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UNIVERSITY OF IDAHO
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Costs of Baling and Chopping Hay in South Central Idaho

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Summary

Hay harvesting costs are analyzed in this publication for nine combinations of baling or chopping equipment and two custom harvesting possibilities. The costs as shown are for the south central Idaho irrigated area.

Custom hay harvesting is more expensive than harvesting with owned equipment in almost all cases for farms producing 125 tons of hay or more. As an exception to this, farmers with less than 150 tons of hay, using the more expensive hay harvesting methods can, in some situations, lower costs by hiring the baling done by a custom operator and hauling and stacking the hay with their own labor.

Farmers who feed all their hay on the farm, and who can use chopped hay, will have lower costs by chopping their hay instead of baling it. The advantage will range from a few cents to as much as \$2 per ton. Farmers who sell a part or all of their hay will usually find it necessary to have it baled in wire-tied bales. Chopped hay is less expensive because: (1) no wire or twine is needed, (2) the initial cost of choppers is less, and (3) choppers last longer than balers.

Power take-off balers and choppers are cheaper to operate than those powered by auxiliary motors. If 250 tons of hay are produced, the saving ranges from 24 cents to 42 cents per ton.

Baled hay tied with twine costs 45 cents less per ton than that tied with wire. Offsetting this advantage is the greater breakage loss from twine-tied bales.

If trucks needed to haul chopped hay are not already owned or available through exchange work arrangements, unloading wagons will be more economical than investing in additional trucks.

Some farmers can pull the chopper with the truck being loaded. In this case, the chopper will be powered by an auxiliary motor. This saves one man and the operating expense of the tractor used to pull the chopper. It is more difficult to make sharp turns with this combination; consequently, it cannot be used on some fields. If the method can be used, it is one of the lowest cost combinations.

As would be expected, the smaller farms have higher costs per ton than the larger farms. On a 240-acre farm costs are from 80 cents to \$1.55 less per ton than those on an 80-acre farm.

Little difference in the ranking of the various methods results whether (1) all labor is included as a cost or (2) none of the labor charge is counted. In both cases the high cost methods are the baling combinations and the low cost ones are the chopping combinations.

When costs are adjusted to include only the typical amount of temporary labor for each farm size and each method, very little change occurs in the ranking of the methods tested. The lowest costs are still obtained when the chopper driven by a power take-off or the chopper pulled by the truck being loaded are used.

Cost of Baling and Chopping Hay in South Central Idaho

DONALD L. WALKER and ROLAND C. BEVAN¹

MOST of the hay in Idaho is either baled or chopped. Described here are hay harvesting costs for (1) four variations of baling equipment, (2) five variations of chopping equipment and (3) two custom harvesting possibilities. The costs as given are for the south central Idaho irrigated area. They can be applied, however, to other areas of southern Idaho and to the other areas of the country with similar conditions. The costs are derived from information obtained from 150 farmers, from implement dealers and from others in 1956, as well as from a detailed machinery costs survey made in the Twin Falls area in 1953.

The charges for operating equipment include two types of costs. These are (1) fixed costs, which are the same regardless of the amount the machine is used; largely depreciation, taxes and housing charges and (2) variable costs, which vary with the machine use—including fuel and repairs. Fixed costs could be thought of as overhead costs, while variable costs might be called operating costs. Interest on the value of equipment or returns to investment are not included as a cost in this study. The labor used to operate this equipment is in the nature of a fixed cost for the regular hired labor and in the nature of variable cost for the added temporary labor.

