FARM BUSINESS NOTES

Prepared by the Divisions of Agricultural Economics and Agricultural Extension
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Mechanization of Minnesota Agriculture

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Minnesota farmers have been adopting machinery to ease their work ever since the state was opened to agriculture, but this movement has been most rapid during the last three decades. The trend in the investment per farm in mechanical equipment is shown by the following data selected from the reports of the United States Census. In 1900, $195 was invested in machinery; 1910, $335; 1920, $1,018; 1930, $981; and 1940, $980.

During this entire period increasing quantities of the farmers' production have been required to purchase and maintain the mechanical equipment. Although farm prices trebled from 1900 to 1920, the investment per farm increased fivefold. The investment in 1930 and 1940 averaged only slightly less than in 1920, but the level of farm prices had fallen by almost one half.

The investment in machinery and equipment, including tractors and the farm share of autos and trucks, represents about 10 per cent of the farm investment in Minnesota. The distribution of the investments on three groups of farms in Minnesota is presented in table 1.

Table 1. Investment per Farm, January 1, 1941
Farm Management Service Members

Item	Southeastern Minnesota		Southwestern Minnesota		Northwestern Minnesota	
	Dollars	Per cent of total	Dollars	Per cent of total	Dollars	Per cent of total
Land	$ 9,320	38	$15,011	45	$ 5,250	37
Buildings	6,536	26	7,090	21	3,585	26
Machinery and equipment	2,723	11	2,859	9	2,234	16
Horses	413	2	362	1	318	2
Productive livestock	3,158	13	3,917	12	1,639	12
Crops, seeds, and feeds	2,402	10	4,075	12	977	7
Total	$24,552	100	$33,314	100	$14,003	100
Number of farms	148		165		98	
Acres per farm	225		279		397	

The investment in machinery and equipment is slightly less than one half that in buildings and is about as high as that in livestock. A brief review of specific phases of mechanization and of advantages and problems attending them are presented in this article.

The widespread use of the farm tractor has been the most important factor in farm mechanization. The number of tractors on Minnesota farms is shown in table 2. There were only 240 tractors on farms in 1910. By 1940 the number had increased to 105,075, or more than one tractor for every two farms. This trend is continuing, with many new purchases and with some farmers adding a second tractor.

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During the early twenties the tractor was used principally for heavy work, as plowing, disking, and threshing. Improvements in design, including the development of the smaller general-purpose tractor and the addition of rubber tires, have adapted the tractor to a wide variety of operations, making it practical for a large number of farms. The following percentage distribution of the use of 581 tractors scattered throughout the state in 1938 illustrates the wide variety of tasks for which it is now used:

Plowing	26	Picking corn	4
Disking	9	Haying	2
Other tillage	12	Hauling manure	1
Drilling grain	4	Grinding feed	3
Cultivating corn	13	Threshing, shredding, filling silo	9
Cutting grain and corn	11	Miscellaneous	6

The number of horses on Minnesota farms decreased by about one third from 1920 to 1940 (see table 2). The introduction of the tractor was the main cause of this decrease, although increases in the number of trucks and automobiles were contributing factors. The number of hours worked per horse has also decreased. Records kept by a group of Winona county farmers show that in 1935 each horse was worked almost 900 hours per year. By 1940 this had fallen to 600 hours.

Table 2. Trends in Power Supply on Minnesota Farms

Year	Number of farms	Tractors	Autos	Trucks	Electricity in home		Horses and mules
					Home plant	High line connection	
		Number	Number	Number	Number	Number	Number
1910	156,137	240	2,895	30	234	215	758,959
1920	178,478	15,503	107,824	3,803	5,116	6,200	943,032
1930	185,255	48,457	185,718	36,557	10,310	13,033	816,747
1940	197,351	105,075	208,693	38,617	9,763	50,075	636,593

Hauling Now Mechanized

The mechanization of travel and road hauling has been quite complete. There was one automobile for each farm by 1930, with more than one for each farm in 1940. (Table 2.) There was one truck for each five farms in 1930, with only a small increase since that time. However, a large proportion of the farmer's hauling is done by commercial truckers or by neighboring farmers hauling for a fee. Little increase in automobile and truck numbers can be expected.

