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Estimating Custom Rates For Farm Machinery

Herman E. Workman and David H. Schroder
Department of Agricultural Economics
College of Agriculture

Prices for farm machinery and repairs are rapidly increasing, and costs for fuel and oil have been fluctuating. Under these conditions, a simple method based on current prices for estimating costs of owning and operating machinery should be useful to farm operators and custom operators.

Custom operators and those who hire custom services often use the *market or going rate* as a guide in determining a rate they consider fair to both parties. (See UMC Guide 302, ''Custom Rates for Farm Services in Missouri.'') However, there is no assurance that the established or *going rate* will cover the costs of performing the service. This Guide will help you estimate the actual costs of doing a specific job.

Besides the cost of performing the service, market or established rates may be based on:

1. supply and demand for custom work in an area,
2. availability of particular machines,
3. the quality of the work done, and
4. the business of the custom operator (commercial operators may charge more than farmers doing extra work for their neighbors.)

Costs Will Vary

Cost for the same operation varies from one custom operator to another. The farmer or custom operator who does only a small amount of custom work may be concerned only with recovering operating costs such as fuel, repairs, and labor. However, the professional or large-scale custom operator must try to recover not only operating costs but also ownership costs like depreciation, interest on investment, taxes, insurance, and management costs.

Custom operators should calculate and compare their own costs to the established market rate when determining charges or deciding whether to stay in the business.

Machinery ownership and operating costs on a per acre, or unit basis can vary with the size, type, and annual use of the machine. The cost of performing the service also varies from farm to farm because of differences in field and crop conditions, weather, and the distance to fields.

How to Estimate Costs

The sample worksheet serves as a handy guide for estimating machinery ownership and operating costs. It illustrates how costs are determined for a 6-cylinder, diesel, self-propelled combine, with an air-conditioned, pressurized cab with a heater and an 8-row crop header.

Basic information (lines 1-6).

Machine list prices, annual usage, capacity, and estimated years of life are recorded in this section. The terms used on the form are *power unit* and *implement*. The power unit in this example is the combine. In other situations, a tractor is the basic power unit. The implement is the 8-row grain header.

In this example, the operator estimated use at 153.8 hours per year for the combine and header. He plans to use the combine to harvest 100 acres of wheat and 200 acres of soybeans of his own crop and to do custom harvesting on an additional 700 acres for others. He expects to harvest 6.5 acres per hour and places an economic life of seven years on both the power unit and the implement.

Basic information

1. Machine operation: **Self-propelled combine with grain header**

		Power unit	Implement	
2.	List price	$55,025	$16,625	
3.	**Acres** covered per hour		6.5	acres/hour
4.	**Acres** covered per year		1,000	acres/year
5.	**Hours** used per year (line 4 ÷ line 3)	153.8	153.8	hours/year
6.	**Years** machine to be kept	7	7	years

Ownership costs (lines 7-9)

Annual ownership costs include depreciation, interest on investment, housing, insurance, and taxes. These costs can be estimated by multiplying the list price of the machine by a factor obtained from Table 1. Table 1 offers factors of annual ownership costs at various interest rates. Choose the interest rate that best reflects your cost of investment. (In the example, the operator used 14 percent). Interest on investment is the annual interest charge on the unrecovered cost of machinery.

Ownership costs are a constant sum for the year, regardless of the number of hours the machine is used. However, the more hours the machine is used per year, the lower the ownership costs per hour.

Ownership costs per hour

7. Power unit: $ 55,025 (line 2) x .224 (Table 1)
   ÷ 153.8 (line 5) ..... $ 80.14
8. Implement: $ 16,625 (line 2) x .224 (Table 1)
   ÷ 153.8 (line 5) ..... $ 24.21
9. Total ownership costs per hour (line 7 + line 8) ..... $ 104.35 /hour

Operating costs (lines 10-16)

Generally, operating costs are fairly constant on an hourly basis.

Fuel cost is figured on the average consumption rate per hour times the price per gallon of fuel.

Lubrication cost is estimated at 15 percent of the fuel cost.

Repair cost per hour can be estimated by multiplying the list price of the machine by the factor in Table 2.

Supply cost, when applicable and added into the charge, includes such items as twine.

Labor cost per hour should be adjusted to include actual machine time, plus an allowance for travel and preparation time. Multiply hourly labor cost by 1.2 for making this adjustment.

Adding lines 10 through 14 gives the estimated hourly operating cost. Dividing this sum (line 15) by acres per hour (line 3) gives the operating cost per acre.

