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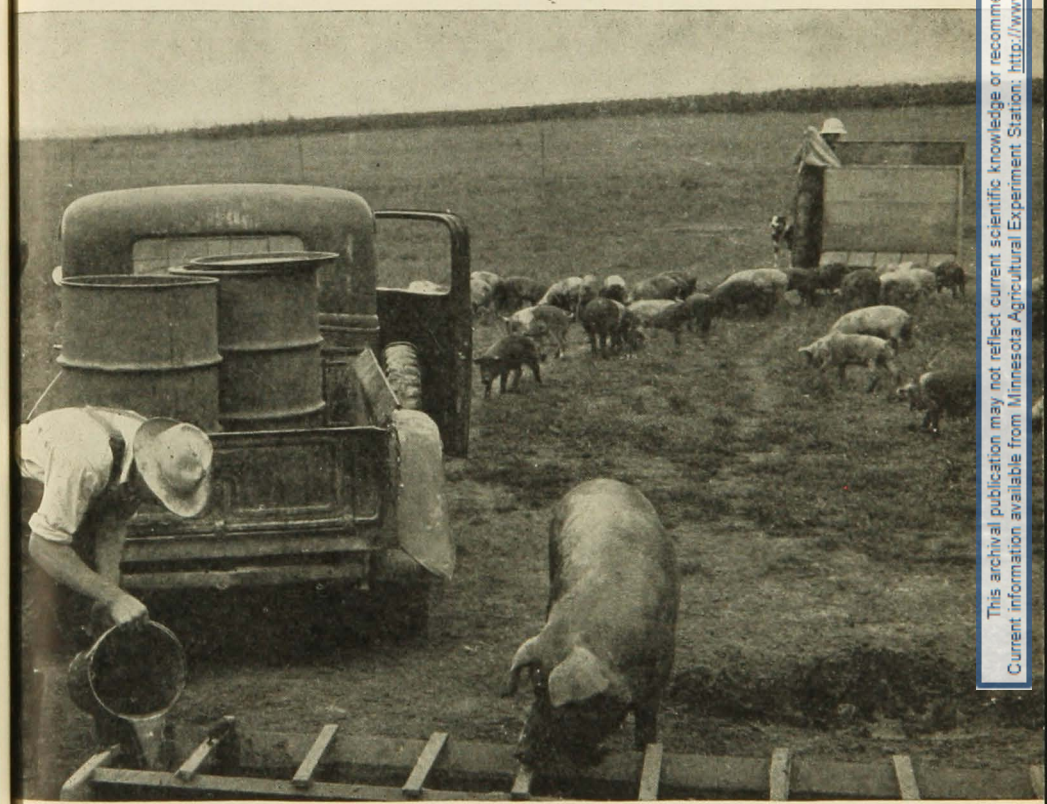
# REDUCING MILEAGE IN FARM TRANSPORTATION

A. A. Dowell and S. B. Cleland





Agricultural Experiment Station
UNIVERSITY OF MINNESOTA

# Reducing Mileage in Farm Transportation[1]

A. A. Dowell and S. B. Cleland

MOST MINNESOTA FARMERS depend upon motor vehicles for local transportation and for hauling farm products to local markets and supplies from local markets to farms. The shift from horse-drawn to motor vehicles has taken place during the last 30 years. Whereas motor vehicles played a relatively modest part in farm transportation and hauling in World War I, the situation was almost completely reversed when World War II began. At present, motor vehicles are essential to efficient operation of Minnesota farms.

VARIOUS TYPES of motor vehicles are used by farmers to meet family and business needs. The automobile is the chief means of local transportation. It is also used extensively for light hauling and for other business purposes. A considerable number of farmers own automobile trailers, pickup trucks, and standard trucks which are used for both on-farm and off-farm hauling. Commercial truckers also are engaged by many farmers to haul farm products to market and to haul some supplies to the farms.

The combination of many independent farmers, each owning one or more motor vehicles, and of a considerable number of companies and individuals who supply trucking service—a situation which is common in the commercial farming areas of the state—has resulted in the development of transportation habits and customs that are more or less wasteful of motor vehicle mileage. While inefficiencies have been generally recognized, little has been done to ascertain their nature or extent. The shortage of strategic materials and of manpower arising out of the war effort makes it imperative that all transportation, including farm transportation, be conducted as efficiently as possible.

## Objectives of Study

This study was undertaken to obtain information that would be helpful in the formulation of suggestions or plans for reducing farm transportation mileage. The principal objectives were (1) to ascertain the number, age, type, and condition of motor vehicles on farms in a typical southwestern Minnesota county, (2) to determine the on-farm and off-farm use of these vehicles during a specified period of time, (3) to as-

[1] The authors are indebted to County Agent Stanley B. Simpson, to Fred Niss, chairman of the Martin County Agricultural Conservation Committee, to the local press, to representatives of various civic organizations, and to local community leaders in Martin County for their cooperation in connection with this and other phases of the Martin County transportation study. The study was initiated in response to suggestions of the Corn Belt Livestock Marketing Research Committee, and the schedule used was adapted from one developed by this Committee.

Assistance in the preparation of this material was furnished by the personnel of Work Projects Administration, Official Project No. 265-1-71-236, Subproject No. 508.

certain the extent of cooperation among farmers in the use of farm-owned motor vehicles, (4) to determine the extent to which commercial trucks are used by these farmers or are readily available to them, and (5) to suggest ways and means for reducing farm transportation mileage.

## Source of Data and Method of Procedure

Martin County was selected as the location of the study, and the county extension service was asked to assist in assembling information. Martin County is in the southernmost tier of counties about midway from east to west and was chosen as being a typical southwestern Minnesota county.

Data were supplied by farmers who filled out a three-page schedule during the seven-day period of the study, August 2-8, 1942. Neighborhood leaders delivered the schedules and collected them from the farmers. Two methods were followed: in one, an attempt was made to obtain coverage of all farms in a few selected neighborhoods; in the other, one neighborhood leader of each neighborhood in the county was asked to obtain schedules from three farms. Under the first plan, 10 leaders of five neighborhoods were visited in company with the county agent, and the plan carefully explained. From the 76 farms in these selected neighborhoods, 66 schedules were obtained. These 76 farms included the farmsteads of 21 sections of land. In the remaining 188 neighborhoods, one of the two neighborhood leaders in each community was selected arbitrarily and requested by letter to obtain schedules from three farmers. It was suggested that one of the three schedules should be filled out by a farmer who owned a truck, and one by a farmer who did not own a truck. Of 564 possible schedules, 427 were obtained.

An inspection of the two groups of schedules revealed a smaller proportion of farms with standard trucks and a higher proportion with one automobile only in the five selected neighborhoods than in the county-wide survey. There was no significant difference in the proportion of farms with automobile trailers or pickup trucks.[2] As no other essential differences between the two groups of schedules were revealed, they were combined and studied together.

The use of motor vehicles by farmers naturally varies from day to day and from season to season according to weather conditions, production, marketing, family, and community factors. Although no single week is fully representative of the entire year, the differences probably are more of degree than of kind. The cooperating farmers were asked to report all driving and hauling done for or by them or their families during the seven days. It is believed that the results for this period are satisfactory indicators of the use made of motor vehicles by farmers of this area.

The tables and accompanying discussion of the number and age of motor vehicles and of the condition of tires are based upon the information supplied by all farmers who filled out schedules. This bulletin deals chiefly with the information supplied by the following four groups of farmers: group 1, those owning one automobile only; group 2, those owning one automobile and one automobile trailer only; group 3, those owning one automobile and one pickup truck only; and group 4, those owning one automobile and one standard truck only. It was believed that enough farms were included in each group to supply dependable data for comparison.

[2] Forty-two per cent of the farmers in the five selected communities owned one automobile only, 40 per cent owned one automobile and one automobile trailer, nearly 12 per cent owned one automobile and one pickup truck, and less than 7 per cent owned one automobile and one standard truck. Comparable figures for the farmers included in the county-wide survey were 28, 40, 14, and 18 per cent, respectively.

# MOTOR VEHICLES ON FARMS

## Number of Motor Vehicles

The 493 participating Martin County farmers reported owning 509 automobiles, 111 standard trucks, 89 pickup trucks, and 209 automobile trailers (table 1). Of these farmers, 122 (group 1) each reported the ownership of one automobile (table 2). An additional 161 (group 2) each reported the ownership of one automobile and one automobile trailer. Other fairly large groups included 57 farmers (group 3) each owning one automobile and one pickup truck, and 66 farmers (group 4) each owning one automobile and one standard truck. The number and type of motor vehicles owned by the remaining 87 farmers varied greatly. As shown in table 2,

**Table 1. Number of Motor Vehicles and Automobile Trailers Owned by 493 Martin County Farmers, August 2-8, 1942**

| Type of vehicle | Number of vehicles owned by 493 farmers |
|---|---|
| Automobiles | 509 |
| Standard trucks | 111 |
| Pickup trucks | 89 |
| Automobile trailers | 209 |

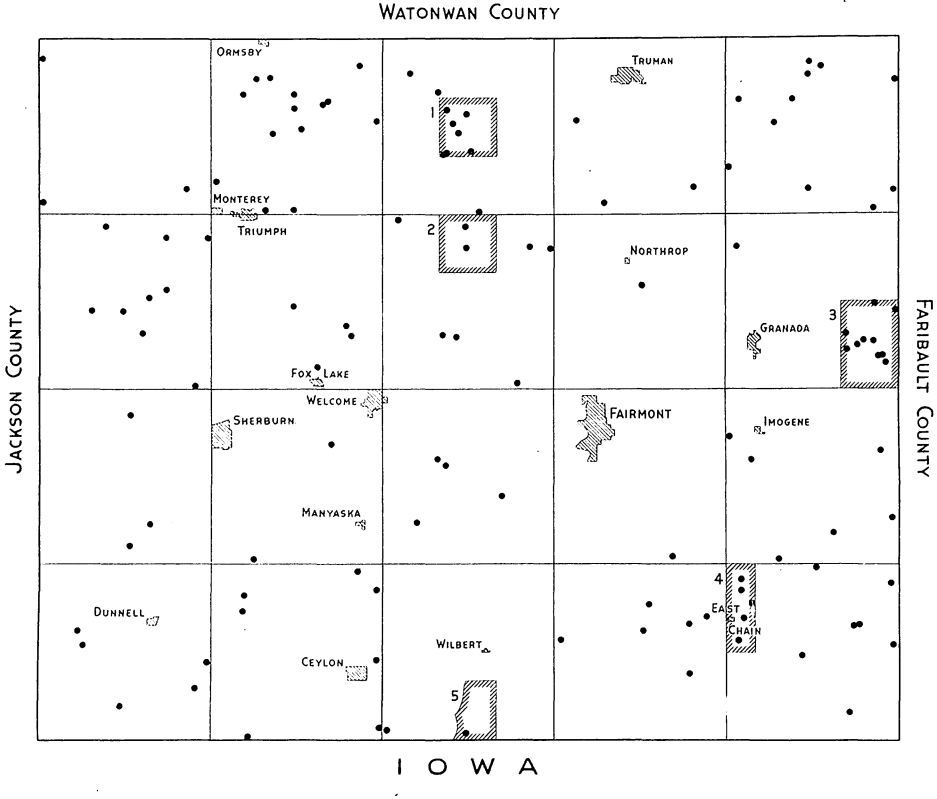



FIG. 1. Location of 122 farms in Martin County each with one automobile only
(Areas indicated as 1, 2, 3, 4, and 5 are the selected neighborhoods in which full coverage of all farms was attempted—see page 3.)

