

MACHINERY COST ESTIMATES: HARVESTING

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This publication shows estimated costs for combining, using grain carts, and hauling grain. These estimates are useful for determining custom rates and for analyzing machinery costs on farms. Costs include overhead (depreciation, interest, insurance, housing and repairs), fuel and labor. Allowances for profit are not included. Charging custom rates at estimated costs should cover costs, but will not generate profits. Adding 5 to 15 percent to estimated costs is appropriate when determining custom rates. Table 1 shows costs of combining corn and soybeans, operating a grain cart, and hauling grain.

Cost Estimates

Formulas 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.

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

Combine overhead includes depreciation, interest, insurance, housing, and repair charges on the combine. Combine overhead for the combine in Table 1 is \$20.70 for corn and \$21.90 for soybeans.

Table 2. Factors Used in Calculating Costs.

Purchase price	85%	of list price
Interest rate	5%	of remaining value
Insurance and housing	1%	of remaining value
Diesel fuel	\$2.50	per gallon
Lubrication cost	10%	of fuel costs
Years of life	7	years
Labor charge	\$17.00	per hour
Labor time	1.10	times combine hours

Labor costs are based on a \$17.00 per hour labor charge. Labor time is 10 percent more than combine operating time.

Table 1. Summary of Harvesting Costs.

Combining¹	
Corn	\$35.20 per acre
Soybean	\$31.10 per acre
Grain Cart²	
Corn	\$12.50 per acre
Soybean	\$6.60 per acre
Grain Hauling³	
	\$0.10 per bu.

¹ Based on a 320 HP combine used on 1,900 acres.

² Based on a \$37,500 grain cart used on 1,900 acres.

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

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 \$8.30 for a corn head and \$5.60 for a soybean platform.

Fuel costs are based on diesel fuel priced at \$2.50 per gallon. Lubrication is 10 percent of fuel cost. Fuel costs for the combine shown in Table 1 are \$3.30 for corn and \$1.70 for soybeans.

Combine Size and Costs

Costs shown in Table 1 are for a 320 horsepower combine with a 30 ft. grain head and a 8-row corn head used to harvest 1,140 acres of corn and 760 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 are in overhead items (i.e., depreciation, interest, insurance, housing, and repairs). On an annual basis, depreciation, interest, insurance, and housing costs remain relatively the same regardless of 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.

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

Total Acres ¹	270 hp combine 6-row corn head 20' grain head		320 hp combine 8-row corn head 30' grain head		470 hp combine 12-row corn head 30' grain head	
	Corn	Soybeans	Corn	Soybeans	Corn	Soybeans
	---- \$ per acre ----		---- \$ per acre ----		---- \$ per acre ----	
600	48.90	44.30	84.00	82.10	107.10	95.00
800	46.20	41.60	65.40	63.00	82.10	72.80
1,000	45.00	40.20	54.50	51.70	67.30	59.60
1,200	44.50	39.50	47.40	44.20	57.50	50.90
1,400	44.40	39.20	42.40	39.00	50.60	44.80
1,600	44.60	39.20	38.90	35.20	45.50	40.30
1,800	45.00	39.30	36.30	32.30	41.60	36.80
2,000	45.60	39.50	34.30	30.00	38.60	34.10
2,200			32.80	28.20	36.20	32.00
2,400			31.70	26.80	34.30	30.30
2,600			30.80	25.70	32.70	28.80
2,800			30.10	24.70	31.40	27.70
3,000			29.60	24.00	30.30	26.70
3,200			29.20	23.40	29.40	25.90
3,400					28.70	25.20
3,600					28.00	24.70

¹ Assumes that 2/3 of the acres are corn and 1/3 are soybeans.

Costs for the Grain Cart

Table 4 shows estimates of owning three different sized grain carts. These costs are estimated assuming that the cart is purchased new at 85% of list price and that the machine is held for 10 years. For a 1,000 bushel grain cart, yearly costs of owning a grain cart with a \$37,500 list price are \$3,446.

Table 4. Yearly Costs of Grain Carts.

Grain Cart Size	List Price	Yearly Costs				Total
		Depreciation	Interest	Repairs	Housing Insurance	
750 bu.	\$34,000	\$1,900	\$896	\$179	\$149	\$3,124
1,000 bu.	44,000	2,459	1,159	232	193	4,043
1,325 bu.	74,000	4,136	1,950	390	324	6,800

Per acre costs will vary based on the amount of use of the grain cart. Table 5 shows estimates of per acre costs for the different sized grain carts. In Table 5, the 1,000 bushel grain cart is assumed to be used on 1,900 acres. This results in grain cart overhead of \$1.80 per acre (\$3,446 yearly costs from Table 4 divided by 1,900 acres).

Table 5. Per Acre Costs of Owning and Operating a Grain Cart.

Grain Cart Size	Crop	Grain Cart Overhead	Tractor + Overhead	Fuel + & Lube	Labor	= Total
750 bu. ¹	Corn	2.20	5.20	2.10	2.30	11.80
	Soybeans	2.20	2.10	0.80	1.70	6.80
1,000 bu. ²	Corn	2.10	6.10	2.60	1.70	12.50
	Soybeans	2.10	2.30	1.00	1.20	6.60
1,325 bu. ³	Corn	2.80	5.70	2.20	1.20	11.90
	Soybeans	2.80	2.70	0.90	1.00	7.40

¹Based on costs in Table 4 and harvest of 1,400 acres.

²Based on costs in Table 4 and harvest of 1,900 acres.

³Based on costs in Table 4 and harvest of 2,400 acres.

Grain Hauling Costs

Hauling costs are estimated for moving grain from a field to commercial storage. Hauling 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. The estimate in Table 1 is based on using a semi-truck having a charge of \$95 per hour to operate. Estimates in Table 1 assume about one trip per hour.

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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	+ Overhead	+ Fuel & Lube	+ Labor
	\$/head	ac/yr	hr/yr	----- \$ per acre -----				
270 Horsepower Combine (\$361,000 List Price)								
6-row (30" rows) corn head	\$55,000	840	174	44.40	26.70	10.10	3.70	3.90
20 ft. grain platform	\$34,000	560	83	39.20	28.40	5.90	2.10	2.80
320 Horsepower Combine (\$383,000 List Price)								
8-row (30" rows) corn head	\$61,000	1,140	177	35.20	20.70	8.30	3.30	2.90
30 ft. grain platform	\$44,000	760	75	31.10	21.90	5.60	1.70	1.90
470 Horsepower Combine (\$460,000 List Price)								
12-row (30" rows) corn head	\$109,000	1,500	155	33.40	17.20	11.10	3.20	1.90
30 ft. grain platform	\$44,000	1,000	99	29.50	20.80	4.30	2.50	1.90
540 Horsepower Combine, Rotary (\$484,000 List Price)								
16-row (30" rows) corn head	\$144,000	2,100	163	28.60	10.30	14.00	2.80	1.50
35 ft. grain platform	\$50,000	1,050	89	26.20	17.60	4.60	2.40	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.