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Jose, H. Douglas and Brown, Lance L., "NF96-310 Costs of Harvesting and Hauling Corn Stalks in Large Round Bales" (1996). *Historical Materials from University of Nebraska-Lincoln Extension*. 409.
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Published by Cooperative Extension, Institute of Agriculture and Natural Resources,
University of Nebraska-Lincoln

Costs of Harvesting and Hauling Corn Stalks in Large Round Bales

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The costs of harvesting crop residues either by machines or grazing are not typically included in the calculations shown in crop enterprise budgets such as the *Nebraska Crop Budgets*. These uses are considered supplementary activities since the grain is the primary product and the residues are only harvested when there is an economic incentive to do so. The following is an analysis of the costs of harvesting corn stalks for either livestock fodder or industrial uses.

The costs calculated below are based on the following assumptions:

1. Stalks are harvested from a 130 acre, center pivot irrigated field, yielding 150 bushels per acre. (The corners are not used to grow corn).
2. The weight of stalks available as residue is assumed to be equal to the weight of grain harvested. For a 150 bushel yield, the weight of stocks available is:

$$150 \times 56 = 8,400 \text{ lbs or } 8,400/2,000 = 4.2 \text{ tons per acre.}$$

The actual yield of stocks depends on how the stocks are harvested and are as follows:¹

- a. Stalks that are shredded and raked — 3.5 tons per acre
 - b. Stalks that are raked — 2.75 tons per acre
 - c. Stalks baled directly after combining — 2.0 tons per acre
3. Bales weigh 1,100 pounds each.
 4. 30 bales can be loaded on a truck for transportation. The load would weigh $(30 \times 1,100)/2,000 = 16.5$ tons.
 5. The machinery cost components including labor at \$6.00 per hour and the costs of owning and operating the machines, are:

Use of round baler	\$5.50 per ton
Use of a tractor for baling, raking and shredding	\$23.00 per hr
Use of rake	\$3.50 per acre
Use of rolling shredder	\$2.00 per acre
Moving bales off the field	\$1.00 per bale

- The transportation of the bales to a processor is \$2.50 per mile per load for a minimum of ten miles or $\$2.50/16.5 = \$.152$ per ton per mile. The cost to haul a load 30 miles is $\$.152 \times 30 = \4.56 per ton.
- The baling rate is 6 acres per hour, the shredding rate is 6.5 acres per hour and the raking is 9 acres per hour.
- The estimated value of the soil nutrients removed from the field is \$9.59 per ton of stover.

Costs of Harvesting Operations

	<i>Baling, Raking & Shredding</i>	<i>Baling & Raking Only</i>	<i>Baling Direct</i>
	<i>costs per acre</i>		
Baling	\$19.25	\$15.15	\$12.00
Tractor for baling	4.00	4.00	4.00
Raking	3.50	3.50	—
Roll shredding	2.00	—	—
Tractor for raking or shredding	7.00	4.00	—
Moving bales off the field	6.36	5.00	3.64
Totals (excluding hauling & value of nutrient loss)			
Per Acre	\$42.11	\$31.65	\$19.64
Per Ton	\$12.03	\$11.50	\$ 9.85
Totals (including hauling 30 miles & value of nutrient loss)			
Per Acre	\$91.64	\$70.59	\$47.94
Per Ton	\$26.18	\$25.67	\$23.97

Summary

The cost to harvest corn fodder when the stalks are shredded, raked and baled is \$12.03 per ton, f.o.b.

the farm. The cost of moving a load of 30 bales 30 miles is another \$4.56 per ton bringing the total cost to \$16.59 per ton. If the stalks are baled direct after combining, the harvesting cost is \$9.85 per ton, f.o.b. the farm. The hauling cost remains \$4.56 per ton for 30 miles bringing the delivered cost to \$14.41 per ton. However, the yield for direct baling is only two tons per acre compared to 3.5 tons per acre for the shredding, raking and baling system.

The feeding value of the residue would be another consideration if grazing is an alternative. It has been estimated that grazing saves 26 pounds of grass hay per head per day or 780 pounds of hay per acre grazed for the winter grazing season. If the grass hay is valued at \$50 per ton, this is worth \$19.50 per acre grazed. For a complete discussion of the feeding value of crop residues, refer to NebGuide G92-1116, *Grazing Crop Residue*.

Sources of Data

1. Dickey, Bob, Laurel, NE. Personal communication, Aug. 1, 1996.
2. Frank, Kenneth. *Estimated Value of Various Nutrients in Corn Stover*. Unpublished manuscript, UNL Soil and Plant Analysis Lab.
3. Powell T, D. Ellis and D. Hansen. *Costs of Owning & Operating Farm Machinery*. EC 92-892, Nebraska Cooperative Extension.
4. Rasby, Rick and Roger Selley. *Grazing Crop Residue*. G92-1116, Nebraska Cooperative Extension.
5. Selley R., L. Bitney, R. Clark, H. D. Jose, T. Holman, R. Klein and R. Massey. *1996 Nebraska Crop Budgets*. EC 96-8725, Nebraska Cooperative Extension.

¹The yields represented are only estimates of production. These can fluctuate greatly depending on the yield of the corn, how soon the stover is baled after the corn is combined, and the process used in the production of stover bales.

File NF310 under: FIELD CROPS

C-2, Corn

Issued October 1996

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Elbert C. Dickey, Director of Cooperative Extension, University of Nebraska, Institute of Agriculture and Natural Resources.

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