**Table 2. Number of Farmers by Groups Owning Various Combinations of Different Types of Motor Vehicles as Reported by 493 Martin County Farmers, August 2-8, 1942**

| Farmer groups and combinations of motor vehicles owned | Number of farmers |
|---|---|
| Group 1—One automobile | 122 |
| Group 2—One automobile and one automobile trailer | 161 |
| Group 3—One automobile and one pickup truck | 57 |
| Group 4—One automobile and one standard truck | 66 |
| Miscellaneous group | |
| Two automobiles | 6 |
| Two automobiles and one or more automobile trailers | 13 |
| Two automobiles and one pickup truck | 2 |
| Two automobiles and one standard truck | 9 |
| One automobile, one pickup truck, and one or more automobile trailers | 11 |
| One automobile, one standard truck, and one or more automobile trailers | 15 |
| Two automobiles, one standard truck, and one or more automobile trailers | 4 |
| One pickup truck | 12 |
| One standard truck | 5 |
| One pickup truck and one or more automobile trailers | 2 |
| One or more automobiles with two or more trucks | 6 |
| Total | 493 |

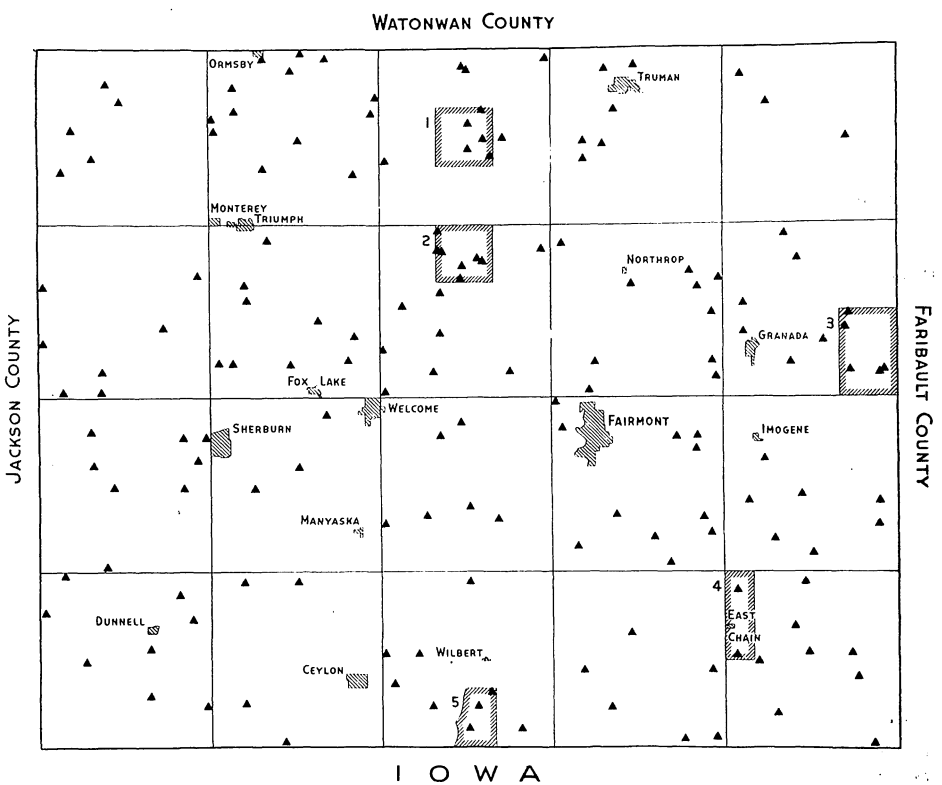



FIG. 2. Location of 161 farms in Martin County each with one automobile and one automobile trailer only

**Table 3. Age of Motor Vehicles Owned by 493 Martin County Farmers, August 2-8, 1942**

| Model year | Automobiles | | | Standard trucks | | | Pickup trucks | | |
|---|---|---|---|---|---|---|---|---|---|
| | Number | Per cent of total | Per cent given year's model or older | Number | Per cent of total | Per cent given year's model or older | Number | Per cent of total | Per cent given year's model or older |
| 1942 | 13 | 2.7 | 100.0 | ..... | ..... | 100.0 | ..... | ..... | 100.0 |
| 1941 | 72 | 14.7 | 97.3 | 8 | 7.5 | 100.0 | 13 | 15.5 | 100.0 |
| 1940 | 73 | 14.9 | 82.9 | 7 | 6.5 | 92.5 | 15 | 17.8 | 84.5 |
| 1939 | 43 | 8.8 | 67.8 | 3 | 2.8 | 86.0 | 8 | 9.5 | 66.7 |
| 1938 | 49 | 10.0 | 59.0 | 6 | 5.6 | 83.2 | 13 | 15.5 | 57.1 |
| 1937 | 97 | 19.8 | 49.0 | 10 | 9.4 | 77.6 | 6 | 7.1 | 41.7 |
| 1936 | 55 | 11.2 | 29.2 | 8 | 7.5 | 68.2 | 12 | 14.3 | 34.5 |
| 1935 | 34 | 6.9 | 18.0 | 12 | 11.2 | 60.7 | 3 | 3.6 | 20.2 |
| 1934 | 14 | 2.9 | 11.0 | 3 | 2.8 | 49.5 | 2 | 2.4 | 16.7 |
| 1933 | 6 | 1.2 | 8.2 | 1 | 0.9 | 46.7 | ..... | ..... | 14.3 |
| 1932 | 2 | 0.4 | 7.0 | 1 | 0.9 | 45.8 | 1 | 1.2 | 14.3 |
| 1931 | 8 | 1.6 | 6.5 | 8 | 7.5 | 44.9 | 2 | 2.4 | 13.1 |
| 1930 | 11 | 2.3 | 4.9 | 12 | 11.2 | 37.4 | ..... | ..... | 10.7 |
| 1929 | 7 | 1.4 | 2.7 | 13 | 12.2 | 26.2 | 4 | 4.7 | 10.7 |
| 1928 | 4 | 0.8 | 1.2 | 6 | 5.6 | 14.0 | ..... | ..... | 6.0 |
| 1927 | 1 | 0.2 | 0.4 | 2 | 1.9 | 8.4 | 2 | 2.4 | 6.0 |
| 1926 | ..... | ..... | 0.2 | 5 | 4.7 | 6.5 | 1 | 1.2 | 3.6 |
| 1925 | ..... | ..... | 0.2 | 1 | 0.9 | 1.9 | ..... | ..... | 2.4 |
| 1924 | ..... | ..... | 0.2 | 1 | 0.9 | 0.9 | ..... | ..... | 2.4 |
| 1923 | ..... | ..... | 0.2 | ..... | ..... | ..... | ..... | ..... | 2.4 |
| 1922 | ..... | ..... | 0.2 | ..... | ..... | ..... | 1 | 1.2 | 2.4 |
| 1921 | 1 | 0.2 | 0.2 | ..... | ..... | ..... | ..... | ..... | 1.2 |
| 1920 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 1.2 |
| 1919 | ..... | ..... | ..... | ..... | ..... | ..... | 1 | 1.2 | 1.2 |
| Total | 490 | 100.0 | | 107 | 100.0 | | 84 | 100.0 | |

these were placed in 11 different groups with from 2 to 15 farms in each.

Eighty-nine per cent of all farmers who supplied information owned one automobile either alone or in combination with other motor vehicles, 7 per cent each owned more than one automobile with or without other motor vehicles, and the remaining 4 per cent each owned one or more trucks but no automobiles. Thus each of the 493 Martin County farmers was equipped with some kind of motor vehicle.

## Age of Motor Vehicles

The standard trucks averaged much older than the other motor vehicles (table 3). There was relatively less difference in the average age of the automobiles and pickup trucks.

Only 8 per cent of the automobiles and 14 per cent of the pickup trucks were 1933 models or older compared with 47 per cent of the standard trucks. The proportions that were 1938 models or earlier were automobiles, 59 per cent;

**Table 4. Distribution of 405 Farm Automobiles According to Estimated Remaining Tire Mileage, Martin County, August 2-8, 1942**

| Remaining tire mileage | Automobiles | |
|---|---|---|
| | Number | Per cent |
| Less than 2,000 | 56 | 13.8 |
| 2,000 to 3,999 | 44 | 10.9 |
| 4,000 to 5,999 | 47 | 11.6 |
| 6,000 to 7,999 | 42 | 10.4 |
| 8,000 to 9,999 | 40 | 9.9 |
| 10,000 to 14,999 | 98 | 24.2 |
| 15,000 and over | 78 | 19.2 |
| Total | 405 | 100.0 |

**Table 5. Distribution of 50 Farm Standard Trucks and 44 Farm Pickup Trucks According to Estimated Remaining Tire Mileage, Martin County, August 2-8, 1942**

| Remaining tire mileage | Standard trucks | | Pickup trucks | |
|---|---|---|---|---|
| | Number | Per cent | Number | Per cent |
| Less than 2,500 | 9 | 18.0 | 6 | 13.6 |
| 2,500 to 7,499 | 16 | 32.0 | 16 | 36.4 |
| 7,500 to 12,499 | 10 | 20.0 | 9 | 20.5 |
| 12,500 to 17,499 | 11 | 22.0 | 6 | 13.6 |
| 17,500 to 22,499 | 1 | 2.0 | 4 | 9.1 |
| 22,500 to 27,499 | ..... | ..... | 1 | 2.3 |
| 27,500 to 32,499 | 2 | 4.0 | ..... | ..... |
| 32,500 and over | 1 | 2.0 | 2 | 4.5 |
| Total | 50 | 100.0 | 44 | 100.0 |

pickup trucks, 57 per cent; and standard trucks, 83 per cent. About one third of the automobiles and pickup trucks were 1940 models or later compared with only 14 per cent of the standard trucks.

### Condition of Tires

**Automobiles**—Estimates of remaining tire mileage were submitted by the owners of 405 farm automobiles (table 4). Tires on nearly 14 per cent of these cars were expected to give less than 2,000 miles of service and, on 47 per cent, less than 8,000 miles of service.[3] When these figures are related to the average miles driven during 1941 (table 6), it is apparent that many of the cars could have been operated only a few weeks or months under usual driving conditions without recapping old tires or purchasing new ones.

**Standard and pickup trucks**—A similar situation was found regarding the condition of tires on standard and pickup trucks. Fourteen per cent of the tires on pickup trucks and 18 per cent of those on standard trucks were expected to give less than 2,500 miles[4] of service (table 5). Over 36 per cent of the tires on pickup trucks and 32 per cent of those on standard trucks were expected to give from 2,500 to 7,499 miles of service. Thus the tires on 50 per cent of both pickup and standard trucks were expected to give less than 7,500 miles service without recapping.

