator	12-Foot	43	.56	.20	.46	.08	1.30
Drag Harrow	6-Sect.	36	.15	.08	.19	.02	.44
Press Drill	12-Foot	60	1.46	.55	1.25	.41	3.67
Swather PTO	12-Foot	52	.96	.36	.82	.23	2.37
Combine	12-Foot	84	4.33	1.21	2.78	1.21	9.53
Lister	2-Row	38	.59	.27	.63	.22	1.71
Corn Tender	2-Row	28	.41	.17	.35	.04	.97
Corn Cultivator	2-Row	56	.21	.09	.17	.02	.49
Forage Harvester	1-Row	49	3.09	.87	1.98	.76	6.70
Mower	7-Foot	40	.55	.21	.47	.19	1.42
Dump Rake	10-Foot	25	.33	.19	.43	.05	1.00
Frontend Loader & Attachments		34	.87	.41	.93	.16	2.37
Two Trailers or Wagons		27	.82	.39	.88	.11	2.20
Sprayer (trailer)	30-Foot	35	.40	.22	.51	.09	1.22

[1] Costs include only machine or implement.

Table 6. Tractor, Machine and Implement Costs Per Hour of Use; 640-Acre Model Farm; Hughes and Sully Counties

Machine or Implement	Size	Dollar Cost Per Hour					
		Depreciation	Insurance & Taxes	Int.	Repairs	Fuel, Oil, & Lubricant	Total
Moldboard Plow	3-14-Inch	$0.45	$0.12	$0.29	$0.56	$0.72	$2.14
Tandem Disc	10-Foot	.56	.19	.44	.48	.54	2.21
Field Cultivator	12-Foot	.83	.28	.65	.44	.92	3.12
Drag Harrow[1/]	6-Sect.	.63	.30	.70	.28	.59	2.50
Press Drill[1/]	12-Foot	1.94	.77	1.76	.67	.48	5.62
Swather PTO[1/]	12-Foot	1.44	.58	1.33	.49	.59	4.43
Combine	12-Foot	4.60	1.29	2.97	1.57	1.67	12.10
Lister	2-Row	.86	.35	.82	.58	.63	3.24
Corn Tender	2-Row	.68	.25	.54	.40	.62	2.49
Corn Cultivator	2-Row	.48	.17	.36	.38	.62	2.01
Forage Harvester	1-Row	3.36	.95	2.17	1.12	.73	8.33
Mower	7-Foot	.82	.29	.66	.55	.40	2.72
Dump Rake[1/]	10-Foot	.81	.41	.94	.31	.35	2.82
Frontend Loader & Attachments		1.35	.63	1.44	.42	.72	4.56
Two Trailers or Wagons[1/]		1.30	.61	1.39	.37	.68	4.35
Sprayer (trailer)[1/]	30-Foot	.88	.44	1.02	.35	.49	3.18
Sprayer (trailer)	30-Foot	.67	.30	.70	.45	.47	2.59

[1/] Two-plow tractor--all other implements and machines pulled with a 3-plow tractor.

Table 7. Tractor Costs Per Acre of Use for Specific Machines and Implements, 640-Acre Model Farm; Hughes and Sully Counties

Machine or Implement	Size	Dollar Cost Per Acre					
		Depreciation	Insurance & Taxes	Int.	Repairs	Fuel, Oil, & Lubricant	Total
Moldboard Plow	3-14-Inch	$0.174	$0.055	$0.126	$0.233	$0.042	$0.630
Tandem Disc	10-Foot	.080	.025	.058	.108	.022	.293
Field Cultivator	12-Foot	.053	.017	.039	.072	.017	.198
Drag Harrow[1/]	6-Sect.	.038	.018	.045	.021	.006	.128
Press Drill[1/]	12-Foot	.110	.052	.129	.059	.021	.371
Swather PTO[1/]	12-Foot	.096	.045	.112	.052	.018	.323
Combine	12-Foot	.085	.027	.062	.115	.024	.313
Lister	2-Row	.120	.038	.087	.162	.031	.438
Corn Tender	2-Row	.088	.028	.064	.118	.024	.322
Corn Cultivator	2-Row	.088	.028	.064	.118	.024	.322
Forage Harvester	1-Row	.280	.088	.204	.377	.012	.961
Mower	7-Foot	.080	.025	.058	.108	.022	.293
Dump Rake[1/]	10-Foot	.091	.043	.106	.049	.017	.306
Frontend Loader & Attachments		.080	.025	.058	.108	.023	.294
Two Trailers or Wagons[1/]		.240	.113	.281	.129	.048	.811
Sprayer (trailer)[1/]	30-Foot	.048	.023	.056	.026	.004	.157
Sprayer (trailer)	30-Foot	.027	.008	.019	.036	.016	.106