All costs, both fixed and variable, are chargeable to the forage crops for operating balers and choppers and other specialized hay equipment. On the other hand, only a part of the fixed costs of operating tractors and trucks can be allocated to the forage crops since this equipment is used in producing and harvesting all crops. In this study, these fixed costs for tractors and trucks are ignored because they are not affected by additional use of the implements. Only the variable or operating costs for this power equipment are considered. Likewise, fixed charges for regular hired labor are ignored, since they are the same for any harvesting method. On the other hand, added temporary labor costs will vary with the harvesting method and must be considered. The costs of mowing and raking will be omitted since they are assumed to be identical for all the harvesting methods used. When all or part of the operation is hired custom work, the usual charges for this are included and the farmer's costs are reduced to include only the part of the operation

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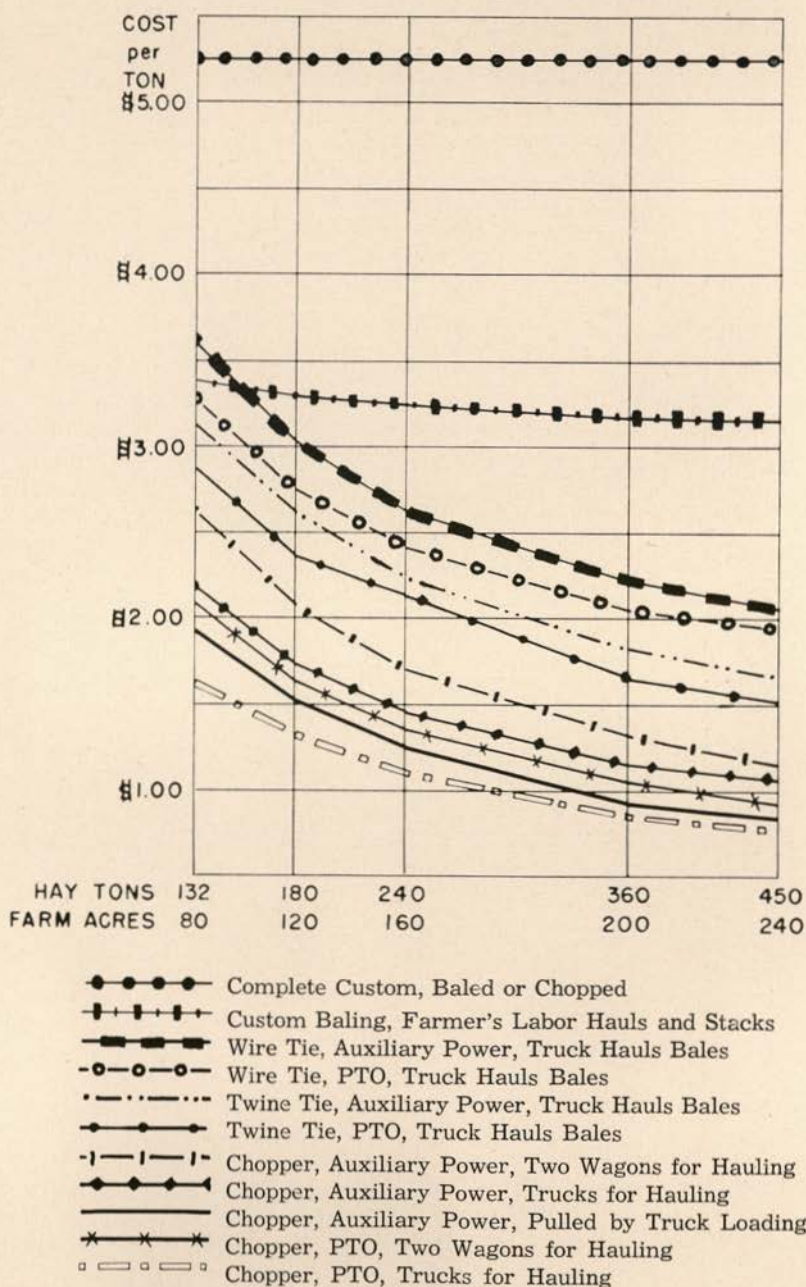


Figure 1.—Operating Cost per Ton for Harvesting Forage by Different Methods by Tonnage of Hay Harvested, South-Central Idaho, 1956. None of Labor Assumed to be Hired Specifically for Hay Harvesting.

Table 1.—Operating cost per ton for harvesting forage by different methods, by tonnage of hay harvested, south-central Idaho, 1956. None of labor assumed to be temporary labor hired specifically for hay harvesting.