## FARM TRANSPORTATION AND HAULING

### Miles Driven and Frequency of Use

The motor vehicles owned by each of the four groups of farmers were driven fewer miles during the week of the study than the average weekly mileage during 1941 (table 6). As this study was made before gas rationing was initiated,

[3] Owners were asked to estimate the remaining tire mileage for each tire. Most automobiles had one spare tire and a few had more than one spare. The total remaining mileage for all tires was divided by four to give the average remaining tire mileage for the vehicle. These estimates were based upon the manner in which the vehicles were being driven at the time of the study which was before gas rationing went into effect.

[4] It will be observed that the classification of remaining tire mileage in table 5 is not the same as in table 4. The classification used in table 4 was adopted to permit comparisons between farm automobile tire expectancy and average yearly mileage. The classification used in table 5 was adopted to permit comparisons with similar estimates submitted by commercial truckers. Most commercial truckers cover much greater mileage during the year than the typical farm automobile or farm-owned standard or pickup truck.

**Table 6. Average Number of Miles Various Motor Vehicles on Farms in Martin County Were Driven During 1941 and During the Week of August 2-8, 1942**

| Combination of vehicles | Number of farms | Average miles driven | | | | | |
|---|---|---|---|---|---|---|---|
| | | Automobile | | | Truck | | |
| | | 1941 | | Week of study | 1941 | | Week of study |
| | | Full year | Per week | | Full year | Per week | |
| Group 1: one automobile | 122 | 7,541 | 145.0 | 121.0 | ..... | ..... | ..... |
| Group 2: one automobile and one automobile trailer | 161 | 8,541 | 164.2 | 139.2 | ..... | ..... | ..... |
| Group 3: one automobile and one pickup truck | 57 | 8,304 | 159.7 | 118.6 | 5,522 | 106.2 | 71.2 |
| Group 4: one automobile and one standard truck | 66 | 9,119 | 175.4 | 134.2 | 5,006 | 96.3 | 56.7 |

the reduction in mileage was not due to that restriction. It is probable that farm automobile mileage normally is less during the summer than during other seasons because farmers are occupied with field work and because some local activities are discontinued during that period. Schools are closed, local organizations are less active, and fewer meetings are held during harvest.

Farm pickup and standard trucks probably are used more extensively on the farm, but less extensively off the farm, during the summer than during other seasons. The marketing of many farm products such as hogs, cattle, sheep, poultry, and some crops is at a low ebb during early August and this tends to lower the off-farm mileage which normally accounts for the larger share of the total mileage (table 7).

Farmers make considerable use of motor vehicles for hauling about the farm, particularly in summer. This is indicated by the frequency of on-farm use rather than by the distance traveled. For example, group 1 farmers with one automobile only averaged only 8.2 miles on the farm during the week, but used their automobiles on three different days, that is, every other work day during the period (table 7). Group 2 farmers with one automobile and one automobile trailer made slightly more use of their vehicles on the farm than those in group 1, averaging 8.9 miles

**Table 7. Use of Motor Vehicles by Farmers Owning Various Combinations, Martin County, August 2-8, 1942**

| Combination of vehicles | Number farmers | Use of vehicles during the week | | | | |
|---|---|---|---|---|---|---|
| | | Average number days on which used | | Average number miles | | |
| | | On-farm | Off-farm | On-farm | Off-farm | Total |
| Group 1: one automobile | 122 | 3.0 | 5.1 | 8.2 | 113.8 | 122.0 |
| Group 2: one automobile and automobile trailer | 161 | 3.2 | 5.2 | 8.9 | 122.1 | 131.0 |
| Group 3: one automobile and one pickup truck | | | | | | |
| Automobile | 57 | 2.2 | 4.0 | 10.1 | 108.5 | 118.6 |
| Pickup truck | 57 | 3.4 | 3.4 | 13.7 | 63.4 | 77.1 |
| Group 4: one automobile and one standard truck | | | | | | |
| Automobile | 66 | 3.2 | 4.4 | 10.5 | 109.0 | 119.5 |
| Standard truck | 66 | 3.1 | 2.0 | 14.0 | 41.6 | 55.6 |

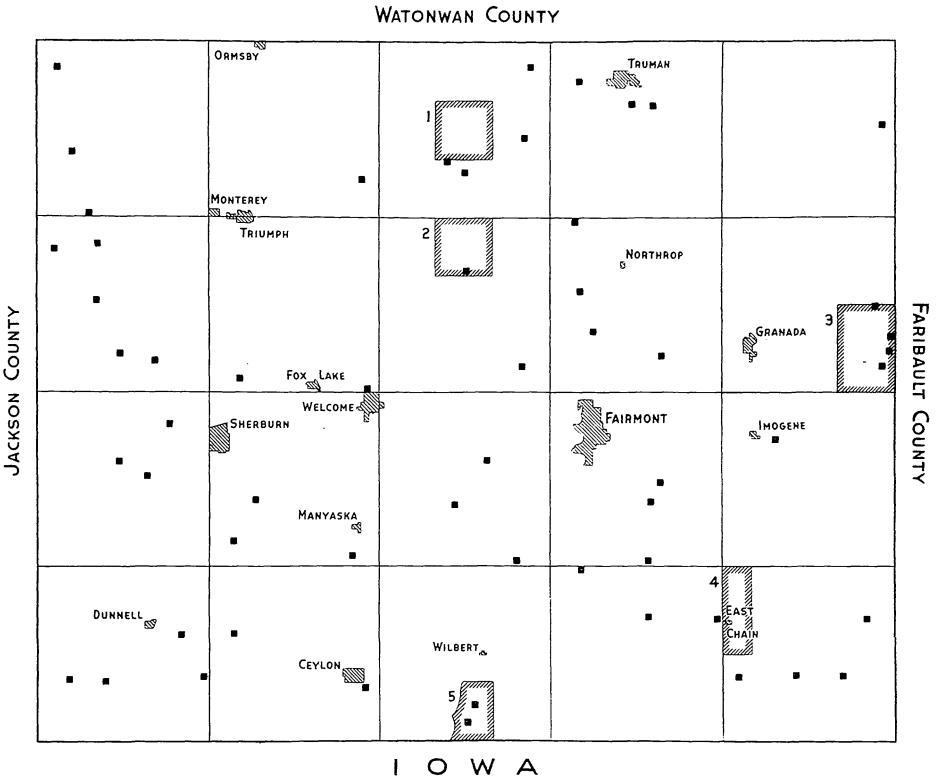



FIG. 3. Location of 57 farms in Martin County each with one automobile and one pickup truck only

and using their vehicles on the farm 3.2 days during the week. The combined automobile and truck mileage on group 3 farms with one automobile and one pickup truck and on group 4 farms with one automobile and one standard truck was over twice that on farms in groups 1 and 2, and they were used about twice as often. Both the automobiles and trucks were used on these farms, the automobiles being used fewer days on farms with pickup trucks than in any of the other groups. The on-farm truck mileage was somewhat greater than the on-farm automobile mileage both for farmers with pickup trucks and those with standard trucks.

The off-farm mileage during the week was much greater than the on-farm mileage for each type of motor vehicle. The frequency of automobile use off the farm also was much greater than the frequency of use on the farm, varying from 4.0 days off-farm use for farmers in group 3 to 5.2 days for those in group 2. On the other hand, the pickup trucks were used as many days on the farm as off the farm, while the standard trucks were used more frequently on than off the farm.

It will be observed that the total mileage during the week, as shown in the last column of table 7, does not agree fully with the total mileage for the same combination of vehicles as reported in the fourth and seventh columns of table 6. The discrepancies, while not marked except in the case of

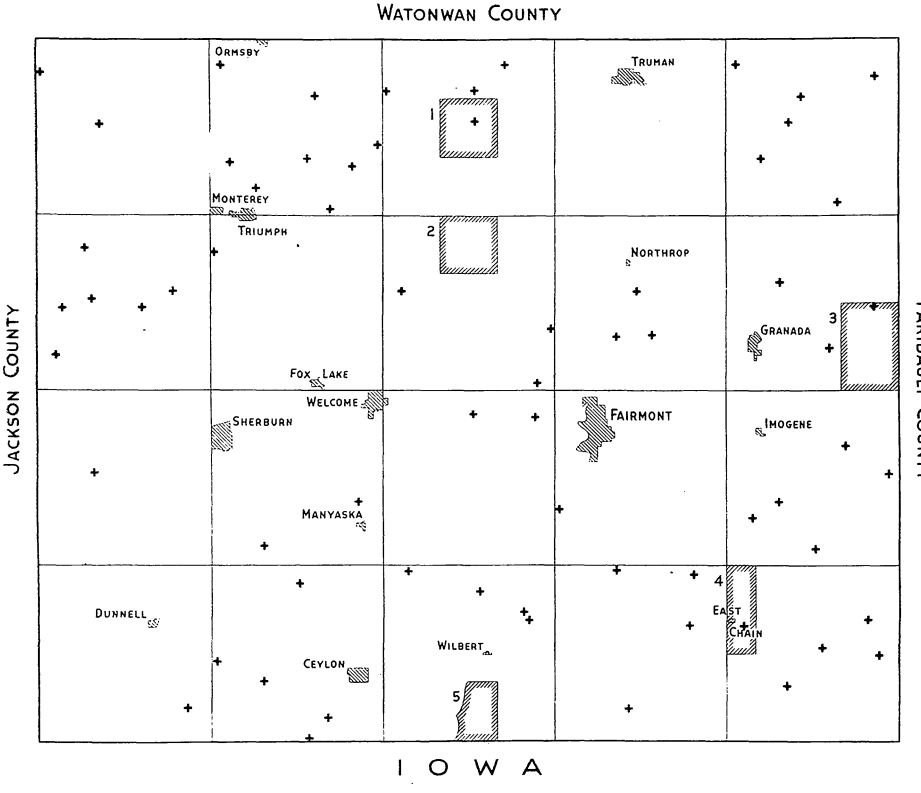



FIG. 4. Location of 66 farms in Martin County each with one automobile and one standard truck only

automobiles in group 4, are due to the fact that the data in table 6 represent speedometer readings, while those in table 7 were obtained from the reports of individual trips on and off the farm. The total mileage reported for the individual trips did not, in all cases, agree with the reported speedometer reading.

## Nature and Number of Trips Off the Farm

The 122 farmers in group 1 averaged 6.3 trips off the farm with their automobiles or nearly one trip a day during the week (table 8). Nearly one half were reported as trips to town on business. The average farm family in this group made slightly more than one trip to town for this purpose every other business day. Trips to work ranked second with an average of one trip per car. Most of these trips were made to other farms to assist with threshing or other farm work. In number of trips, recreation and church ranked third and fourth, with trips to neighbors on business other than to work ranking fifth, trips for medical attention sixth, and miscellaneous trips seventh. Recreation accounted for about 12 per cent of the trips and nearly 17 per cent of the mileage. Trips to neighbors on business and trips to work accounted for a considerably smaller proportion of the total mileage than of total trips because of the short distances involved. The same applied, but to a lesser extent, to trips

**Table 8. Trips Off the Farm Made by 122 Martin County Farmers Each Owning One Automobile Only, Group 1, August 2-8, 1942**

| Vehicle and nature of trip | Average number | | Proportion | |
|---|---|---|---|---|
| | Trips per farm | Miles per farm | Trips | Miles |
| | | | Per cent | Per cent |
| Automobile | | | | |
| Town on business | 3.1 | 54.2 | 48.3 | 47.6 |
| Recreation | 0.7 | 18.9 | 11.6 | 16.6 |
| Church | 0.7 | 9.8 | 10.7 | 8.6 |
| Work | 1.0 | 11.7 | 15.9 | 10.3 |
| Neighbors on business | 0.5 | 4.1 | 7.9 | 3.6 |
| Medical | 0.2 | 6.5 | 3.0 | 5.8 |
| Miscellaneous | 0.1 | 8.6 | 2.6 | 7.5 |
| Total | 6.3 | 113.8 | 100.0 | 100.0 |

to church. The situation was just the reverse in the case of miscellaneous trips and trips for medical attention—the proportion of total miles was much greater than of total trips.

