



SPECIALIZED farming equipment, such as this self-propelled combine, is highly priced these days. Research shows growers how to figure whether

machinery investments will save or lose money. In the long run, farmers may save money by renting, hiring custom operators, working with friends.

Farm Machinery---Own or Hire?

Research shows how farmers can more closely figure probable costs between owning or renting farm equipment. Comparing these costs may save you money and show ways for figuring other profitable farm investments.

IS THAT HIGH priced machine you're thinking about buying going to make or lose money for you?

A new study by OSC Agricultural Economist Emery Castle and Extension Farm Management Specialist Frank Conklin shows ranchers how to figure their "break-even" point when comparing machinery ownership with custom hiring.

Much specialized farming equipment carries a high price tag these days, and the wise operator balances this high initial cost, plus all the other costs of maintenance and operation, against cost of custom hire and rental.

Before sinking large sums of money in new machinery, the wise operator might compare per-acre or per-hour-

cost-of-use with cost of rental or custom work.

If ownership rates are too high, a rancher might be better off to rent equipment, hire custom work, or pool costs with his neighbors.

Cost of ownership, say Conklin and Castle, declines with increasing use because costs that don't change—depreciation, interest, taxes, shelter, insurance, repairs—are spread out over a greater number of hours or acres of use.

The table below includes these fixed, as well as variable, costs of owning and operating three highly specialized pieces of equipment. Cost of custom hiring is shown, and the rancher's break-even point is determined.

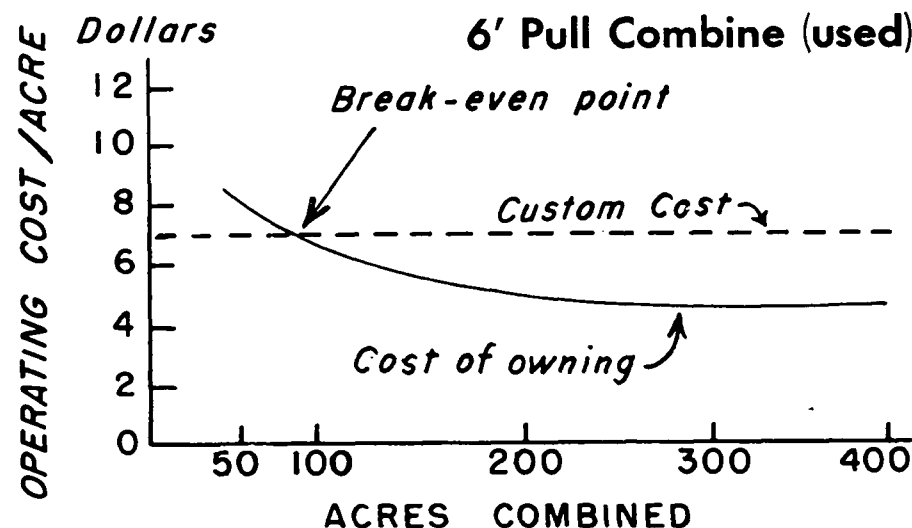
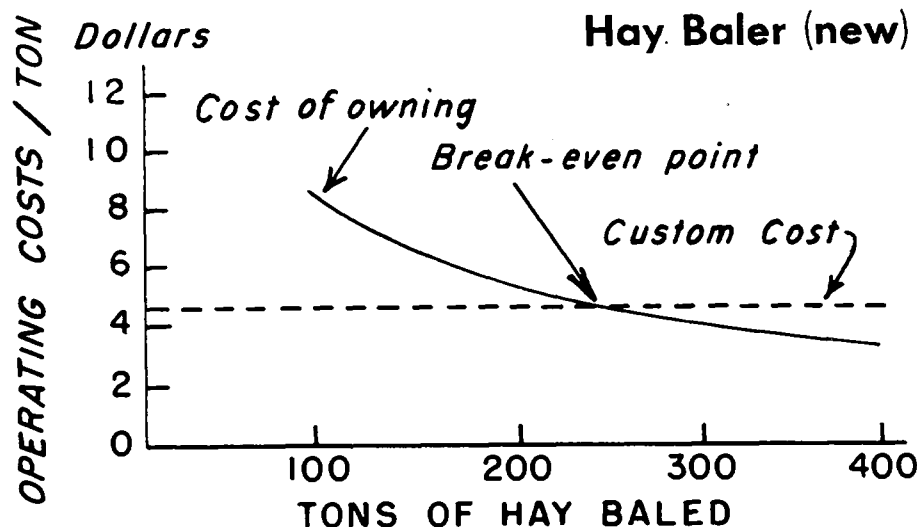
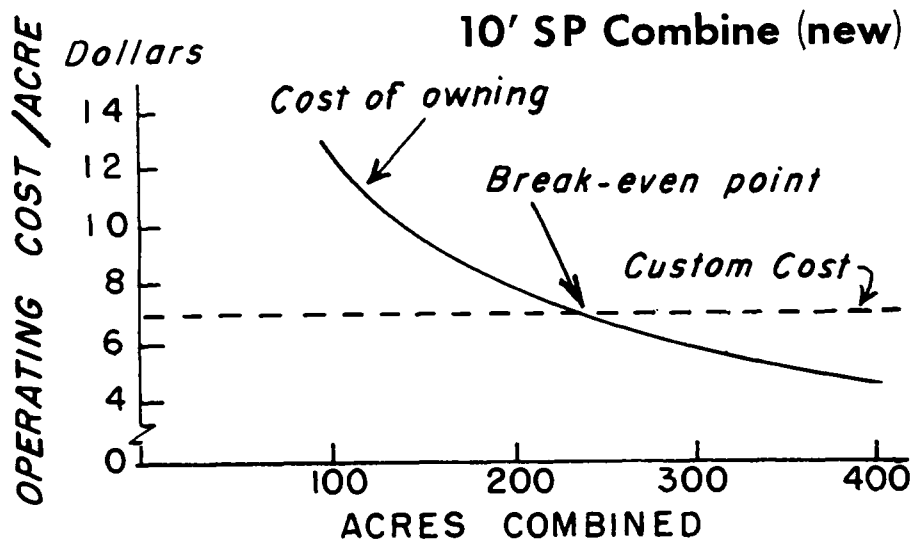
While machine costs in these examples were taken from irrigated farms in central Oregon, the same analysis can be applied to farm machinery on any farm.

