

Estimating Haying and Silage Machinery Costs

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This publication provides a guide for estimating cost of owning and operating forage and haying machinery. The data in Table 1 represent the cost per hour of owning and operating tractors but excludes labor cost. The tractors are designated by two categories. The first designation is whether the tractor is equipped with a roll bar (RB) or cab (CAB). Second, the tractors are designated as either typical rear wheel drive (2WD) or mechanical front wheel drive (MFWD). Table 2 presents both a total cost per hour and a cost per acre for performing the specified operations, including labor costs. The implement width, tractor horsepower and performance rate are given for each operation. It is assumed the equipment is fully utilized.

Operating costs for field operations include repairs and maintenance, fuel and labor. However, as previously mentioned, Table 1 does not include labor. Since the tractor costs are already presented in dollars per hour, the user can easily add a specific hourly wage to the costs. Specific costs include diesel (\$1.80 per gallon) and labor (\$9.21 per hour). Table 1 provides the tractor fuel use per hour so the user can calculate an alterna-

tive diesel fuel price. This can also be achieved in Table 2 by backing out the gallons used for the operation and then adjusting it for the current diesel price. Operating interest is not included in either table. Operating interest can be defined as the cost of borrowing money to perform daily farm operations.

Costs associated with a different tractor than the one listed can be estimated by the following example of converting a Hay Baler (Square) in Table 2 being pulled by a 50hp RB 2WD tractor to a 75hp RB 2WD tractor. Using Table 1, calculate the difference in total costs per hour between the two tractors ($\$13.53 - \$9.14 = \$4.39$). The 75hp tractor would cost \$4.39 more per hour than the 50hp tractor or \$1.01 per acre more when using the Hay Baler (Square) in Table 2 [$\$4.39 \div 4.36$ (Hay Baler (Square) performance rate of acres/hour)]. Using a 75hp tractor is estimated to cost \$10.60 per acre instead of \$9.59 per acre as shown in Table 2 with the 50hp tractor.

Fixed costs include depreciation, interest, taxes and insurance on the machinery. Various financing arrangements and tax depreciation methods

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can produce costs that vary significantly from these estimates in a given year. Tractors in Table 1 are estimated to be utilized 600 hours per year, and this level of annual use may not be realistic for some forage operations in Arkansas. If the annual usage hours of a tractor decrease, per hour fixed costs will increase. Equipment fixed costs are also based upon an assumed annual use. Equipment fixed costs become more expensive per hour when annual usage decreases or less expensive when usage increases.

This information may also be used in comparing or estimating custom rates. Farmers may perform custom work in order to spread out their ownership

costs. Although custom rates do not always cover total operating and ownership costs, farmers should charge enough to cover all operating expenses and at least some ownership costs. Otherwise, performing custom work only wears out equipment without spreading out costs and negatively impacts the return to assets. In cases where custom operations are intended to be a form of income, adding 10 to 15 percent to the estimated total cost is customary as the operator's profit. However, custom operators should evaluate the costs based upon their annual usage and other specific parameters from their operation.

Table 1. Estimated Tractor Costs Per Hour.

Tractor*	Horse-power (PTO)	Annual Hours Use	Diesel Fuel Use (gal/hour)	\$/Hour				
				Diesel Fuel	Repairs & Maint.	Total Direct	Fixed Costs	Total Costs
Tractor RB 2WD	50	600	2.57	\$4.63	\$0.58	\$5.21	\$3.93	\$9.14
Tractor RB MFWD	50	600	2.57	\$4.63	\$0.74	\$5.37	\$4.96	\$10.33
Tractor CAB 2WD	50	600	2.57	\$4.63	\$0.91	\$5.54	\$6.11	\$11.65
Tractor CAB MFWD	50	600	2.57	\$4.63	\$1.00	\$5.63	\$6.72	\$12.35
Tractor RB 2WD	75	600	3.86	\$6.95	\$0.85	\$7.80	\$5.73	\$13.53
Tractor RB MFWD	75	600	3.86	\$6.95	\$1.03	\$7.98	\$6.97	\$14.95
Tractor CAB 2WD	75	600	3.86	\$6.95	\$1.22	\$8.17	\$8.22	\$16.39
Tractor CAB MFWD	75	600	3.86	\$6.95	\$1.30	\$8.25	\$8.78	\$17.03
Tractor RB 2WD	105	600	5.40	\$9.73	\$1.17	\$10.90	\$7.92	\$18.82
Tractor RB MFWD	105	600	5.40	\$9.73	\$1.40	\$11.13	\$9.46	\$20.59
Tractor CAB 2WD	105	600	5.40	\$9.73	\$1.69	\$11.42	\$11.41	\$22.83
Tractor CAB MFWD	105	600	5.40	\$9.73	\$2.03	\$11.76	\$13.69	\$25.45
Tractor CAB 2WD	130	600	6.69	\$12.04	\$2.38	\$14.42	\$16.03	\$30.45
Tractor CAB MFWD	130	600	6.69	\$12.04	\$2.77	\$14.81	\$18.68	\$33.49
Tractor CAB 2WD	150	600	7.72	\$13.90	\$2.76	\$16.66	\$18.63	\$35.29
Tractor CAB MFWD	150	600	7.72	\$13.90	\$3.19	\$17.09	\$21.52	\$38.61

Note: Per hour tractor cost estimates do not include labor.

*2WD = Rear Wheel Drive

MFWD = Mechanical Front Wheel Drive

RB = Roll Bar

CAB = Tractor Cab

Table 2. Estimated Haying and Silage Machinery Costs Per Acre.