Harvesting Method	Annual Fixed Costs per ton					Total Costs per ton							
	Variable Machine Cost p.ton	Hired Labor Cost p.ton	Total Variable Cost p.ton	132	180	240	360	450	132	180	240	360	450
Tons of hay				132	180	240	360	450	132	180	240	360	450
Acres in farm				80	120	160	200	240	80	120	160	200	240
Custom harvesting—entire operation			\$5.25						\$5.25	\$5.25	\$5.25	\$5.25	\$5.25
Custom baling—farmer hauls and stacks with own labor	\$3.09	0	3.09	\$.28	\$.20	\$.15	\$.10	\$.08	3.37	3.29	3.24	3.19	3.17
Baling—wire tie baler with auxiliary motor	1.40	0	1.40	2.20	1.61	1.21	.81	.64	3.60	3.01	2.61	2.21	2.04
Wire tie baler power take-off driven	1.34	0	1.34	1.93	1.42	1.06	.71	.57	3.27	2.76	2.40	2.05	1.91
Twine tie baler with auxiliary motor	1.00	0	1.00	2.20	1.61	1.21	.81	.64	3.20	2.61	2.21	1.81	1.64
Twine tie baler power take-off driven	.94	0	.94	1.93	1.42	1.06	.71	.57	2.87	2.36	2.20	1.65	1.51
Chopping—chopper with auxiliary motor and two wagons	.55	0	.55	2.08	1.53	1.15	.76	.61	2.63	2.08	1.70	1.31	1.16
Chopper with auxiliary motor and trucks	.57	0	.57	1.59	1.17	.88	.58	.47	2.16	1.74	1.45	1.15	1.04
Chopper with auxiliary motor pulled by truck being loaded	.39	0	.39	1.55	1.14	.85	.57	.46	1.94	1.53	1.24	.96	.85
Chopper power take-off driven and two wagons	.43	0	.43	1.67	1.22	.92	.61	.49	2.10	1.65	1.35	1.04	.92
Chopper power take-off driven and trucks	.45	0	.45	1.17	.86	.65	.43	.34	1.62	1.31	1.10	.88	.79

Low cost method for each farm size is underlined. If none of the labor is extra labor the low cost method for all sizes is the use of a tractor pulled chopper, with power take-off and with trucks for hauling.

