

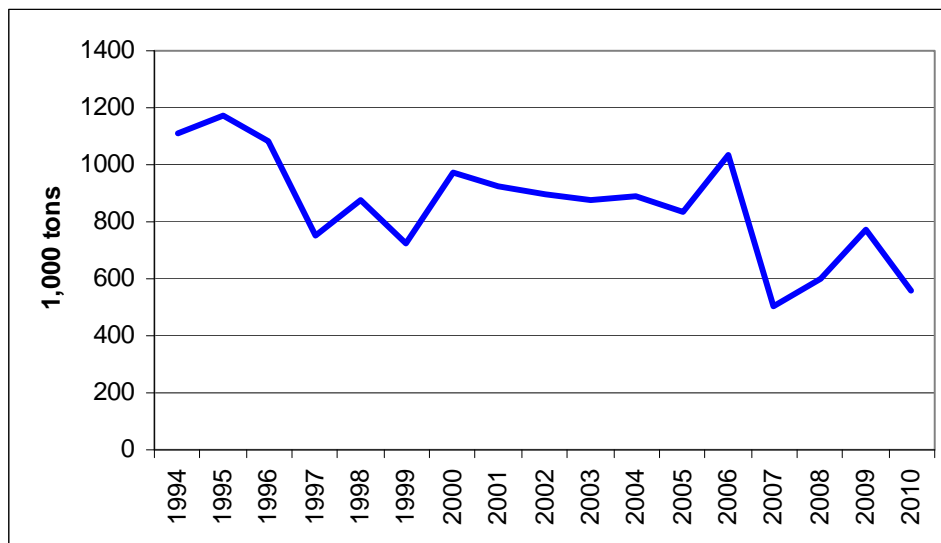
DOLLARS & CENTS OF ALFALFA PRODUCTION

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The last several years have been incredibly challenging for all of Kentucky agriculture and hay producers have been no exception to the rule. Statewide, alfalfa yields have been below average in 3 of the last 4 years due to challenging weather in 2007, 2008, and again in 2010. In addition to the weather challenges, producers are also dealing with higher costs of fuel, fertilizer, and machinery. These challenges make budgeting especially important looking ahead to the 2011 growing season.

Alfalfa has always been somewhat under that radar screen in terms of production in Kentucky. Despite being a fairly profitable hay crop historically, it has remained fairly small in terms of acreage in the state. From the mid 1990's through 2007, Kentucky's alfalfa hay acreage generally ranged from 250 to 300 million acres. Since 2007, acreage has dropped drastically and was estimated at 200 million for 2010. This decrease is likely the result of recent challenging growing conditions, increased costs, and competition for ground from other crops. Figure 1 below shows Kentucky alfalfa production trends, which reflect both acreage and yield affects.

Figure 1: Kentucky Alfalfa / Alfalfa Mix Hay Production (1994 – 2010)



Source: USDA NASS

When estimating cost and returns, yields are perhaps the most challenging factor to predict in advance. USDA estimates alfalfa yields each year, which can be used as an index of overall alfalfa yield in the state. State average yields over the last four years

have ranged from 1.8 tons per acre in 2007 (spring freeze and summer drought) to 3.5 tons per acre in 2009. In the fall, yields for 2010 were estimated to be 2.8 tons per acre. Of course many producers see considerably better yields than these based on their management practices and stand quality, so these should be used as general guidelines only.

In addition to weather and yield concerns, rising input costs have also been a major concern for alfalfa producers over the last several years. Rising fuel and fertilizer prices have drastically changed the breakeven prices for alfalfa hay. Generally speaking, prices for Nitrogen and Phosphorus peaked in 2008, while Potash prices peaked in 2009. Fertilizer prices were lower in 2010, providing some relief on the cost side, but are expected to rise again in 2011.

The final economic factor worth discussing is price. Nationally, alfalfa prices peaked in 2008 / 2009, a time of high feed prices and relatively low production levels, and have trended downward since then. As we move into 2011, feed prices are going to be near those 2009 levels. As the price of feeds, such as corn and bean meal increase, the value of hay should also increase based on its substitute value.

Finally, I would make the point that hay prices tend to be very localized. Since hay is an expensive commodity to transport, local markets have a greater impact on price than larger market trends. The market for quality alfalfa mix hays in Kentucky is largely driven by the equine and dairy sectors, both of which have dealt with serious economic challenges in recent years.

Figure 2 presents an estimated alfalfa budget for 2011. This budget skeleton is available on-line in spreadsheet form at the UK Ag Econ Forage website at the following address: <http://www.ca.uky.edu/agecon/index.php?p=210>. Simply click on Forage Budgets and look for alfalfa. While attempts have been made to make this budget as realistic as possible, one should clearly modify this budget based on their own situation.

The budget is set up for alfalfa square bale hay production and assumes a yield of five tons per acre. The assumed sale price is \$150 per ton or \$4.50 per 60 lb square bale. This price is meant to include production and moving costs, not delivery to buyer. One should also be aware that this price would represent the price of an average alfalfa bale sold. In some cases, lower quality bales may move at a considerable discount to higher quality bales. Cost estimates are based on the best estimates available, but certainly should be changed based on actual quotes in the producer's area. Since the return is to land and management, producers should ask themselves if this adequately compensates them for owning the land and managing the crop.