[1/] Used with a 2-plow tractor--all other implements and machines pulled with a 3-plow tractor.

Table 8. Costs Per Acre by Machine and Implement Used, 640-Acre Model Farm; Hughes and Sully Counties

Machine or Implement	Size	Annual Use in Acres	Dollars Cost Per Acre: Depreciation	Insurance & Taxes	Int.	Repairs	Fuel, Oil, & Lubricant	Total
Moldboard Plow	3-14-Inch	313	$0.118	$0.027	$0.061	$0.131	$0.419	$0.756
Tandem Disc	10-Foot	389	.086	.033	.076	.036	.141	.372
Field Cultivator	12-Foot	215	.108	.040	.092	.016	.170	.426
Drag Harrow	6-Sect.	450	.012	.007	.015	.002	.040	.076
Press Drill	12-Foot	262	.336	.126	.287	.094	.089	.932
Swather PTO	12-Foot	262	.190	.071	.163	.045	.099	.568
Combine	12-Foot	262	1.389	.390	.891	.388	.513	3.571
Lister	2-Row	85	.264	.123	.282	.098	.250	1.017
Corn Tender	2-Row	85	.137	.057	.116	.013	.181	.504
Corn Cultivator	2-Row	170	.068	.029	.058	.013	.181	.349
Forage Harvester	1-Row	47	3.221	.904	2.067	.792	.688	7.672
Mower	7-Foot	134	.165	.062	.141	.057	.098	.523
Dump Rake	12-Foot	134	.062	.035	.080	.009	.049	.235
Frontend Loader & Attachments		112	.265	.124	.283	.049	.182	.903
Two Trailers or Wagons		54	.412	.193	.441	.055	.268	1.369
Sprayer (trailer)	30-Foot	347	.040	.023	.052	.009	.040	.164

Table 9. Tractor, Machine and Implement Costs Per Acre of Use, 640-Acre Model Farm; Hughes and Sully Counties

Machine or Implement	Size	Annual Use in Acres	Dollar Cost Per Acre: Depreciation	Insurance & Taxes	Int.	Repairs	Fuel, Oil, & Lubricant	Total
Moldboard Plow	3-14-Inch	313	$0.292	$0.082	$0.187	$0.364	$0.461	$1.386
Tandem Disc	10-Foot	389	.166	.058	.134	.144	.163	.665
Field Cultivator	12-Foot	215	.161	.057	.131	.088	.187	.624
Drag Harrow[1/]	6-Sect.	450	.050	.025	.060	.023	.046	.204
Press Drill[1/]	12-Foot	262	.446	.178	.416	.153	.110	1.303
Swather PTO	12-Foot	262	.286	.116	.275	.097	.117	.891
Combine	12-Foot	262	1.474	.417	.953	.503	.537	3.884
Lister	2-Row	85	.384	.161	.369	.260	.281	1.455
Corn Tender	2-Row	85	.225	.085	.180	.131	.205	.826
Corn Cultivator[1/]	2-Row	170	.156	.057	.122	.131	.205	.671
Forage Harvester	1-Row	47	3.501	.992	2.271	1.169	.700	8.633
Mower	7-Foot	134	.245	.087	.199	.165	.120	.816
Dump Rake[1/]	10-Foot	134	.153	.078	.186	.058	.066	.541
Frontend Loader & Attachments		112	.345	.149	.341	.157	.205	1.197
Two Trailers or Wagons[1/]		54	.652	.306	.722	.184	.316	2.180
Sprayer (trailer)[1/]	30-Foot	173	.088	.046	.108	.035	.043	.320
Sprayer (trailer)	30-Foot	174	.067	.031	.071	.045	.058	.272

[1/] Used with a 2-plow tractor--all other implements and machines pulled with a 3-plow tractor.

