12-1-1956

Labor, power, and equipment for harvesting feed and forage crops

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BULLETIN 547 DECEMBER 1956

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Harvesting Feed And Forage Crops

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Summary and Conclusions

This study was made to determine labor requirements for harvesting different feed and forage crops and the cost of operation for specialized harvesting equipment.

Farms in Lowndes, Monroe, DeSoto, Tate and Panola counties having several items of feed and forage harvesting equipment were selected for study. Information was secured from operators of these farms regarding their experience relative to costs of operation, labor requirements, extent of use, etc., for different items of feed and forage harvesting equipment. In addition, information was obtained on costs associated with feed processing equipment and buildings used for storing feed and forage crops, custom charges for haresting feed and forage crops, and labor requirements for feeding the crops.

Results of this study indicate that:

(1) Labor requirements for harvesting corn by hand can be reduced substantially by throwing the pulled corn directly into the wagon, trailer, or trucks instead of into a heaprow.

(2) Labor requirements for harvesting silage material can be reduced considerably by use of field forage harvesters, especially if a trench silo is used for storage.

(3) Due to the relatively high fixed cost as compared to variable cost for most of the items of feed and forage harvesting equipment, more use each year would offer possibilities for reducing per unit costs of operation.

Because of high fixed costs, many operators of small farms cannot profitably buy expensive specialized harvesting equipment for use on only a few acres, even though a dependable supply of farm labor is not available. For this group of farmers two possibilities are open:

(1) Buy specialized harvesting equipment with the intention of doing work for others on a custom basis to help defray at least a part of the fixed cost.

(2) Make arrangements with owners of the required harvesting equipment to do work on his farm on a custom basis.

TABLE OF CONTENTS

LABOR, POWER, EQUIPMENT REQUIREMENTS, AND EQUIPMENT COSTS FOR HARVESTING FEED AND FORAGE

By THOMAS E. TRAMEL and DAVID W. PARVIN

Labor shortages, production restrictions on cotton, and relatively high prices for livestock products have caused Mississippi farmers to shift toward a livestock economy. As late as 1950 the U. S. Census reported only 1,569,327 head of cattle and calves on Mississippi farms. By 1954 the same report shows an increase to 2,319,590 head, or an increase of 48 percent. As to whether this trend will continue only time will tell. But possibilities of tighter production controls on cotton and continued high levels of employment in industry make it seem quite likely.

An increase in livestock numbers requires additional feed and forage production. Moreover, this additional feed and forage must be obtained at a cost which permits a profit to be realized from livestock on individual farms. In view of the shortage of farm labor, mechanization of production, harvesting, and feeding of feed and forage crops seems desirable. Generally, the same equipment used in the production of other crops may be used in the production of feed and forage crops. On the other hand, harvesting equipment is generally specialized.

The purpose of this study was to determine labor and power requirements and cost of operation for some of the more specialized items of equipment required in harvesting feed and forage crops. In addition, cost of processing equipment, cost of storage facilities, and labor requirements for feeding different types of feed and forage crops are presented.

Method of Study

To meet the objectives of study, areas of the state were selected where a large number of the items of specialized equipment could be found. Within these areas, county Extension agents and other agricultural workers helped select farmers who operated several of the items of specialized equipment. These farmers were then interviewed and the figures presented in this report are the result of their experiences regarding costs, extent of use, labor requirements, etc. A total of 304 farmers in Lowndes, Monroe, DeSoto, Tate, and Panola Counties were interviewed in this study.

Description of Farms Studied

Size. Size of the farms included in this study averaged much larger than size of all farms operated by white owners in the respective counties, 796 acres, compared to 137 acres.[1] Of the total land operated, about four-fifths was owned and one-fifth rented.

Land Use. Almost one-half (45 percent) of all the total land area of the farms studied was used for crops. Another 31.8 percent was used as open permanent pasture. The remainder was accounted for by woodland pasture (14.8 percent) and other uses (8.4 percent).

[1]Census of Agriculture, 1950.

Table 1. Average size of farm and land use, 304 farms, North Mississippi, 1954

Item	Acres per farm	Percent of total
Size of farm operated:		
Owned	625*	78.5
Rented in	171	21.5
Total operated	796	100.0
Land use:		
Crop land	358	45.0
Open permanent pasture	253	31.8
Woodland pasture	118	14.8
Other	67	8.4
Total operated	796	100.0

*An average of 18 acres per farm was owned and rented out in addition.

Feed and Forage Production Pattern. Different combinations of corn, oats, hay and silage were grown on all farms studied. Corn acreage averaged 58 on farms growing corn and oat acreage averaged 49 on farms growing oats. Hay and silage acreages averaged 99 and 32, respectively, on farms where these crops were grown. Of the 147 farms growing oats, 63 grazed oats before harvesting while 84 did not.

Considerable year-to-year variation in yields for each of the feed and forage crops was reported by the farmers interviewed. An average of the highest yields reported for the past several years was from twice as high to almost four times as high as the average of the lowest reported yield for the same period. Normal yields were 41 bushels for corn, 47 bushels for oats, 1.65 tons for hay and 12 tons for silage, primarily corn.

Labor, Power and Equipment

Harvesting Corn

Pulling corn by hand was the predominant method of harvesting on the farms studied. This method was used on 163 of the 230 farms where corn harvesting information was obtained. (Table 3). Corn was thrown into heaprows as it was pulled and then hauled later in 128 cases out of the 163. Data indicates that considerable labor saving can be effected by omitting the heaprow. Where corn was pulled and thrown into a heaprow, 12.6 hours of harvest labor were required per acre compared to from 6.5 to 9.7 hours where the heaprow was omitted.

Machine harvesting of corn was performed on 67 farms. These farms in general had larger acreages of corn than those using hand methods, an average of 94 acres compared to 43. Man labor requirements were 2.8 hours per acre where a 2-row picker was used and from 3.9 to 4.2 hours per acre with a 1-row picker. It should be pointed out that, compared to hand methods, savings in man labor by using pickers would be greater with higher yields. Man labor requirements for operating the picker itself would be essentially the same with much higher yields.

Harvesting Oats

Combining oats required from .5 to 2.2 hours of man labor and from .5 to 1.1 hours of combine time per acre, depending upon the type and size of combine used, (Table 4). Large self-propelled combines equipped with bins required only .5 hours of man labor per acre. Some of the pull-type combines were also equipped with bins.

Hauling oats required from 1.0 to 1.6 hours of labor per acre. Use of pick-up trucks for hauling resulted in the higher figure and use of 1½ ton trucks resulted in the lower figure.

Harvesting Hay

The hay harvesting operation may be conveniently divided into mowing, raking, baling, and hauling.