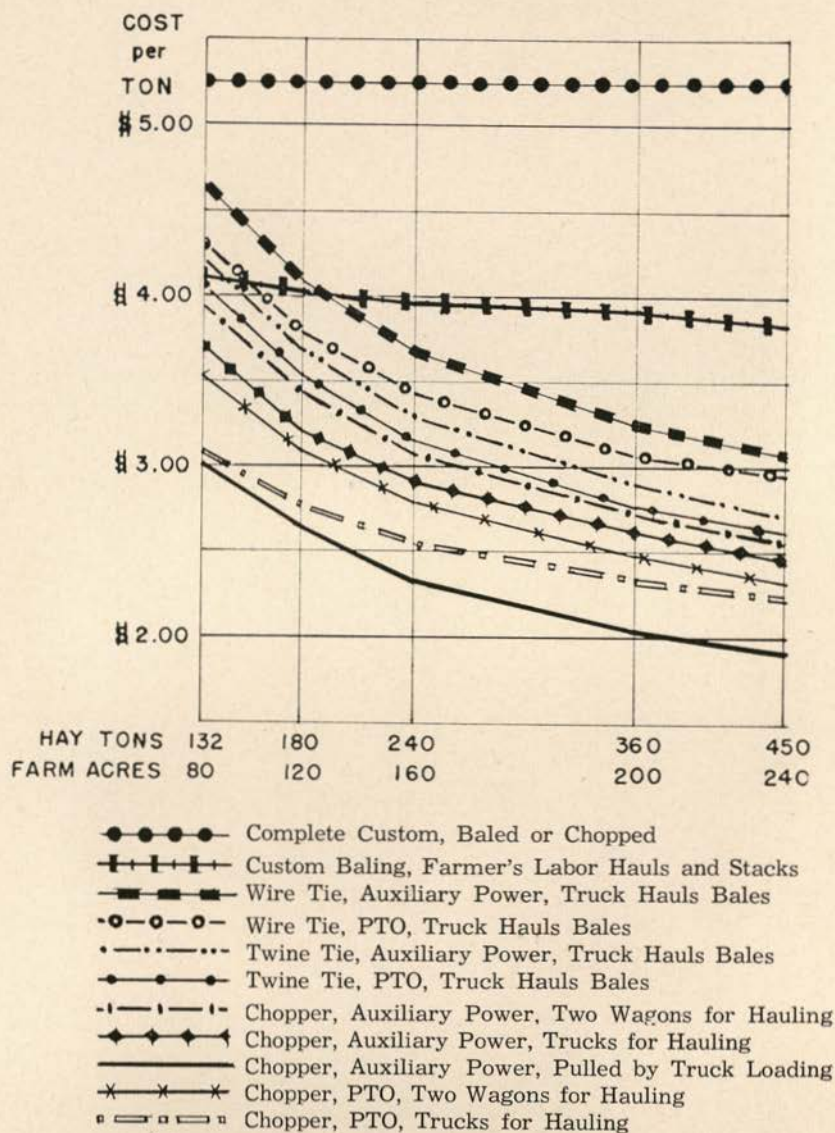


Figure 2.—Operating Cost per Ton for Harvesting Forage by Different Methods, by Tonnage of Hay Harvested, South-Central Idaho, 1956. All of Labor Assumed to be Temporary Labor Hired Specifically for Hay Harvesting.

Table 2.—Operating cost per ton for harvesting forage by different methods, by tonnage of hay harvested, south central Idaho, 1956. All of labor assumed to be temporary labor hired specifically for hay harvesting.

Harvesting Method	Annual Fixed Costs per ton					Total Costs per ton							
	Variable Machine Cost p.ton	Hired Labor Cost p.ton	Total Variable Cost p.ton	132	180	240	360	450	132	180	240	360	450
Tons of hay				132	180	240	360	450	132	180	240	360	450
Acres in farm				80	120	160	200	240	80	120	160	200	240
Custom harvesting—entire operation			\$5.25						\$5.25	\$5.25	\$5.25	\$5.25	\$5.25
Custom harvesting — farmer hauls, stacks with own labor	\$3.09	\$.72	3.81	\$.28	\$.20	\$.15	\$.10	\$.08	4.09	4.01	3.96	3.91	3.89
Baling—wire tie baler with auxiliary motor	1.40	1.03	2.43	2.20	1.61	1.21	.81	.64	4.63	4.04	3.64	3.24	3.07
Wire tie baler power take-off driven	1.34	1.03	2.37	1.93	1.42	1.06	.71	.57	4.30	3.79	3.43	3.08	2.94
Twine tie baler with auxiliary motor	1.00	1.09	2.09	2.20	1.61	1.21	.81	.64	4.29	3.70	3.30	2.90	2.73
Twine tie baler power take-off driven	.55	1.45	2.00	2.08	1.53	1.15	.76	.61	4.08	3.53	3.15	2.76	2.61
Chopping—Chopper with auxiliary motor and two wagons	.94	1.09	2.03	1.93	1.42	1.06	.71	.57	3.96	3.45	3.09	2.74	2.60
Chopper with auxiliary motor and trucks	.57	1.45	2.02	1.59	1.17	.88	.58	.47	3.61	3.19	2.90	2.60	2.49
Chopper with auxiliary motor pulled by truck being loaded	.39	1.09	1.48	1.55	1.14	.85	.57	.46	3.03	2.62	2.35	2.05	1.94
Chopper power take-off driven and two wagons	.43	1.45	1.88	1.67	1.22	.92	.61	.49	3.55	3.10	2.80	2.49	2.37
Chopper power take-off driven and trucks	.45	1.45	1.90	1.17	.86	.65	.43	.34	3.07	2.76	2.55	2.33	2.24

Low cost method for each farm size is underlined. If all of the labor is extra hired labor, the low cost method for all sizes is the chopper powered by an auxiliary motor, pulled by the truck being loaded.

which he performs. The costs shown in this study are, therefore, limited to:

1. All costs for specialized hay equipment other than mowers and rakes, including both fixed and variable costs.
2. Baling wire or baling twine.
3. Variable or operating costs only for tractors and trucks used.
4. Temporary labor hired for putting up hay.
5. Custom harvesting when hired, for all or part of the operation, with a resulting decrease in other costs.

