FARM BUSINESS MANAGEMENT

Machinery Cost Estimates: Forage Field Operations

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MACHINERY COST ESTIMATES: FORAGE FIELD OPERATIONS **August 2025**

This publication shows estimated costs for owning and operating forage machinery. These estimates aid in determining custom rates and analyzing machinery costs on farms. Costs are estimated for charges for overhead (depreciation, interest, insurance, housing and repairs), fuel, and labor. Allowances for profit are not included. Charging custom rates at estimated costs should cover all costs but will not generate a profit. Adding 5 to 15 percent to estimated costs may be appropriate for determining custom rates.

Costs are given for:
1. Cutting, conditioning and raking hay,
2. Baling hay,
3. Harvesting forages as silage.

Cutting, Conditioning and Raking Hay

Table 1 shows costs per acre for cutting, conditioning and raking hay. Formulas published by the American Society of Agricultural Engineers are used to calculate costs. Costs are based on buying new machinery and holding machinery for 10 years. Other variables used in calculating costs are shown in Table 2.

Table 1. Per Acre Costs of Cutting, Conditioning, and Raking Hay[1].

Operation	**Total**	Tractor = Overhead	Implement + Overhead	Fuel + & Lube	+ Labor
			$ per acre		
Sickle Bar Mower	**34.60**	19.20	4.10	4.10	7.20
Rotary Mower	**23.10**	10.10	7.00	2.20	3.80
Pull-type Mower/Conditioner	**27.40**	11.20	9.70	3.50	3.00
Self-propelled Mower/Conditioner	**35.90**		29.40	4.30	2.20
Rake (Side Delivery)	**14.30**	5.70	5.30	1.20	2.10
Rake (Wheeled)	**9.90**	5.10	1.80	1.10	1.90
Tedder	**13.10**	6.30	3.00	1.40	2.40

[1] See text for more detail on how costs are calculated.

Costs per acre in Table 1 are divided into four categories:

Tractor overhead includes depreciation, interest, insurance, housing, and repair charges for tractors used to pull implements.

Implement overhead includes depreciation, interest, insurance, housing, and repair charges for the implement.

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Table 2. Factors Used in Calculating Costs.

Purchase price	85%	of list price
Interest rate	5.5%	of remaining value
Insurance and housing	1.0%	of remaining value
Diesel fuel	$3.00	per gallon
Lubrication cost	10%	of fuel costs
Years of life	10	years
Labor charge	$22.00	per hour
Labor time	1.10	times machine hours

Fuel and lube costs are based on diesel fuel priced at $3.00 per gallon. Lubrication cost is 10 percent of fuel cost.

Labor costs are based on a $22.00 per hour labor charge. Labor time is 10 percent more than operating time of the tractor or self-propelled machine.

The sickle bar cuts a 7-foot swath and the rotary mower cuts a 9-foot swath. Both are assumed to be used 50 hours per year. Sickle bar mowers have higher costs per acre than rotary mowers because field capacity is less for sickle bar mowers.

The pull-type mower/conditioner cuts an 11.5-foot swath. Per acre costs are based on cutting 610 acres per year. The self-propelled conditioner cuts a 16-foot swath and is assumed to cover 1,680 acres per year.

The costs of side delivery and wheeled rakes are based on covering 570 acres and 630 acres per year respectively with a 19-foot side-delivery rake and 21 foot wheeled rake. The tedder is 17 feet wide and is assumed to cover 510 acres per year.

Annual use has impacts on costs. On an annual basis, implement overhead costs are relatively constant no matter how many acres are covered. Reducing acres by 50 percent from those listed above will result in an 80 percent increase in implement overhead. A 50 percent increase in acres results in a 25 percent decrease in implement overhead.

Baling Hay

Costs per acre for hay baling are shown in Table 3. These costs only include baler operation costs. Not included are costs of moving hay to storage. Costs per acre represent an average over all cuttings. During the first cutting, production may be greater than later cuttings, increasing the amount of time required to cover an acre. Therefore, costs per acre may be higher for the first cutting than for later cuttings.

Table 3. Per Acre Costs of Baling Hay[1].

Operation	**Total**	Tractor = Overhead	Implement + Overhead	Fuel + & Lube	+ Labor
		$ per acre			
Small Square Baler	**45.60**	20.70	11.60	5.90	7.40
1,000 lb. Square Baler	**39.60**	10.90	22.30	3.60	2.80
Round Baler	**44.40**	19.10	13.10	5.40	6.80

[1] See text for more detail on how costs are calculated.

All balers in Table 3 are assumed to be used 100 hours per year, resulting in 327 acres covered with the small square baler, 873 acres for the 1,000 lb. square baler, and 355 acres for the round baler.

Baling costs can also be stated on a per bale basis. The following costs are based on a 1.3-ton yield per acre.

Type	Costs per bale
50 lb. square bale	$.88
1,000 lb. square bale	$15.23
1,000 lb. round bale	$17.08

Costs per bale tend to be more stable for level of production than are costs on a per acre basis.

Harvesting Forages as Silage

Costs per acre for silage harvesting are shown in Table 4. This table list costs for two types of harvesters:

Table 4. Per Acre Costs of Forage Harvesting[1].

Operation	**Total**	Tractor = Overhead	Implement + Overhead	Fuel + & Lube	+ Labor
Pull-type forage harvester	----------	----------	$ per acre	----------	----------
First cut hay	**49.00**	22.30	13.70	8.80	4.20
Remaining cuts	**40.10**	18.30	11.20	7.20	3.40
Corn Silage	**150.80**	67.70	43.80	26.60	12.70
Self-propelled forage harvester					
First cut hay	**40.30**		22.40	14.90	3.00
Remaining cuts	**32.90**		18.30	12.20	2.40
Corn Silage	**185.30**		160.70	20.50	4.10

[1] See text for more detail on how costs are calculated.

1. A pull-type forage harvester with a 3-row, 30-inch head for harvesting corn. This unit's list price is $86,100, the hay pickup's list price is $18,500, and the corn head's list price is $32,400. Each year, 250 acres of corn silage, 250 acres of first cut hay, and 250 acres of later cuttings are harvested.

2. A 530-horsepower, self-propelled forage harvester with an 8-row, 30-inch head for harvesting corn. The list price of the harvester is $584,000, the hay pickup's list price is $58,500, and the corn head's list price is $172,500. Each year, 500 acres of corn silage, 500 acres of first cut hay, and 500 acres of latter cuttings are harvesting.

Per hour corn silage harvesting costs vary between the two machines. The pull-type harvester is estimated to harvest 1.9 acres per hour while the self-propelled unit harvests 5.9 acres per hour. Based on costs shown in Table 4, per hour costs for harvesting corn silage are:

Type	$ per hour
Pull-type	$287
Self-propelled	$742

Use has impacts on costs. The majority of implement overhead costs is for depreciation and interest. On an annual basis, depreciation and interest are relatively constant no matter how many acres are covered. Reducing annual use by 50 percent from those listed above will result in an 80 percent increase in implement overhead. A 50 percent increase in annual use results in a 25 percent decrease in implement overhead.

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