Farmers in group 2 made somewhat more trips and drove slightly more miles off the farm than those in group 1. This group averaged 7.0 trips or one trip per day during the week (table 9). The greater off-farm mileage was due chiefly to more business trips to town—3.9 for group 2 and 3.1 for group 1.

The average number of trips and miles per farm and proportion of trips and miles for various purposes by farmers in group 3 are shown in table 10. Similar data for farmers in group 4 are presented in table 11. In each case, figures are given for the automobile and for the pickup or standard truck separately and both vehicles combined.

In each of these groups, fewer trips were made off the farm with automobiles, but more trips with automobiles and trucks combined than was the case with groups 1 and 2. The chief difference was in the number of trips to town on business: farmers in group 3 made 5.1 trips and drove 99.9 miles for this purpose with both vehicles combined, while those in group 4 made the same number of trips but drove somewhat fewer miles. Slightly less than half of the automobile mileage was the result of trips to town on business,

**Table 9. Trips Off the Farm Made by 161 Martin County Farmers Each Owning One Automobile and One Automobile Trailer Only, Group 2, August 2-8, 1942**

| Vehicle and nature of trip | Average number | | Proportion | |
|---|---|---|---|---|
| | Trips per farm | Miles per farm | Trips | Miles |
| | | | Per cent | Per cent |
| Automobile with or without automobile trailer | | | | |
| Town on business | 3.9 | 66.9 | 56.0 | 54.8 |
| Recreation | 0.6 | 20.8 | 9.3 | 17.0 |
| Church | 0.6 | 7.2 | 8.0 | 5.9 |
| Work | 1.0 | 11.8 | 13.7 | 9.7 |
| Neighbors on business | 0.5 | 4.9 | 7.1 | 4.0 |
| Medical | 0.3 | 6.2 | 3.7 | 5.0 |
| Miscellaneous | 0.1 | 4.3 | 2.2 | 3.6 |
| Total | 7.0 | 122.1 | 100.0 | 100.0 |

**Table 10. Trips Off the Farm Made by 57 Martin County Farmers Each Owning One Automobile and One Pickup Truck Only, Group 3, August 2-8, 1942**

| Vehicle and nature of trip | Average number | | Proportion | |
|---|---|---|---|---|
| | Trips per farm | Miles per farm | Trips | Miles |
| | | | Per cent | Per cent |
| Automobile | | | | |
| Town on business | 2.1 | 52.1 | 45.6 | 48.1 |
| Recreation | 0.9 | 27.5 | 18.4 | 25.3 |
| Church | 0.8 | 10.9 | 17.2 | 10.1 |
| Work | 0.2 | 4.5 | 4.6 | 4.1 |
| Neighbors on business | 0.3 | 4.8 | 6.9 | 4.4 |
| Medical | 0.1 | 2.5 | 2.3 | 2.3 |
| Miscellaneous | 0.2 | 6.2 | 5.0 | 5.7 |
| Total | 4.6 | 108.5 | 100.0 | 100.0 |
| Pickup truck | | | | |
| Town on business | 3.0 | 47.7 | 73.6 | 75.3 |
| Recreation | 0.1 | 1.2 | 1.7 | 1.9 |
| Church | 0.0* | 0.2 | 0.4 | 0.3 |
| Work | 0.5 | 8.3 | 11.5 | 13.2 |
| Neighbors on business | 0.3 | 3.8 | 8.5 | 5.9 |
| Medical | 0.0* | 1.4 | 0.4 | 2.2 |
| Miscellaneous | 0.2 | 0.8 | 3.9 | 1.2 |
| Total | 4.1 | 63.4 | 100.0 | 100.0 |
| Automobile and pickup truck combined | | | | |
| Town on business | 5.1 | 99.9 | 58.9 | 58.1 |
| Recreation | 0.9 | 28.7 | 10.5 | 16.7 |
| Church | 0.8 | 11.1 | 9.3 | 6.4 |
| Work | 0.7 | 12.9 | 7.9 | 7.5 |
| Neighbors on business | 0.7 | 8.5 | 7.6 | 5.0 |
| Medical | 0.1 | 3.8 | 1.4 | 2.2 |
| Miscellaneous | 0.4 | 7.0 | 4.4 | 4.1 |
| Total | 8.7 | 171.9 | 100.0 | 100.0 |

* Less than 0.1.

while 75 per cent of the pickup truck mileage and 86 per cent of the standard truck mileage was for this purpose. Farmers in groups 3 and 4 drove more miles for recreation than farmers in groups 1 and 2. About 25 per cent of the total automobile mileage in the case of farmers in groups 3 and 4 was for recreational purposes.

## Farm Products Sold

Seventy-seven per cent of the farmers in group 1 reported the sale of cream during the week and 75 per cent reported the sale of eggs (table 12). Only 9 per cent reported the sale of hogs; 9 per cent, grain; 8 per cent, poultry; 3 per cent, cattle and calves; and 4 per cent, miscellaneous items. Thus, during this particular week, most of the farmers in this group were concerned with the sale and hauling of cream and eggs, and relatively few with the marketing of other farm products.

The amount of products sold per farm reporting sales is shown in the third column of table 12. Those selling cream sold an average of 86 pounds during the week, and those selling eggs marketed an average of 35 dozen. In weight of product sold per farm, the most important items were grain, hogs, cattle and calves, miscellaneous products, and

**Table 11. Trips Off the Farm Made by 66 Martin County Farmers Each Owning One Automobile and One Standard Truck Only, Group 4, August 2-8, 1942**

| Vehicle and nature of trip | Average number | | Proportion | |
|---|---|---|---|---|
| | Trips per farm | Miles per farm | Trips | Miles |
| | | | Per cent | Per cent |
| Automobile | | | | |
| Town on business | 2.9 | 50.0 | 52.9 | 45.9 |
| Recreation | 0.6 | 26.3 | 11.0 | 24.1 |
| Church | 0.6 | 6.8 | 10.5 | 6.2 |
| Work | 0.6 | 6.9 | 10.7 | 6.3 |
| Neighbors on business | 0.3 | 2.9 | 5.8 | 2.7 |
| Medical | 0.2 | 9.7 | 3.6 | 8.9 |
| Miscellaneous | 0.3 | 6.4 | 5.5 | 5.9 |
| Total | 5.5 | 109.0 | 100.0 | 100.0 |
| Standard truck | | | | |
| Town on business | 2.2 | 35.8 | 81.0 | 86.2 |
| Recreation | ..... | ..... | ..... | ..... |
| Church | ..... | ..... | ..... | ..... |
| Work | 0.3 | 2.8 | 10.6 | 6.8 |
| Neighbors on business | 0.1 | 1.1 | 5.0 | 2.7 |
| Medical | ..... | ..... | ..... | ..... |
| Miscellaneous | 0.1 | 1.8 | 3.4 | 4.3 |
| Total | 2.7 | 41.5 | 100.0 | 100.0 |
| Automobile and standard truck combined | | | | |
| Town on business | 5.1 | 85.8 | 62.2 | 57.0 |
| Recreation | 0.6 | 26.3 | 7.4 | 17.5 |
| Church | 0.6 | 6.8 | 7.0 | 4.5 |
| Work | 0.9 | 9.7 | 10.7 | 6.4 |
| Neighbors on business | 0.4 | 4.0 | 5.5 | 2.7 |
| Medical | 0.2 | 9.7 | 2.4 | 6.4 |
| Miscellaneous | 0.4 | 8.2 | 4.8 | 5.5 |
| Total | 8.2 | 150.5 | 100.0 | 100.0 |

**Table 12. Volume and Method of Hauling Various Farm Products Sold by 122 Martin County Farmers Each Owning One Automobile Only, Group 1, August 2-8, 1942**

| Product | Farmers reporting sale | | Amount sold per farm reporting sale | Proportion of sales hauled | | |
|---|---|---|---|---|---|---|
| | Number | Per cent of farmers in group | | Owner | Trucker | Neighbor |
| | | | | Per cent | Per cent | Per cent |
| Cream | 94* | 77.0 | 86.2 lb. | 59.6 | 34.2 | 6.2 |
| Eggs | 92 | 75.4 | 34.9 doz. | 59.9 | 40.1 | ..... |
| Poultry | 10 | 8.2 | 119.2 lb. | 17.5 | 82.5 | ..... |
| Hogs | 11 | 9.0 | 2,077.4 lb. | 9.2 | 90.8 | ..... |
| Cattle and calves | 4 | 3.3 | 692.5 lb. | ..... | 100.0 | ..... |
| Grain | 11 | 9.0 | 5,379.1 lb. | 4.7 | 59.8 | 35.5 |
| Miscellaneous | 5 | 4.1 | 585.8 lb. | 62.5 | 37.5 | ..... |

* One additional farmer sold whole milk instead of cream and this is included in the miscellaneous item.

poultry. However, cattle marketings were at an extremely low level, and hog and poultry marketings were much below other months. Most of the feed grain in this area is fed on farms where it is produced and cash grain crops do not involve extensive acreage. Frequent showers interfered with threshing during the week, and this resulted in less grain being sold for cash than usual at the height of threshing.

A higher proportion of the farmers in group 2 than in group 1 sold each kind of farm product and the amount sold per farm was greater (table 13). Farms in group 3 sold somewhat more cream, poultry, and hogs, considerably more cattle and calves, but slightly less eggs, grain, and miscellaneous products per farm reporting sales than was the case with farms in group 2. However, 26 per cent of these farmers sold grain, compared with 13 per cent of those in group 2, and 9 per cent of those in group 1 (table 14).

In the proportion of farmers reporting sales and the amount of the various products sold per farm, group 4 was more nearly comparable with group 3 than with groups 1 and 2. However, a smaller proportion of farmers in group 4 sold cream and eggs than in any other group. The proportion of farmers selling grain was second only to those in group 3, but the amount sold per farm was less than for any other except group 1 (table 15).

These figures suggested that farms in group 2 were larger business enterprises than those in group 1, and that farms in groups 3 and 4 were larger than those in group 2. An examination of AAA records on individual farms in Martin County proved this assumption to be correct (table 16). Farms in group 1 averaged 168 acres; group 2, 176 acres; group 3, 222 acres; and group 4, 233 acres. The acreage of corn, oats, barley, and mixed grain, and of all crops combined, increased with size of farm. The number of the different species and classes of livestock which are important in the area also tended to increase with size of farm. This applied to all cattle and calves, dairy cows, hens, and, with the exception of group 4 where numbers were slightly below group 3, to cattle and calves on feed, and to the number of sows kept for farrow during the spring and summer of 1942.