Hay harvesting costs, varying with the amount of hay handled, are first shown for two labor situations. Figure 1 and Table 1 show costs per ton when **none** of the labor cost is included. This assumes that no labor must be hired specifically for putting up hay and that the expense for labor will not be increased by any of the harvesting possibilities. Figure 2 and Table 2 show costs per ton when **all** of the labor used is assumed to be extra hired labor. This means that labor costs will be the full value of all of the labor used for hay harvesting. Although costs are approximately \$1 per ton higher when labor costs are included, the ranking of the methods changes little in the two situations. In both cases the chopping methods are the low cost methods, while the baling combinations show higher costs. When labor costs are included the low cost combination is the motor driven chopper pulled by the truck being loaded. If labor costs are excluded, the power take-off driven chopper with trucks for hauling becomes the least expensive. The only other change in the order of costs is that the highest cost chopping combination becomes relatively less favorable if labor is included as a cost.

Farm sizes considered range from 80 to 240 acres, with 130 to 450 tons of hay produced. The methods and prices used in calculating costs are described in pages 13 to 16.

OWNING EQUIPMENT OR HIRING CUSTOM WORK

It is cheaper to own your own equipment than to hire custom work for all farm sizes considered in this study when the complete operation including the hauling is hired. The advantage of owning your own equipment ranges from 60 cents to \$4.50 per ton, depending on the amount of hay handled and the method used to harvest the hay.

If the baling only is hired custom work, and the farmer hauls and stacks the hay with his own labor and equipment, total costs, in almost all cases, are still higher than if one owns his own equipment. Comparing this practice with the most expensive method of using owned equipment, a farmer must produce less than 150 to 185 tons of hay to have lower costs by hiring custom work for the baling only. The tonnage will vary with the amount of extra labor one must hire for haying. As shown in Figures 1 and 2 and Tables

1 and 2, all of the chopping methods and part of the baling methods show lower costs for owned equipment in all farm sizes considered.

BALING OR CHOPPING

Chopping is cheaper than baling because no wire or twine is used and because the initial cost of choppers is less, especially for the power take-off chopper. Also, farmers report that choppers last longer than balers.

Some farmers do not chop their hay because they sell part of it or because they prefer to feed baled hay. Others may find the fine dust of the chopping operation very disagreeable. If the hay is to be sold off the farm, it is usually harvested in wire-tied bales. For these reasons, farmers are separated into three groups regarding the advisability of baling or shopping.

1. Those who feed all their hay on the farm and who can use chopped hay will have appreciably lower costs by chopping instead of baling. The saving will range from a few cents to as much as \$2 per ton.
2. Those who sell their hay usually bale it so that it can be trucked to another location easily.
3. Those who sell part of their hay and feed part of it on the farm must usually bale all of it since they do not know what part of it will be sold and since it would be too expensive to own both a baler and a chopper. If as much as 500 tons of hay or more is handled, one could afford to own both baler and chopper. If half the hay were baled and sold and the other half chopped and fed, costs would be less than if all the hay were baled.

POWER TAKE-OFF OR AUXILIARY MOTOR

Power take-off equipment is cheaper to operate than that powered by an auxiliary motor. For a farm producing 250 tons of hay, the saving amounts to 24 cents per ton if the hay is baled and 42 cents per ton if the hay is chopped. The cost is less because the increased tractor operating costs with a power take-off are less than the depreciation and operating expense for the auxiliary motor. It is assumed that a 25 hp tractor can be used to pull equipment powered by an auxiliary motor while a 33 hp tractor will be needed to pull equipment using a power take-off. It is further assumed that the amount of hay processed per hour or per day by power take-off equipment will be the same as that processed by equipment using an auxiliary motor.

The development of live power take-offs and a wider selection of forward speeds on modern tractors has made the power take-off driven balers and choppers much more practical than they were a few years ago.