Mowing. The 6-ft. and 7-ft. tractor

Table 2. Acreages and yield per acre for selected feed and forage crops, 304 farms, North Mississippi, 1954.

Crop	No. farms	Acres per farm	Yield per acre			
			Unit	Normal	Highest	Lowest
Corn	238	58	Bu.	41	66	19
Oats, all	147	49	Bu.	47	67	30
Oats, grazed[1]	63	50	Bu.	46	66	30
Oats, not grazed	84	48	Bu.	48	67	30
Hay	256	99	Ton	1.65	2.48	.90
Silage crops	107	32	Ton	12	17	8

[1]An average of 831 cattle hours of grazing was secured per acre—mostly during December 15 to March 15; this is the equivalent of about 1 cow per acre for 9 hours per day during this period.

Table 3. Labor, power, and equipment requirements for harvesting corn, by type of power and size of equipment, North Mississippi, 1954.

Operation	No. farms	Acres corn per farm	Yield per acre (bu.)	Hours per acre					
				Man	Tractor	Truck	Mule	Trailer or wagon	Picker
Harvested by hand:	163	43	39	-----	-----	-----	-----	-----	-----
Pulling and hauling (heaprow)[1]:	128	44	39	-----	-----	-----	-----	-----	-----
Mules and wagon	43	43	39	12.6	-----	-----	4.2	2.1	-----
Tractor and trailer	66	41	40	12.6	1.7	-----	-----	1.7	-----
1½ ton truck	19	55	38	12.6	-----	1.5	-----	-----	-----
Pulling and hauling (no heaprow):	35	41	38	-----	-----	-----	-----	-----	-----
Mules and wagon	18	53	34	9.7	-----	-----	5.4	2.7	-----
Tractor and trailer	13	27	42	8.2	2.1	-----	-----	2.1	-----
1½ ton truck	4	36	40	6.5	-----	1.5	-----	-----	-----
Harvested by machine:	67	94	46	-----	-----	-----	-----	-----	-----
One-row picker, hauled with tractor	46	83	46	4.2	2.9	-----	-----	2.2	1.4
One-row picker, hauled with truck	4	50	55	3.9	1.3	1.6	-----	-----	1.3
Two-row picker. hauled with tractor	17	133	44	2.8	1.7	-----	-----	1.4	.7

[1]Labor requirements for pulling only when thrown into heaprow were 7.7 man hours per acre based on 124 farms having an average of 44 acres of corn with an average yield of 40 bushels per acre.

Table 4. Labor, power, and equipment requirements for harvesting oats, by type of power and size of equipmnt, North Mississippi, 1954.

Operation	No. farms	Acres oats per farm	Yield per acre (bu.)	Acres per 10-hr. day	Hours per acre				
					Man	Tractor	Truck	Trailer	Combine
Combining:									
5-ft., power take-off	13	31	42	9	2.2	1.1	-----	-----	1.1
5-ft., auxiliary engine	8	44	50	11	2.0	.9	-----	-----	.9
6-ft., power take-off	15	61	52	11	1.6	.9	-----	-----	.9
6-ft., auxiliary engine	38	43	48	11	1.5	.9	-----	-----	.9
10-to-14-ft., Self-propelled	18	82	52	20	.5	-----	-----	-----	.5
Hauling:									
Truck, pickup	8	35	42	11	1.6	-----	.9	-----	-----
Truck, 1½ ton	24	61	48	16	1.0	-----	.6	-----	-----
Tractor and trailer	24	50	48	16	1.2	.6	-----	.6	-----

mower were the predominant sizes used, (Table 5). In general, the larger mowers were found on farms having the larger acreages of hay. However, in some instances both large mowers and small ones were found on the same farms.

Labor requirements for mowing using tractor mowers ranged from .5 hours per acre for 7-ft. mowers to .9 hours per acre for 5-ft. mowers. Use of 5-ft. mule mowers required an average of 1.2 hours of labor per acre.

Raking. Raking hay with a tractor side-delivery rake required .5 hours per acre, (Table 6). Use of a mule dump rake required an average of .7 hours per acre.

Baling. Automatic pick-up balers were the prevalent type used on the farms studied. This type baler with an auxiliary engine required only .6 hours of man

labor per acre, compared to 2.1 hours for non-automatic pick-up balers and 4.1 hours for the stationary type baler, (Table 7). Hours of labor required per ton were about the same for all pick-up balers but slightly higher for stationary balers. Hay yields were considerably lower on farms using the latter type baler, and this probably accounts for some of the difference in labor requirements.

Stationary balers were generally used on farms having the smaller numbers of acres of hay. Of the pick-up type balers, those with auxiliary engines were generally on farms having larger acreages of hay than farms having power take-off type balers.

Hauling. As would be expected, labor requirements for hauling hay were considerably less for baled hay than for an equivalent amount of loose hay. Hours of labor required for hauling are presented in Table 8 by type of hauling equipment. Differences in requirements are no doubt due partly to differences in size of crew and in distance hauled as

Table 5. Labor, power, and equipment requirements[1] for mowing hay, by type of power and size of equipment, North Mississippi, 1954.

Size and type of equipment	No. farms	Acres hay per farm	Yield per acre per cutting (ton)	Acres per 10-hr. day	Hours per acre			
					Man	Tractor	Mule	Mower
5-ft., mule	16	28	1.39	8.3	1.2	....	2.4	1.2
5-ft., tractor	17	81	1.31	11.1	.9	.9	....	.9
6-ft., tractor	110	99	1.36	16.7	.6	.6	....	.6
7-ft., tractor	112	110	1.30	20.0	.5	.5	....	.5

[1] Requirements are for one cutting only.

Table 6. Labor, power, and equipment requirements[1] for raking hay, by type of power and equipment, North Mississippi, 1954.

Type equipment	No. farms	Acres hay per farm	Yield per acre per cutting (ton)	Acres per 10-hr. day	Hours per acre			
					Man	Tractor	Mule	Rake
Mule, dump	33	40	1.37	14.3	.7	....	1.4	.7
Tractor, dump	8	12	1.15	16.7	.6	.6	....	.6
Tractor, side delivery	195	115	1.37	20.0	.5	.5		.5

[1] Requirements are for one cutting only.

Table 7. Labor, power, and equipment requirements[1] for baling hay, by type of equipment, North Mississippi, 1954.

Type equipment	No. farms	Acres hay per farm	Yield per acre per cutting (ton)	Bales per 10-hr. day	Hours per acre		Hours per ton	
					Man	Tractor and baler	Man Tractor	and baler
Pick-up, automatic:								
Power take-off	38	93	1.43	618	.8	.7	.6	.5
Auxiliary engine	106	136	1.30	787	.6	.5	.5	.4
Pick-up, non-automatic:								
Auxiliary engine	17	167	1.48	771	2.1	.6	1.4	.4
Stationary:								
Power take-off	7	54	.95	411	4.1	.7	4.3	.7

[1] Requirements for one cutting only.