Table 10. Annual Machine Costs by Machine or Implement Used on the 1,600-Acre Model Farm; Hughes and Sully Counties

Machine	Size	Annual Use Acres	Annual Use Hours	Depre-ciation	Insurance & Taxes	Interest	Repairs	Fuel, Oil, & Lubricant	Total
Tractor	2-Plow	1,339	227	$ 104.92	$ 49.03	$ 112.25	$ 56.30	$ 19.30[1]/	$ 341.80
Tractor	3-Plow	2,145	471	128.84	59.84	137.80	120.24	35.33[1]/	482.05
Tractor	4-Plow	2,654	824	320.85	77.97	178.46	379.04	42.20[1]/	998.52
Moldboard Plow	4-14-Inch	475	209	61.83	13.86	31.72	68.97	156.75	333.13
Tandem Disc	10-Foot	605	182	49.64	12.96	29.72	21.84	85.54	199.70
Field Cultivator	14-Foot	239	38	40.50	15.66	34.65	3.12	40.28	134.21
Drag Harrow[2]/	6-Sect.	666	53	5.40	3.03	6.93	1.06	26.50	42.82
Press Drill[3]/	14-Foot	354	71	114.35	36.37	83.16	31.95	28.40	294.23
Swather PTO[4]/	15-Foot	354	57	54.15	20.28	46.39	14.25	31.92	166.99
Combine	12-Foot	371	119	360.40	102.10	233.58	143.99	190.40	1,030.47
Lister	4-Row	201	56	58.76	22.88	52.36	26.88	39.76	200.64
Corn Tender[2]/	2-Row	201	66	12.83	4.87	9.89	2.64	35.64	65.87
Corn Cultivator	4-Row	402	80	20.80	7.81	17.83	5.60	44.00	96.04
Cornpicker	2-Row	96	57	165.30	46.38	106.07	31.35	39.90	389.10
Forage Harvester	2-Row	88	48	170.20	47.75	109.22	40.80	43.20	411.17
Mower[2]/	7-Foot	463	139	31.50	8.25	18.87	26.41	45.87	130.90
Dump Rake[5]/	12-Foot	463	69	9.30	5.21	11.94	3.45	18.63	48.53
Frontend Loader & Attachments[2]/		406	122	29.68	13.86	31.72	19.52	73.20	167.98
Two Trailers or Wagons[4]/		199	100	22.24	10.40	23.80	11.01	53.33	120.78
Sprayer (trailer)[5]/	30-Foot	555	56	15.48	7.81	17.90	5.04	22.40	68.63
Total Costs				$1,776.97	$566.32	$1,294.26	$1,013.46	$1,072.55	$5,723.56

1/ Overhead maintenance.
2/ Used with a 3-plow tractor.
3/ Used with a 3- and 4-plow tractor.
4/ Used with a 2- and 3-plow tractor.
5/ Used with a 2-plow tractor.

Table 11. Machine Costs Per Hour of Use by Machine and Implement Used, 1,600-Acre Model Farm; Hughes and Sully Counties

Machine or Implement	Size	Annual Use Hours	Dollar Cost Per Hour[1]/ Depre-ciation	Insurance & Taxes	Int.	Repairs	Total
Moldboard Plow	4-14-Inch	209	$0.30	$0.07	$0.15	$0.33	$0.85
Tandem Disc	10-Foot	182	.27	.07	.16	.12	.62
Field Cultivator	14-Foot	38	1.06	.41	.91	.08	2.46
Drag Harrow	6-Sect.	53	.15	.06	.13	.02	.36
Press Drill	14-Foot	71	1.61	.51	1.17	.45	3.74
Swather PTO	15-Foot	57	.95	.35	.81	.25	2.36
Combine	12-Foot	119	3.03	.86	1.96	1.21	7.06
Lister	4-Row	56	1.05	.41	.93	.48	2.87
Corn Tender	2-Row	66	.19	.07	.15	.04	.45
Corn Cultivator	4-Row	80	.26	.10	.22	.07	.65
Cornpicker	2-Row	57	2.90	.81	1.86	.55	6.12
Forage Harvester	2-Row	48	3.54	.99	2.27	.85	7.65
Mower	7-Foot	139	.23	.06	.14	.19	.62
Dump Rake	12-Foot	69	.13	.08	.17	.05	.43
Frontend Loader & Attachments		122	.24	.11	.26	.16	.77
Two Trailers or Wagons		100	.22	.10	.24	.11	.67
Sprayer (trailer)	30-Foot	56	.28	.14	.32	.09	.83

1/ Costs include only machine or implement.