There has been a rapid increase in electrification during the last few years, resulting largely from the activities of the Rural Electrification Administration. One out of every four farms in the state had a high line connection in 1940, a threefold increase over 1930. The number of home plants decreased during this period. This trend is continuing at the present time.

Fewer Changes in Machinery

Changes in machinery have been less marked than changes in power. Most field tillage operations were done by machines before the turn of the century. These have been altered in design and in size to adapt them to the tractor. Grain binders have been increased in size but the design has been changed very little. Combines with cutting widths of from 3½ to 6 feet are now replacing some grain binders and threshing rigs. This is eliminating the hand work of shocking and hand loading of bundles. From 5 to 10 per cent of the small grain in Minnesota was probably harvested by combines in 1941. Mechanical pickers are replacing part of the hand work in harvesting corn. Considerable corn is still harvested by hand, although no exact data are available. About 10,000 corn pickers have been sold annually in the United States during the last 15 years. Field ensilage cutters have not proven very popular. Most of the work of loading wagons and unloading into the ensilage cutters is still done by hand. A large proportion of the hay is now loaded with mechanical loaders, but considerable hand work is still involved in haying. On the whole, there is a gradual trend toward mechanization of harvesting.

Farm Workers' Productivity Increased

The proportion of work done by hand is larger for livestock production than for crop production. The use of milking machines, cream separators, automatic waterers, and self feeders has mechanized some operations. But lack of standardization of operations and the shortness of the time required for many tasks has limited mechanization.

The mechanization of farm operations has resulted in several advantages. The productivity of Minnesota farm workers has been increased by more than one half since 1910.[1] A considerable part of this can be ascribed to mechanization. In many cases there has also been an increase in the quality of the work done. Feed formerly used by horses has been released for use by other livestock. Since a good deal of the heavy work is now being done by machines, the farmers' work is somewhat lighter.

[1] Sallee, G. A., "An Economic Study of Agricultural Labor in Minnesota," Thesis submitted to the University of Minnesota, page 75.

Mechanization also has introduced new problems. Release of horse feeds for use by other livestock has contributed to a larger production of marketable livestock and livestock products, thus depressing prices which were already low. It has made the farmers somewhat more dependent upon market conditions. A larger proportion of his output is sold, while gasoline, oil, grease, repairs, and replacements of power and machinery must be purchased. Since the prices of products sold by farmers tend to fluctuate more widely than products purchased, margins available for living can be seriously reduced during periods of depressed prices.

Joint Ownership May Reduce Costs

The operation and maintenance of the mechanical power and machinery involves a large cost. These costs averaged $600 per year on a group of southeastern Minnesota dairy farms during the ten-year period from 1931 through 1940. Some of these costs, as gasoline, oil, and much of the repairs, must be paid each year, causing difficulties in years when the prices of farm products are low. Other costs, as replacements and some repairs, may be delayed for a year or more. Careful planning of operations, correct adjustments of machinery, and good maintenance can reduce operating expenses. Joint ownership of large machines or the hiring of neighbors to do small jobs can reduce costs. Since these operating and maintenance costs represent almost one third of the farm operating costs, inefficient managers may find their profit margins wiped out while good managers achieve low unit production costs and high profits.

Three-Year Comparison of the Operating Results of 90 Cooperative Oil Associations[1]

E. Fred Koller

Analysis of the operating statements of 90 Minnesota cooperative oil associations[2] shows that their net income averaged $6.67 for each $100 of sales. This is a slightly better result than experienced by this identical group of associations in the previous year but below their net income in 1938 (Table 1). Another indication of the improvement in operating results in 1940 is the fact that none of the 90 associations showed a net loss whereas in the previous year five operated in the red. Eight associations showed net income in excess of 10 per cent as compared with seven associations in 1939.

The improvement shown in the 1940 statements is due mainly to a higher gross margin of 23.53 per cent as compared with a gross of 22.98 per cent in 1939. This change is accounted for in part by more stable conditions in certain areas affected by price wars and related competitive difficulties in the previous year. Some associations have improved their gross margins by increasing their sales

[1] Assistance in the preparation of this material was furnished by the personnel of the Works Progress Administration, Official Project No. 165-1-71-124, Subproject 452.