Operation	Size*	Horsepower (PTO)	Performance Rate (ac/hr)	Total Machinery Costs Per Hour (\$/hour)	----- Operating Cost -----			Ownership Cost (\$/acre)	Total Specified Cost Per Acre (\$/acre)
					Repairs & Maint. (\$/acre)	Diesel Fuel (\$/acre)	Labor (\$/acre)		
TILLAGE/PLANTING EQUIPMENT									
Disk & Incorporate	24'	2WD 105	11.64	\$64.94	\$1.00	\$0.84	\$1.28	\$2.46	\$5.58
Field Cultivate	24'	2WD 105	16.07	\$56.32	\$0.37	\$0.61	\$0.62	\$1.91	\$3.50
Grain Drill	12'	2WD 105	6.36	\$58.06	\$1.15	\$1.53	\$3.12	\$3.33	\$9.12
NT Grain Drill	10'	2WD 50	4.24	\$58.64	\$2.35	\$1.09	\$4.68	\$5.71	\$13.82
NT Grain Drill	12'	2WD 105	5.09	\$73.26	\$2.38	\$1.91	\$3.90	\$6.20	\$14.39
Tailgate Seeder	-	2WD 50	5.00	\$20.11	\$0.21	\$0.93	\$1.98	\$0.90	\$4.02
HAY/PASTURE EQUIPMENT									
Front Loader	0.5 yd	2WD 75	8.33	\$32.64	\$0.45	\$0.83	\$1.19	\$1.44	\$3.92
Hay Baler (Square)	small	2WD 50	4.36	\$41.83	\$2.21	\$1.06	\$2.27	\$4.04	\$9.59
Hay Baler (Round)	medium	2WD 75	4.73	\$43.95	\$2.03	\$1.47	\$2.10	\$3.70	\$9.30
Hay Baler (Round)	large	2WD 105	4.73	\$62.98	\$3.34	\$2.06	\$2.10	\$5.83	\$13.32
Hay Cut-Cond	9'	2WD 105	4.36	\$53.52	\$2.84	\$2.23	\$2.27	\$4.92	\$12.27
Hay Cut-Cond	12'	2WD 105	5.82	\$61.70	\$2.77	\$1.67	\$1.71	\$4.46	\$10.61
Hay Disc Mower	8'	2WD 75	3.88	\$34.24	\$1.48	\$1.79	\$2.56	\$3.00	\$8.83
Hay Disc Mower	10'	2WD 75	4.85	\$36.13	\$1.36	\$1.43	\$2.05	\$2.61	\$7.45
Hay Mover	1 round bale lift	2WD 50	3.33	\$19.37	\$0.20	\$1.39	\$2.98	\$1.25	\$5.81
Hay Rake	8.5'	2WD 50	4.95	\$24.87	\$0.59	\$0.94	\$2.01	\$1.50	\$5.03
Hay Rake-Double	17'	2WD 75	9.89	\$29.61	\$0.33	\$0.70	\$1.00	\$0.95	\$2.99
Hay Tedder	17'	2WD 105	9.89	\$132.42	\$0.38	\$10.82	\$1.00	\$1.19	\$13.39
Hay Trailer	20'	2WD 75	11.11	\$26.43	\$0.17	\$0.63	\$0.89	\$0.69	\$2.38
Rotary Mower	7'	2WD 50	5.94	\$24.45	\$0.60	\$0.78	\$1.67	\$1.06	\$4.12
Rotary Mower	8'	2WD 75	6.79	\$30.97	\$0.74	\$1.02	\$1.46	\$1.33	\$4.56
Rotary Mower	12'	2WD 105	10.18	\$41.02	\$0.79	\$0.96	\$0.97	\$1.31	\$4.03
Rotary Mower	15'	2WD 105	12.73	\$49.99	\$1.02	\$0.76	\$0.78	\$1.36	\$3.93

* ' = feet, yd = yard, lb = pound

Table 2. Estimated Haying and Silage Machinery Costs Per Acre (cont).

Operation	Size*	Horse-power (PTO)	Performance Rate (ac/hr)	Total Machinery Costs Per Hour (\$/hour)	----- Operating Cost -----			Ownership Cost (\$/acre)	Total Specified Cost Per Acre (\$/acre)
					Repairs & Maint. (\$/acre)	Diesel Fuel (\$/acre)	Labor (\$/acre)		
SILAGE EQUIPMENT									
Silage Harvester	2-row	2WD 105	1.96	\$77.64	\$11.89	\$4.96	\$5.06	\$17.69	\$39.61
Silage Harvester	3-row	2WD 105	2.97	\$90.67	\$9.40	\$3.28	\$3.34	\$14.52	\$30.53
Silage Wagon	10-ton	2WD 75	1.96	\$31.85	\$1.64	\$3.55	\$5.06	\$6.00	\$16.25
Silage Wagon	12-ton	2WD 105	1.96	\$41.43	\$2.11	\$4.96	\$5.06	\$9.00	\$21.14
SPRAYER/SPREADER EQUIPMENT									
Cyclone Spinner	825-lb	2WD 105	5.00	\$36.01	\$0.36	\$1.95	\$2.98	\$2.09	\$7.37
Spinner Spreader	5-ton	2WD 105	23.76	\$59.73	\$0.32	\$0.41	\$0.84	\$0.95	\$2.51
Sprayer	20'	2WD 50	10.24	\$30.33	\$0.32	\$0.45	\$1.45	\$0.74	\$2.96
Sprayer	27'	2WD 105	15.95	\$39.75	\$0.23	\$0.61	\$0.93	\$0.71	\$2.49

* ' = feet, yd = yard, lb = pound

Printed by University of Arkansas Cooperative Extension Service Printing Services.

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FSA34-PD-4-09N

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