Table 12. Tractor, Machine and Implement Costs Per Hour of Use, 1,600-Acre Model Farm; Hughes and Sully Counties

Machine or Implement	Size	Dollar Cost Per Hour					
		Depreciation	Insurance & Taxes	Int.	Repairs	Fuel, Oil, & Lubricant	Total
Moldboard Plow	4-14-Inch	$0.69	$0.16	$0.37	$0.79	$0.80	$2.81
Tandem Disc	10-Foot	.66	.16	.38	.58	.52	2.30
Field Cultivator	14-Foot	1.45	.50	1.13	.54	1.11	4.73
Drag Harrow[2/]	6-Sect.	.42	.19	.42	.27	.59	1.89
Press Drill	14-Foot	1.88	.64	1.46	.70	.48	5.16
Press Drill[2/]	14-Foot	2.00	.60	1.39	.91	.45	5.35
Swather PTO[2/]	15-Foot	1.22	.48	1.10	.50	.61	3.91
Swather PTO[1/]	15-Foot	1.41	.57	1.30	.50	.67	4.45
Combine	12-Foot	3.42	.95	2.18	1.67	1.65	9.87
Lister	4-Row	1.44	.50	1.15	.94	.76	4.79
Corn Tender[2/]	2-Row	.46	.20	.44	.29	.62	2.01
Corn Cultivator	4-Row	.65	.19	.44	.53	.60	2.41
Cornpicker	2-Row	3.29	.90	2.08	1.01	.75	8.03
Forage Harvester	2-Row	3.93	1.08	2.47	1.31	.95	9.74
Mower[2/]	7-Foot	.50	.19	.43	.44	.41	1.97
Dump Rake[1/]	12-Foot	.59	.30	.66	.30	.36	2.21
Frontend Loader & Attachments[2/]		.51	.24	.55	.41	.68	2.39
Trailer or Wagon[1/]		.68	.32	.73	.36	.61	2.70
Trailer or Wagon[2/]		.49	.23	.53	.36	.62	2.23
Sprayer (trailer)[1/]	30-Foot	.74	.36	.81	.34	.49	2.74

1/ Used with a 2-plow tractor.
2/ Used with a 3-plow tractor--all other implements and machines pulled with a 4-plow tractor.

Table 13. Tractor Costs Per Acre of Use for Specific Machines and Implements, 1,600-Acre Model Farm; Hughes and Sully Counties

Machine or Implement	Size	Dollar Cost Per Acre					
		Depreciation	Insurance & Taxes	Int.	Repairs	Fuel, Oil, & Lubricant	Total
Moldboard Plow	4-14-Inch	$0.171	$0.042	$0.095	$0.202	$0.022	$0.532
Tandem Disc	10-Foot	.117	.028	.065	.138	.015	.363
Field Cultivator	14-Foot	.062	.015	.035	.074	.008	.194
Drag Harrow[2/]	6-Sect.	.022	.010	.023	.020	.006	.081
Press Drill	14-Foot	.078	.019	.043	.092	.010	.242
Press Drill[2/]	14-Foot	.054	.025	.059	.051	.015	.204
Swather PTO[2/]	15-Foot	.044	.020	.047	.041	.012	.164
Swather PTO[1/]	15-Foot	.074	.035	.079	.040	.014	.242
Combine	12-Foot	.124	.030	.069	.147	.016	.386
Lister	4-Row	.109	.027	.060	.129	.014	.339
Corn Tender[2/]	2-Row	.090	.042	.097	.084	.025	.338
Corn Cultivator	4-Row	.078	.019	.043	.092	.010	.242
Cornpicker	2-Row	.233	.057	.130	.276	.030	.726
Forage Harvester	2-Row	.214	.052	.119	.253	.028	.666
Mower[2/]	7-Foot	.082	.038	.088	.076	.023	.307
Dump Rake[1/]	12-Foot	.069	.032	.074	.037	.013	.225
Frontend Loader & Attachments[2/]		.082	.038	.088	.076	.023	.307
Trailer or Wagon[1/]		.231	.108	.247	.124	.043	.753
Trailer or Wagon[2/]		.136	.064	.146	.127	.038	.511
Sprayer (trailer)[1/]	30-Foot	.046	.022	.049	.025	.009	.151

1/ Used with a 2-plow tractor.
2/ Used with a 3-plow tractor--all other implements and machines pulled with a 4-plow tractor.

