

This publication show estimated costs for grain harvest operations. Cost estimates are given for combines, grain carts, and grain hauling. These estimates are useful for determining custom rates for machinery operations and for analyzing machinery costs on farms. Estimates include charges for overhead (depreciation, interest, insurance, housing and repairs), fuel and labor. Not included is an allowance for profit. Charging custom rates at estimated costs should cover costs, but will not generate a profit. Adding 5 to 15 percent to estimated costs is appropriate when determining custom rates. Table 1 shows per acre costs of combining corn and soybeans, operating a grain cart, and hauling grain.

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Cost Estimates

Formulas contained in standards published by the American Society of Agricultural Engineers are used in calculating costs

for combines and grain carts. All combine costs are based on buying a new combine and holding the machinery for 7 years. Table 2 lists other variables used in calculating costs.

Table 1. Summary of Harvesting Costs.

| | |
|----------------------------------|------------------|
| Combining¹ | |
| Corn | \$25.80 per acre |
| Soybean | \$22.40 per acre |
| Grain Cart² | \$5.40 per acre |
| Grain Hauling³ | \$0.06 per bu. |

¹ Based on a 220 HP combine used on 1,200 acres.

² Given a \$19,000 grain cart used on 1,600 acres.

³ Hauling costs from field to storage will vary depending on distance to storage, unloading time, and other factors

Combine costs in Table 1 can be divided into four categories:

Combine Overhead includes depreciation, interest, insurance, housing, and repair charges on the combine. Overhead costs are higher for corn than for soybeans because hours required to harvest an acre are higher for corn than for soybeans. Combine overhead for the combine in table 1 is \$14.50 for corn and \$14.20 for soybeans.

Platform Overhead includes depreciation, interest, insurance, housing, and repair charges on the grain platform and corn head. Platform overhead for the combine shown in Table 1 is \$6.20 for a corn head and \$4.10 for soybean platform.

Fuel costs are based on diesel fuel priced at \$1.10 per gallon. Lubrication is 10 percent of fuel cost. Fuel costs for the combine shown in Table 1 are \$2.80 for corn and \$2.30 for soybeans.

Labor costs are based on a \$13.50 per hour labor charge. Labor time is 10 percent more than combine operating time.

Table 2. Factors Used in Calculating Costs.

| | | |
|-----------------------|---------|---------------------|
| Purchase price | 85% | of list price |
| Interest rate | 7% | of remaining value |
| Insurance and housing | 1% | of remaining value |
| Diesel fuel | \$1.10 | per gallon |
| Lubrication cost | 10% | of fuel costs |
| Years of life | 7 | years |
| Labor charge | \$13.50 | per hour |
| Labor time | 1.10 | times combine hours |

Combine Size and Costs

Costs shown in Table 1 are for a 220 horsepower combine with a 25 ft. grain head and an 8-row corn head used to harvest 600 acres of corn and 600 acres of soybeans. Appendix Table 1 shows costs for different size combines. Generally, per acre costs decrease as combine size increases, given that acres harvested also increase.

Use and Costs

A major portion of total costs for combines is in overhead costs which include depreciation, interest, insurance, housing, and repair charges. On an annual basis, depreciation, interest,

Table 3. Per Acre Costs for Combines of Different Sizes and Acres Harvested.

| Total Acres ¹ | 190 hp combine 6-row corn head 20' grain head | | 220 hp combine 8-row corn head 25' grain head | | 275 hp combine 8-row corn head 30' grain head | |
|--------------------------|---|----------|---|----------|---|----------|
| | Corn | Soybeans | Corn | Soybeans | Corn | Soybeans |
| | ---- \$ per acre ---- | | ---- \$ per acre ---- | | ---- \$ per acre ---- | |
| 600 | 41.10 | 36.10 | 44.50 | 39.30 | 49.10 | 44.10 |
| 800 | 33.00 | 28.60 | 35.00 | 30.80 | 38.70 | 34.30 |
| 1,000 | 28.20 | 24.20 | 29.40 | 25.70 | 32.60 | 28.50 |
| 1,200 | 25.20 | 21.30 | 25.80 | 22.40 | 28.60 | 24.60 |
| 1,400 | 23.20 | 19.30 | 23.20 | 20.10 | 25.80 | 21.90 |
| 1,600 | | | 21.40 | 18.40 | 23.80 | 20.00 |
| 1,800 | | | 20.00 | 17.20 | 22.30 | 18.50 |
| 2,000 | | | 18.90 | 16.20 | 21.10 | 17.30 |
| 2,200 | | | 18.10 | 15.40 | 20.20 | 16.40 |
| 2,400 | | | | | 19.50 | 15.60 |

¹ Assumes half the acres are corn and half are soybeans.

insurance, and housing costs remain constant regardless of the acres harvested. As acres increase, these overhead costs are spread over more acres. Therefore, for a given size combine, costs per acre decline as acres of use increase, as illustrated in Table 3.

Costs for the Grain Cart

Table 4 shows the costs for the grain cart divided into tractor overhead, grain cart overhead, fuel and lubrication, and labor categories. Costs are shown for a 600 bu. grain cart that will be held for ten years and has a list price of \$19,000. The grain cart is assumed to be used on 800 acres of corn and 800 acres of soybeans each year. The grain cart will be use for 211 hours each year, the same hours that the combine will be operated.