Farms in group 4 did not differ greatly from those in group 3 either in size of farm or farm organization, while farms in group 2 were more nearly comparable to those in group 1 than to those in groups 3 and 4.

Farms in each of the four groups averaged about the same distance from town and there seemed to be no significant differences among groups as to the location of individual farms in relation to type of road. All-season gravel or hard-surfaced roads predominate throughout the county.

## Farm Supplies Bought

Supplies delivered at the farms during the week included groceries, machinery and repairs, sacked feed, grain, tractor fuel, gasoline, and miscellaneous commodities. The proportion of farmers obtaining supplies and the average amounts of each item delivered per farm reporting purchases, for each of the four groups, are shown in tables 17, 18, 19, and 20.

Most of the farmers in each group reported the purchase of groceries during the week. About one third reported the purchase of machinery and repairs, and about one fourth purchased various miscellaneous items. Occasional showers, which interfered with threshing and other farm work, resulted in the delivery of tractor fuel and gasoline at relatively few farms during the period. The most significant difference between the various groups occurred in connection with the purchase of grain. Much

**Table 13. Volume and Method of Hauling Various Farm Products Sold by 161 Martin County Farmers Each Owning One Automobile and One Automobile Trailer Only, Group 2, August 2-8, 1942**

| Product | Farmers reporting sale | | Amount sold per farm reporting sale | Proportion of sales hauled | | |
|---|---|---|---|---|---|---|
| | Number | Per cent of farmers in group | | Owner | Trucker | Neighbor |
| | | | | Per cent | Per cent | Per cent |
| Cream | 140* | 87.0 | 123.3 lb. | 62.1 | 28.2 | 9.7 |
| Eggs | 139 | 86.3 | 44.7 doz. | 54.6 | 45.4 | ..... |
| Poultry | 21 | 13.0 | 163.7 lb. | 34.3 | 65.7 | ..... |
| Hogs | 28 | 17.4 | 2,783.5 lb. | 36.9 | 61.5 | 1.6 |
| Cattle and calves | 14 | 8.7 | 1,455.8 lb. | 47.9 | 52.1 | ..... |
| Grain | 21 | 13.0 | 18,258.3 lb. | 14.7 | 82.7 | 2.6 |
| Miscellaneous | 12 | 7.5 | 866.7 lb. | 34.6 | 65.4 | ..... |

* Seven additional farmers sold whole milk instead of cream. Six of these reported the amount of whole milk sold, and this is included in the miscellaneous item.

**Table 14. Volume and Method of Hauling Various Farm Products Sold by 57 Martin County Farmers Each Owning One Automobile and One Pickup Truck Only, Group 3, August 2-8, 1942**

| Product | Farmers reporting sale | | Amount sold per farm reporting sale | Proportion of sales hauled | | |
|---|---|---|---|---|---|---|
| | Number | Per cent of farmers in group | | Owner | Trucker | Neighbor |
| | | | | Per cent | Per cent | Per cent |
| Cream | 48* | 84.2 | 137.4 lb. | 69.6 | 24.1 | 6.3 |
| Eggs | 46 | 80.7 | 41.5 doz. | 59.0 | 40.3 | 0.7 |
| Poultry | 5 | 8.8 | 181.2 lb. | 99.4 | 0.6 | ..... |
| Hogs | 7 | 12.3 | 3,854.3 lb. | 33.4 | 66.6 | ..... |
| Cattle and calves | 6 | 10.5 | 3,032.8 lb. | 1.6 | 98.4 | ..... |
| Grain | 15 | 26.3 | 14,319.5 lb. | 39.7 | 60.3 | ..... |
| Miscellaneous | 6 | 10.5 | 377.3 lb. | 56.4 | 43.6 | ..... |

* Four additional farmers reported the sale of milk instead of cream. Three of these reported the amount of milk sold, and this is included in the miscellaneous item.

**Table 15. Volume and Method of Hauling Various Farm Products Sold by 66 Martin County Farmers Each Owning One Automobile and One Standard Truck Only, Group 4, August 2-8, 1942**

| Product | Farmers reporting sale | | Amount sold per farm reporting sale | Proportion of sales hauled | | |
|---|---|---|---|---|---|---|
| | Number | Per cent of farmers in group | | Owner | Trucker | Neighbor |
| | | | | Per cent | Per cent | Per cent |
| Cream | 50* | 75.8 | 124.6 lb. | 66.7 | 30.1 | 3.2 |
| Eggs | 48 | 72.7 | 38.5 doz. | 58.0 | 39.6 | 2.4 |
| Poultry | 5 | 7.6 | 72.8 lb. | 41.2 | 58.8 | ..... |
| Hogs | 9 | 13.6 | 3,635.0 lb. | 88.9 | 11.1 | ..... |
| Cattle and calves | 7 | 10.6 | 2,039.3 lb. | 65.6 | 34.4 | ..... |
| Grain | 14 | 21.2 | 7,831.9 lb. | 91.4 | ..... | 8.6 |
| Miscellaneous | 6 | 9.1 | 944.5 lb. | 21.6 | 78.4 | ..... |

* Five other farmers reported the sale of milk instead of cream. Three of these reported the amount of milk sold, and this is included in the miscellaneous item.

**Table 16. Size and Organization of Farms with Various Combinations of Motor Vehicles, Martin County, 1942***

| | Group 1 (122 farmers each owning one automobile) | Group 2 (161 farmers each owning one automobile and one automobile trailer) | Group 3 (57 farmers each owning one automobile and one pickup truck) | Group 4 (66 farmers each owning one automobile and one standard truck) |
|---|---|---|---|---|
| Average distance to town, *miles* | 6 | 5 | 5 | 6 |
| Average size of farm, acres | 168 | 176 | 222 | 233 |
| Cropland | 142 | 153 | 195 | 205 |
| Corn | 52 | 57 | 71 | 77 |
| Oats, barley, and mixed grain | 38 | 43 | 51 | 53 |
| Tame hay | 14 | 15 | 18 | 15 |
| Average number of livestock on farm | | | | |
| All cattle and calves | 26 | 30 | 40 | 40 |
| Dairy cows | 10 | 11 | 13 | 14 |
| Cattle and calves on feed | 9 | 10 | 19 | 15 |
| All sheep | 13 | 6 | 12 | 12 |
| Sheep and lambs on feed | 7 | 1 | 5 | 2 |
| Horses | 3 | 4 | 4 | 4 |
| Hens | 229 | 233 | 264 | 266 |
| Average number of sows to farrow, spring and fall, 1942 | 9 | 11 | 15 | 14 |

* The data on size, crop acreage, and livestock were obtained from AAA records in Martin County.

more grain was purchased by farmers in group 2 than by those in group 1, and more by farmers in groups 3 and 4 than by those in group 2. Farmers with the most livestock and poultry (table 16) purchased the most feed.

## Method of Hauling Farm Products and Supplies

All of the products sold from, and supplies delivered to, these farms were hauled in motor vehicles or automobile trailers owned by the farm operators or by their neighbors, or in trucks operated by others. In the case of some commodities, chief reliance was placed upon the farmers' own vehicles while other commodities were hauled largely or entirely by outside truckers. In general, a relatively small amount of hauling was done by these farmers for their neighbors or by neighbors for them.

There was considerable variation among farmers who owned the same type of motor vehicle or combination

**Table 17. Volume and Method of Hauling Various Supplies Purchased by 122 Martin County Farmers Each Owning One Automobile Only, Group 1, August 2-8, 1942**

| Supplies | Farmers reporting purchases | | Amount bought per farm reporting purchase | Proportion of purchases hauled | | |
|---|---|---|---|---|---|---|
| | Number | Per cent of farmers in group | | Owner | Trucker | Neighbor |
| | | | | Per cent | Per cent | Per cent |
| Groceries | 103 | 84.4 | 54.3 lb. | 98.5 | 1.4 | 0.1 |
| Machinery and repairs | 36 | 29.5 | 28.1 lb. | 100.0 | ..... | ..... |
| Sacked feed | 28 | 23.0 | 457.1 lb. | 100.0 | ..... | ..... |
| Grain | 8 | 6.6 | 1,683.9 lb. | 15.3 | 84.7 | ..... |
| Tractor fuel | 6 | 4.9 | 60.8 gal. | ..... | 100.0 | ..... |
| Gasoline | 11 | 9.0 | 81.4 gal. | ..... | 100.0 | ..... |
| Miscellaneous | 38 | 31.1 | 1,070.7 lb. | 18.5 | 81.2 | 0.3 |

**Table 18. Volume and Method of Hauling Various Supplies Purchased by 161 Martin County Farmers Each Owning One Automobile and One Automobile Trailer Only, Group 2, August 2-8, 1942**

| Supplies | Farmers reporting purchases | | Amount bought per farm reporting purchase | Proportion of purchases hauled | | |
|---|---|---|---|---|---|---|
| | Number | Per cent of farmers in group | | Owner | Trucker | Neighbor |
| | | | | Per cent | Per cent | Per cent |
| Groceries | 143 | 88.8 | 66.0 lb. | 99.5 | 0.4 | 0.1 |
| Machinery and repairs | 61 | 37.9 | 118.7 lb. | 100.0 | ..... | ..... |
| Sacked feed | 75 | 46.6 | 551.6 lb. | 100.0 | ..... | ..... |
| Grain | 41 | 25.5 | 3,433.3 lb. | 60.2 | 30.4 | 9.4 |
| Tractor fuel | 7 | 4.3 | 110.6 gal. | ..... | 100.0 | ..... |
| Gasoline | 21 | 13.0 | 85.5 gal. | ..... | 100.0 | ..... |
| Miscellaneous | 43 | 26.7 | 1,088.3 lb. | 70.9 | 28.8 | 0.3 |

**Table 19. Volume and Method of Hauling Various Supplies Purchased by 57 Martin County Farmers Each Owning One Automobile and One Pickup Truck Only, Group 3, August 2-8, 1942**

| Supplies | Farmers reporting purchases | | Amount bought per farm reporting purchase | Proportion of purchases hauled | | |
|---|---|---|---|---|---|---|
| | Number | Per cent of farmers in group | | Owner | Trucker | Neighbor |
| | | | | Per cent | Per cent | Per cent |
| Groceries | 46 | 80.7 | 51.5 lb. | 99.8 | 0.2 | ..... |
| Machinery and repairs | 21 | 36.8 | 54.7 lb. | 34.6 | 61.2 | 4.2 |
| Sacked feed | 18 | 31.6 | 619.4 lb. | 100.0 | ..... | ..... |
| Grain | 16 | 28.1 | 8,734.6 lb. | 87.9 | 12.1 | ..... |
| Tractor fuel | 1 | 1.8 | 5 gal. | ..... | ..... | 100.0 |
| Gasoline | 2 | 3.5 | 175 gal. | ..... | 100.0 | ..... |
| Miscellaneous | 12 | 21.1 | 1,123.3 lb. | 100.0 | ..... | ..... |

**Table 20. Volume and Method of Hauling Various Supplies Purchased by 66 Martin County Farmers Each Owning One Automobile and One Standard Truck Only, Group 4, August 2-8, 1942**

| Supplies | Farmers reporting purchases | | Amount bought per farm reporting purchase | Proportion of purchases hauled | | |
|---|---|---|---|---|---|---|
| | Number | Per cent of farmers in group | | Owner | Trucker | Neighbor |
| | | | | Per cent | Per cent | Per cent |
| Groceries | 51 | 77.3 | 52.3 lb. | 98.2 | 1.8 | ..... |
| Machinery and repairs | 24 | 36.4 | 135.6 lb. | 100.0 | ..... | ..... |
| Sacked feed | 18 | 27.3 | 479.2 lb. | 100.0 | ..... | ..... |
| Grain | 15 | 22.7 | 27,673.6 lb. | 100.0 | ..... | ..... |
| Tractor fuel | 3 | 4.5 | 120.0 gal. | ..... | 100.0 | ..... |
| Gasoline | 9 | 13.6 | 104.4 gal. | ..... | 100.0 | ..... |
| Miscellaneous | 16 | 24.2 | 6,387.5 lb. | 21.6 | 78.4 | ..... |

of vehicles in the methods employed to transport some products to market. For example, 55 of the 103 farmers in group 1 who reported the sale of cream or eggs, or both, transported all of those products to market in their own or in their neighbors' vehicles. Truckers were employed to render all of this service for 19 farms; the other 29 farms used both farm vehicles and outside trucks.