[2] The associations included in this analysis are the same as those described in Minn. Ag. Expt. Stat. Bul. 351, "Minnesota Cooperative Oil Associations" by E. Fred Koller and O. B. Jesness.

Table 1. Average of Operating Statements of 90 Minnesota Cooperative Oil Associations, 1938-1940

Item	1938	1939	1940
	Per $100.00 of Sales		
Sales	$100.00	$100.00	$100.00
Cost of Sales	77.01	77.02	76.47
Gross Margin	22.99	22.98	23.53
Operating Expense	16.58	17.67	17.85
Net Operating Income	6.41	5.31	5.68
Other Income	.99	1.14	.99
Total	7.40	6.45	6.67
Other Expense	.17	.02	.....
Net Income	7.23	6.43	6.67
Average sales per association	$70,954.00	$70,861.00	$74,388.00

of the higher margin commodities such as lubricating oils and greases. Increases in the sales of these commodities averaged 3.5 and 16 per cent, respectively, as compared with a gain of 1.5 per cent in the total sales volume.

The improvement in gross margins is not reflected in full in net income owing to a further increase in the operating expense of these cooperatives during 1940. The average expense for the year was $17.85 per $100 of sales as compared with $17.67 and $16.58 in 1939 and 1938, respectively. The average increase in operating expense of $1.27 per $100 of sales from 1938 to 1940 was due to the changes in the component expense items shown in table 2. The largest part of the change was due to the increase in wages and commissions. This increased cost arose in part from the addition of further services by some associations such as super-service stations which involve the use of more labor. Some of the increase was occasioned by upward adjustments of wages due to various causes. Other factors which accounted for a considerable part of the increase in expense were the advance in fuel and utility costs and also the rise in bad debts expense. A sizable reduction in interest expense was effected as these associations have improved their financial condition.

Table 2. Average Change in Operating Expense per $100 of Sales of 90 Oil Associations from 1938 to 1940

Expense item	Change per $100 of sales	Expense item	Change per $100 of sales
Increases		*Decreases*	
Wages and commissions	$ .82	Plant and station supplies	$ .01
Fuel, light, power, water	.14	Social security taxes	.02
Bad debts expense	.13	Depreciation	.02
Meetings and education	.11	Office salaries	.02
Truck expense	.09	Interest expense	.13
Repairs	.09	Miscellaneous	.21
Local taxes	.09		
Advertising	.06	Total decreases	$ .41
Insurance and bonds	.05		
Directors fees, telephone, bank charges, auditing, office supplies	.11	Net increase of expense per $100 of sales	$1.27
Total increases	$1.68		

The upward trend in costs shown above is likely to become more marked as prices of supplies and other needs rise because of the defense program. This emphasizes the importance of giving more attention to efficient and economical operation, if net income is to be maintained near the high level of former years.

Tax Status of Oleomargarine

HARLOW W. HALVORSON

This is a summary of the status of federal and state taxation of margarine as of April 15, 1941. Probably few significant changes have occurred since that date.

Federal taxes include a manufacturer's stamp tax of ¼ cent per pound of uncolored margarine and 10 cents per pound of colored margarine. Because of this tax on colored margarine, only about one half of one per cent of the margarine sold is colored.

The following table summarizes the status of margarine excise and license taxes as of April 15, 1941, by states.