Table 8. Labor, power, and equipment requirements[1] for hauling hay, by type of power and equipment, North Mississippi, 1954.

Item	No. farms	Acres hay per farm	Yield per acre per cutting (ton)	Hrs. per acre			Hrs. per ton		
				Man	Power	Trailer or wagon	Man	Power	Trailer or wagon
Baled hay:									
2 ton truck	18	127	1.68	2.5	.7		1.5	.4	
1½ ton truck	93	135	1.25	2.7	.7		2.2	.6	
Pickup truck	9	41	1.70	3.2	1.1		1.9	.6	
Tractor	75	65	1.34	3.1	.8	.8	2.3	.6	.6
Mules	10	72	1.11	1.6	1.4	.7	1.4	1.2	.6
Loose hay:									
Tractor	9	16	1.44	3.6	1.3	1.3	2.5	.9	.9
Mules	11	18	1.36	6.1	4.4	2.2	4.5	3.2	1.6

[1]Requirements are for one cutting only.

well as to differences in type of hauling equipment used.

Harvesting Silage

Silage material is harvested by two general methods, field harvesters and binders. For the latter method, silage cutters and blowers are required. For the former method, blowers are required for up-right silos, but not for trench silos. In addition, use of a field harvester permits harvesting small grains, grasses, and legumes as silage material as well as corn and sorghum.

Time required to harvest an acre of silage material was roughly the same for 1-row binders and 1-row field harvesters (Table 9) but more labor was used with the former method. When silage was stored in trench silos, an average of 12.1 hours of man labor were required per acre with a 1-row binder, compared to an average of 6.9 to 7.9 hours when a 1-row field harvester was used. Similar differences were evident when silage was stored in upright silos.

Processing Feeds

Use of hammer mills to process feeds was quite a common practice on the farms studied. Both corn and hay was processed in this manner. In many instances blackstrap molasses was added during processing to make the feeds more palatable. Labor requirements to process one ton of feed averaged 2.3 man hours and .9 hours for equipment (Table 10). To crimp oats, an average of 4.1 man hours and 1.6 hours for equipment were required per ton.

Feeding Concentrates

Time required for feeding concentrates ranged from an average of .63 minutes to an average of 1.01 minutes per animal fed per feeding (Table 11). In general cattle were fed by use of buckets or carts or wheelbarrows when they were fed near where the feeds were stored. Trucks or tractors and trailers were used only when the feed had to be moved a considerable distance.

A savings in labor required by use of carts or wheelbarrows instead of buckets is evident from the data in Table 11. To feed 180 pounds of concentrates to 43 animals using buckets required .73 hours, or an average of 1.01 minutes per animal, compared to .67 hours, or an average of .63 minutes per animal, to feed 192 pounds of concentrates to 64 animals using carts or wheelbarrows. An average of 2 percent of all concentrates fed are estimated to have been wasted (Appendix Table 6).

Feeding Baled Hay

Baled hay was fed by hand when feeding was done near where the hay was stored and generally by use of trucks or

tractor and trailer when the hay had to be moved considerable distances. About the same amount of man labor was required per animal per feeding for both methods, .82 hours and .81 hours (Table 12). More animals were fed when trucks or tractors and trailers were used, however. An estimated 10 percent of all baled hay fed to cattle was wasted.

Feeding Silage

As was the case with concentrates and baled hay, generally trucks and tractors were used in feeding silage only where a larger number of animals were to be fed and where the silage had to be moved a considerable distance, (Table 13). In other cases feeding was accomplished by using forks, buckets, carts, wheelbarrows, etc. Man labor required per animal per feeding ranged from an average of 1.01 minutes for carts and wheelbarrows from upright silos to an average 2.66 minutes for forks and buckets from a trench silo. The latter figure is based upon only 4 cases, but this in itself indicates that use of forks and buckets to feed silage from a trench silo is an inefficient method. Farmers interviewed estimated that an average of 4 percent of all silage fed was wasted.

Cost Of Operation

Cost of operation for harvesting and processing equipment includes (1) fixed cost items such as depreciation, interest on investment, and housing and (2) variable cost items, whenever applicable, such as repairs, fuel, and oil and oil filters. An important item which should be considered along with costs in determining which of two machines to buy is the relative amount of risk of weather damage. In general, such risk is smaller for larger machines that do the job more quickly. In some cases, a lessening of risk due to unfavorable weather may offset cost differences. On the other hand, alternative uses for money invested in farm equipment may make smaller items of equipment more economical, in spite of advantages held by the larger items.

Table 9. Labor, power, and equipment requirements[1] for harvesting and storing silage. North Mississippi, 1954.

Item	No. farms	Acres per farm	Yield per acre (ton)	Hours per acre					
				Man	Tractor	Truck	Trailer or wagon	Binder or harvester	Blower & silage cutter
Trench silo:									
1-row binder, hauled with truck	6	28	10.2	12.1	2.8	2.8		1.4	1.4
1-row harvester, hauled with truck	7	29	13.4	6.9	2.4	2.4		1.4	
1-row harvester, hauled with tractor	19	32	12.4	7.9	5.1		4.1	1.6	
Upright silo:									
1-row binder, hauled with truck	13	22	10.8	15.3	3.2	2.7		1.5	1.5
1-row binder, hauled with tractor	14	29	10.9	14.1	4.8	....	2.8	1.5	1.5
1-row harvester, hauled with truck	8	30	12.0	9.4	3.0	3.7		1.5	1.5
1-row harvester, hauled with tractor	18	29	12.3	10.3	5.3		4.2	1.7	1.5
2-row harvester, hauled with tractor	4	17	10.8	8.5	3.5		2.6	1.2	1.2

[1]Each item of power and equipment considered as being required for the harvesting operation for the time indicated even though it might not be in actual operation for the entire time.

Table 10. Labor requirements for processing feeds, North Mississippi, 1954.

Item	No. farms	Tons processed per farm	Hours per ton	
			Man	Equipment
Hammer mill	135	98	2.3	.9
Oat crimper	6	97	4.1	1.6

Table 11. Labor requirements for different methods of feeding concentrates to cattle, North Mississippi, 1954.

Item	No. operations reported	Average per operation reported				Average per animal per feeding	
		No. animals fed	Lbs. concentrates per feeding	Distance one way, ft.	Hours labor per feeding	Lbs. concentrates	Minutes labor
Buckets	273	43	180	59	.73	4.2	1.01
Carts	25	64	192	61	.67	3.0	.63
Trucks and tractors[1]	57	147	1,096	3,860	1.55	7.5	.63
Average	355[2]	61	328	669	.86	5.4	.85

[1]Total truck time or tractor and trailer time per feeding was 1.00 hours.