Of the 55 farmers who transported these products to market entirely with farm vehicles, 42 hauled for themselves only, while 13 also hauled for neighbors, usually on an exchange basis. Of the 19 farmers who relied entirely upon truckers for hauling whatever cream and eggs were marketed, 13 sold both products and 12 of these employed separate truckers for the cream and for the eggs. Of the 29 farmers who used both farm vehicles and commercial trucks, 13 hauled cream for themselves only, or for themselves and neighbors, but turned the hauling of eggs over to truckers, while 11 hauled eggs for themselves only, or for themselves and neighbors, but employed truckers to haul all of the cream, and 5 transported some of the cream or eggs or both in their own or in their neighbors' vehicles and some in outside trucks.

Sixty per cent of the cream produced on farms in group 1 was hauled to market by the farmers, 34 per cent by outside truckers, and 6 per cent by neighbors (table 12). Sixty per cent of the eggs also were hauled by the farmers in their own automobiles, the remaining 40 per cent being hauled by truckers. All of the cattle and most of the poultry and hogs were hauled by truckers, only small amounts being hauled in the farmers' own automobiles. Sixty per cent of the grain was hauled by commercial truckers, 36 per cent by neighbors who owned trucks, and less than 5 per cent in the farmers' own automobiles. The farm operators hauled two thirds of the miscellaneous products and truckers hauled one third.

The type of motor vehicle or combination of vehicles on farms appeared to have little effect upon the methods employed in transporting cream and eggs to market. In all four groups, about the same proportions were hauled in the farmers' own vehicles, by truckers, and by neighbors. However, farmers with an automobile and automobile trailer (table 13), or automobile and pickup truck (table 14), or automobile and standard truck (table 15), hauled a higher proportion of poultry, hogs, cattle and calves, and grain in their own vehicles than those with an automobile only (table 12). Those with an automobile and standard truck hauled a higher proportion of hogs, cattle and calves, and grain in their own vehicles than any of the other groups, and a higher proportion of poultry than any except group 3. These relationships would be expected from the types of vehicles available. The combination of vehicles had no appreciable effect on the kind or amount of products hauled for these farmers by their neighbors.

The type of motor vehicle or combination of vehicles on farms appeared to have little effect upon the method of transporting some supplies to the farms, but an important effect upon others. For example, most of the groceries, all of the sacked feed, and all of the machinery repairs except for group 3 were hauled to the farms in the farmers' own vehicles (tables 17, 18, 19, and 20). On the other hand, all of the tractor fuel, except an insignificant amount for one farm in group 3, and all of the gasoline were delivered by outside truckers. Special petroleum trucks render this service throughout the commercial farming areas of the state.

The most important differences in the methods employed in hauling supplies to the four groups of farms were found in the case of grain and miscellaneous products. Whereas relatively small amounts of these supplies were hauled

in their own vehicles by farmers in group 1 (table 17), 60 per cent of the grain and 71 per cent of the miscellaneous supplies for farms in group 2 were hauled in the farmers' own vehicles, and 88 and 100 per cent, respectively, in the case of farmers in group 3. Farmers in group 4 hauled all of the grain in their own vehicles. The relatively small proportion of miscellaneous commodities hauled by these farmers (table 20) was owing chiefly to a large amount of gravel delivered at one farm in outside trucks.

## Cooperation with Neighbors

Relatively little organized effort appears to have been made by the farmers to cooperate with their neighbors in the use of motor vehicles and automobile trailers. For example, 45 per cent of the farmers in group 1 reported taking neighbors along on one or more trips, but such trips accounted for only slightly over 16 per cent of all trips during the week (table 21). A slightly higher proportion of farmers in group 2 reported taking neighbors along, but this occurred on slightly less than 16 per cent of the trips. The proportions of farmers in groups 3 and 4 reporting taking neighbors along on trips with automobiles and the proportions of trips on which neighbors were transported were less than for groups 1 and 2, and the proportions were still less for the pickup (group 3) and standard (group 4) trucks. Neighbors were taken along on only 11.1 per cent of the combined automobile and pickup truck trips made by farmers in group 3, and 11.2 per cent of the combined automobile and standard truck trips made by farmers in group 4.

The proportion of farmers reporting serving neighbors is shown for farmers with each combination of vehicles in the third column of table 21. The proportion serving neighbors naturally is higher than the proportion taking neighbors along because this figure includes the hauling of products and supplies for neighbors as well as the trips on which neighbors were taken along. However, the difference is not very great except in the case of the pickup and standard trucks. This suggests that relatively little hauling was done for neighbors. This is confirmed by data on the amounts of various farm products (table 22) and supplies (table 23)

**Table 21. Extent of Cooperation with Neighbors in the Use of Motor Vehicles by Farmers Owning Various Combinations of Vehicles, Martin County, August 2-8,1942**

| Combination of vehicles | Farmers reporting taking neighbors along | Trips with neighbors along | Farmers reporting serving neighbors | Average number of neighbor families served per vehicle on farms |
|---|---|---|---|---|
| | Per cent | Per cent | Per cent | Per cent |
| Group 1. 122 farmers each owning one automobile | 45.1 | 16.3 | 55.7 | 1.3 |
| Group 2. 161 farmers each owning one automobile and one automobile trailer | 50.9 | 15.9 | 60.2 | 1.4 |
| Group 3. 57 farmers each owning one automobile and one pickup truck | | | | |
| Automobile | 35.1 | 15.2 | 42.1 | 0.8 |
| Pickup truck | 19.3 | 7.2 | 36.8 | 0.7 |
| Group 4. 66 farmers each owning one automobile and one standard truck | | | | |
| Automobile | 42.4 | 13.3 | 47.0 | 1.0 |
| Standard truck | 12.1 | 7.0 | 24.2 | 0.7 |

**Table 22. Amount of Various Farm Products Hauled for Neighbors and Number of Neighbors Served by Farmers Owning Various Combinations of Vehicles, Martin County, August 2-8, 1942**

| Product | Group 1 122 farmers each owning one automobile | | Group 2 161 farmers each owning one automobile and one automobile trailer | | Group 3 57 farmers each owning one automobile and one pickup truck | | Group 4 66 farmers each owning one automobile and one standard truck | |
|---|---|---|---|---|---|---|---|---|
| | Product hauled | Neighbors served | Product hauled | Neighbors served | Product hauled | Neighbors served | Product hauled | Neighbors served |
| Cream, pounds | 1,780 | 18 | 2,132 | 25 | 1,547 | 12 | 1,084 | 8 |
| Eggs, dozens | 53 | 3 | 79 | 5 | 1 | 1 | 35 | 2 |
| Poultry, pounds | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Hogs, pounds | 44 | 1 | ..... | ..... | 1,250 | 1 | ..... | ..... |
| Cattle and calves, pounds | ..... | ..... | ..... | ..... | ..... | ..... | 850 | 1 |
| Grain, pounds | 412 | 2 | ..... | ..... | 16,800 | 2 | 252,904 | 10 |
| Miscellaneous, pounds | ..... | ..... | 200 | 1 | 1,324 | 1 | 67 | 1 |

hauled by these farmers for their neighbors.

Farmers in groups 1, 2, and 3 served from two to four times as many neighbors by hauling cream as by hauling all other farm products combined, while farmers with standard trucks (group 4) served slightly more neighbors by hauling grain than by hauling cream. However, even the hauling of cream for neighbors by groups 1, 2, and 3 and the hauling of both grain and cream for neighbors by group 4 were relatively unimportant compared with the total hauling done by each group. Such hauling was more important in the case of farmers with standard trucks (group 4) than farmers with pickup trucks (group 3) and more important for the latter than for groups 1 and 2.

Groceries were the most important farm supplies hauled for neighbors by each group of farmers (table 23). Farmers in groups 1 and 2 served slightly more neighbors by hauling groceries than by hauling cream, those in group 4 served the same number, and those in group 3 served approximately

**Table 23. Amount of Various Supplies Hauled for Neighbors and Number of Neighbors Served by Farmers Owning Various Combinations of Vehicles, Martin County, August 2-8, 1942**

| Supplies | Group 1 122 farmers each owning one automobile | | Group 2 161 farmers each owning one automobile and one automobile trailer | | Group 3 57 farmers each owning one automobile and one pickup truck | | Group 4 66 farmers each owning one automobile and one standard truck | |
|---|---|---|---|---|---|---|---|---|
| | Supplies hauled | Neighbors served | Supplies hauled | Neighbors served | Supplies hauled | Neighbors served | Supplies hauled | Neighbors served |
| Groceries, pounds | 538 | 24 | 916 | 33 | 151 | 11 | 120 | 8 |
| Machinery and repairs, pounds | ..... | ..... | 155 | 6 | 15 | 1 | ..... | ..... |
| Sacked feed, pounds | 400 | 2 | 520 | 3 | ..... | ..... | ..... | ..... |
| Grain, pounds | ..... | ..... | 2,840 | 2 | 43,000 | 2 | 128,120 | 3 |
| Tractor fuel, gallons | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Gasoline, gallons | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Miscellaneous, pounds | 500 | 1 | 11 | 2 | 60 | 2 | 25,070 | 1 |

the same number. Relatively few neighbors were served by hauling supplies other than groceries.

Not only did the farmers included in this study do relatively little hauling for their neighbors, but neighbors hauled relatively little for them. The latter is indicated for farm products sold in the last column of tables 12, 13, 14, and 15, and for supplies bought in the last column of tables 17, 18, 19, and 20.

### Number of Commercial Trucks Passing Farms

Commercial trucks hauling various farm products and supplies passed many of the farms in each group regularly. These included separate trucks hauling cream, eggs and poultry, livestock, oil, bread, and other commodities. From 56 to 63 per cent of the farmers in the various groups reported oil trucks passing regularly (table 24). Egg and poultry trucks were reported to pass regularly by from 55 to 61 per cent, cream trucks by from 45 to 50 per cent, and other trucks by from 24 to 34 per cent of the farmers in the various groups. The proportion reporting livestock trucks passing regularly varied much more than for any of the other types of trucks, from 20 per cent for group 4 to 42 per cent for groups 1 and 2. A relatively small proportion of farms in group 1 and 2 reported special bread trucks passing regularly.