Figure fixed costs

First step is to figure your fixed costs. The table lists these, and footnotes show where the economists got their figures. This method of determining fixed costs is the one generally used by economists and accountants.

Variable costs are also given in the table below. Economist Conklin emphasizes that these costs are hard to pin down and will vary with each situation. Footnotes also explain these figures.

"Break-even" Owing, Custom Costs



Cost of custom hiring will vary from area to area, but rates in your neighborhood should be fairly easy to come by.

It's a matter of simple division and addition to convert fixed and variable costs to either total costs per acre or per ton. Simply divide acre or ton figures into the total fixed cost per year, add the total variable costs. With the hay baler, for example, suppose you were baling 100 tons annually. $\$634 / 100 = \6.34 . $\$6.34 + \$1.74 = \$8.08$. This is the figure plotted on the graph for 100 tons. Repeat this arithmetic for 200, 300 or whatever tonnage you bale per year. The arithmetic is similar for the combine, except you divide the number of acres combined into total fixed costs per year.

When all these figures are assembled, make a graph, using the ones at left as a guide, and decide where the break-even point is for your equipment. If you get stuck, ask your County Agent for help—he probably will have some suggestions.

Cost is not the only thing to consider, the economists pointed out. If getting money to invest is a problem, a rancher must decide whether his available capital is best invested in machinery—which may stand idle part of the year—or in fertilizer or livestock.

Timeliness is also important. Cost of owning a machine at the exact moment it is needed should be offset by the decreased risk of jeopardizing a crop. This question will be answered differently by different ranchers—type of crop, nature of climate, and availability of custom work all have a bearing on this problem.

Labor saved can also be deceiving. Conklin and Castle emphasize that several days of work may be saved—but how are these saved days spent? If they aren't spent productively, they cost in income. Leisure time costs money—can you afford it?

This method of analyzing machinery cost was developed by the economists while they were studying the North Unit Irrigation Project in Jefferson County. Results showed that at least one-third of the farm operators in that area have over-invested in machinery of one type or another. (Part of this over-investment is explained by conditions in the early 1950's—clover

prices were high and custom services limited.)

An operator who has already over-invested in machinery and equipment must decide what to do about it.

Figure all costs

Conklin and Castle suggest that cost of keeping a machine and using it as long as possible be carefully compared with what the machine would bring if sold immediately. Quite possibly, a rancher could get a satisfactory price by selling now—while if he kept the machine and worked it out he would get only salvage value. Also, the machine would cost him money throughout the time he was using it.

Operators thinking about buying new machinery may save themselves money by carefully working out all the costs ahead of time, according to the researchers. Cost of ownership and cost of custom hiring can be carefully compared.

Partnerships in machinery ownership are sometimes successfully worked

out between neighbors and friends and are also worth considering.

Sell the old machine?

Some farmers may figure they have overinvested in machinery. Yet, a piece of specialized equipment which is being "under-used" may sell for considerably less than its purchase price. For old machines it is likely that only salvage value can be obtained. Even so, you may wonder if you should sell the machine for whatever it brings and hire the work done. No clear-cut advice can be given, since sale price or salvage value will depend on local conditions. However, a "rule of thumb" applied to your actual cost data will provide information necessary to answer this question.

The rule is: *if returns from selling the machine are greater than the amount saved by owning and operating for the rest of its useful life, it would pay to sell, assuming custom operators are available, and ownership costs are less than custom costs.*

Ownership vs. Custom Hiring of Farm Machines.