Table 14. Costs Per Acre by Machine and Implement Used, 1,600-Acre Model Farm; Hughes and Sully Counties

Machine or Implement	Size	Annual Use in Acres	Dollar Cost Per Acre: Depreciation	Insurance & Taxes	Int.	Repairs	Fuel, Oil, & Lubricant	Total
Moldboard Plow	14-Inch	475	$0.130	$0.029	$0.067	$0.145	$0.330	$0.701
Tandem Disc	10-Foot	605	.082	.022	.049	.036	.141	.330
Field Cultivator	14-Foot	239	.169	.066	.145	.013	.168	.561
Drag Harrow	6-Sect.	666	.008	.004	.010	.002	.040	.064
Press Drill	14-Foot	354	.323	.103	.235	.090	.080	.831
Swather PTO	15-Foot	354	.153	.057	.131	.040	.090	.471
Combine	12-Foot	371	.971	.275	.630	.388	.513	2.777
Lister	4-Row	201	.292	.114	.260	.134	.198	.998
Corn Tender	2-Row	201	.064	.024	.049	.013	.178	.328
Corn Cultivator	4-Row	402	.052	.019	.044	.014	.110	.239
Cornpicker	2-Row	96	1.722	.483	1.105	.326	.416	4.052
Forage Harvester	2-Row	88	1.934	.542	1.241	.464	.491	4.672
Mower	7-Foot	463	.068	.018	.041	.057	.099	.283
Dump Rake	12-Foot	463	.020	.011	.026	.007	.040	.104
Frontend Loader & Attachments		406	.073	.034	.078	.048	.180	.413
Two Trailers or Wagons		199	.112	.052	.120	.055	.268	.607
Sprayer (trailer)	30-Foot	555	.028	.014	.032	.009	.040	.123

Table 15. Tractor, Machine and Implement Costs Per Acre of Use, 1,600-Acre Model Farm; Hughes and Sully Counties

Machine or Implement	Size	Annual Use in Acres	Dollar Cost Per Acre: Depreciation	Insurance & Taxes	Int.	Repairs	Fuel, Oil, & Lubricant	Total
Moldboard Plow	4-14-Inch	475	$0.301	$0.071	$0.162	$0.347	$0.352	$1.233
Tandem Disc	10-Foot	605	.199	.050	.114	.174	.156	.693
Field Cultivator	14-Foot	239	.231	.081	.180	.087	.176	.755
Drag Harrow[1/]	6-Sect.	666	.030	.014	.033	.022	.046	.145
Press Drill	14-Foot	177	.401	.122	.278	.182	.096	1.079
Press Drill[1/]	14-Foot	177	.377	.128	.294	.141	.088	1.028
Swather PTO[1/]	15-Foot	177	.197	.077	.178	.081	.097	.630
Swather PTO[2/]	15-Foot	177	.227	.092	.210	.080	.109	.718
Combine	12-Foot	371	1.095	.305	.699	.535	.529	3.163
Lister	4-Row	201	.401	.141	.320	.263	.212	1.337
Corn Tender[1/]	2-Row	201	.154	.066	.146	.097	.203	.666
Corn Cultivator	4-Row	402	.130	.038	.087	.106	.120	.481
Cornpicker	2-Row	96	1.955	.540	1.235	.602	.446	4.778
Forage Harvester	2-Row	88	2.148	.594	1.360	.717	.519	5.338
Mower[1/]	7-Foot	463	.150	.056	.129	.133	.122	.590
Dump Rake[2/]	12-Foot	463	.089	.043	.100	.044	.053	.329
Frontend Loader & Attachments[1/]		406	.155	.072	.166	.124	.203	.720
Trailer or Wagon[2/]		144	.343	.160	.367	.179	.307	1.356
Trailer or Wagon[1/]		55	.248	.114	.166	.182	.315	1.025
Sprayer (trailer)[2/]	30-Foot	555	.074	.036	.081	.034	.049	.274

[1/] Used with a 3-plow tractor--all other machines and implements pulled with a 4-plow tractor.
[2/] Used with a 2-plow tractor.