Tractor overhead in table 4 is charged on an hourly rate for a 185 horsepower tractor (see Machinery Cost Estimates: Tractors). Tractor overhead is charged on 105 hours which is one-half of the hours put on the combine. This reduction accounts for idle time on the grain cart. Labor is charged for all 211 hours.

Grain Cart Impacts on Combine Costs

Use of a grain cart should reduce per acre combine costs because the combine has to run fewer hours to harvest the same number of acres. Estimates of these cost reductions are shown in Table 5. Each row in this table gives per acre costs for different acres harvested. At 1,600 acres, costs when a grain cart is not used are \$21.90 per acre. Without the grain cart the combine hours of use are 210. Use of a grain cart is estimated to reduce hours to 184 and per acre costs to \$20.90. In Table 5, use of a grain cart reduces combine costs by about \$1.00 per acre. This decrease will offset some of the costs associated with grain cart use.

Grain cart use may allow one combine to harvest more acres. In these cases, combine costs will be further reduced because increasing acres harvested generally decreases per acre costs.

Grain Hauling Costs

Grain hauling costs are estimated for a situation of hauling grain from a field to commercial storage. These costs will vary depending on the miles between the field and the storage. They will also vary depending on terrain, road conditions, and contracting time.

Table 4. Per Acre Grain Cart Costs¹

| Total | = | Tractor Overhead | + | Grain Cart Overhead | + | Fuel & Lube | + | Labor |
|---------------|---|---------------------|---|---------------------------|---|----------------|---|--------|
| \$5.40 | | \$1.10 | | \$1.80 | | \$0.60 | | \$1.90 |

¹Based on a grain cart with list price of \$19,000 and a ten-year life. The grain cart will be used on 1,600 acres.

Table 5. Combining Costs, With and Without Grain Cart.¹

| Acres | Without Grain Cart | | With Grain Cart | |
|-------|--------------------|---------------|-----------------|---------------|
| | Hours of Use | Per Acre Cost | Hours of Use | Per Acre Cost |
| 1,400 | 184 | \$23.85 | 161 | \$22.95 |
| 1,600 | 210 | 21.90 | 184 | 20.90 |
| 1,800 | 237 | 20.40 | 207 | 19.35 |
| 2,000 | 263 | 19.20 | 230 | 18.10 |
| 2,200 | 289 | 18.30 | 253 | 17.20 |
| 2,400 | 316 | 17.55 | 276 | 16.40 |
| 2,600 | | | 299 | 15.89 |

¹ Based on a 275 HP combine with a \$170,800 list price given that half the acres are corn and half are soybeans.

Appendix Table 1. Costs of Different Size Combines.

| Machine description Head size | List Price ¹ | Acres per Year | Hours per Year | Costs Per Acre | | | | |
|---|-------------------------|----------------|----------------|----------------|------------|---------------------|---------------|---------|
| | | | | Total | = Overhead | + Platform Overhead | + Fuel & Lube | + Labor |
| | \$/head | ac/yr | hr/yr | \$ per acre | | | | |
| 190 Horsepower Combine (\$133,000 List Price) | | | | | | | | |
| 6-row (30" rows) corn head | \$28,900 | 400 | 83 | 33.00 | 18.80 | 7.80 | 3.30 | 3.10 |
| 20 ft. grain platform | \$21,000 | 400 | 59 | 28.60 | 18.50 | 5.60 | 2.30 | 2.20 |
| 220 Horsepower Combine (\$150,400 List Price) | | | | | | | | |
| 8-row (30" rows) corn head | \$34,500 | 600 | 93 | 25.80 | 14.50 | 6.20 | 2.80 | 2.30 |
| 25 ft. grain platform | \$23,000 | 600 | 74 | 22.40 | 14.20 | 4.10 | 2.30 | 1.80 |
| 275 Horsepower Combine (\$170,800 List Price) | | | | | | | | |
| 8-row (30" rows) corn head | \$34,500 | 800 | 128 | 23.80 | 13.00 | 4.80 | 3.60 | 2.40 |
| 30 ft. grain platform | \$26,900 | 800 | 83 | 20.00 | 12.50 | 3.60 | 2.40 | 1.50 |
| 275 Horsepower Combine, Rotary (\$181,900 List Price) | | | | | | | | |
| 8-row (30" rows) corn head | \$34,500 | 800 | 128 | 24.60 | 13.80 | 4.80 | 3.60 | 2.40 |
| 30 ft. grain platform | \$26,900 | 800 | 83 | 20.80 | 13.30 | 3.60 | 2.40 | 1.50 |
| 275 Horsepower Combine, Rotary (\$181,900 List Price) | | | | | | | | |
| 12-row (30" rows) corn head | \$49,400 | 1000 | 106 | 20.80 | 10.90 | 5.40 | 2.90 | 1.60 |
| 30 ft. grain platform | \$26,900 | 1000 | 106 | 17.30 | 10.90 | 2.90 | 1.90 | 1.60 |

¹ List prices in this column are for the grain platform or corn head. List prices for the combine are listed next to the machine description.