WIRE TIE OR TWINE TIE BALERS

Bales tied with wire cost 45 cents more per ton at the time of this study than those tied with twine. Breakage is, of course, greater for twine-tied bales. If the hay is fed on the farm, this is a minor problem. Hay that must be trucked to other locations or handled several times should be in wire-tied bales even though they are more expensive. The reduced breakage will more than offset the additional cost of wire.

MOTOR TRUCKS OR UNLOADING WAGONS FOR CHOPPED HAY

If the trucks needed to haul chopped hay are already on the farm, it is cheaper to use them than to make additional investments in unloading wagons. This assumes only the added operating costs for the trucks, with no charge for depreciation on them. If the unloading wagons must be used, however, both depreciation on the wagons and the costs of operating the tractors that pull them must be included. Costs are 20 to 25 cents more per ton on a 160 acre farm if unloading wagons are used instead of trucks. These statements assume the purchase of unloading wagons with an original cost of \$500, and an estimated life of 14 years. The annual depreciation for each wagon is \$35. Farmers who build their own unloading wagons for less than \$500 will have lower costs than those shown.

If the trucks needed to haul chopped hay are not already owned or available through exchange work arrangements, unloading wagons will usually be more economical than investing in additional trucks.

MOTOR DRIVEN CHOPPER PULLED BY TRUCK BEING LOADED

Since the motor driven chopper pulled by the truck being loaded requires one less man than other methods of harvesting chopped hay, it is especially advantageous where extra labor must be hired for haying. In addition to the labor saving, the operating costs of the tractor pulling the chopper are saved. If all labor used is included in costs, this is the lowest cost method for all farm sizes (Figure 2 and Table 2). If none of the labor is extra for haying and labor costs are, therefore, omitted, it is still the second lowest cost method (Figure 1 and Table 1). Not all farmers can use this combination to advantage. Trucks pulling a chopper are less maneuverable than tractors. If trucks are available and if the field layout is such that this method can be used, it results in low harvesting costs.

THE SIZE OF FARM AND ITS EFFECT ON COSTS AND HARVESTING METHODS

Costs per ton decrease as the amount of hay produced increases. This is shown graphically in Figures 1 and 2 as well as in Tables 1

and 2. For example, when the wire-tie baler with auxiliary motor is used and no extra labor is assumed to be needed for haying, costs decrease from \$3.60 per ton on an 80-acre farm to \$2.04 per ton on a 240-acre farm. In the various equipment and labor combinations, the amount of decrease ranges from 80 cents to \$1.55 per ton as farm size increases from 80 to 240 acres.

Work flow budgets were constructed to determine total labor and equipment needed for farms of 80, 120, 160, 200, and 240 acres. One baler or chopper was found to be adequate to complete the haying in less than 14 days on the 240-acre farm. For smaller farms this equipment would be progressively more than adequate. In all cases, then, only one baler or chopper was included in calculating costs.

COSTS WHEN TYPICAL PROPORTIONS OF EXTRA HIRED LABOR ARE USED

In south central Idaho, an 80-acre farm is usually a one-man operation. For operations requiring more than one man, family labor or exchange labor supplies would be used. Typically, no extra labor would be hired. A 160-acre farm requires a full time regular hired man, so that two men are available at all times. Like the 80-acre unit, the operator could bale or chop with the regular labor plus exchange labor. Likewise, a 240-acre farm would most commonly need two regular hired men so that a three-man labor force is available. With this crew, one could bale or chop without hiring extra labor.

On the other hand, a farm of 120 acres is between a one and a two-man operation. Usually extra labor must be hired for haying and for other peak labor periods. Typically one-third of the labor must be hired if the hay is baled, and two-thirds to three-fourths if it is chopped. Likewise, the 200-acre farm is too large for two men to handle and too small for three. Any of the baling operations could be performed with the regular labor force of two men, but for chopping methods, one-third to one-half of the labor will be extra hired labor. With the changing proportions of the labor supply that is typically hired for each method in each farm size, costs are as given in Table 3. For example, on the 120-acre farm, usually, one-third of the labor must be hired if the hay is baled, two-thirds if the hay is chopped and the chopper pulled by the truck being loaded, and three-fourths if other chopping combinations are used. Costs, as calculated for each method, include only the typical proportion of the labor that must be hired. The low-cost methods are still the chopper driven by a power take-off where little extra labor is needed, and the chopper with motor, pulled by the truck being loaded where extra labor must be hired. These proportions of extra labor needed for the different methods, will, of course, vary as family labor, regular labor and available exchange labor supplies differ on individual farms.

