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The use of

Horses and Mules on Farms

**Agricultural Research Service
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THE USE OF HORSES AND MULES ON FARMS

by

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One of the most pronounced changes in American agriculture since 1920 has been the almost complete replacement of horses and mules by mechanical power.

As the number of horses and mules has decreased, the use of horse-drawn implements has also declined, both in total and per machine. In 1956, the average horse-drawn machine was used to cover far less than half the acreage it covered in 1941. Workstock is now used mainly on such light draft implements as planters and cultivators.

The use of horses and mules will probably continue to decline, but the bulk of the decrease is over. The largest future decline is likely to be found in the South Atlantic and East South Central areas, which now have about two-fifths of the Nation's work animals. Even there, however, the continued adjustment will not be difficult, as most of the work animals are used very little.

THE TREND IN HORSE AND MULE NUMBERS

When farming was done with animal power, horses were used chiefly in the northern and western farming areas and mules were used mainly in the Southern States. The horse population was most dense in the Central and Lake States, where large acreages were in corn and other row crops that required several cultivations during the growing season.

Horses and mules in the United States have declined in numbers from a near all-time peak of almost 26 million in 1920 to less than 3.4 million in 1958 (table 1). In the two decades from 1920 to 1940, a 44-percent decline in horse and mule numbers occurred. From 1940 to 1950, the decline was more pronounced; about 46 percent of the horses and mules disappeared from farms. Since 1950, the decline has been accentuated even more. From 1950 to 1958, horse and mule numbers declined by more than 57 percent. Along with the reduction in numbers, the general distribution of horses and mules has changed markedly throughout the Nation; they are now concentrated in the South Atlantic and East South Central areas. In 1958, these areas had more than 38 percent of all horses and mules compared with 17 percent in 1920. In identical periods, the West North Central area had about 16 and 30 percent, respectively, of the Nation's total number of horses and mules.

In 1940, according to the Census of Agriculture, there was one tractor for every four farms, and an average of two work animals per farm. Most plowing, cultivating, mowing, raking, and so on, depended on horses and mules for power. The situation has changed radically, in 1956, there was an average of about one tractor and less than one horse or mule per farm.

What were some of the reasons for this change? First, a farmer can get more work done faster with tractor-drawn equipment. Also, the cost of operation is reduced considerably through the use of tractor power. For example, a study made in the South in 1943 showed that use of tractor instead of mule power for certain operations saved up to 50 percent in operating expenses per acre. ^{1/} Costs have been reduced further as more versatile tractors with interchangeable equipment have come into use. Improved farming methods and increased specialization in farming also have had a part in accelerating the exodus of horsepower.

^{1/} Brooks, James H., and Barlow, Frank D., Jr. Farm Mechanization, Power Costs, and Production Requirements in the Northern Coastal Plains, N. C. Agr. Expt. Sta. Bul. 348 (Reprint), September 1946.

Where Are Horses and Mules Used as Workstock?

Numbers of horses and mules have declined in all regions of the United States. They are most numerous now in the South Atlantic and East South Central areas. In these areas, labor is relatively cheap, and workstock can be used to advantage on small acreages of such crops as cotton and tobacco. Usually, a farmer with a small acreage allotment of cotton or tobacco cannot afford to own a tractor plus the implements to be used with it, unless he can also do custom work for others. Here as elsewhere, however, small farms are being merged with other units to form larger operations so that machinery and other resources can be used more economically. This process has been speeded up during the last two decades by the opportunities for nonfarm employment both in the South and elsewhere. Indications are that elimination of horses and mules will continue as the process of farm consolidation and mechanization continues.

How Are Horses and Mules Used?

Despite the drastic decline in the total number of horses and mules, a significant percentage of farms still have one or more. The 1954 census reported that 38 percent of U. S. farms had horses or mules, and that 17 percent had horses or mules but no tractor. The number of these animals used as workstock is not shown. It seems safe to assume that many were not so used, particularly on farms with tractors.

Information is now available from a random survey of farms to show the extent to which horses and mules are used as workstock on farms. This source indicates that about one-third of our farms had horses or mules that were used for at least one day of farmwork in 1956. This represented about 85 percent of the horses and mules on farms. The remaining 15 percent were not used at all or were used only for riding purposes.