Table 1. State Excise and License Taxes on Margarine, Year of Enactment, and Exceptions

State	Per pound excise tax: Colored	Per pound tax	Exceptions to tax	License taxes: Retailers	Wholesalers	Manufacturers
Ala.	prohib.	10(35)	Dom.	.....	.....	.....
Ark.	prohib.	10(35)	Dom.	.....	.....	.....
Calif.	prohib.	.....	.....	(23) 5.00	50.00	100.00
Colo.	.....	10(33)	Dom.S.B.	(31)	25.00	25.00
Conn.	prohib.	.....	.....	(33) 6.00	50.00	100.00
Fla.	prohib.	10(35)	Dom.	.....	.....	.....
Ga.	.....	10(35)	Dom.	.....	.....	.....
Idaho	prohib.	5(31)	.....	(29) 50.00	200.00	.....
Iowa	prohib.	5(31)	.....	.....	.....	.....
Kans.	.....	10(33)	Dom.S.B.	.....	.....	.....
La.	.....	12(34)	Dom.	.....	.....	.....
Me.	prohib.	10(35)	Dom.	.....	.....	.....
Md.	prohib.	.....	.....	.....	.....	.....
Mass.	prohib.	.....	.....	(86) Local sellers registration fee 50c		
Mich.	prohib.	.....	.....	.....	.....	.....
Minn.	prohib.	10(33)	Dom.(A)	(31) 1.00	1.00	.....
Miss.	.....	.....	Dom.	(20) 10.00	(32)100.00	.....
Mo.	prohib.	.....	.....	.....	.....	.....
Mont.	prohib.	.....	.....	(25)400.00	1,000.00	.....
Neb.	.....	15(31)	Dom.(A)	(25) 1.00	25.00	100.00
N.J.	prohib.	.....	.....	.....	.....	.....
N.H.	prohib.	.....	.....	.....	.....	.....
N.Y.	prohib.	.....	.....	.....	.....	.....
N.C.	prohib.	10(35)	Dom.	.....	.....	.....
N.Dak.	prohib.	10(31)	.....	(31) 2.00	5.00	15.00
Ohio	prohib.	.....	.....	.....	.....	.....
Okla.	prohib.	10(31)	.....	(31) 5.00	10.00	10.00
Ore.	prohib.	.....	.....	.....	.....	.....
Pa.	prohib.	.....	.....	(1899)100.00	500.00	1,000.00
S.C.	prohib.	10(31)	.....	.....	.....	.....
Tenn.	.....	10(31)	Dom.	(41) 5.00	75.00	300.00
Texas	.....	10(34)	Dom.	.....	.....	.....
Utah	prohib.	5(29)	.....	All sellers	5.00	.....
Vt.	prohib.	.....	.....	All sellers	25.00	.....
Wash.	prohib.	15(31)	.....	.....	.....	.....
W.Va.	prohib.	.....	.....	.....	.....	.....
Wis.	prohib.	15(35)	.....	(31) 25.00	500.00	100.00
Wyo.	prohib.	10(31)	Dom.(A)	.....	.....	.....

This table is adapted from W. T. Mickle, "Margarine Legislation," Journal of Farm Economics, Vol. XXIII, No. 3, August, 1941, page 574. Numbers in parentheses indicate year in which tax was enacted. Exceptions include:

Dom. —domestic fats and oils.
Dom. S.B.—domestic soybean oil.
Dom. (A)—domestic animal fats.

The following states have no tax or color restrictions on oleomargarine: Arizona, Illinois, Indiana, Kentucky, Nevada, New Mexico, Rhode Island, and Virginia.

On the basis of preliminary 1940 Census figures 15 per cent of the people in the United States live in states having neither color prohibition nor state excise taxes against oleomargarine, while 48 per cent of the people live in states which prohibit the sale of colored oleomargarine but do not tax its sale in the uncolored form. Thus, on April 15, 1941, 63 per cent of the people in the United States could purchase uncolored oleomargarine without paying a *state* excise tax.

Minnesota Farm Prices for September, 1941

Prepared by W. C. WAITE and H. W. HALVORSON

The index number of Minnesota farm prices for the month of September, 1941, was 92. When the average of farm prices of the three Septembers, 1924-25-26, is represented by 100, the indexes for September of each year from 1924 to date are as follows:

1924— 94	1929—110	1934— 78	1939— 68*
1925—103	1930— 84	1935— 73	1940— 63*
1926—103	1931— 55	1936— 97	1941— 92*
1927—100	1932— 41	1937— 88	
1928—101	1933— 58	1938— 64	

* Preliminary.

