Hay, Fertility, and Profit

by Chris Agee

Kerr Center for
Sustainable Agriculture
P.O. Box 588
Poteau, OK 74953
Phone: 918.647.9123
Fax: 918.647.8712
mailbox@kerrcenter.com
www.kerrcenter.com

The cheapest cattle weight gains are made on pasture. Soil fertility must be maintained to deliver the gains required. While soil tests aren't perfect, they give the producer some idea of where his ground stands. Fertilizer decisions should be based on production goals and soil test results. Applying fertilizer to ground of unknown fertility is like putting money into the bank with an account number that you don't know and no account statement to tell you how much is there.

Most pasture fertilization takes place on hayfields. Before applying fertilizer to a hayfield, plan for next winter's expected feed requirements and outline your production goals.

Questions to consider:

- How much hay will you need?
- Do you need to increase or decrease hay acreage?
- Are you aiming for quality or quantity?
- What is your projected cost per bale?
- Have you tested your soil within the past three years?
- If you fertilized last year, did you get the expected results?
- Is contract haying your fields an option? If so, is a reliable contractor available?

- Can you buy higher quality bales cheaper than you can bale questionable quality yourself?
- Will purchasing hay allow you to graze more animals and will this pencil out to profit?

Answering these questions will require effort, but pencil and paper are cheap.

Hay production removes nutrients from the soil. A ton of bermudagrass hay removes approximately 45 lbs. of nitrogen (N), 10 lbs. of phosphorus (P), and 45 lbs. of potassium (K); a ton of fescue removes about the same amounts of N, P, and K. Therefore, in purchased fertilizer dollars (N @31 cents/lb., P @ 32 cents/lb., K @ 13 cents /lb.) a 1,000-lb. bale has a fertilizer value of roughly $12. Assuming cattle retain about 65% of the nitrogen and 10% of the phosphorus and potassium minerals, there is the potential for cattle to redistribute $6.50 worth of N, P, and K per bale. There are, of course, other nutrients and organic matter in manure which are a benefit to the pasture. How evenly manure and urine are distributed is largely determined by paddock size and layout. Hay, supplement and mineral feeders, watering points, and shade should be spaced to encourage travel across a paddock. Moving these areas within a paddock further helps to distribute manure and urine.

Pastures or paddocks that are hayed year after year will become less productive unless fertility is replaced. Alternating paddocks that are cut for hay every few years and feeding the hay back on those paddocks helps offset negative fertility impacts. Purchased hay and feed are essentially a transfer of fertility from the farm where they were produced to your farm. Feeding purchased hay and feed on areas of low production can help maintain soil fertility.

When planning your hay production, evaluate the true cost of your haying operation. Ohio State University researchers surveyed hay producers who cut from 10 to 590 acres annually and calculated equipment costs. Equipment costs alone ranged from $3.66 to $62.65 per ton of hay harvested. The producer with the highest per ton equipment cost harvested 34 tons annually; the producer with the lowest per ton equipment cost harvested over 1,000 tons annually. Land charges and variable expenses (seed, fertilizer, labor, fuel) came to $57/ton. Grand total (land, variable, and equipment costs) per ton of hay ranged from $60.66 to $119.65. These numbers don't even include storing and feeding costs. According to the researchers, the quality of hay that was put up could have been purchased for $30 to $50 per ton. Pencil out all of your costs, because you really have to love making hay to lose money at it.

Compare two cow-calf producers in two different scenarios (see accompanying table). Producer One owns 112 acres and grazes 33 spring-calving 1200-lb. cows on 100 acres of bermudagrass and keeps a 12-acre bermudagrass hayfield. The stocking rate is 2.5:1 (100 acres/40 AU), reasonable for this area. The winter feeding period is 90 days, and Producer One figures his herd will need one 1000-lb. bale/day, so he will need 45 tons of hay. He applies 300 lb./acre of 17-17-17 and an additional 140 lb./acre of ammonium nitrate for a total of 100 lbs. of nitrogen/ acre onto the hayfield. He harvests 4 tons/ acre over two cuttings for a total of 48 tons. Rainfall is timely, and he is able to harvest the bermudagrass at four weeks of maturity. He has his hay tested and is pleased to find that it contains 12% crude protein (CP) and 67% digestible dry matter (DDM). He figures the good hay quality will ensure his cows' intake is 2.5% of their body weight and be sufficient to eliminate the need for protein supplements. Assume Producer One is a fairly efficient hay producer, and his production cost (land, variable, and equipment cost) is $50/ton. He has a 92% (30 calves)

Comparison of Two Production Systems

	PRODUCER ONE (BALES 12 AC)	PRODUCER TWO BUYS HAY)
COSTS:		
FERTILIZER: TRIPLE 17 (300 LB./AC.)	400	0
FERTILIZER: AMMONIUM NITRATE (150 LB./AC.)	200	0
HAY ($50/TON)	2,250	2,500
VALUE OF NUTRIENTS RECYCLED ($6.50/BALE)	1,080	0
TOTAL COSTS	3,930	2,500
INCOME:		
CALVES (550 LBS. @ 62 CENTS/LB.)	10,230	11,594
VALUE OF NUTRIENTS RECYCLED ($6.50/BALE)	585	650
TOTAL INCOME	10,815	12,244
GROSS (TOTAL VALUE - TOTAL COSTS)	**$6,885**	**$9,744**

weaning rate and sells the calf crop at weaning.

Producer Two owns 112 acres and grazes 37 spring calving 1200-lb. cows on 112 acres. The stocking rate is 2.5:1 (100 acres/40 AU), reasonable for this area. The winter feeding period is 90 days, and this producer figures his herd will need 100 lbs. of hay/day, so he will need 50 tons of hay. He locates a hay producer who will sell grass hay that is 12% CP and 67% DDM for $50/ton. He figures hay intake will be sufficient to eliminate the need for protein supplements. He has a 92% (34 calves) weaning rate and sells the calf crop at weaning.

Producer One could probably not produce hay for $50/ton considering the small acreage that was cut. Using the results from Ohio State, his costs would be closer to $100/ton. Even assuming he could produce hay for $50/ton, his costs are still higher than if he purchased his hay. Producer Two increased his gross by optimizing production with more cows, weaning more calves, and reducing his feed cost. Furthermore, if the $15,000 to $20,000 Producer Two would have invested in haying equipment (mower, rake, baler) were invested elsewhere at an annual return of 8%, $1200 to to $1600 in interest income would have been realized. This is about half of the $2500 hay purchase cost, further offsetting his winter feed costs. By not having to manage hay production, Producer Two can focus management time on the pasture and cows where it will likely have positive bottom line results.

First published in
The Kerr Center for Sustainable Agriculture Newsletter 23(2), 1997

Editing: Wylie Harris

Communications Director:
Maura McDermott

Design/Layout: Tracy Clark,
Argus DesignWorks

For more information, contact:

Kerr Center for Sustainable Agriculture

P. O. Box 588

Poteau, OK 74953

918.647.9123; 918.647.8712 fax

mailbox@kerrcenter.com

www.kerrcenter.com