Most of the farms that used workstock, about 75 percent of the total, had no tractors and depended entirely on horses and mules or custom work for power in field operations. As the census treats cropper units as farms, these figures probably overstate somewhat the situation for all farms as reported by the Census of Agriculture. Our survey did not do this, but it did include the horses and mules used by croppers and owned by plantation operators.

Among the farms using horses or mules in 1956, about two-thirds used the workstock less than 10 days. The other third used workstock for 10 days or more, but only a small proportion fell in the 20-day and over group (table 2). That is, even on the farms that used horses and mules, the

amount of use was usually limited. As might be expected, farmers having tractors used their horses and mules somewhat less than did nontractor farmers. Nearly three-fourths of the operators of tractor farms using horses and mules used their workstock less than 10 days in 1956, compared with about two-thirds of the nontractor farms (table 2). Most of the tractor owners used their horses and mules only for intermittent operations, and more than 45 percent of them used their workstock for only 4 days or less in 1956. Over one-fourth used their workstock from 5 to 9 days in that year.

Naturally, there is more use of workstock on nontractor than on tractor farms, but about one-third of the operators of the former worked their stock less than 5 days in 1956. Another third used their workstock from 5 to 9 days that year and about one-fourth from 10 to 19 days (table 2). Most of the nontractor farms contain less than 100 acres and many of them are part-time operations with the operator having a full-time job off the farm. Many of the operators keep horses for limited use, and quite a few have riding horses.

The decline in use of workstock started with the larger machines that required several animals for power. Horses and mules are now used chiefly with light draft implements, usually for intermittent operations, and on the smaller farms. Horse-drawn machines are used mainly on nontractor farms, but they are used to some extent also on farms that have tractors. The horse-drawn corn-cotton planter, moldboard plow, disk plow, row-crop cultivator, and mower are the machines most commonly drawn by horses. Each was used on more than 5 percent of the acreage covered in these operations on farms in the 1956 survey (table 3).

Crop planting is one of the more important operations for which workstock is still used. Crops were planted by horse-drawn implements on about 12 percent of the acreage planted by corn and cotton planters (table 3). However, acreage planted per horse-drawn machine was low; it averaged 16 acres per machine annually.

Workstock is also used widely for plowing. On farms on which moldboard plows were used in 1956, more than 9 percent of the acreage plowed in this way was turned over by horse-drawn plows (table 3). The use of these plows averaged 22 acres per machine, somewhat more than horse-drawn planters. With respect to other types of plows, only 6 percent of the total disk plowing was done with horse-drawn implements. Their average use in 1956 was 28 acres. Ordinarily, disk plows are used where soil conditions are such that moldboard plows will not operate efficiently. Usually, this is in soil so dry and hard that moldboard plows cannot penetrate. Disk plows are used to a considerable extent on stony, stumpy land and on very loose ground.

The row-crop cultivator, a widely used machine, is often drawn by workstock. Horse-drawn machines were used to cultivate an average of 45 acres of cropland in 1956, but this was only 6 percent of the total acreage cultivated. Destruction of weeds is the primary purpose of cultivation, and to do an effective job of keeping weed growth to a minimum, some crops are cultivated as many as 6 times during the season.

On farms with mowers, 5 percent of the acreage of hay was cut by horse-drawn mowers. Depending on the crop and area, the mower may be used from one to four times annually on the same land. In some areas, farmers cut their hay crop once or twice during the growing season and use the land for pasture the rest of the year.

Some of the other machines used with horses for motive power deserve mention here, even though they are used on a very small percentage of the cropland. In areas with limited rainfall where row crops are grown, the lister planter is used to advantage. It is used mainly to plant seed to a depth at which the roots can get moisture from the deeper soil. In 1956, on the farms whose operators reported these implements, about 3 percent of the cropland was prepared for planting or planted by horse-drawn listers or lister planters. The average acreage of cropland prepared in this way by individual horse-drawn machines was 21 acres.

A very small percentage of farmers reported using horse-drawn grain drills in 1956. These drills were used on about 2 percent of the acreage drilled and the average use per horse-drawn drill was 14 acres.

The disk harrow is used to level plowed ground, make soil particles finer, and destroy sprouting weed seeds. About 2 1/2 percent of the disking done on farms in 1956 was done by horse-drawn machines, with an average of 30 acres per machine.