Table 16. Machine Costs Per Acre by Crop and Type of Operation, 640-Acre Model Farm, Hughes and Sully Counties

Crop	Type of Operation	Machine Time Hours Per Acre	Dollar Cost Per Acre: Depreciation	Insurance & Taxes	Int.	Repairs	Fuel, Oil, & Lubricant	Total
Summer Fallow	Tillage	1.25	$0.78	$0.25	$0.58	$0.63	$1.02	$ 3.26
Small Grain After Summer Fallow	Tillage	.58	.38	.14	.32	.25	.40	1.49
	Planting	.23	.45	.18	.41	.15	.11	1.30
	Spraying	.10	.03	.04	.09	.04	.05	.30
	Harvest	.52	1.76	.53	1.23	.60	.65	4.77
	Total	1.43	2.67	.89	2.05	1.04	1.21	7.86
Small Grain After Small Grain or Corn Silage	Tillage	1.03	.51	.17	.38	.53	.67	2.26
	Planting	.23	.45	.18	.41	.15	.11	1.30
	Spraying	.10	.03	.04	.09	.04	.05	.30
	Harvest	.52	1.76	.53	1.23	.60	.65	4.77
	Total	1.88	2.80	.92	2.11	1.32	1.48	8.63
Small Grain After Corn Grain	Tillage	1.33	.68	.22	.51	.67	.83	2.91
	Planting	.23	.45	.18	.41	.15	.11	1.30
	Spraying	.10	.03	.04	.09	.04	.05	.30
	Harvest	.52	1.76	.53	1.23	.60	.65	4.77
	Total	2.18	2.97	.97	2.24	1.46	1.64	9.28
Small Grain After Alfalfa	Tillage	1.41	.72	.25	.58	.70	.88	3.13
	Planting	.23	.45	.18	.41	.15	.11	1.30
	Spraying	.10	.08	.04	.09	.04	.05	.30
	Harvest	.52	1.76	.53	1.23	.60	.65	4.77
	Total	2.26	3.01	1.00	2.31	1.49	1.69	9.50
Corn After Summer Fallow	Tillage	1.18	.65	.24	.52	.47	.72	3.60
	Planting	.45	.38	.16	.37	.26	.28	1.45
	Spraying	.10	.08	.04	.09	.04	.05	.30
	Subtotal	1.73	1.11	.44	.98	.77	1.05	4.35
Corn Grain	Harvest (custom hired)							3.30
	Total	1.73	1.11	.44	.98	.77	1.05	7.65
Corn Silage	Harvest	1.05	3.50	.99	2.27	1.17	.70	8.63
	Total	2.78	4.61	1.43	3.25	1.94	1.75	12.98
Corn After Small Grain	Tillage	1.54	.82	.29	.65	.67	.97	3.40
	Planting	.45	.38	.16	.37	.26	.28	1.45
	Spraying	.10	.08	.04	.09	.04	.05	.30
	Subtotal	2.09	1.28	.49	1.11	.97	1.30	5.15
Corn Grain	Harvest (custom hired)							3.30
	Total	2.09	1.28	.49	1.11	.97	1.30	8.45
Corn Silage	Harvest	1.05	3.50	.99	2.27	1.17	.70	8.63
	Total	3.14	4.78	1.48	3.38	2.14	2.00	13.78
Corn After Corn Grain	Tillage	1.76	.93	.33	.72	.79	1.09	3.86
	Planting	.45	.38	.16	.37	.26	.28	1.45
	Spraying	.10	.03	.04	.09	.04	.05	.30
	Subtotal	2.31	1.39	.53	1.18	1.09	1.42	5.61
Corn Grain	Harvest (custom hired)							3.30
	Total	2.31	1.39	.53	1.18	1.09	1.42	8.91
Corn Silage	Harvest	1.05	3.50	.99	2.27	1.17	.70	8.63
	Total	3.36	4.89	1.52	3.45	2.26	2.12	14.24
Corn After Corn Silage	Tillage	1.46	.76	.27	.58	.65	.93	3.19
	Planting	.45	.38	.16	.37	.26	.28	1.45
	Spraying	.10	.08	.04	.09	.04	.05	.30
	Subtotal	2.01	1.22	.47	1.04	.95	1.26	4.94
Corn Grain	Harvest (custom hired)							3.30
	Total	2.01	1.22	.47	1.04	.95	1.26	8.24
Corn Silage	Harvest	1.05	3.50	.99	2.27	1.17	.70	8.63
	Total	3.06	4.72	1.46	3.31	2.12	1.96	13.57
Corn After Alfalfa	Tillage	2.17	1.24	.39	.87	1.00	1.37	4.87
	Planting	.45	.38	.16	.37	.26	.28	1.45
	Spraying	.10	.08	.04	.09	.04	.05	.30
	Subtotal	2.72	1.70	.59	1.33	1.30	1.70	6.62
Corn Grain	Harvest (custom hired)							3.30
	Total	2.72	1.70	.59	1.33	1.30	1.70	9.92
Corn Silage	Harvest	1.05	3.50	.99	2.27	1.17	.70	8.63
	Total	3.77	5.20	1.58	3.60	2.47	2.40	15.25
Tame Hay[1/]	Mow, Rake, Bale	.49	.40	.17	.39	.22	.27	6.58[2/]
	Mow, Rake, Stack	.79	.74	.31	.73	.33	.39	2.55
Native Hay[1/]	Mow, Rake, Stack	.79	.74	.31	.73	.38	.39	2.55