Operating costs per hour

10. Repair and maintenance cost:
    Power unit: 55,025 (line 2) x .0003 (Table 2) ..... $ 16.51
    Implement: 16,625 (line 2) x .0003 (Table 2) ..... $ 4.98
11. Fuel for operation 7 (gal./hr.) x 1.20 price 8.40
12. Lubrication $ 8.40 (line 11) x .15 ..... 1.26
13. Other costs per hour (supplies, twine, etc.) ..... —
14. Labor cost per **hour** $ 4.00 /hour x 1.2 ..... 4.80
15. Operating cost per **hour** (add lines 10 through 14) ..... $ 35.95 /hour
16. **Operating cost per acre** (line 15 ÷ line 3) ..... $ 5.53 /acre

Total costs (lines 17-18)

The total cost per hour of operation is the hourly ownership plus the operating costs. Dividing this hourly sum (line 17) by acres (or bushels) per hour (line 3) gives the total machine cost per acre (or bushel).

Keep in mind that as the number of hours of equipment use per year increases, the lower the ownership costs per hour. Consequently, the total cost per hour and per acre decreases. If hours of usage change, then calculate costs again.

Total costs

17. Total cost per **hour** (line 9 + line 15) ..... $ **140.30** /hour
18. **Total cost per acre** (line 17 ÷ line 3) ..... $ **21.58** /acre

Table 1. Annual ownership cost as a percent (decimal) of list price at various market interest rates.

Years kept	*Ownership factor*			
	10% interest	**12% interest**	**14% interest**	**16% interest**
4	.300	.310	.320	.330
5	.255	.265	.275	.285
6	.225	.235	.245	.255
7	.204	.214	.224*	.234
8	.188	.198	.208	.218
9	.175	.185	.195	.205
10	.165	.175	.185	.195

* .224 was computed as follows:

a. Depreciation = $\frac{100\% - 10\% \text{ (salvage)}}{7 \text{ year}}$ = .129

b. Interest = $\frac{.14}{2}$ = .070

c. Taxes, insurance, housing = .025

Sum of a + b + c = .224

What to Charge?

Commercial custom operators should make sure that rates will pay ***all*** ownership and operating costs. Income from custom work must cover both operating and machine replacement costs.

On the other hand, farmer-operators already have some ownership costs, whether or not custom work is done. Their charges must cover operating costs. Any charge higher than this will help pay part of the ownership costs.

In determining rates, operators may also want to include an allowance for risk and return to management. Differences in field and crop conditions must also be considered in determining specific rates.

Table 2. Per hour repair and maintenance cost as a percent (decimal) of list price.*

Machine type	**Repair factor**
Tractor	.00012
Tillage	.0006
Harvesting	.0003
Planting	.00075

*"Machinery Management VI - Annual Costs," UMC Guide 1205.

Estimating cost of machine operation

Basic information

1. Machine operation: _____

	Power unit	Implement	
2. List price	$ _____	$ _____	
3. **Acres** covered per hour		_____	acres/hour
4. **Acres** covered per year		_____	acres/year
5. **Hours** used per year (line 4 ÷ line 3)	_____	_____	hours/year
6. **Years** machine to be kept	_____	_____	years

Ownership costs per hour

7. Power unit: $ _____ (line 2) x _____ (Table 1)
   ÷ _____ (line 5) ..... $ _____
8. Implement: $ _____ (line 2) x _____ (Table 1)
   ÷ _____ (line 5) ..... $ _____
9. Total ownership costs per hour (line 7 + line 8) ..... $ _____ /hour

Operating costs per hour

10. Repair and maintenance cost:
    Power unit: _____ (line 2) x _____ (Table 2) $ _____
    Implement: _____ (line 2) x _____ (Table 2) _____
11. Fuel for operation _____ (gal./hr.) x _____ price _____
12. Lubrication: $ _____ (line 11) x .15 ..... _____
13. Other costs per hour (supplies, twine, etc.) ..... _____
14. Labor costs per **hour** $ _____ /hour x 1.2 ..... _____
15. Operating cost per **hour** (add lines 10 through 14) ..... $ _____ /hour
16. **Operating cost per acre** (line 15÷ line 3) ..... $ _____ /acre

Total costs

17. Total cost per **hour** (line 9 + line 15) ..... $ _____ /hour
18. **Total cost per acre** (line 17 ÷ line 3) ..... $ _____ /acre

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