The average number of cream trucks passing the different groups of reporting farms regularly varied from 1.5 to 1.7, egg and poultry trucks from 1.7 to 2.1, oil trucks from 2.5 to 2.6, livestock trucks from 2.9 to 3.8, and other trucks from 4.4 to 9.4. From the standpoint both of the proportion of farmers reporting and the average number of trucks of various types passing the reporting farms regularly, it appears that commercial trucks for hauling farm products and supplies were readily available to farmers of each of the four groups at the time of the study.

## REDUCING MILEAGE IN FARM TRANSPORTATION

Minnesota farmers depend so completely upon motor vehicles for local transportation and hauling that it is imperative that adequate transportation facilities remain available for nec-

**Table 24. Average Number of Commercial Trucks Regularly Passing Farms with Various Combinations of Motor Vehicles, Martin County, August 2-8, 1942**

| Class of truck | Group 1 122 farmers each owning one automobile | | Group 2 161 farmers each owning one automobile and one automobile trailer | | Group 3 57 farmers each owning one automobile and one pickup truck | | Group 4 66 farmers each owning one automobile and one standard truck | |
|---|---|---|---|---|---|---|---|---|
| | Farmers reporting | Average number trucks passing regularly | Farmers reporting | Average number trucks passing regularly | Farmers reporting | Average number trucks passing regularly | Farmers reporting | Average number trucks passing regularly |
| | Per cent | | Per cent | | Per cent | | Per cent | |
| Cream | 50.0 | 1.6 | 50.2 | 1.5 | 49.1 | 1.7 | 45.4 | 1.5 |
| Egg and poultry | 54.9 | 1.7 | 59.0 | 1.9 | 61.4 | 1.9 | 54.5 | 2.1 |
| Oil | 57.4 | 2.5 | 62.7 | 2.6 | 56.1 | 2.6 | 56.1 | 2.5 |
| Livestock | 41.8 | 2.9 | 41.6 | 3.8 | 35.1 | 3.5 | 19.7 | 3.6 |
| Bread | 5.7 | 1.6 | 1.2 | 1.5 | ..... | ..... | ..... | ..... |
| Other | 34.4 | 4.4 | 31.7 | 9.4 | 26.3 | 5.2 | 24.2 | 4.9 |

essary local travel and hauling. It is not a question of whether motor vehicles are required to do the job, but rather a question of whether the job is being done effectively.

The formulation of workable plans for reducing farm transportation and hauling mileage is much more complicated than in the case of commercial trucks engaged in hauling special commodities such as cream, eggs and poultry, livestock, oil, etc. Farm transportation and hauling may involve the hauling of some or all of these commodities in addition to various other business uses both on and off the farm, and to the use of the automobile or truck by the farm family. In some cases it is difficult to distinguish between family and farm business uses. Granting the complexity of the problem, it is apparent from this study that many inefficiencies and much duplication of effort are involved in the existing farm transportation structure.

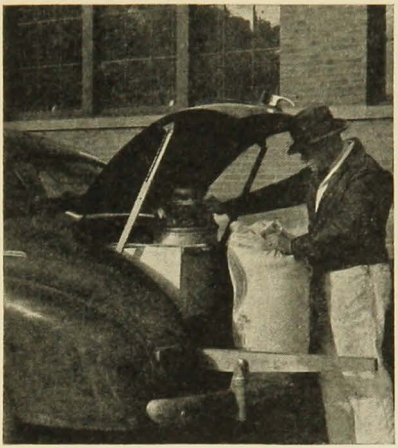
Suggestions for bringing about greater efficiency in farm transportation and hauling include (1) better planning of trips with farm motor vehicles, (2) greater cooperation with neighbors in the use of farm vehicles, and (3) greater use of commercial trucks for hauling farm products and supplies. Some of these suggestions may be helpful only during the war emergency, while others may be useful in more normal times as well.

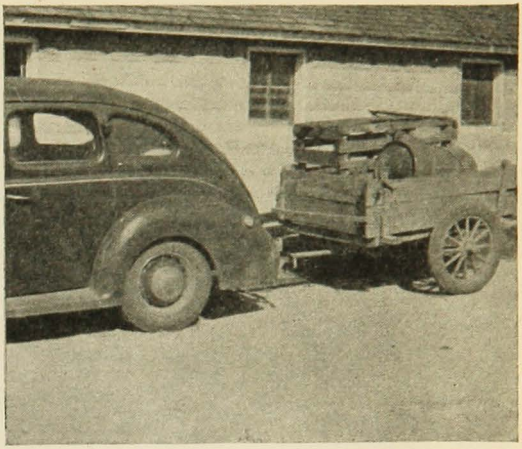
## Better Planning of Trips

While there are sharp differences of opinion as to what should be included under the heading of "necessary" use of farm motor vehicles, it appears that considerable reduction in mileage could be effected through more careful planning of trips without lowering farm efficiency. It has been shown that farmers with one automobile only (group 1) averaged 6.3 trips off the farm during the week, those with one automobile and automobile trailer (group 2) 7.0 trips, those with one automobile and one pickup truck combined (group 3) 8.7 trips, and those with one automobile and one standard truck combined (group 4) 8.2 trips. Nearly one half both of total trips and total off-farm mileage by farmers in group 1, and more than one half for the other groups, were reported as trips to town on business. The average number of trips to town on business was 3.1 for group 1, 3.9 for group 2, and 5.1 for each of the other groups. In other words, farmers with only one automobile made trips for this purpose slightly more often than every other work day while those with one automobile and one pickup or standard truck averaged a little more than five trips during the six work days of the week. The place to begin the search for ways and means of reducing motor vehicle mileage is at the point of greatest use and that is in connection with trips to town on business. It should be possible to eliminate a considerable number of these trips by better planning.

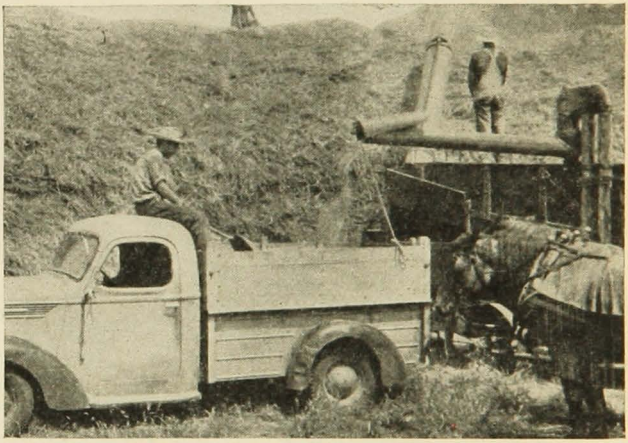
It is, of course, true that all trips cannot be planned in advance. Nor can the importance of the trip be measured by the number of people transported or by the weight of the items hauled. Whereas farmers of an earlier period could make many temporary repairs on the farm with such primitive materials as baling wire and binder twine, the modern farmer must have access to innumerable repair parts and perhaps specialized mechanical skills which are not always available on the farm. In the event of a breakdown during planting, harvesting, or at other critical times, an immediate trip to town may be exceedingly important even though the weight of the necessary repair part is insignificant. However, this should not be used as an excuse for the wasteful use of transportation resources.

The second most important use of motor vehicles was for social and rec-





Above and right: The automobile, with or without a trailer, can be used for hauling light loads, as well as for family travel.



Right: The pickup truck is used for many jobs around the farm, as well as for hauling products to or from town. See also front cover.

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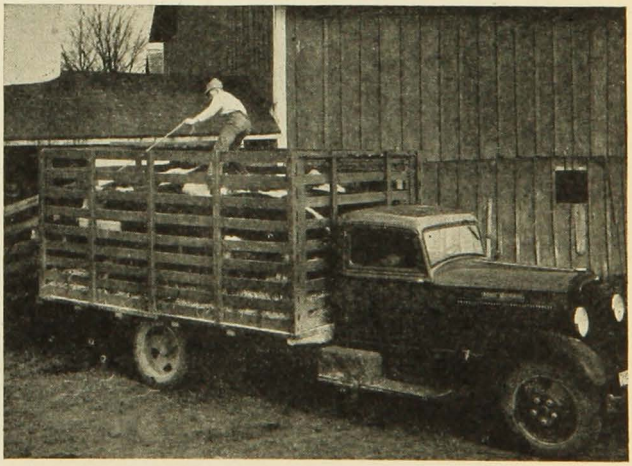

Right: Standard trucks are used for heavy hauling, mostly for off-the-farm duty. Most farms with pickup trucks or standard trucks also have automobiles.

reational purposes. Nearly 17 per cent of the total off-farm mileage for group 1 was for this purpose, 17 per cent for group 2, 25 per cent of the automobile and 17 per cent of the combined automobile and pickup truck mileage for group 3, and 24 per cent of the automobile and over 17 per cent of the combined automobile and standard truck mileage for group 4. Some social contacts with other people and other recreational activities are commonly believed to be essential to the well being of all people. Consequently, it is not a question of eliminating all driving for recreational purposes, but rather a question of how much can be eliminated during the war emergency without impairing the efficiency of those involved. Requirements no doubt vary from community to community and from family to family in a given community. Each family will need to consider this matter from the standpoint of the various individuals within the family circle. Part of the need for social contacts and other recreational activities can be, and are being, met in connection with trips to town on business. People are finding it possible to satisfy recreational needs nearer home than was common in normal times. It appears that a considerable reduction in mileage solely for social and recreational purposes could be brought about without undue hardship.

Considerable reduction in mileage also could be made in connection with trips to neighbors on business and miscellaneous trips. Trips to neighbors on business do not include trips to neighbors to work, the latter being included under a separate heading. Trips under this particular heading include trips to see neighbors about exchanging work, about borrowing machinery, to use the neighbor's telephone, etc. Farmers whose homes are equipped with telephones could avoid many of these trips by making more use of the telephone, and all farmers could transact some of this business in connection with trips made primarily for other purposes.

Miscellaneous trips included trips by a few farmers to sell certain products for others on commission, trips to see the owners of threshing machines about plans for threshing, trips made to measure farm crop acreages for the local agricultural conservation committee, and for numerous other purposes. Some of these trips did not appear to be a necessary part of farm operations and some could have been eliminated through greater use of the telephone or the mails.

Relatively little mileage can be eliminated from trips for medical attention, trips to work, and trips to church.

As an aid in the reduction of motor vehicle mileage off the farm, it may be desirable for farmers to return to some of the practices which were common during the horse and buggy age when a trip to town involved hours rather than minutes. Consequently trips were planned with considerable care. Many farmers kept a record of the quantity of farm and home supplies on hand. As a given commodity ran short it was listed for attention on the next trip to town. The automobile made this seem unimportant during the time when expense was the only limitation on motor vehicles, repair parts, tires, and gasoline. If a particular item was overlooked or forgotten, it was a simple matter to repeat the trip to town. Now, however, the need to conserve transportation resources has become so urgent that farmers must plan trips off the farm with much greater care than during more normal times.

