

Forage Economics With High Grain Prices

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The economics of producing forage crops has changed dramatically in the past year. Input costs have increased dramatically which is largely due to rising energy costs and higher prices for key inputs such as seed and fertilizer. Fortunately, these increases in input costs are being offset by higher prices for hay. According to the National Agricultural Statistics Services (NASS), hay prices have risen, on average, about \$20/ton in the U.S. from around \$121/ton in March of 2007 to \$143/ton in March of 2008.

The recent increases in hay prices are generally not the result of higher input costs. Rather this hike in the price of hay is the result of a supply adjustment that is being driven by the high prices of corn, soybeans, and wheat. Hay supplies are on the decline because farmers are shifting acreage into the production of wheat, corn, and soybeans. This change in farmers' cropping practices is reducing hay production and in turn raising hay prices. Additional increases in hay prices could be on the horizon if there are further cuts in hay acreage.

High corn, soybeans, and wheat prices are also driving cash rents up on farmland across the U.S. In the Midwest, there are instances where rents of \$350/ac, or more, are being paid for prime cropland. These high bids for rent are rippling across the U.S. such that rents on all farmland are all substantially higher than they were two or three years ago. These higher rents are turning into higher costs for producing corn, soybeans, and wheat. They are also turning into higher costs for farmers who are raising hay on rented land.

Forage Quality Is Important

Dairy producers know very well that high quality forage is desirable in that it reduces the need for corn and soybean meal in the rations fed to dairy cows. Now that corn is costing \$6.00 or more/bushel and soybean meal is selling for about \$350/ton, it is quite costly to put these feeds into dairy rations. Thus, there are high incentives to produce high quality forages in these times (Table 1).

Table 1. Example rations for milk production goal of 80 lbs of milk/day/cow

RFV of Hay in Ration	Lbs of Feed Fed, Daily, On an As-Fed Basis:			Value of Corn and Soybean Meal Fed*
	Hay	Corn	Soybean Meal	
135	35.20	18.67	4.00	\$2.74
150	39.72	15.28	2.47	\$2.09

*Prices of \$6.00/bushel corn and \$370/T soybean meal used to compute these values

rations that result in a cow producing 80 lbs of milk/day. One ration contains hay with a relative feed value (RFV) of 135 and the other ration is formulated using hay with 150 RFV. In the case where the hay being fed has a RFV of 135, the ration fed contains, on an as fed basis, 35.20 lbs of hay, 18.67 lbs of corn, and 4.00 lbs of soybean meal. The ration formulated with the higher quality hay (150 RFV) has 39.72 lbs of hay, 15.28 lbs of corn, and 2.47 lbs of soybean meal, all on an as-fed basis. This latter ration contains less corn and soybean meal than the former, resulting in less spent on both corn and soybean meal.

In the example, corn and soybean meal costs are \$2.74/day for lower quality hay ration (135 RFV) and \$2.09/day for higher quality hay ration (150 RFV). This difference in costs of corn and soybean meal in the daily ration of \$0.65 is the economic gain associated with using (producing) high quality forage.

The key thing to remember when corn and soybean prices are quite high is that the value of high quality hay is also much greater than when corn is \$2.00/bushel and soybeans are around \$5.50/bushel.

Yield Impacts Forage Costs

Raising hay comes at the cost of raising other crops such as corn and soybeans. This trade-off is what economists refer to as opportunity cost. This fundamental principle of economics essentially says that the "cost" of raising hay is forgoing the "opportunity" of reaping the returns from raising corn. This is important, it means there is always a cost for raising one crop when another crop could be grown.

The values in the table show how quantities of feed fed and the costs of corn and soybean can vary depending on the quality of hay that is fed.

