FARM BUSINESS MANAGEMENT

Machinery Cost Estimates: Harvesting

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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 $20.10 for corn and $23.50 for soybeans.

Table 1. Summary of Harvesting Costs.

Combining[1]	
Corn	$37.60 per acre
Soybean	$32.70 per acre
Grain Cart[2]	
Corn	$14.20 per acre
Soybean	$7.80 per acre
Grain Hauling[3]	$0.10 per bu.

[1] Based on a 470 HP combine used on 2,500 acres.

[2] Based on a $57,500 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.

Table 2. Factors Used in Calculating Costs.

Purchase price	85%	of list price
Interest rate	5.5%	of remaining value
Insurance and housing	1.0%	of remaining value
Diesel fuel	$2.50	per gallon
Lubrication cost	10%	of fuel costs
Hours of use per year	175	per year
Years of life	10	years
Labor charge	$19.00	per hour
Labor time	1.10	times combine hours

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 $12.40 for a corn head and $5.50 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 $2.90 for corn and $1.90 for soybeans.

Labor costs are based on a $19.00 per hour labor charge. Labor time is 10 percent more than combine operating time.

Combine Size and Costs

Costs shown in Table 1 are for a 470 horsepower combine with a 35 ft. grain head and a 12-row corn head used to harvest 1,500 acres of corn and 1,000 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]	320 hp combine 8-row corn head 30' grain head		470 hp combine 12-row corn head 35' grain head		540 hp combine 16-row corn head 35' grain head	
	Corn	Soybeans	Corn	Soybeans	Corn	Soybeans
	---- $ per acre ----		---- $ per acre ----		---- $ per acre ----	
600	99.60	94.90	123.30	111.60	136.10	115.70
800	77.20	72.60	94.30	85.00	103.50	88.10
1,000	64.10	59.50	77.10	69.20	84.00	71.70
1,200	55.50	50.80	65.70	58.80	71.10	60.80
1,400	49.60	44.70	57.70	51.40	61.90	53.10
1,600	45.30	40.20	51.70	45.90	55.10	47.40
1,800	42.10	36.80	47.20	41.70	49.90	43.00
2,000	39.70	34.20	43.70	38.40	45.80	39.50
2,200	37.90	32.10	40.90	35.80	42.40	36.80
2,400	36.50	30.50	38.60	33.60	39.70	34.50
2,600	35.40	29.10	36.70	31.80	37.40	32.60
2,800			35.20	30.40	35.50	31.00
3,000			33.90	29.10	33.90	29.10
3,200			32.80	28.10	32.50	28.50
3,400					31.30	27.60
3,600					30.30	26.70

[1] Assumes that 60% of the acres are corn and 40% 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 $57,500 list price are $5,436.

Table 4. Yearly Costs of Grain Carts.

Grain Cart Size	List Price	Yearly Costs				
		Depreciation	Interest	Housing Insurance	Repairs	Total
750 bu.	$51,345	$2,870	$1,488	$271	$225	$4,854
1,000 bu.	57,500	3,214	1,667	303	252	5,436
1,325 bu.	99,400	5,556	2,881	524	435	9,396

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 $2.90 per acre ($5,436 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
875 bu.[1]	Corn	3.50	4.60	1.50	1.90	11.50
	Soybeans	3.50	1.80	0.60	1.30	7.20
1,000 bu.[2]	Corn	2.90	7.00	2.40	1.90	14.20
	Soybeans	2.90	2.70	0.90	1.30	7.80
1,325 bu.[3]	Corn	3.90	6.50	2.80	1.30	14.50
	Soybeans	3.90	3.10	1.30	1.10	9.40

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

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

[3]Based 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	Total	Costs Per Acre: Combine = Overhead	Platform + Overhead	Fuel + & Lube	+ Labor
	$/head	ac/yr	hr/yr	$ per acre				
320 Horsepower Combine ($435,500 List Price)								
8-row (30" rows) corn head	$77,750	1,140	177	**40.80**	23.70	10.90	3.00	3.20
30 ft. grain platform	$48,250	760	75	**35.50**	25.60	6.30	1.50	2.10
470 Horsepower Combine ($523,000 List Price)								
12-row (30" rows) corn head	$119,250	1,500	155	**37.60**	20.10	12.40	2.90	2.20
35 ft. grain platform	$54,750	1,000	85	**32.70**	23.50	5.50	1.90	1.80
540 Horsepower Combine, Rotary ($547,000 List Price)								
16-row (30" rows) corn head	$157,250	1,890	147	**32.80**	15.80	12.90	2.50	1.60
35 ft. grain platform	$54,750	1,260	107	**28.80**	20.40	4.40	2.20	1.80

[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.