Item	Baler (new)	10' S.P. Combine (new)	6' Pull Combine (used)
Original Cost	\$3400	\$6200	\$1250
Useful Life (years)	10	12	13
Fixed Costs Per Year			
Depreciation ¹	\$ 306	\$ 465	\$ 87
Interest ²	102	186	38
Taxes ³	56	102	21
Shelter ⁴	26	46	9
Insurance ⁵	8	16	3
Repairs ⁶	136	248	50
Total Fixed Cost Per Year	\$ 634	\$1063	\$ 208
Variable Cost			
Fuel ⁷	\$/ton	\$/acre	\$/acre
	.08	.63	.49
Lubricants ⁸01	.02	.03
Supplies (wire)	1.00		
Labor ⁹			
Tractor-Gas, Oil, Grease22		1.26
Operators Labor ⁹43	1.36	2.50
Total Variable Cost	\$1.74	\$2.01	\$4.28
Cost of Custom Hiring (variable by area)	\$4.50/T	\$7/A	\$7/A
Approximate "break-even" point.....	230 tons	210 acres	75 acres

¹ Original cost less 10% of original cost (salvage value) divided by years of useful life.

² 6% (amount you could earn on other investment) of $\frac{1}{2}$ the original investment.

³ Original cost \times 1.65% (personal property tax varies by area but is usually about $1\frac{1}{2}\%$ of original cost).

⁴ Estimated at .75% of original cost.

⁵ Estimated at .25% of original cost.

⁶ Estimated at 4% of original cost.

⁷ 23¢ per gallon (does not include tax).

⁸ Estimated at 2¢ per hour of operation.

⁹ \$1.50 per hour (typical cost in area of study—North Unit Project in Jefferson County).



USDA Photo

HAY-BALER may save time, money. Wise operator figures exactly what it costs him in the long run.

To illustrate, let's use the baler example again and make the following assumptions:

1. The baler is now 7 years old with a remaining useful life of 3 years;
2. 250 tons of hay are baled annually with a baling cost of \$4.28/ton (\$634 annual fixed cost \div 250 tons + 1.74/ton variable cost = \$4.28/ton);
3. Custom baling is \$4.50/ton;
4. The baler could be sold for \$700.

Should the baler be sold? Let's work it out and see.

Tons of hay to be baled in next 3 years: 250 tons/yr. \times 3 years = 750 tons

Custom charge for baling:
750 tons \times \$4.50/ton.....\$3,375

Less ownership charge for baling: 750 tons \times \$4.28/ton 3,210
Amount saved by owning

baler\$ 165

Salvage value of baler
(10% of original cost).....\$340
+ value saved by owning

baler 165

Break-even sale price\$505

In this case, if only economics are considered, you would sell the baler since the \$700 sale price is \$195 more than the \$505 break-even sale price.

Remember, the figures used here were for illustrative purposes only and don't necessarily apply to your situation. Substitute your own figures in this example to determine your own situation. Then temper your decision with the other considerations discussed above.

Budget Form for Determining Machinery Break-even Ownership, Custom Costs

Machine				
<i>Costs that will not change with amount of work done</i>	<i>Yearly Costs</i>	<i>Yearly Costs</i>	<i>Yearly Costs</i>	<i>Yearly Costs</i>
1. Depreciation	_____	_____	_____	_____
2. Interest	_____	_____	_____	_____
3. Taxes	_____	_____	_____	_____
4. Shelter	_____	_____	_____	_____
5. Insurance	_____	_____	_____	_____
6. Repairs*	_____	_____	_____	_____
7. Total	_____	_____	_____	_____
<i>Cost that will change with amount of work done</i>	<i>Cost/Unit</i>	<i>Cost/Unit</i>	<i>Cost/Unit</i>	<i>Cost/Unit</i>
8. Fuel	_____	_____	_____	_____
9. Lubricants	_____	_____	_____	_____
10. Supplies	_____	_____	_____	_____
11. Operators Labor	_____	_____	_____	_____
12. Tractor Costs	_____	_____	_____	_____
13. Other	_____	_____	_____	_____
14. Total	_____	_____	_____	_____
<i>Calculation of break-even point</i>	<i>Cost/Unit</i>	<i>Cost/Unit</i>	<i>Cost/Unit</i>	<i>Cost/Unit</i>
15. Custom rate	_____	_____	_____	_____
16. Less No. 14 above	_____	_____	_____	_____
17. Divide No. 7 above by No. 16 above	_____	_____	_____	_____
18. Units required to break-even with varying yields.....	_____	_____	_____	_____

* Repairs will vary with use. The more use, the more repairs. However, if the machine is used at all, broken parts must be replaced. Thus, the cost is fixed for the season and will not change with the amount of work done.

This budget form is for your use in figuring break-even points between ownership and custom costs of farm machinery. Footnotes for the table on page 3 may be used as guides if you are not able to pin down costs. Your County Extension Agent also may be able to supply you with current prices and costs.