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Is Nitrogen Fertilizer Worth the Cost for Winter Pasture?

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At the time of writing this article in July 2012, urea costs about \$750 per ton. This means that a pound of nitrogen (N) from urea costs about 82 cents. This

is a very high price and leads to the logical question, "Is it worth the cost to fertilize winter pasture for stockers?" I'll try to answer this question, but let's define the ground rules.

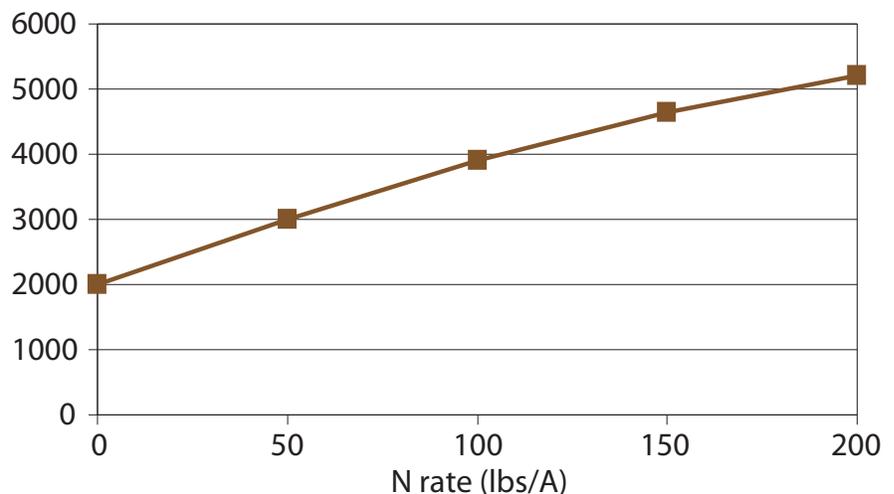
First, you already have the winter pasture planted and your only question is whether or not to fertilize it. Second, the pasture will be completely grazed out by stockers and you are receiving 70 cents per pound of gain. Third, soil test phosphorus (P) and potassium (K) levels are high and only nitrogen is needed for optimum yields.

To determine if it is worth it to fertilize, you must know the benefits of fertilization. Figure 1 shows the results of applying nitrogen to winter pasture. This study was conducted on the Noble Foundation Red River Research and Demonstration Farm from 1979 to 1992. About 2,000 pounds of dry matter forage were produced with no fertilization, and about 4,000 pounds of dry matter forage were produced when 100 pounds of actual

Figure 1.

Total Winter Pasture Forage Yield Response to Applied Nitrogen

Burneyville, Okla., 1979-1992



nitrogen per acre (217 pounds of urea per acre) were applied. When 100 pounds of N were applied, each pound of nitrogen resulted in a yield increase of 20 pounds of dry matter forage per acre.

In winter pasture graze-out situations, we generally assume that cattle eat all the forage produced except for about 500 pounds per acre. If no fertilizer was used, that means that the cattle ate about 1,500 pounds of dry matter forage (2,000 pounds produced – 500 pounds not grazed). Stocker cattle will generally gain

about 1 pound for each 8 pounds of dry matter winter pasture forage consumed. This means that stocker calves grazing unfertilized winter forage will gain about 188 pounds of beef per acre (1,500 pounds dry matter forage consumed ÷ 8 pounds dry matter per pound of gain). At a value of gain of 70 cents per pound, the beef gain is worth \$132 per acre. There is obviously no cost for fertilizer or application in this situation.

If you apply 100 pounds actual nitrogen per acre, the cattle should consume about 3,500 pounds of dry

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matter forage per acre (4,000 pounds produced – 500 pounds not grazed). This will result in a gain of 438 pounds of beef per acre (3,500 pounds dry matter forage consumed ÷ 8 pounds dry matter per pound of gain). At a value of 70 cents per pound, the gross gain value is \$307 per acre. The cost of fertilizer plus application must be subtracted from this. At a fertilizer price of 82 cents per pound of actual

nitrogen, the fertilizer cost for 100 pounds nitrogen per acre is \$82 per acre. Add an application cost of \$5 per acre, and the total cost of fertilization is \$87 per acre. This makes the net value of the gain from fertilizer \$220 per acre (\$307 per acre gross – \$87 per acre cost).

The short story is that applying 100 pounds of nitrogen per acre to winter pasture should generate \$88

per acre more net revenue to the operation than not fertilizing the same field. Fertilizer still pays in this situation even though it is very expensive. The thing that makes fertilization profitable at this price is the very high value of gain. If the value of gain declines, that would greatly affect the question of profitability of fertilizing when prices are high. ■