Economics of Hay Production and Harvesting

Agricultural Economics - Extension No. 2005-10
Richard L. Trimble, Kenny Burdine, and Steve Isaacs
December 2005

Introduction
The key to economic success for the cow-calf operation is cost control. According to a recent study of beef farms participating in the Kentucky Farm Business Management Program 1, feed costs make up more that 40% of the total cost of producing a weaned calf. Over 80% of feed costs are made up of homegrown feed, the majority of which is undoubtedly hay. Anything producers can do to reduce the costs associated with hay production and harvesting should help improve the profitability of their beef business.

Many beef producers are not aware of the costs associated with hay production and harvesting. They just consider it to be an integral part of their beef business. Producers justify it simply as an absolute requirement for their beef enterprise. Alternatively, they may argue that it is a matter of convenience to facilitate the overall management of their beef enterprise. However, very few producers have fully considered all costs associated with hay production and harvesting.

Determining the Costs of Producing and Harvesting Hay
A computer based decision aid (MS Excel format) has been developed to help Kentucky beef producers analyze the costs associated with hay production and harvesting. This decision aid is available for downloading and use from the University of Kentucky, Department of Agricultural Economics Website. It is an Excel based spreadsheet and requires the Excel program for effective use.

The Hay Production and Harvesting Enterprise Budgeting Decision Aid simply builds on previous hay budgets that have been a part of our Departmental Crop and Forage Budget series for many years. It assumes that you have an existing improved grass and legume pasture paddock that could easily be changed to the production of hay with the addition of appropriate fertilizer and clover seed. As such, it does not attempt to account for the establishment of an improved grass and legume forage source. It then takes the existing Improved Grass and Legume Hay Budget2 and makes numerous modifications to it. The decision aid allows the user to analyze the costs and returns of hay production and harvesting under many different conditions and assumptions about the specific farm situation.

The first major modification is to add an input option that describes the size of the hay enterprise, in acres. This addition to the basic hay budget allows a "Total Enterprise" column that facilitates the calculation and reporting of totals for all costs and returns listed in the enterprise budget. The user should be better able to appreciate the total magnitude of costs and returns generated by the hay enterprise.
A second modification is the consideration of the size of bales produced by the hay enterprise. This allows the expected sale price to be expressed per ton of hay regardless of the size of bale being produced. The user can then input the number and size of bales he is producing in the enterprise. As a result, the decision aid can accommodate either large round or small square bales, depending on the preferences of the user. All other production costs can be adjusted to reflect the number and size of bales being produced. This should make the budgeting aid more adaptive and useful across most hay enterprises.

Another addition to the basic hay budget is a Capital Investment Supporting Schedule, which allows the user to specify the capital investment costs of each machinery and equipment item required for hay production and harvesting. This addition facilitates the calculation of the annual capital costs associated with the hay enterprise.

These modifications were made to help make beef producers more aware of all costs associated with the production and harvesting of hay in Kentucky. Specifically, the Capital Investment Supporting Schedule was added to make producers aware of the machinery investment required by the hay enterprise. The user can also more fully investigate both variable and fixed costs and the components that go to makeup these costs.

**Purpose of Hay Enterprise Costs and Return Budgeting Decision Aid**

The hay cost budgeting decision aid should be useful to beef producers whether they are producing and harvesting their own hay or not. For the producer investigating the possibility of producing and harvesting their own hay, it will help determine the various costs associated with the "new venture." Those that are currently producing and harvesting their own hay can consider their current costs. The user can then compare these costs to the alternative of buying hay. Producers can also determine the potential savings they might realize from disinvestment in the capital investment associated with the hay enterprise.

Beef producers, particularly those of limited size, should fully consider the possibility of buying hay for their beef cow-calf business. All costs associated with hay production and harvesting should be compared to the cost of buying hay. As these comparisons are made, one should also be sure to consider differences in hay quality and feed value. In addition, all producers, whether buying or producing their own hay, should investigate the economics of different methods of hay storage. Once these comparisons are made, it may be discovered that the costs associated with buying hay are not as expensive as expected. Further, it may be determined that while purchased hay is expensive, the cost of producing and harvesting your own hay is even more costly! Use of the hay budgeting decision aid to make such comparisons is the express purpose of the tool.

**Using the Hay Enterprise Costs and Return Budgeting Decision Aid Tool**

The actual use of the hay budgeting tool should be quite easy. Once you have the spreadsheet loaded and are viewing the screen, the numbers in blue are the numbers that you can change. All other numbers are calculated by the program and need not be supplied by the user. (Formulas supplied by the program are used and protected so they will not be changed by the user.) The default numbers in the budget are the best available when the program was developed; however, you should change the numbers to reflect your specific situation. These numbers should come from your own records or
personal experience. The accuracy of the overall result will be determined by the quality of the input you provide!

A word of caution! The first three items listed in the Fixed Costs section of the hay budget are determined by inputs in the Capital Investment Supporting Schedule. Therefore, you must fill in the capital investment section before you can complete the hay budget. There are "yellow" navigation buttons for moving between the budget and the capital investment schedule.

Once you have completed a hay budget analysis, you can print out part or all of your results. There are print buttons for; the Budget, the Capital Investment Supporting Schedule, or All (both). Printing out your results will give you something to refer to in the future and make comparisons to as you go about correcting or "fine-tuning" your budgeting analysis. You can also save your current spreadsheet for future use when better information becomes available.

An Example
The default example used in the Hay Budgeting Decision Aid involves 50 acres of improved grass-legume hay. The enterprise requires an investment of $41,175 in machinery and equipment to produce and harvest the hay. Based on these 50 acres producing 4 tons of hay per acre, the Total Cost per ton of hay produced is $75.48. Alternately, using an expected sale price (or on farm use value) of $70.00 per ton, the yield would have to be at least 4.3 tons per acre, without any increase in production costs, to cover the Total Costs of producing and harvesting the hay.

Many similar comparisons can be made using this decision aid. Never forget that the Total Costs of producing and harvesting the hay must be paid. We often look at only covering the variable costs of an enterprise in the short run. However, this enterprise should be viewed over the long run. This is expressly the case for anyone looking to start a new hay enterprise.

Summary and Conclusions
The success of any enterprise or "new venture" depends on your specific farm situation. The Hay Production and Harvesting Enterprise Budgeting Decision Aid was developed to help you analyze the specific costs and returns of the hay enterprise on your farm. In turn, it should prove helpful in improving the profitability of your beef cow-calf enterprise.

References

2Isaacs, Steve, Stephanie Goode, and Richard Trimble, Field Crop and Forage Budgets (Version 5.0), Department of Agricultural Economics, University of Kentucky College of Agriculture, February 2005.