[2]Does not agree with total in appendix Table 5 because necessary details were not obtained on six operations.

Table 12. Labor requirements for different methods of feeding baled hay to cattle, North Mississippi, 1954.

Item	No. operation reported	Average per operation reported				Average per animal per feeding	
		No. animals fed	Bales of hay per feeding	Distance one-way ft.	Hrs. labor per feeding	Lbs. hay	Minutes labor
Hand	169	49	7	54	.67	4.5	.82
Trucks and tractors[1]	119	124	24	1,938	1.68	6.0	.81
Average	288	80	14	832	1.09	5.5	.82

[1]Total truck time or tractor and trailer time per feeding was 1.00 hrs.

Another important item which should be taken into account when comparing costs, is the fact that tractor costs differ for pulling a piece of equipment operated by power take-off from those incurred if the piece of equipment was operated by an auxiliary engine. Estimates of the Department of Agricultural Engineering indicate that tractor costs when pulling a machine operated by power take-off are higher by about the amount required for fuel and oil for the auxiliary engine. Whenever applicable, these amounts are indicated also.

Total variable cost especially, and to some extent depreciation, depends upon the extent of use of the particular item of equipment. The cost figures which are presented below are based upon the average amount of use on the farms studied. They should be interpreted in this light rather than as costs a farmer would expect to incur under a different set of circumstances. Still, the figures presented should be extremely valuable as an aid in determining the cost of operation under a different set of circumstances. Examples of how they might be used are given in the sections which follow on corn pickers and on hay harvesting equipment.

Corn Pickers

Initial cost of corn pickers averaged $896 for 1-row pickers and $1664 for 2-row pickers (table 14). Total annual cost averaged $171 and $292, respectively. For both sizes, depreciation accounted

for over half of the total annual cost. Total fixed cost, including interest on investment and housing in addition to depreciation, accounted for 75 percent and 81 percent, respectively, for 1-row and 2-row pickers.

Total cost per day of operation amounted to $12 for 1-row pickers and $17 for 2-row pickers. But, since the 2-row pickers were used more days and covered a larger number of acres per day of use, cost per acre was less for the 2-row pickers ($1.21 compared to $1.69). Which machine an individual farmer would buy, however, would depend on the circumstances on his farm.

Suppose that a farmer has decided to buy a corn picker. Either a 1-row or 2-row machine can be used on his farm. He has 30 acres of corn to harvest each year. Which machine should he buy?

From Table 14 it appears that either machine should last about 10 years if used on only 30 acres each year. This would mean about $90 depreciation per year for the 1-row machine and about $166 depreciation for the 2-row machine. Interest on investment and housing would be about $33 for the 1-row machine and about $54 for the 2-row machine.

Thus, total fixed cost would be about $123 for the 1-row machine and about $220 for the 2-row machine.

From Table 14 also we see that variable cost (repairs) will amount to around $3 for the 1-row machine and around $4 for the 2-row machine per

Table 13. Labor requirements for different methods of feeding silage to cattle, North Mississippi, 1954.

Item	No. operation reported	Average per operations reported: No. animals fed	Lbs. silage fed per feeding	Distance one-way ft.	Hrs. labor per feeding	Average per animal per feeding: Lbs. silage	Minutes labor
Trench silo:							
Forks and buckets	4	32	942	48	1.42	29	2.66
Carts and wheelbarrows	1						
Trucks and tractors[1]	21	137	2,631	1,733	3.99	19	1.75
Average	27[2]	116	2,254	1,396	3.50	19	1.81
Upright silo:							
Forks and buckets	32	66	1,440	36	1.58	22	1.44
Carts and wheelbarrows	12	56	1,063	49	.94	19	1.01
Trucks and tractors[1]	15	183	4,035	1,021	3.90	22	1.28
Average	61[3]	97	1,851	285	1.86	19	1.15
All silos:							
Forks and buckets	39[4]	63	1,451	36	1.50	23	1.43
Carts and wheelbarrows	14[5]	59	1,258	51	1.13	21	1.15
Trucks and tractors[1]	46[6]	162	3,498	1,347	4.13	22	1.53
Average	102[7]	110	2,239	642	2.47	20	1.35

[1]Total truck time or tractor and trailer time per feeding was 2.27 hours for trench silos, 2.17 hours for upright silos, and 2.23 hours average for all silos.

[2]Includes one observation not classified as to method of feeding.

[3]Includes two observations not classified as to method of feeding.

[4]Includes three observations not classified by type of silo.

[5]Includes one observation not classified by type of silo.

[6]Includes ten observations not classified by type of silo.

[7]Includes all silos.

Table 14. Cost of operation and related information for corn pickers, North Mississippi, 1954.

Item	1-row	2-row
No. farms	37	7
10-hr days used during summer	14	18
Acres covered during year	100	257
Years useful life	9.4	9.1
Replacement cost (dollars)	896.00	1,664.00
Cost of operation (dollars):		
Total annual	169.42	311.60
Total fixed cost:	128.01	237.03
Depreciation	95.32	182.86
Interest on investment	22.40	41.60
Housing	10.29	12.57
Total variable cost (repairs)	41.41	74.57
Total per day	12.10	17.31
Total per acre	1.69	1.21

10-hr. day used. From Table 3 we see that machine time required to harvest one acre of corn with a 1-row picker is 1.4 hours and with a 2-row picker is .7 hours. In terms of 10-hour days, 4.2 days are required to harvest 30 acres with a 1-row picker and 2.1 days with a 2-row picker. This would mean about $13 repairs per year for the 1-row picker and about $8 repairs for the 2-row machine. Thus, total machine cost per year for harvesting 30 acres would be about $136 for the 1-row machine and about $228 for the 2-row machine.

The difference in labor and tractor time required (about 2 10-hr. days) should be considered too. If we count the extra labor at $4 per day and the extra[2] tractor costs at $7 per day,[3] the comparison would be $158 for the 1-row machine and $250 for the 2-row machine. Therefore, a 1-row machine would be much cheaper if only 30 acres were to be harvested.

If the same farmer had 200 acres of corn to harvest instead of 30 acres though, the answer would be different. The 1-row machine would probably last about 8 years and the 2-row machine about 9 if 200 acres were harvested each year. This would mean about $112 depreciation for the 1-row machine; thus, total fixed cost would be about $145. For the 2-row machine depreciation would be about $186 and total fixed cost would be about $240.