Use of Horse-drawn Compared with Tractor-drawn Machines

Ordinarily, the average tractor-drawn machine is used much more than the average horse-drawn machine of the same type. In 1956, for example, tractor-drawn corn-cotton planters were used to plant an average of 70 acres, whereas horse-drawn planters averaged only 16 acres (table 4). In 1941, the differences were even more pronounced, although use of both types of planters was greater. Similar relationships were found for mowers and for grain drills.

This limited average use of horse-drawn machines reflects the fact that they are found on the smaller farms, are usually older than the tractor-drawn types, and have less capacity.

In studying machine use over time, it is important to recognize the shift from horse-drawn to tractor-drawn machines and to understand the effect of this shift on average use. For example, the average use of both tractor-drawn and horse-drawn mowers decreased materially from 1941 to 1956 as tractor mowers spread to smaller farms and as horse-drawn mowers largely disappeared. Yet if both types are combined, the average use for all mowers was essentially the same in both years, 65 acres in 1941 and 67 acres in 1956. That is, two changes were going on at the same time, and these changes offset each other so far as average use of mowers was concerned. Similar changes occurred with planters and grain drills. This points up the need for proper classification of machines in measuring trends in their use.

Horsemeat for Animal Food

During the last decade, an increasing proportion of the horses and mules disappearing from farms have been slaughtered for animal food. From 1948 through 1958, horses and mules killed for animal consumption in federally inspected plants averaged about 40 percent of the number that disappeared from farms. In 1940, only 6 percent of the total disappearing from farms were slaughtered for animal food (table 5). By 1956, about 49 percent of all horses and mules disappearing from farms were converted into animal food, mostly dog and cat food.

The peak year for numbers slaughtered for the animal food industry was in 1952 when more than 357,000 equines were processed. Since then, numbers killed for animal food have gone down, as has the total number disappearing off farms. The percentage of those killed for animal food remains between 40 and 50 percent of the total number taken off farms annually.

Table 1. - Horses and mules on farms, by regions, specified years,
1920-58 1/

Region	1920	1930	1940	1950	1958
	<u>Thous.</u>	<u>Thous.</u>	<u>Thous.</u>	<u>Thous.</u>	<u>Thous.</u>
North Atlantic-----	1, 488	959	783	371	150
East North Central-----	4, 424	2, 995	2, 404	843	250
West North Central-----	7, 790	5, 886	3, 884	1, 697	526
South Atlantic and East South Central-----	4, 418	3, 480	3, 265	2, 612	1, 302
West South Central-----	4, 317	3, 481	2, 514	1, 289	545
Mountain and Pacific-----	3, 305	2, 323	1, 628	969	575
United States-----	25, 742	19, 124	14, 478	7, 781	3, 348

1/ Livestock reports of the Agricultural Estimates Division, Agricultural Marketing Service.

Table 2.- Workstock: Number of days used on farms, United States, 1956

Days stock was used	Tractor farms		Nontractor farms		All farms	
	Number	Percent	Number	Percent	Number	Percent
1-4	268	45.4	527	30.6	795	34.4
5-9	158	26.8	569	33.0	727	31.4
10-19	106	18.0	428	24.9	534	23.1
20 and over	58	9.8	198	11.5	256	11.1
Total or average	590	100.0	1,722	100.0	2,312	100.0

Table 3. - Selected farm machines: Use on farms, United States, 1956

Type of machine and kind of farm	Number of machines	Average		Percentage		Percentage of acreage done by horse-drawn machines
		annual use per machine	Acres	of machines	horse drawn	
	Thousands			Percent		Percent
Corn and cotton planter:						
Nontractor farms	691	16		99.4		99.4
Tractor farms	1,509	70		11.1		2.5
Total	2,200	53		38.8		11.7
Mower (grass and hay):						
Nontractor farms	375	16		94.3		94.3
Tractor farms	2,125	75		7.6		1.6
Total	2,500	66		20.6		5.0
Side-delivery rake:						
Nontractor farms	67	20		81.0		81.0
Tractor farms	1,293	89		3.1		.7
Total	1,360	86		6.9		1.6
Power sprayer:						
Nontractor farms	22	17		74.2		74.2
Tractor farms	678	109		2.5		.4
Total	700	106		4.8		.8
Lister (including lister planter):						
Nontractor farms	76	21		94.6		94.6
Tractor farms	474	124		2.1		.4
Total	550	110		15.0		2.9