1/ Per acre per cutting.
2/ Custom baling charge is included only in total cost.

Table 17. Machine Costs Per Acre by Crop and Type of Operation, 1,600-Acre Model Farm; Hughes and Sully Counties

Crop	Type of Operations	Machine Time Hours Per Acre	Dollar Cost Per Acre: Depreciation	Insurance & Taxes	Int.	Repairs	Fuel, Oil, & Lubricant	Total
Summer Fallow	Tillage	1.92	$0.99	$0.31	$0.70	$0.61	$0.88	3.49
Small Grain After Summer Fallow	Tillage	.54	.46	.15	.33	.28	.38	1.60
	Planting	.20	.39	.13	.29	.16	.09	1.06
	Spraying	.10	.07	.04	.08	.03	.05	.27
	Harvest	.48	1.31	.39	.89	.62	.63	3.84
	Total	1.32	2.23	.71	1.59	1.09	1.15	6.77
Small Grain After Small Grain or Corn or Sorghum Silage	Tillage	.82	.53	.14	.31	.54	.55	2.07
	Planting	.20	.39	.13	.29	.16	.09	1.06
	Spraying	.10	.07	.04	.08	.03	.05	.27
	Harvest	.48	1.31	.39	.89	.62	.63	3.84
	Total	1.60	2.10	.70	1.37	1.15	1.12	7.24
Small Grain After Corn Grain or Grain Sorghum	Tillage	1.12	.73	.19	.42	.66	.60	2.60
	Planting	.20	.39	.13	.29	.16	.09	1.06
	Spraying	.10	.07	.04	.08	.03	.05	.27
	Harvest	.48	1.31	.39	.89	.62	.63	3.84
	Total	1.90	2.50	.75	1.68	1.47	1.37	7.77
Small Grain After Alfalfa	Tillage	1.20	.76	.20	.46	.74	.76	2.92
	Planting	.20	.39	.13	.29	.16	.09	1.06
	Spraying	.10	.07	.04	.08	.03	.05	.27
	Harvest	.48	1.31	.39	.89	.62	.63	3.84
	Total	1.98	2.53	.76	1.72	1.35	1.53	8.09
Row Crop After Summer Fallow	Tillage	.92	.53	.18	.39	.41	.54	2.05
	Planting	.28	.40	.14	.32	.26	.21	1.33
	Spraying	.10	.07	.04	.08	.03	.05	.27
	Subtotal	1.30	1.00	.36	.79	.70	.80	3.65
Corn Grain	Harvest	.60	1.96	.54	1.23	.60	.45	4.78
	Total	1.90	2.96	.90	2.02	1.30	1.25	8.43
Sorghum Grain	Harvest	.48	1.31	.39	.89	.62	.63	3.84
	Total	1.78	2.31	.75	1.68	1.32	1.43	7.49
Silage	Harvest	.55	2.15	.59	1.36	.72	.52	5.34
	Total	1.85	3.15	.95	2.15	1.42	1.32	8.99
Row Crop After Small Grain	Tillage	1.14	.69	.22	.49	.59	.74	2.73
	Planting	.28	.40	.14	.32	.26	.21	1.33
	Spraying	.10	.07	.04	.08	.03	.05	.27