The 1-row machine would be used about 28 days and the 2-row machine would be used about 14 days. This would mean about $84 for repairs for the 1-row picker and about $56 for repairs for the 2-row picker. Total machine costs would be about $270 for the 1-row machine and about $296 for the 2-row machine. This would mean a difference of $26 in favor of the smaller machine. But the extra labor at $4 per day and the extra tractor time at $7 per day would mean to save the $26, an additional cost of $154 would have to be incurred.

Thus, the larger machine would be cheaper when all costs were considered. In addition, the 28 days required for harvesting by the 1-row machine may be longer than the corn would remain in a condition suitable for harvesting by machine.

[2]The total cost of operating a tractor two days should not be counted in since a part of the total cost (fixed costs) would be about the same regardless of whether it was used the extra two days or not. The small difference in tractor costs per day as a result of pulling a 1-row machine instead of a 2-row machine is ignored in the above calculations.

[3]A large tractor was used to pull both type machines in the majority of cases on the farms studied. See Appendix Table 1.

Combines

Replacement cost of combines ranged from an average of $1,508 for the 5-ft. power take-off type to $5,275 for the self-propelled type. (Table 15). Total annual cost for the pull-type machines ranged from $304 for the 5-ft. power take-off machine to $412 for the 6-ft. machine equipped with an auxiliary engine. Total annual cost averaged $1,020 for the self-propelled type combine.

Total fixed cost accounted for an average of from 73 percent to 82 percent of the total cost of operation. Depreciation was by far the most important fixed cost item.

Variable cost (that part of total cost which depends to a considerable extent upon the amount of use) was naturally higher for combines equipped with auxiliary engines than for those not so equipped. Variable cost ranged from an average of $64 for 5-ft. power take-off combines to $102 for 6-ft. combines equipped with auxiliary engines and averaged $274 for self-propelled combines.

Total cost per day of operation and per acre covered was highest for the 5-ft. combine equipped with auxiliary engine. The fact that this type combine was used only an average of 7 days per year compared to from 10 to 20 days for the other types accounts in part for the higher total cost per day and per acre covered.

Hay Harvesting Equipment

Different types of equipment may be substituted for each other in either of the four stages of the hay harvesting operation—mowing, raking, baling, and hauling. Thus costs for various types of equipment are discussed separately for each stage of the harvesting operation.

Mowers. Initial costs of 6-ft. and 7-ft. tractor mowers were essentially the same, $299 and $300, (Table 16). Five-ft. tractor mowers were somewhat lower priced, averaging $216. Replacement cost of mule mowers averaged $168 each.

Total annual cost of operation for the tractor mowers ranged from $69 for the

Table 15. Cost of operation and related information for combines, North Mississippi, 1954.

Item	5-ft.		6-ft.		Self propelled
	Power take-off	Auxiliary engine	Power take-off	Auxiliary engine	
No. farms	16	25	13	43	12
10-hr. days used during year	10	7	13	11	20
Acres covered during year	91	78	144	122	400
Years useful life	8.2	8.8	8.0	8.5	8.9
Replacement cost (dollars)	1,508.00	1,876.00	1,829.00	2,036.00	5,275.00
Cost of operation (dollars):[1]					
Total annual:	303.96	365.72	359.58	411.77	1,020.38
Total fixed cost:	239.54	278.02	294.17	310.26	746.76
Depreciation	183.90	213.18	228.62	239.53	592.70
Interest on investment	37.70	46.90	45.72	50.90	31.88
Housing	17.94	17.94	19.83	19.83	22.18
Total variable cost:	64.42	87.70	65.41	101.51	273.62
Repairs	64.42	69.91	65.41	71.57	158.21
Gasoline		15.26		26.40	110.83
Oil and oil filters		2.53		3.54	4.58
Total per day	30.40	52.25	27.66	37.43	51.02
Total per acre	3.34	4.69	2.50	3.38	2.55

[1]Additional tractor costs for pulling the 5-ft. power take-off combine over and above those for pulling the 5-ft. machine equipped with auxiliary engines would total about $25.41, or about $2.54 per day and $.28 per acre. For the 6-ft. power take-off combine, additional tractor costs would total about $35.39, or about $2.72 per day and $.25 per acre. See text.

5-ft. size to $84 for the 6-ft. size. Total annual cost of operating mule mowers averaged $31. On the average, cost of operation was approximately evenly divided between fixed cost items and variable cost items. Depreciation was the major item of fixed cost and repairs the only items of variable cost.

Operating cost per day of use ranged from $2.79 for mule mowers to $4.59 for the 7-ft. tractor mowers. Contrarywise, cost of operation per acre covered was lowest for the 7-ft. tractor mower ($.23) and highest for mule mowers ($.33). This situation was due to the wide difference in acres covered per day of use.

Rakes. Initial cost of tractor side-delivery rakes was almost four times as great as the initial cost of mule dump rakes, $375 compared to $99, (Table 17). Considerable difference was also found in years of estimated life of the two types of rakes. Estimated life of mule dump rakes was 21.1 years compared to 8.4 years for the side-delivery rakes.

Annual cost of operation averaged $14 for mule dump rakes and $95 for tractor side-delivery rakes. For both type rakes, fixed cost items, of which depreciation was the most important, accounted for over one-half of the total cost of operation.

Cost per day of operation averaged $2.35 for mule dump rakes and $5.94 for tractor side-delivery rakes. Cost per acre

Table 16. Cost of operation and related information for mowing machines, North Mississippi, 1954.

Item	Mule mowers	Tractor mowers		
		5-ft.	6-ft.	7-ft.
No. farms	29	18	113	101
10-hr. days used during year	11	20	20	18
Acres covered during year	92	222	333	360
Years useful life	14.8	9.2	9.2	9.2
Replacement cost (dollars)	168	216	299	300
Cost of operation (dollars):				
Total annual:	30.68	69.44	83.92	82.60
Total fixed costs:	18.92	32.28	44.34	43.61
Depreciation	11.35	23.48	32.50	32.61
Interest on investment	4.20	5.40	7.48	7.50
Housing	3.37	3.40	3.46	3.50
Total variable cost (repairs)	11.76	37.16	40.48	38.99
Total per day	2.79	3.47	4.20	4.59
Total per acre	.33	.31	.25	.23

Table 17. Cost of operation and related information for hay rakes, North Mississippi, 1954.

Item	Tractor side-delivery	Mule dump
No. farms	139	40
10-hr. days used during year	16	6
Acres covered once over	320	86
Years useful life	8.4	21.1
Replacement cost (dollars)	375	99
Cost of operation (dollars):		
Total annual:	95.02	14.11
Total fixed cost:	59.17	9.71
Depreciation	44.64	4.69
Interest on investment	9.38	2.48
Housing	5.15	2.54
Total variable cost (repairs)	35.85	4.40
Total per day	5.94	2.35
Total per acre	.30	.16

covered was also lower for the mule dump rakes, $.16 compared to $.30.

