

## Own or Custom-Hire Hay Harvesting and Hauling\*

### Objective

The high cost of machinery ownership is prompting many farm and ranch managers to consider custom harvest arrangements for hay. Owners of small hay fields, in particular, should consider custom harvest as an alternative to owning hay equipment. However, considering the timeliness of operations plus the quality of work complicates the machinery decision process. This decision aid determines the operating and ownership costs of haying machinery and equipment and helps evaluate whether ownership is justified with respect to custom harvest operations.

An often forgotten aspect of the custom hire decision is the impact that yields play in hay harvest decisions. Low yields increase harvest cost per bale significantly. This decision aid illustrates the sensitivity of hay yields on ownerships costs in comparison to custom operations.

Farm and ranch managers often complain that custom operators cannot be counted on to harvest hay at optimal quality. This spreadsheet also provides an estimate of increased hay quality value. This determination may be used to calculate incentives attracting custom operators to perform operations in a timely manner given the producer's quality standards. An additional dollar or two per bale in custom fees may be sufficient to ensure a timely harvest that returns the same amount or more in increased quality.

### Getting Started

Cells for data entry in the spreadsheet appear in blue on the screen. Values generated by the program are protected so they cannot be accidentally overwritten and the equations erased.

This spreadsheet contains two worksheets:

- One provides machine ownership or custom hire analysis
- The second values improvements in forage quality.

Data needed for accurate results in this analysis include Schedule F or economic depreciation schedule, hay production records, labor requirements by field operation, and the percent usage of the machinery complement in the hay enterprise. Implied feed component valuations in hay quality are derived from corn and cottonseed meal prices. Take care to use reliable estimates for all data input when decision aids are used. If the decision to custom hire is close, it is even more important to have precise data. The following inputs may require some additional explanation:

**Insurance rate** - Enter the insurance cost for machinery and equipment as a percentage of its total market value.

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**Wage rate** - Enter the total cost per hour of labor involved in hay harvest. Include non-wage payroll expenses associated with hourly employees such as the employer contributions to Social Security, Medicare and unemployment insurance.

**Miscellaneous costs** - Enter the value for items such as hay-wrap, twine or wire on a per bale basis. This value should cover all costs other than depreciation, interest, repairs, fuel and lube, insurance and management.

**Annual cost of supervisory management** - Enter the total annual value of supervisory time allocated to overseeing hay harvest and hauling.

**Current market value** - Enter the net amount each machine or implement would bring if sold. A value of zero should be entered if the machine is leased.

**Remaining economic life** - Enter the number of years that the machine is expected to remain in use on the ranch.

**Salvage value** - Enter the net sale proceeds expected when the machine is sold after its useful life on the ranch.

**Lease payment** - Enter the annual lease payment for each implement that is leased and not owned.

**Time used on hay** - Many implements are used for multiple purposes or enterprises on a farm or ranch. Enter the percentage of total machine use that should be allocated to each hay activity.

**Remaining life if not used for hay** - Because many machines are used for multiple purposes on the farm or ranch, a machine may not be sold if custom work is performed instead. Consequently, the ownership costs associated with that machine will still be incurred but they may be allocated over a longer period of time due to lower hours of usage each year. Enter a “new” economic life in this column if machinery would be kept on the ranch but for a longer period of time. If the life of the machine will not be greater, enter the original life again.

**Tractor HP used with operation** - Enter the horsepower of the tractor typically used with each implement. Since fuel use is associated with each field activity, enter a zero horsepower for tractors and self-propelled implements.

**Fuel used per acre for operation** - Enter the number of gallons of fuel used per acre for each operation in a single cutting. One method to estimate this number is to calculate the amount of fuel required to mow a field and then divide by the number of acres in that field. If the fuel usage is unknown, enter a zero to have the program calculate the fuel usage.

**Annual repair cost** - Enter the annual repair cost for the machine or implement. If the repair cost is unknown, use the repair cost calculator at the bottom of the decision aid to estimate the annual repair cost for the machine. Repair costs are estimated based on the age and price of the machine, annual hours of use and length of ownership.

The repair cost calculator provides two figures. The first figure is an estimate of the coming year's repair cost for the machine. The second figure is an annual average of the repair costs over the remaining life of the machine. This second figure should be larger than the first as it reflects general increases in repairs as the machine ages. The second figure should be used for long-term planning while the first figure is an estimate only for the next year.

## **Results**

The "Hay Harvest Cost Summary" section outlines annual ownership and operating costs for each implement and illustrates the total annual cost of hay harvest and hauling compared to custom hire. Included is a section outlining the change in annual capital ownership costs if the ranch manager elects to custom hire hay harvest. A negative change in ownership cost reflects the sale of a machine whereas an additional change reflects a retained machine whose portion of ownership costs previously devoted to haying would now be incurred on the farm.

Any additional ownership charges associated with a custom hay harvest are added to custom harvest rates and then compared to machinery ownership on the ranch. If this comparison value (either harvest only or harvest and hauling) is positive, it would be an advantage to have hay operations performed by a custom operator.

This decision aid also calculates implied values of protein and the non-protein portion of total digestible nutrients (TDN) based on market prices for corn and cottonseed meal. The resulting values reflect how much the value of hay would increase with a one-percentage point increase in either protein or non-protein TDN. These values are then used to calculate quality incentives that might be offered to arrange for timely harvest by custom operators.

An evaluation of the sensitivity of the custom-hire advantage to the total annual number of bales harvested is also presented in the results. Poor hay crop years will have higher fixed expenses per unit which enhances the advantage of custom harvest. Managers should consider the probabilities associated with different yields to appraise expected gains or losses from custom hire.

## **Other Aids to the Process**

Machinery costs can often account for as much as 50% of the annual cost of producing and harvesting a forage crop. The producer's own production records (or alternatively, Schedule F tax information plus the depreciation schedule) are a good place to start when determining hay production expenses. Of course, if an operation has multiple crop enterprises, the total farm expenses (such as those listed on the Schedule F) must be prorated among hay and other enterprises. An OSU fact sheet, AGEC-242, "From Cash Records to Cost of Production", may be helpful in this process (<http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Document-1663/AGEC-242web.pdf>). Software tools such as AGMACH\$ may also assist with machinery cost calculations (<http://agmach.okstate.edu>).

For small acreages, custom hire of various forage operations is typically less expensive than machinery and equipment ownership and maintenance. Of course, the trade-off is forced

reliance on someone else to perform operations in a timely manner to the producer's quality standards. Information on the cost of custom work in Oklahoma is in CR-205, Oklahoma Farm and Ranch Custom Rates available online at <http://osueextra.com/> or through local Extension offices. OSU Enterprise Budget software is another tool designed to assist producers in evaluating the cost of forage production and is available at <http://www.agecon.okstate.edu/budgets/>

## References

- Doye, D and R. Sahs. Oklahoma Farm and Ranch Custom Rates. *OSU Extension Current Report CR-205*, Cooperative Extension Service, Oklahoma State University. <http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Document-8064/CR-205%202011-2012web.pdf>
- Huhnke, R. AGMACH\$ - Agricultural Field Machinery Cost Estimation Software. OSU Cooperative Extension Service, Oklahoma State University. <http://agmach.okstate.edu/>
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