	Subtotal	1.52	1.16	.40	.89	.88	1.00	4.33
Corn Grain	Harvest	.60	1.96	.54	1.23	.60	.45	4.78
	Total	2.12	3.12	.94	2.12	1.48	1.45	9.11
Sorghum Grain	Harvest	.48	1.31	.39	.89	.62	.63	3.84
	Total	2.00	2.47	.79	1.78	1.50	1.63	8.17
Silage	Harvest	.55	2.15	.59	1.36	.72	.52	5.34
	Total	2.07	3.31	.99	2.21	1.60	1.49	9.67
Row Crop After Row Crop Harvested for Grain	Tillage	1.40	.86	.25	.57	.74	.85	3.27
	Planting	.28	.40	.14	.32	.26	.21	1.33
	Spraying	.10	.07	.04	.08	.03	.05	.27
	Subtotal	1.78	1.33	.43	.97	1.03	1.11	4.87
Corn Grain	Harvest	.60	1.96	.54	1.23	.60	.45	4.78
	Total	2.38	3.29	.97	2.20	1.63	1.56	9.65
Sorghum Grain	Harvest	.48	1.31	.39	.89	.62	.63	3.84
	Total	2.26	2.64	.82	1.86	1.65	1.74	8.71
Silage	Harvest	.55	2.15	.59	1.36	.72	.52	5.34
	Total	2.33	3.48	1.02	2.31	1.75	1.63	10.21
Row Crop After Row Crop Harvested for Silage	Tillage	1.10	.67	.20	.46	.57	.70	2.60
	Planting	.28	.40	.14	.32	.26	.21	1.33
	Spraying	.10	.07	.04	.08	.03	.05	.27
	Subtotal	1.48	1.14	.38	.86	.86	.96	4.20
Corn Grain	Harvest	.60	1.96	.54	1.23	.60	.45	4.78
	Total	2.08	3.10	.92	2.09	1.46	1.41	8.98
Sorghum Grain	Harvest	.48	1.31	.39	.89	.62	.63	3.84
	Total	1.96	2.45	.77	1.75	1.48	1.59	8.04
Silage	Harvest	.55	2.15	.59	1.36	.72	.52	5.34
	Total	2.03	3.29	.97	2.22	1.78	1.48	9.54
Row Crop After Alfalfa	Tillage	1.70	1.04	.30	.69	.94	1.08	4.05
	Planting	.28	.40	.14	.32	.26	.21	1.33
	Spraying	.10	.07	.04	.08	.03	.03	.27
	Subtotal	2.08	1.51	.48	1.09	1.23	1.34	5.65
Corn Grain	Harvest	.60	1.96	.54	1.23	.60	.45	4.78
	Total	2.68	3.47	1.02	2.32	1.83	1.79	10.43
Sorghum Grain	Harvest	.48	1.31	.39	.89	.62	.63	3.84
	Total	2.56	2.82	.87	1.98	1.85	1.97	9.49
Silage	Harvest	.55	2.15	.59	1.36	.72	.52	5.34
	Total	2.63	3.66	1.07	2.45	1.95	1.86	10.99
Tame Hay[1/]	Mow, Rake, Bale	.45	.24	.10	.23	.18	.17	6.05[2/]
	Mow, Rake, Stack	.75	.39	.71	.40	.30	.38	2.18
Native Hay[1/]	Mow, Rake, Stack	.75	.39	.71	.40	.30	.38	2.18

1/ Per acre per cutting.
2/ Includes cost for custom baling.