Balers. Replacement cost of hay balers ranged from $923 for the stationary balers operated by power take-off to $2,512 for the automatic pick-up baler with auxiliary engine, (Table 18). Replacement cost of automatic pick-up balers operated by power take-off and non-automatic pick-up balers with auxiliary engine averaged essentially the same, $1,651 and $1,650.

Total annual cost of operation for the different types ranges from $141 for the stationary baler operated by power take-off to $517 for the automatic pick-up baler with auxiliary engine. Of the total, fixed cost items accounted for from 64 percent to 80 percent. Depreciation was the main item of fixed cost.

Operating costs per day of operation ranged from $11 for stationary balers operated by power take-off to $27 for automatic pick-up balers with auxiliary engine. Costs per acre ranged from $.76 to $1.69. The stationary baler operated by power take-off had the lowest cost per acre and the automatic pick-up baler operated by power take-off had the highest cost per acre.

Cost of operation per bale was considerably lower for the non-automatic pick-up baler operated with auxiliary engine than for either of the other three types of balers. Total cost of operation for this type baler was only 1.7 cents per bale compared to 3.0 cents, 3.1 cents, and 3.4 cents for the automatic pick-up baler equipped with auxiliary engine, the stationary baler operated by power take-off, and the automatic pick-up operated by power take-off respectively.

Since a large proportion of the total

Table 18. Cost of operation and related information for hay balers, North Mississippi, 1954.

Item	Pick-up			Stationary, power take-off
	Automatic		Non-automatic, auxiliary engine	
	Power take-off	Auxiliary engine		
No. farms	10	66	13	18
10-hr. days used during year	14	19	30	13
Acres covered during year	200	380	500	186
Bales baled during year	10,044	17,445	22,921	4,578
Years useful life	7.9	8.5	8.3	11.7
Replacement cost (dollars)	1,651	2,512	1,650	923
Cost of operation (dollars)[1]				
Total annual:	338.22	517.28	398.00	140.85
Total fixed cost:	264.56	372.66	253.93	112.29
Depreciation	208.99	295.53	198.80	78.89
Interest on investment	41.28	62.80	41.25	23.07
Housing	14.29	14.33	13.88	10.33
Total variable cost:	73.66	144.62	144.07	28.56
Repairs	73.66	96.59	69.31	28.56
Gasoline		43.34	68.18	
Oil and oil filters		4.69	6.58	
Total per day	24.16	27.23	13.27	10.83
Total per acre	1.69	1.36	.80	.76
Total per bale[2]	.034	.030	.017	.031

[1]Additional tractor costs for pulling the automatic pick-up power take-off baler over and above those for pulling one with auxiliary engine would total about $35.39; this would be about $2.53 per day, about $.18 per acre, and about $.004 per bale. See text.

[2]Differences in cost of material used in tying bales, if any, should also be considered in cost comparisons. Information as to these differences were not secured in this study, however.

cost of operating a hay baler is accounted for by items which are relatively fixed regardless of amount of use, the extent of use has considerable influence on costs per unit. The cost of the relatively fixed items is spread over more units. Difference in cost per bale, per acre, and per day are due in part to difference in amount of use. Machine costs would not be the only consideration in deciding which of two types of machines to purchase, however. The example below illustrates the point.

Suppose a farmer had 500 acres of hay to bale, his own plus some custom baling for his neighbors. He is trying to decide whether to buy an automatic pick-up with auxiliary engine or a non-automatic pick-up with anxiliary engine. If he buys the former, he does not have to hire any labor for the hay baling. But if he buys the latter he has to hire labor for the tying. We can calculate from the figures in Table 7 that the number of 10-hr. days required to do the job will be about 25 with the former and about 30 with the latter. Thus, two men for the tying at $4 per day for 30 days would cost $240. If a large tractor is used to pull the baler, 5 extra days at about $7 per day would be about $35 extra tractor costs associated with the non-automatic type baler. These costs, together with the $398 machine cost for the non-automatic pick-up baler would total $673 for hired labor, machine, and added tractor costs.

For the automatic pick-up baler with auxiliary engine we can estimate years of useful life at about the same as for the non-automatic pick-up baler with auxiliary engine, if it is to be used on the same number of acres. We would estimate depreciation, based on 8.3 years of useful life, to be about $303 Interest on investment would be about $63 and housing about $14. Thus, total fixed cost of the automatic pick-up baler with auxiliary engine would be around $380, if used on 500 acres.

From Table 18 we see that variable cost amounted to $144.62 for 19 days of use, or about $7.60 per day. For 25 days, variable costs would amount to around $190. Thus, total machine costs for this type baler to harvest 500 acres per year would be about $570. The farmer would save the difference between $673 and $570 each year by buying the automatic baler. In addition, he would work about 5 days less himself.

On the other hand, if he had unpaid family labor to do the tying, extra tractor costs and machine costs for the non-automatic pick-up baler with auxiliary engine would total only about $433 compared to a machine cost of about $570 for the automatic pick-up baler with auxiliary engine. Differences in cost of material used in tying bales should also be considered before reaching a final decision. Such differences are usually in favor of the automatic baler.

Ensilage Equipment

Replacement cost of 1-row forage harvesters averaged $2,023 and $2,258, respectively, for power take-off machines and harvesters equipped with auxiliary engines (Table 19).

Annual cost of operation totaled $377 and $486, respectively, for the two types of harvesters. Fixed cost, of which depreciation was by far the most important item, accounted for approximately three-fourths of the total. Total cost per day of operation, per acre, and per ton was about the same for the two types of harvesters.

Initial cost of 1-row binders was low relative to initial cost of forage harvesters, averaging $557 each. Annual cost of operation averaged $93 and cost of operation per day, per acre, and per ton amounted to $15.50, $2.33, and $.22 respectively.

Replacement cost of ensilage cutters and blowers averaged $513. On an annual basis, cost of operation amounted to $74. Per day, per acre, and per ton figures

Table 19. Cost of operation and related information for ensilage equipment, North Mississippi 1954.

Item	Ensilage cutter and blower	1-row binder	1-row forage harvester	
			Power take-off	Auxiliary engine
No. farms	47	41	32	8
10-hr. days used during year	6	6	11	14
Acres covered during year	43	40	63	92
Tons harvested during year	461	429	784	1,144
Years useful life	13.1	11.6	8.2	8.1
Replacement cost (dollars)	513.00	557.00	2,023.00	2,258.00
Cost of operation (dollars):[1]				
Total annual:	74.40	93.01	376.96	485.73
Total fixed cost:	58.29	67.16	313.74	351.66
Depreciation	39.16	48.02	246.71	278.76
Interest on investment	12.82	13.92	50.58	56.45
Housing	6.31	5.22	16.45	16.45
Total variable cost:	16.11	25.85	63.22	134.07
Repairs	16.11	25.85	63.22	73.33
Gasoline				54.70
Oil and oil filters				6.04
Total per day	12.40	15.50	34.27	34.70
Total per acre	1.73	2.33	5.98	5.28
Total per ton	.16	.22	.48	.42

[1]Additional tractor costs for pulling the 1-row forage harvester operated by power take-off over and above those for pulling the machine equipped with auxiliary engine would total about $47.75 This would be about $4.34 per day, $.76 per acre, and $.06 per ton. See text.

were $12.40, $1.73, and $.16, respectively.