- Continued

Table 3. - Selected farm machines: Use on farms, United States, 1956 - Continued

Type of machine and kind of farm	Number of machines	Average annual use per machine	Percentage of machines horse drawn	Percentage of machines done by horse-drawn machines
	<u>Thousands</u>	<u>Acres</u>	<u>Percent</u>	<u>Percent</u>
Grain drill:				
Nontractor farms-----	100	14	82.4	82.4
Tractor farms-----	1,400	87	6.0	1.0
Total-----	1,500	82	11.1	1.9
Disk harrow:				
Nontractor farms-----	286	30	92.5	92.5
Tractor farms-----	2,314	153	1.3	.3
Total-----	2,600	139	11.3	2.4
Row-crop cultivator:				
Nontractor farms-----	483	45	97.3	97.3
Tractor farms-----	2,517	155	3.3	1.0
Total-----	3,000	137	18.4	6.0
Moldboard plow:				
Nontractor farms-----	878	22	98.0	98.0
Tractor farms-----	2,722	77	3.1	.9
Total-----	3,600	64	26.2	9.1
Disk plow:				
Nontractor farms-----	86	28	100.0	100.0
Tractor farms-----	439	92	1.3	.4
Total-----	525	82	17.5	6.0

Table 4. - Selected horse-and tractor-drawn machines: Use on farms,
United States, 1941 and 1956 ^{1/}

Implement	Number of machines		Average annual use per machine	
	1941 ^{2/}	1956	1941 ^{2/}	1956
	<u>Thous.</u>	<u>Thous.</u>	<u>Acres</u>	<u>Acres</u>
Corn-cotton planter ^{3/} :				
Tractor-drawn ^{4/} -----	204	1, 511	161	70
Horse-drawn-----	3, 451	689	36	16
Total-----	3, 655	2, 200	43	53
Mower:				
Tractor-drawn-----	314	2, 145	154	75
Horse-drawn-----	2, 565	355	54	16
Total-----	2, 879	2, 500	65	67
Grain drill:				
Tractor-drawn-----	422	1, 416	201	87
Horse-drawn-----	1, 290	84	44	14
Total-----	1, 712	1, 500	83	83

^{1/} It was assumed that machines on tractor farms were drawn exclusively by tractors, that machines on nontractor farms were drawn exclusively by horses or mules.

^{2/} From Work Performed with Principal Farm Machines, by A. P. Brodell and J. W. Birkhead, U. S. Bur. Agr. Econ. FM 42, May 1943.

^{3/} The 1941 total includes lister planters. These were not included in 1956.

^{4/} The data for 1941 are available only for 2-, 3-, and 4-row tractor planters.

Table 5. - Horses and mules: Numbers disappearing off farms, and slaughtered in federally inspected plants, 1940-58

Year	On farms <u>1/</u>	Disappeared	Slaughtered <u>2/</u>	
			Number	Percentage of total disappearing
	<u>Thous.</u>	<u>Thous.</u>	<u>Thous.</u>	<u>Pct.</u>
1940-----	14,478	314	18.7	6.0
1941-----	14,104	374	25.9	6.9
1942-----	13,655	449	28.9	6.4
1943-----	13,231	424	56.5	13.3
1944-----	12,613	618	52.1	8.4
1945-----	11,950	663	77.9	11.7
1946-----	11,108	842	192.2	22.8
1947-----	10,129	979	276.4	28.2
1948-----	9,279	850	304.0	35.8
1949-----	8,498	781	237.8	30.4
1950-----	7,781	717	275.9	38.5
1951-----	7,036	745	340.3	45.7
1952-----	6,150	886	357.1	40.3
1953-----	5,403	747	270.5	36.2
1954-----	4,791	612	247.3	40.4
1955-----	4,309	482	196.1	40.7
1956-----	3,928	381	185.0	48.6
1957-----	3,574	354	141.7	40.0
1958-----	3,348	226	107.4	47.5

1/ Livestock reports of the Agricultural Estimates Division, Agricultural Marketing Service.

2/ Reports of the Meat Inspection Division, Agricultural Research Service.