## Greater Cooperation with Neighbors

Attention also should be given to the possibility of reducing farm transportation and hauling mileage by greater cooperation with neighbors in the use of motor vehicles. This study has shown that farmers in groups 1 and 2 took one

or more neighbors along on about 16 per cent of the trips off the farm with their automobiles and automobile trailers. Farmers in groups 3 and 4 took neighbors along on about 11 per cent of all off-farm trips with automobiles and pickup or standard trucks. The farmers also hauled some farm products and supplies for their neighbors and neighbors did some hauling for them.

The importance of these data on cooperation with neighbors does not rest upon the amount or frequency of such cooperation, but upon the fact that in normal times farmers found it desirable and practicable to cooperate as much as they did in the use of transportation facilities. This suggests that the amount of cooperation among farmers could be increased considerably during the present emergency through concerted effort in a given community.

Possibilities for cooperative use of motor vehicles will vary considerably from community to community. Numerous devices for this purpose have been suggested including signals on mail boxes, arranging rotation of trips, etc. The opportunities are greater in thickly settled communities where most of the farms are equipped with telephones. On the other hand, possible savings per farm increase with the distance to be traveled. Much depends upon the interest farmers take in this type of cooperation.

### Greater Use of Commercial Trucks

A third possibility of conserving farm transportation resources lies in making more general use of commercial trucks and consequently less use of farm motor vehicles for hauling farm products and supplies. This study has shown that the methods of hauling some farm products and supplies vary greatly among farmers owning the same type of motor vehicle or combination of vehicles. For example, farmers with one automobile only (group 1) hauled 60 per cent of their cream, while truckers hauled 34 per cent and neighbors 6 per cent. These farmers also hauled 60 per cent of their eggs, and truckers the remaining 40 per cent. Some hauled all of their own products, some hauled one product but used truckers for the other, some hauled part of a given product and truckers hauled part, and some exchanged hauling with neighbors. Much the same situation prevailed with respect to the hauling of cream and eggs among farmers owning other combinations of motor vehicles (groups 2, 3, and 4). This lack of uniformity among farmers owning the same type of motor vehicle or combination of vehicles suggests that existing arrangements have developed over a period of time without much regard to the efficient use of transportation resources.

For some products, however, the methods of hauling were definitely influenced by the type of motor vehicles on farms. This was particularly noticeable in the case of cattle, hogs, and grain. Farmers with one automobile only (group 1) hauled no cattle and insignificant proportions of the hogs and grain. On the other hand, farmers with one automobile and one standard truck (group 4) hauled the greater part of these products in their own trucks, while farmers in groups 2 and 3 hauled considerably smaller proportions than those in group 4 but more than those in group 1.

There was somewhat greater uniformity within a given group and between the different groups in the methods of hauling farm supplies, except grain and miscellaneous items, than in the methods of hauling farm products. Farmers in each of the four groups tended to haul most of their own groceries, machinery repairs, and sacked feed. On the other hand, practically all tractor fuel and gasoline for all groups were delivered in regular petroleum trucks by outside truckers.

The chief difference between groups was in the methods of hauling grain and miscellaneous items. Farmers in group 1 hauled relatively small proportions of these supplies, while the proportions were much greater in the case of those with other combinations of vehicles.

It is apparent that farmers in Martin County depend almost entirely upon commercial truckers for the delivery of tractor fuel and gasoline. This has come about in part because of the nature of the product, and in part because of the competitive situation among suppliers. Since farm motor vehicles are not used to haul these products, the question of reducing farm motor vehicle mileage is not involved. That does not mean that the delivery of tractor fuel and gasoline in rural areas has been placed on an efficient basis. On the contrary, studies made in Martin County at the same time as this one revealed considerable crosshauling and many deliveries of light loads.[5] Farmers can assist in sharply reducing petroleum truck mileage by placing orders well in advance of time needed and by providing storage space on the farm for larger deliveries.

Operators of many of the farms included in this study reported that special cream, egg and poultry, and livestock trucks passed their farms regularly. It has been shown that a considerable number of those owning each type of motor vehicle or combination of vehicles depend upon these truckers for hauling cream and eggs. Furthermore, farmers in group 1 depend upon outside truckers for all heavy hauling which includes most of the livestock and grain. Those in group 2 also rely upon outside truckers for considerable heavy hauling. The same applies to a lesser extent to group 3, and still less to group 4. As a result of these variations, a situation has developed where large numbers of individual farmers are hauling small quantities of farm products, either regularly as in the case of cream and eggs, or at infrequent intervals as in the case with odd lots of livestock, while commercial truckers drive past their farms regularly, often with their trucks loaded far below normal capacity.[6]

This problem deserves the thoughtful consideration of farmers, not only in Martin County but also in other areas. Its solution is not as simple as it may at first appear for it may involve the quality and quantity of farm products on individual farms as well as the question of joint use of farm-owned motor vehicles. For example, operators of egg and poultry trucks prefer to pick up eggs regularly on farms where the supply is large and quality high. Important problems in transporting dairy products to creameries arise because some farmers have strong preferences for certain creameries, and some creameries handle cream only while others handle only whole milk. The supply areas not only may overlap but the difference in frequency of delivering milk and cream adds further complications. Furthermore, little or no additional mileage is involved when farm products are hauled in connection with a trip made primarily for some other purpose, and it is probable that many combination trips of this sort are made by farmers. There is also a tendency among farmers owning automobile trailers, pickup trucks, and standard trucks to make

[5] See E. F. Koller and W. H. Dankers, "Petroleum Truck Condition and Operation in Martin County, August 2-8, 1942." Mimeograph, 2 pages, November, 1942.

[6] See A. A. Dowell, "Reducing Livestock Truck Mileage," Minnesota Agricultural Experiment Station Bulletin 369. June, 1942; W. H. Dankers and E. F. Koller, "Creamery Truck Condition and Operation in Martin County, August 2-8, 1942." Mimeograph, 2 pages, November, 1942; and E. F. Koller and W. H. Dankers, "Egg and Poultry Truck Condition and Operation in Martin County, August 2-8, 1942." Mimeograph, 3 pages, November, 1942.

trips to market with loads which average lighter in relation to normal carrying capacity than is the case with commercial trucks.[7]

The cooperation of farmers and truckers will be necessary to bring about maximum efficiency in the use of commercial trucks for hauling farm products and supplies. This will be necessary to eliminate overlapping and crosshauling and to insure capacity or near-capacity loads. In some areas, it may also be questioned whether it is necessary for separate trucks to pick up cream and eggs at the farm. To pick up more than one product at the same time would save considerable truck mileage. There is the further question as to whether some supplies could not be delivered at the farm by commercial truckers at the time they stop to pick up farm products. This is a complicated matter as it would involve extra work on the part of the truckers, the placing of orders by telephone or through the truckers, and in some cases the extension of credit. However, it deserves careful consideration especially during the existing emergency. Greater use of commercial trucks for hauling farm products and supplies should result in considerable saving of farm motor vehicle mileage as well as farm manpower.

## Other War Emergency Considerations

This study has shown that farmers make considerable use of motor vehicles on farms. Such uses include, among others, the hauling of feed and water to livestock and poultry, hauling seed, fertilizer, and other supplies to the fields, taking men to the field to work, and fixing fence. Motor vehicles enable farmers to do these necessary tasks quickly and efficiently. Farmers in group 1 used their automobiles on the farm on an average of 3.0 days during the week; those in group 2, 3.2 days; those in group 3, 2.2 days for the automobile and 3.4 days for the pickup truck, and those in group 4, 3.2 days for the automobile and 3.1 days for the standard truck. As these figures suggest, the farmers' need for automobile trailers or pickup or standard trucks does not rest entirely upon off-farm hauling. Use on the farm may be as important as, or more so than, use off the farm.

This study did not include the gathering of data on the cost of operating the various vehicles. Consequently, it throws no light upon the relative economy of the various combinations of motor vehicles for use on or off the farm. It may be assumed that conditions vary widely from area to area and from farm to farm. Hence, the decision must rest with the individual farmer, and his decision, under normal conditions, will be based upon cost and convenience. It appears that if all or most of the on-farm tasks can be performed with an automobile, as was the case with farmers in group 1, or with an automobile and automobile trailer as in group 2, and if commercial trucks are available for heavy over-the-road hauling, these will be the combinations used. On the other hand, if the work to be performed on or off the farm or both is such as to justify the purchase and maintenance of a pickup or standard truck, it would be logical, under normal conditions, to add the appropriate vehicle to the farm equipment.

It is probable that some of the hauling on farms which was done with the various motor vehicles could have been done with horses. Farmers in group 1 had an average of three horses each

[7] See A. A. Dowell, "A Study of Livestock Trucks at Minnesota Markets," Minnesota Agricultural Experiment Station Miscellaneous Report 2. June, 1943.

and those in groups 2, 3, and 4 had four horses each (table 16). There are doubtless many instances where the speed and convenience of motor vehicles justify their use, even under emergency situations, but careful planning of farm work, and care in the layout of hog pastures, poultry areas, etc., should make it possible to effect considerable savings in motor transportation on farms. Furthermore most farms in this area are equipped with tractors and these are being used by a considerable number of farmers to move feed, water, and other supplies to feedlots and pastures.

At the time this study was made, there were in Martin County 22 commercial cream trucks and 22 egg and poultry trucks operating over regular pickup routes in the county, 8 trucks used for special poultry pickup trips, and 99 commercial livestock and general trucks, most of which were engaged chiefly in hauling livestock and grain. Thus there were 151 commercial trucks in the county available for hauling farm products and supplies to and from farms. The conclusion was reached that if certain efficiency measures were adopted, fewer trucks could render the same total transportation service, or the same number of trucks could handle a considerably larger volume of business.

The demand for strategic materials and manpower to make the necessary implements of war has been so great that the manufacture of trucks for civilian use was temporarily discontinued. At the time this decision was reached, it was stated that the trucks in use at that time plus the few that might be made available out of an extremely limited stock pile would have to take care of civilian requirements until after the war. It may be assumed that this decision will be subject to revision in the light of subsequent war needs and other developments. Consequently, there is a possibility that new trucks for commercial hauling may be made available. However, it does not appear to be the part of wisdom to rely upon such a happy outcome. It seems more logical to conclude that an increased volume of farm products will need to be moved with a reduced supply of trucks. Thus, every effort should be made to prolong the usefulness of the existing supply of commercial and farm trucks. This involves, first, the elimination of all unnecessary truck mileage and, second, the manufacture of necessary repair parts, recapping old tires, and the manufacture of new tires. If these steps are taken they will do much to relieve the situation at least temporarily. However, if the war continues over an extended period and strategic materials and manpower cannot be released to manufacture trucks and tires to replace those worn out, it may be necessary to tap the reservoir of trucks now on farms to insure the efficient movement of farm products and supplies during the war emergency.

The more general use of farm-owned standard trucks might be accomplished either by the farm owner rendering custom service as required or by the sale of these trucks to commercial truckers. Because of the shortage of manpower on farms, the latter appears to be the more logical procedure. In this event, it may be necessary to make available automobile trailers to some farmers who release their standard trucks for more general use.

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