Table 3.—Operating cost per ton for harvesting forage by different methods, by tonnage of hay harvested, south-central Idaho, 1956. Typical amounts of hired temporary labor included for each method in the various farm sizes.

Acres in farm	80	120	160	200	240					
Tons of hay	132	180	240	360	450					
Proportion of labor hired temporarily	None	None	1/3	2/3	3/4	None	None	1/3	1/2	None
Harvesting Method										
Custom harvesting—entire operation	\$5.25	\$5.25				\$5.25	\$5.25			\$5.25
Custom baling—farmer hauls and stacks with own labor	3.37	3.29				3.24	3.19			3.17
Baling—Wire tie baler with auxiliary motor	3.60		\$3.37			2.61	2.21			2.04
Wire tie baler power take-off driven	3.27		3.12			2.40	2.05			1.91
Twine tie baler with auxiliary motor	3.20		2.97			2.21	1.81			1.64
Twine tie baler, power take-off driven	2.87		2.72			2.00	1.65			1.51
Chopping—Chopper with auxiliary motor and two wagons	2.63				\$3.17	1.70			\$2.05	1.16
Chopper with auxiliary motor, trucks for hauling	2.16				2.82	1.45			1.88	1.04
Chopper with auxiliary motor, pulled by truck being loaded	1.94			\$2.25		1.24		\$1.38		.85
Chopper, power take-off driven and two wagons	2.10				2.74	1.35			1.78	.92
Chopper, power take-off driven with trucks for hauling	1.62				2.39	1.10			1.60	.79

Low cost method for each farm size is underlined.

APPENDIX A

Methods and Prices Used in Calculating Costs

SIZE OF CREW AND EQUIPMENT USED FOR BALING AND CHOPPING

With the automatic balers in use today, one man with a tractor and baler is all that is needed for the baling operation. When the bales are hauled from the field to storage, typically in a truck, the crew usually includes two or three men. The equipment used in hauling will be typically a bale loader and a bale piler in addition to the truck. The cost of all this equipment is included in the calculated costs.

When chopping methods are used, the equipment on which costs are figured includes a chopper, a tractor or truck to pull the chopper, a chopped hay elevator and trucks or chopped hay wagons for hauling. The crew for chopping will be more than that required for baling. Typically, three to four men will be used. Chopping differs from baling in that the chopped hay must be hauled as it is chopped. Baled hay, on the other hand, may be left in the field for a number of days before hauling is necessary.

PERFORMANCE RATES OF BALERS AND CHOPPERS

Choppers and twine tie balers handle about 3.5 tons per hour. The wire tie balers will be a little faster and will process four tons per hour.

EQUIPMENT COSTS — DEPRECIATION

The costs of new machinery were summarized from information obtained from Twin Falls implement dealers in the summer of 1956. Depreciation was determined by the straight-line method using the formula:

$$\frac{\text{New price less salvage value}}{\text{divided by estimated useful life}} = \frac{\text{Annual depreciation cost}}{\text{cost}}$$

This cost is considered an annual fixed cost which is incurred regardless of use. Salvage value is assumed to be ten percent of the new price. A somewhat different method than usual was used to determine the estimated useful life of machines. It was observed that when you asked a farmer how long a machine would last, the farmer often said 10 years, basing his answer on what he reported for his income taxes. A better estimate of the true life of machines was obtained by asking the farmer how old each machine was and how much longer each would be used. Given below are the new

costs, years of life and annual depreciation used for forage harvesting equipment.