Feed Processing Equipment

Cost information was secured on 6 oat crimpers and 135 hammer mills. Replacement cost of these items of equipment averaged $167 and $384, respectively, (Table 20).

Cost of operation annually amounted to $27 for oat crimpers and $53 for hammer mills. Per day of operation, costs totaled $1.71 and $5.87, respectively. On a "per ton processed" basis, total cost amounted to $.28 and $.54, respectively.

Custom Work

Harvesting equipment for feed and forage crops is quite specialized. As a result, fixed cost is necessarily high for a farmer who has only a few acres on which the equipment can be used. Thus, many farmers follow either the practice of hiring a part of the specialized equipment needed on a custom basis, or buying it with the intention of doing work for other farmers on a custom basis to defray a part of the cost of owning the equipment. Others sometimes buy specialized harvesting equipment for the sole purpose of doing custom work. For the harvesting operations studied, baling hay was the job most frequently reported as being hired on a custom basis (Appendix Table 7). Raking hay, combining oats, and cutting and storing ensilage were others quite frequently done on a custom basis. Custom rates for performing several operations are presented in Appendix Table 8.

Cost of Storing Feed and Forage

In general, several different types of facilities were used for storing feed and forage crops. In many cases, the same facility may be used to store several different feed and forage crops. In the discussion below, cost of storage for corn, oats, hay and silage is presented for the different types of facilities in which they were stored on the farms studied.

Corn

Corn was stored in general barns, corn cribs, granaries, and tenant houses. The average quantity stored in each type facility ranged from 101 bushels per tenant house to 1,124 bushels per corn crib (Table 21). Annual cost of buildings chargeable to corn storage ranged from an average of from 5.0 cents per bushel for general barns to 7.4 cents for granaries.

Oats

Oats were stored in general barns, oat cribs, granaries, and tenant houses. The quantity stored per building ranged from 272 bushels for general barns to 1,589 bushels for granaries (Table 22). Building costs chargeable to oat storage ranged from an average of 4.9 cents per bushel for oat cribs to 6.1 cents for tenant houses.

Hay

General barns, barns built especially for hay storage, and tenant houses were used for hay storage. An average of 11 tons per building was stored in tenant

Table 20. Cost of operation and related information for feed processing equipment, North Mississippi, 1954.

Item	Oat crimper	Hammer mill
No. farms	6	135
10-hr. days used during year	16	9
Tons processed during year	97	98
Years useful life	18.8	15.1
Replacement cost (dollars)	167.00	384.00
Cost of operation (dollars):		
Total annual:	27.37	52.81
Total fixed cost:	17.29	41.16
Depreciation	8.88	25.43
Interest on investment	4.18	9.60
Housing	4.23	6.13
Total variable cost (repairs)	10.08	11.65
Total per day	1.71	5.87
Total per ton	.28	.54

Table 21. Cost of storing corn in different types of facilities, North Mississippi, 1954.

Item	General barn	Corn crib	Granary[1]	Tenant house
Annual cost per building charged to corn (dollars)[2]	24.30	57.14	44.99	6.18
Corn stored per building (bushels)	489	1,124	610[1]	101
Cost of storage per bushel (cents)	5.0	5.1	7.4	6.1

[1]Where only corn was stored in the granary. an average of 1,514 bushels of corn was stored per granary.

[2]See Appendix Table 8 for detailed cost.

Table 22. Cost of storing oats in different types of facilities, North Mississippi, 1954.

Item	General barn	Corn crib	Granary[1]	Tenant house
Annual cost per building charged to oats (dollars)[2]	14.84	75.78	85.91	28.10
Oats stored (bushels)	272	1537	1589[1]	463
Cost of storage per bushel (cents)	5.5	4.9	5.4	6.1

[1]Where only oats were stored in the granary, an average of 1,635 bushels were stored per granary.

[2]See Appendix Table 8 for detailed cost.

houses which were used for hay storage compared to 44 tons per building for general barns and 86 tons per building for hay barns (Table 23). Building costs for hay storage averaged around $2.50 per ton or about 8 cents per bale.

Silage

Trench silos appear to offer a cheaper method of storing silage than upright silos, if a comparison is made on the basis of annual cost of the storage facility only. Total facility cost amounted to only 16 cents per ton for trench silos compared to 55 cents for upright silos (Table 24).

Table 23. Cost of storing hay in different types of facilities, North Mississippi, 1954.

Item	General barn	Hay barn	Tenant house
Annual cost per building charged to hay (dollars)[1]	116.18	211.05	28.10
Hay stored per building (tons)	44	86	11
Cost of storage per ton (dollars)	2.64	2.45	2.55
Cost of storage per bale (cents)	8.4	7.8	8.2

[1]See Appendix Table 8 for detailed cost.

Table 24. Cost of storing silage in upright and trench silos, North Mississippi, 1954.

Item	Upright silo	Trench silo
Annual cost per silo (dollars)[1]	87.00	38.69
Silage stored per silo (tons)	157	246
Cost per ton of silage stored (dollars)	.55	.16

[1]See Appendix Table 8 for detailed cost.

APPENDIX

Appendix Table 1. Source of power[1] for corn harvesting operation, North Mississippi, 1954.

Operation	No. farms reporting	Percentage of farms using		
		Large tractors	Medium tractors	Small tractors
Picking:				
1-row picker	91	57.1	42.9	0
2-row picker	15	80.0	20.0	0
Hauling:[2]				
Tractor and trailer	160	31.9	65.6	2.5

[1]Tractors of over 24 h. p. were classified as large, from 18-24 h. p. as medium, and less than 18 h. p. as small.

[2]Trucks were used for hauling on 29 farms. On these farms ½, 1, 1½, and 2 ton trucks were used in 6.9, 3.5, 7.2, and 17.2 percent of the cases respectively.

Appendix Table 2. Source of power[1] for oat harvesting operations, North Mississippi, 1954.