The price index of 92 for the past month is the net result of increases and decreases in the prices of farm products in September, 1941, over the average of September, 1924-25-26, weighted according to their relative importance.

Average Farm Prices Used in Computing the Minnesota Farm Price Index, September, 1941, with Comparisons*

	Sept. 15, 1941	Aug. 15, 1941	Sept. 15, 1940		Sept. 15, 1941	Aug. 15, 1941	Sept. 15, 1940
Wheat	$0.98	$0.90	$0.62	Cattle	$9.10	$8.90	$7.70
Corn	.60	.58	.50	Calves	11.40	10.60	9.00
Oats	.36	.27	.20	Lambs-Sheep	9.89	9.20	7.68
Barley	.53	.40	.34	Chickens	.14	.14	.12
Rye	.56	.48	.31	Eggs	.27	.23	.17
Flax	1.86	1.68	1.31	Butterfat	.39	.38	.29
Potatoes	.50	.60	.43	Hay	5.08	4.54	4.75
Hogs	11.20	10.30	6.10	Milk	2.00	1.85	1.60
				Wool†	.38	.37	.28

* These are the average prices for Minnesota as reported by the United States Department of Agriculture.

† Not included in the price index number.

The prices of all commodities included in the index advanced between August 15 and September 15, except potatoes which declined, and chickens which were unchanged. The crops group showed the largest gain, the September crop price index increasing 20 per cent over the August index, with livestock and livestock product prices following in that order. Taking account of the prices paid by farmers for items used in living and production, the index at 92 indicates a purchasing power of farm products 5 per cent above the 1924-1926 base year level.

Indexes and Ratios of Minnesota Agriculture*

	Sept. 1941	Aug. 1941	Sept. 1940	Average Sept. 1924-26
U. S. farm price index	101.5	92.9	70.8	100
Minnesota farm price index	92.0	84.4	63.0	100
U. S. purchasing power of farm products	116.0	107.8	88.2	100
Minn. purchasing power of farm products	105.4	98.0	78.4	100
Minn. farmers share of consumers food dollar	.....	52.0	.....	53.9
U. S. hog-corn ratio	15.7	14.8	9.9	11.7
Minnesota hog-corn ratio	18.7	17.8	12.2	12.9
Minnesota beef-corn ratio	15.2	15.3	15.4	7.4
Minnesota egg-grain ratio	20.7	19.6	19.1	17.5
Minnesota butterfat-farm-grain ratio	35.3	42.7	40.7	35.4

* Explanation of the computation of these data may be had upon request.

Dairy Products and Lease-Lend Program

It has been estimated that 250 million pounds of cheese, 200 million pounds of dry skim milk, and 15 million cases of evaporated milk will be needed under the lease-lend program for Great Britain in the 15-month period ending June 30, 1942. This is a considerable portion of our ordinary domestic production of these products, amounting to about 30 per cent of our annual production of cheese, 50 per cent of our dry skim milk, and 25 per cent of the evaporated milk. In terms of the milk equivalent of all manufactured products, however, these requirements amount to only 6 or 8 per cent of the total.

The purchase of these products between March and September 11, 1941 amounted to 71,352,811 pounds of cheese, 20,344,600 pounds of dry skim milk, and 5,325,620 cases of evaporated milk. Thus only a small portion of the requirements has been purchased to date. These purchases amount to 28 per cent of the estimated requirements for cheese, 24 per cent of evaporated milk, and only 10 per cent of the skim milk powder.

The production of dairy products in Minnesota is not well adapted for taking direct advantage of this situation since the required products are a relatively small portion of our normal production of manufactured products. In recent years in the state 96 per cent of the milk equivalent used in the production of manufactured dairy products has gone into butter and only about 2 per cent into cheese and 1 per cent to evaporated milk. Even though our output of cheese and evaporated milk should double, butter would still remain the predominant product in our dairy income.

The largest part of the improvement in the general dairy situation in Minnesota will come from improved demand resulting from larger domestic payrolls. In addition there will be a diversion of milk in other areas for products required under the lease-lend export program from milk that would otherwise have been used for butter production. This will indirectly augment the increase in the dairy income for the state but probably only to a small degree.

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