

PRODUCTION COSTS THE PURCHASE OR LEASE DECISION

OBJECTIVE: To determine whether we should purchase a piece of machinery or equipment, or whether we should rent or lease the services of such machinery or equipment.

EXAMPLE: We have a field of corn to harvest soon, and we are trying to figure out whether it is more economical to buy and use our own combine OR to use a custom combining service.

Cost of combine	\$60,000
Expected useful life	12 years
Salvage value	\$20,000
Custom rate	\$50.00 /ac.

1. ANNUAL OWNERSHIP COSTS:

a. Depreciation = $\frac{(\text{cost} - \text{salvage value})}{\text{useful life}}$ = $\frac{(\$60,000 - \$20,000)}{12 \text{ years}}$
= \$3,333.33 /year

b. Interest = $\frac{(\text{Cost} + \text{salvage value})}{2} \times \text{interest rate}$
= $\frac{(60,000 + 20,000)}{2} \times .08 = \$3,200.00 / \text{year}$

c. Insurance = $\frac{(\text{Cost} + \text{salvage value})}{2} \times \text{insurance rate}$
= $\frac{(60,000 + 20,000)}{2} \times .008 = \$320.00 / \text{year}$

$$\begin{aligned}
 \text{d. Property taxes} &= \frac{(\text{Cost} + \text{salvage value})}{2} \times \text{local tax rate} \\
 &= \frac{(60,000 + 20,000)}{2} \times .00445 = \$178.00
 \end{aligned}$$

Total annual ownership costs \$7,031.33 /year

e. If I have 10 acres then \$703.13 will be ownership cost per acre

100 \$ 70.31

1000 \$ 7.03

2. OPERATING COST : Assume \$8.50 per acre

3. Therefore, if you have 1000 acres, it will pay to buy a combine :

\$15.53 /ac. vs. \$50.00 /ac.

At what acreage would I "BREAKEVEN" with respect to buying a combine versus using a custom combining service?

ACRES	ANNUAL OWNERSHIP COST PER ACRE	OPERATING COST PER ACRE	TOTAL COST OF OWNING AND OPERATING PER ACRE
50	\$140.63	\$8.50	\$149.13
100	70.31	8.50	78.81
150	46.88	8.50	55.38
200	35.16	8.50	43.66
250	28.13	8.50	36.63
300	23.44	8.50	31.94
350	20.09	8.50	29.39
400	17.58	8.50	26.08

At what acreage is it economical to purchase a combine?

Note: If 400 acres was all I could do with one combine in a season, it would pay to purchase my own. But if I owned 550 acres, then it would pay to purchase one combine and have the remaining 150 acres custom combined.

If I had 700 acres, it would pay to buy 2 combines.

Each time you exceed your limit of production with a machine, you must re-evaluate the remaining output level to see whether it pays to buy another machine or use custom service.

Using the previous example, assume you only have 100 acres :

Cost of combining with own machine = \$78.81 /ac.

How many acres would I have to custom harvest to make my investment profitable?

1. Total revenue from each acre harvested	\$50.00
Operating cost for each acre	\$ 8.50
Total net operating revenue /acre	\$41.50

2. Total cost for own operation :

Ownership cost **\$ 7,031.33 /year**

Operating expense **\$ 850.00 /year**

Total cost **\$ 7,881.33 /year**

Less the value of combining own land **\$ 5,000.00 /year**

Balance to be covered by custom combine

enterprise to break-even **\$ 2,881.33 /year**

3. Custom break-even acreage = \$2,881.33 /year / \$41.50 /ac. = 69.43 acres.

FORMULA FOR COMPUTING BREAK-EVEN ACREAGE:

$$\frac{\text{Total annual ownership cost}}{\text{(custom rate /ac.) - (operating cost /ac.)}}$$

An example :

$$\text{B.A.} = \frac{\$ 7031.33 \text{ /year}}{\text{(\$50 /ac.) - (\$8.50 /ac)}} = 169.43 \text{ ac./yr}$$