In this example, a dairy producer has the option of formulating two

Table 2. 2007 hay and corn silage enterprise budgets

Items	Cost/ac (\$)	
	Hay	Corn Silage
Seed	18	60
Fertility	140	125
Pesticides		52
Miscellaneous	18	30
Custom Fees		
Planting	5	
Mowing	13	
Raking	7	
Windrowing	8	
Baling (15/T)	71	
Tillage, Fertilizer Application		30
Planting		20
Pesticide Application		12
Chop, Haul, Fill		100
Rent	150	150
Total Costs	429	579
Yield (T DM)	3.13	6.0
Cost/T DM	137	96.5

Uses enterprise budgets constructed by Kenneth Barnett (<http://cdp.wisc.edu/crop%20enterprise.htm>) and custom rate data compiled by the WI Ag. Statistics Service (http://www.nass.usda.gov/Statistics_by_State/Wisconsin/Publications/custom_rates_2007.pdf)

Producers know that forages have to be fed to dairy cows, but nothing says that 100 percent of the forages have to be hay. Corn silage is another forage source that can also be put in dairy rations. Since corn silage or hay can be used in rations, dairy producers have choices between raising hay or corn silage as forage.

Corn silage has advantages, making it a more desirable forage crop than hay. The biggest advantage is the tonnage from an acre of corn silage is considerably higher than the hay yield. Good corn silage will typically yield around 6 tons of DM/ac (18 ton corn silage/ac at 35% DM). This is about twice the amount of DM that can annually be harvested from an acre of land in hay. This yield advantage of corn silage is noteworthy because it means a dairy producer can use half as much land to produce needed forages by raising corn silage.

Another advantage of raising corn silage as a forage crop is that it gives producers the option of chopping the corn for silage or harvesting the corn as grain. The harvesting flexibility has value because it gives producers opportunities to respond to supply and demand conditions in both the forage markets and grain markets. If, for example, hay is scarce and high priced, chopping corn for silage may be best. Alternatively, hay could be plentiful in the market and priced low; the best strategy may be to harvest corn as grain instead of chopping it as silage, and purchase hay. Producers only have this option, however, if they elect to raise corn as a potential source of forage.

Given the high prices of fertilizer, seed corn, fuel, and other inputs, producers may be hesitant to plant corn for silage on acreage that could be used to produce hay. Corn silage costs/ac are well above those of hay, but the higher costs of raising corn are offset by the greater yields of corn silage (Table 2).

The total cost of raising an acre of hay (25% new planting and 75% established hay ground) is estimated to be around \$429, if \$150 is paid as rent. The total cost of raising an acre of corn silage on the same land, rented for \$150/acre, is \$579. So, on a per acre basis, it is more expensive to raise corn silage versus hay.

Despite higher total costs for raising corn silage, it is less costly to raise corn silage due to higher yields on per T basis. In return, for spending \$579 by raising corn silage, one gets about 6.0 ton of forage DM. Thus, the average cost of a ton of corn silage DM is around \$96; well below the average cost of \$137/ton of DM for hay, which yields around 3 tons of DM/ton.

Summary

The recent increases in the prices of wheat, corn, soybeans, and other grain crops have had numerous impacts on hay and other forage crops. These higher grain prices are encouraging farmers to shift more acreage into the production of these crops. This acreage adjustment is coming at the expense of hay ground. So hay supplies most likely will not be as plentiful in the coming year. Assuming there are no changes in the demand for hay, this decrease in supply should translate into higher prices for hay.

Somewhat ironically, higher prices for corn and soybeans are helping boost the demands for high quality forage, which means less corn and soybeans are needed in rations formulated with higher quality forages. It is likely that higher corn and soybean prices are making higher quality forages more valuable and desirable.

Corn silage may be displacing hay as a forage crop due to higher corn prices. It may be advantageous to plant corn and let market conditions determine whether the corn crop should be chopped as silage or harvested as grain. This lets farmers capitalize on relationships between hay and corn prices. With high corn prices farmers will likely be planting more corn acres and letting economic conditions determine how much of the corn crop should be harvested as silage versus grain.