Operation	No. farms reporting	Percentage of farms using		
		Large tractors	Medium tractors	Small tractors
Combining				
5-ft power take-off	13	84.6	15.4	0
5-ft auxiliary engine	8	100.0	0	0
6-ft. power take-off	15	80.0	20.0	0
6-ft. auxiliary engine	36	38.9	58.3	2.8
Hauling:[2]				
Tractor and trailer	24	41.7	58.3	0

[1]See footnote 1 Appendix Table 1.

[2]Trucks were used for hauling on 40 farms. On these farms ½, 1, 1½, and 2 ton trucks were used in 20, 10, 60, and 10 percent of the cases, respectively.

Appendix Table 3. Source of power[1] for hay harvesting operations, North Mississippi, 1954.

Operation	No. farms reporting	Percentage of farms using		
		Large tractors	Medium tractors	Small tractors
Mowing:				
5-ft. mower	17	0	52.9	47.1
6-ft. mower	110	29.1	66.4	4.5
7-ft. mower	109	45.0	51.4	3.6
Raking:				
Side-delivery	187	28.9	65.3	5.9
Baling:				
Automatic pick-up, power take-off	37	54.1	45.9	0
Automatic pick-up, auxiliary engine	103	45.6	54.4	0
Non-automatic pick-up, auxiliary engine	16	56.2	43.8	0
Stationary	8	12.5	87.5	0
Hauling (tractor and trailer)[2]				
Bales	83	39.8	60.2	0
Loose	8	0	100.0	0

[1]See footnote 1 Appendix Table 1.

[2]Trucks were used to haul baled hay on 120 farms. On these farms ½, 1½, and 2 ton trucks were used in 7.5, 77.5, and 15.0 percent of the cases, respectively.

Appendix Table 4. Source of power for silage harvesting and storage operations, North Mississippi, 1954.

Operation	No. farms reporting	Percent of farms using		
		Large tractors	Medium tractors	Small tractors
Field harvester:				
1-row harvester	56	66.1	32.1	1.8
Hauling chopped silage[1]	62	35.5	61.3	3.2
Blowing silage into upright silo	18	77.8	22.2	0
Packing silage in trench silo	14	28.6	71.4	0
Bound silage:				
1-row binder	47	27.7	72.3	0
Hauling bound silage[2]	33	33.3	66.7	0
Storing silage in upright silo	32	71.9	28.1	0
Storing silage in trench silo	6	33.3	66.7	0

[1]Trucks were used to haul chopped silage on 14 farms. On these farms 1½ ton and 2 ton trucks were used in 93.8 and 6.2 percent of the cases, respectively.

[2]Trucks were used to haul bound silage on 30 farms. On these farms 1, 1½, and 2 ton trucks were used in 6.7, 60.0, and 33.3 percent of the cases, respectively.

Appendix Table 5. Feeding intervals and crew size for feeding cattle, North Mississippi, 1954.

Item	Feeding intervals			Number men feeding		
	One time daily	Two times daily	Not fed daily	One	Two	Three or more
	No. farms					
Concentrates:						
Dairy cattle	28	138	0	124	42	0
Beef cattle	134	43	18	139	50	6
Total	162	181	18	263	92	6
Hay:						
Dairy cattle	80	32	8	82	35	3
Beef cattle	133	33	2	96	58	14
Total	213	65	10	178	93	17
Silage:						
Dairy cattle	26	42	0	33	32	3
Beef cattle	31	3	0	10	19	5
Total	57	45	0	43	51	8

Appendix Table 6. Percentage of feed and forage wasted when fed to cattle, North Mississippi, 1954.

Item	Number operations reported	Number animals fed per group	Lbs. per animal per day	Percent wasted
Concentrates	361	61	7	1.6
Hay	288	80	14	9.6
Silage	102	110	35	3.6

Appendix Table 7. Number and percent of farmers hiring custom work or doing custom work for other farmers for specified operations, 304 farms, North Mississippi, 1954.

Crop and operation	Number farmers reporting	Number farmers		Percent of farmers	
		Hiring custom work	Doing custom work	Hiring custom work	Doing custom work
Corn:					
Picking	244	6	7	2	3
Hauling	244	0	0	0	0
Oats:					
Combining	161	41	18	25	11
Hauling	161	3	1	2	1
Hay:[1]					
Mowing	272	25	15	9	6
Raking	272	61	18	22	7
Baling	246	89	21	36	9
Hauling	272	12	6	4	2
Silage:					
Cutting	118	26	12	22	10
Hauling	118	17	4	14	3
Storing	118	24	6	20	5

[1]Of the 114 farmers reporting hiring or doing custom work, 30 reported baling only, 39 raking and baling, 23 mowing, raking and baling, and 14 mowing, raking, baling, and hauling.

Appendix Table 8. Custom rates for specified harvesting operations, North Mississippi, 1954.

Crop and harvesting operation	Unit	Range[1]	Usual rate
		Dollars	
Corn :			
Picking	Acre	6.00 - 6.50	6.00
Oats:			
Combining	Acre	5.00 - 7.50	6.00
Hay:			
Baling	Bale	.15 - .20	.15
Raking and baling	Bale	.20 - .25	.20
Mowing, raking, and baling	Bale	.25 - .30	.25
Mowing, raking, baling, and hauling	Bale	.30 - .35	.35
Silage:			
Cut	Ton	1.00 - 2.00	1.50
Cut and store[2]	Ton	1.50 - 2.50	2.00
Cut, haul, and store	Ton	2.50 - 3.50	3.00
Processing feeds (hammer mill)	Cwt.	.20 - .35	.25

[1]Range within most reported custom rates fell.

[2]Hauling done by farmer; cutting and storing only by custom operator.

Appendix Table 9. Annual cost and related information for feed and forage storage facilities, North Mississippi, 1954.

Item	General barn	Hay barn	Tenant houses	Granary	Corn crib	Oat crib	Upright silo	Trench silo
No. farms	248	105	35	40	101	42	81	46
No. of buildings	415	182	73	64	145	59	124	58
Yrs. of useful life	31	37	23	22	28	25	37	15
Replacement cost (dollars)	3195	3277	656	1670	707	816	1223	241
Annual cost (dollars):								
Depreciation	103.06	88.57	28.52	75.91	25.25	32.64	33.05	16.07
Interest	79.88	81.92	16.40	41.75	17.68	20.40	30.58	6.02
Insurance	22.01	10.24	3.74	4.44	1.72	4.46	0	0
Repairs	58.09	40.22	19.03	15.64	12.78	21.17	23.37	16.60
Total	263.04	220.95	67.69	137.74	57.43	78.67	87.00	38.69
Annual cost (dollars) charged to:								
Corn	24.30		6.18	44.99	57.14			
Oats	14.84		28.10	85.91		75.78		
Hay	116.18	211.05	28.10					
Silage							87.00	38.69
Other uses	107.71	9.90	5.31	6.84	.29	2.89