Machine	New cost	Average years of useful life	Annual depreciation
Pick-up baler with motor	\$2878	11	\$235
Power take-off pick-up baler	2490	11	204
Field chopper with motor	2500	13	173
Power take-off field chopper	1530	13	118
Elevator with motor	800	22	33
Bale loader and piler	605	15	36
Unloading wagon	500	13	35

EQUIPMENT COSTS — TAXES, INSURANCE, AND HOUSING

In addition to depreciation, annual fixed or overhead costs include taxes, license fees, insurance and housing costs. Since insurance and housing costs are small compared to depreciation costs, and since they are shared by the entire farm operation, they are not included in the costs computed for forage harvesting methods. Annual personal property taxes in the Twin Falls area are approximately \$20 for the motor driven balers and \$16 for power take-off balers. No tax is assessed against choppers or other forage harvesting equipment.

EQUIPMENT COSTS — REPAIRS

Repair costs for individual machines were obtained from fourteen farmers in the area who had records of repair costs by machines. Using these as a basis, the following repair costs were estimated:

Machine	Repair Cost per Hour of Use
Tractor	11.3 cents
Baler	26 cents
Chopper	10 cents
Elevator	Nil
Loader	Nil
Piler	Nil
Unloading wagon	Nil
Truck	4 cents

EQUIPMENT COSTS — FUEL, OIL, GREASE, AND BALING TWINE OR WIRE

The 1956 prices of these supplies in Twin Falls were used. They are as follows:

Gasoline	\$.20 per gallon
Oil	.91 per gallon
Oil filters	1.65 each
Transmission lubricant	1.40 per gallon
Grease	.20 per pound
Baling twine	4.38 per 20 lb. ball
Baling wire	13.00 per cwt.

The consumption of these supplies was estimated for each tractor size. Fuel consumption was based on the Nebraska Tractor Test E for tractors in each horsepower classification.¹ The fuel and supply costs of operating the two sizes of tractors are as follows:

20-25 hp tractors — 42 cents per hour

33-38 hp tractors — 62 cents per hour

The hourly cost of operating power implements, such as the motor operated baler or chopper, was assumed to be equal to that for a tractor in the same horsepower class plus two cents per hour for grease. Most of the engines used on balers are in the 20 to 25 hp class, while on choppers they are in the 33-38 hp class. Thus the estimated cost of fuel, oil, and grease for motor operated balers was 44 cents, while for motor operated choppers the cost was 64 cents per hour. For power take-off operated machines, the estimated cost of grease, 2 cents per hour, is the operating cost.

At the prices used, baling twine costs 1.82 cents per bale and baling wire 3.88 cents per bale. This results in a cost of 52 cents per ton for twine and 97 cents per ton for wire.

Bale pilers and elevators are equipped with small gasoline engines or electric motors of less than 3 horsepower. Gasoline engines of this size consume less than 1/2 gallon of fuel per hour. Repair costs and oil consumption for each engine are insignificant. Operating costs of bale pilers and elevators were, therefore, assumed to be the cost of 1/2 gallon of fuel or 10 cents per hour.

Trucks used for such field work as hauling bales are estimated to consume 1 gallon of gasoline per hour costing 26 cents per gallon including tax. The 2 mile round trip, estimated for each load of baled or chopped hay, will take about an hour and will use a gallon of fuel. The fuel cost per mile for trucks is, therefore, estimated at 13 cents.

¹ Reported in Summary of Results of the Nebraska Tractor Tests by W. V. Lambert and E. F. Frolick, Dept. of Ag. Engineering, Neb. Ag. Exp. Station, Lincoln, Neb., 1956.

WAGE RATES

Since the cost of regular full-time hired labor is ignored, the only labor considered is temporary labor hired by the day. This is estimated to cost \$1.25 per hour at the time of this study.

CUSTOM FORAGE HARVESTING

Custom harvesting rates assumed were:

- \$3.00 per ton for baling
- 2.25 per ton for hauling and stacking bales
- 5.25 per ton for chopping, hauling and stacking chopped hay.

These rates are typical for the Twin Falls area at the time of this study.

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MUCH valuable basic data for this publication was obtained from an unpublished study of machinery costs and farm organizations in 1953 by Don A Marshall, then Associate Agricultural Economist in the Idaho Agricultural Experiment Station.

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