Figure 2: Estimated Alfalfa Budget for 2011

**ALFALFA HAY ENTERPRISE
ESTIMATED COSTS AND RETURNS**

**Return to
Intro Page**

| | | | | | | | |
|---------------------------------------|-----------------|---|-----------------|---------------|------------------|-----------------|-------------------|
| Total Acres in Enterprise: | 200 | acre | | | | | |
| Number Bales per Acre: | 166.7 | | | | | | |
| Weight per Bale: | 60 | lbs | | | | | |
| | AMOUNT | | UNIT | PRICE | FREQUENCY | TOTAL | TOTAL |
| GROSS RETURNS | | | | | | Per Acre | Enterprise |
| Hay (Sold or On-Farm Value) | 5 | | tons | \$150.00 | annually | \$750.00 | \$150,000 |
| VARIABLE COSTS | | | | | | | |
| Seed | 20 | | lbs | \$5.00 | every 5 years | \$20.00 | \$4,000 |
| Nitrogen | 0 | | lbs | \$0.45 | annually | \$0.00 | \$0 |
| Phosphorus | 75 | | lbs | \$0.73 | annually | \$54.75 | \$10,950 |
| Potassium | 300 | | lbs | \$0.48 | annually | \$144.00 | \$28,800 |
| Boron | 2 | | lbs | \$10.00 | every 2 years | \$10.00 | \$2,000 |
| Lime | 2 | | tons | \$20.00 | every 2 years | \$20.00 | \$4,000 |
| Herbicides | 1 | | acre | \$30.00 | annually | \$30.00 | \$6,000 |
| Hay Preservative | 1 | | acre | \$0.00 | annually | \$0.00 | \$0 |
| Fuel and Oil | 1 | | acre | \$40.00 | annually | \$40.00 | \$8,000 |
| Repairs | 1 | | acre | \$30.00 | annually | \$30.00 | \$6,000 |
| Custom Application | 1 | | acre | \$5.00 | annually | \$5.00 | \$1,000 |
| Equipment Rental | 1 | | acre | \$0.00 | annually | \$0.00 | \$0 |
| Cash Land Rent | 1 | | acre | \$0.00 | annually | \$0.00 | \$0 |
| Hired Labor | 3 | hours / ac | | \$10.00 | annually | \$30.00 | \$6,000 |
| Interest (1/2 year) | \$383.75 | | dollars | 6.0% | annually | \$23.03 | \$4,605 |
| TOTAL VARIABLE COST | | | | | | \$406.78 | \$81,355 |
| RETURN ABOVE VARIABLE COST | | | | | | \$343.22 | \$68,645 |
| FIXED COSTS | | | | | | | |
| Annual Interest on Investment | 1 | | acre | \$30.00 | | \$30.00 | \$6,000 |
| Annual Depreciation of Capital Assets | 1 | | acre | \$50.00 | | \$50.00 | \$10,000 |
| Insurance: Casualty and Liability | 1 | | acre | \$10.00 | | \$10.00 | \$2,000 |
| Operator and Family Labor | 3 | hours / ac | | \$10.00 | | \$30.00 | \$6,000 |
| TOTAL FIXED COST | | | | | | \$120.00 | \$24,000 |
| TOTAL COSTS | | | | | | \$526.78 | \$105,355 |
| RETURN TO LAND AND MANAGEMENT | | | | | | \$223.22 | \$44,645 |
| Break Even Price | \$81.36 | per ton to pay VARIABLE costs at | 5.0 | tons per acre | | | |
| Break Even Yield | 2.7 | tons to cover VARIABLE costs at | \$5.00 | per ton | | | |
| Break Even Price | \$105.36 | per ton to cover TOTAL costs at | 5.0 | tons per acre | | | |
| Break Even Yield | 3.5 | tons to cover TOTAL costs at | \$150.00 | per ton | | | |

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Finally, I think it is important that we look at the sensitivity of this return to land and management per acre to both price and yield. This will help the producer think about the level of risk that is involved with the alfalfa enterprise this year. Table 1 below is a simple sensitivity table that shows estimated returns to land and management using the same set of assumptions as shown in the budget estimate in Figure 2. The only items changed from the budget in Figure 2 are price per ton and yield per acre.

Table 1. Return to Land and Management as Price and Yield Change

| Yield | Price per ton Received (price per 60# bale) | | | | |
|-----------------|--|----------------|----------------|----------------|----------------|
| | \$100 (\$3) | \$133 (\$4) | \$167 (\$5) | \$200 (\$6) | \$233 (\$7) |
| 3.5 tons | (\$176.78) | (\$61.28) | \$57.72 | \$173.22 | \$288.72 |
| 4.0 tons | (\$126.78) | \$5.22 | \$141.22 | \$273.22 | \$405.22 |
| 4.5 tons | (\$76.78) | \$71.73 | \$224.73 | \$373.23 | \$521.23 |
| 5.0 tons | (\$26.78) | \$138.22 | \$308.22 | \$473.22 | \$638.22 |
| 5.5 tons | \$23.22 | \$204.72 | \$391.72 | \$573.22 | \$754.72 |
| 6.0 tons | \$73.22 | \$271.23 | \$475.23 | \$673.22 | \$871.23 |

Table 1 provides some insight into how sensitive return to management is to yield per acre and the price received for alfalfa hay. This is a better way to look at the upcoming year than a single snapshot as in Figure 2. Notice that, at a price of \$100 per ton, money is still lost at a five ton per acre yield. On the other end of the spectrum, note that if yields are as low as 3.5 tons per acre, price must be around \$150 per ton (\$450 per 60# bale) to cover all costs. Producers should look at Table 1 and think about where their yields are in a typical year and what prices they have been moving hay for recently.

While 2011 will likely be another challenging year for Kentucky farmers, alfalfa has the potential to make a positive contribution to farm income if production costs are reasonable and weather allows for decent production levels. I would strongly recommend that each producer work through a budget similar to Figure 2 for their operation and generate a sensitivity table similar to Table 1. Soil conditions, fertilizer costs, machinery compliments, and many other factors will vary greatly across operations in Kentucky. The more effort that is made to adjust the proceeding numbers, the better position the producer will be in to evaluate the costs and returns from alfalfa hay production in the upcoming year.