

Cost of Winter Grazing

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Beef cattle fed round bale hay have a winter feed cost ranging from \$1 to \$1.70 per animal unit per day. Extending the grazing season is one way to reduce winter feed costs since grazing costs only a third to half as much as harvested feed.

Nitrogen (N) fertilization is a tool to help increase forage for grazing in the winter. However, when fertilizer prices are high, we need to compare the cost of stockpiled pasture to other feeds before buying N to apply to grassland.

For comparison purposes, we will use round baled hay as a base feed. Round bales typically cost about \$20 per bale unless it has been a dry year. Most bales weigh about 700 pounds and will have about 85 percent dry matter (DM). Cattle often waste 20 percent to 50 percent of the hay fed. A 20-percent feeding loss results in a hay cost of about \$1.05 (Table 1) for a 1,000-pound animal-unit day (AUD), consuming 25 pounds DM a day. If feeding loss increases to 50 percent, the AUD cost will increase to \$1.68.

Cost of a pound of nitrogen

To determine the economics of N fertilization for stockpiling forage, it is important to know the value of a pound of N (Table 2). This is different than the value of a pound of fertilizer because not all fertil-

izers have the same N content. Urea costs \$418/ton and has 46 percent N or 920 pounds of N in a ton. Therefore, a pound of N from urea costs \$0.45 (Table 2). The cost per pound of N from ammonia nitrate (treated with calcium to prevent its use in explosives) and ammonia sulfate differs since N content and the cost per ton of fertilizer differ.

Production response to nitrogen source and rate

The response of fescue to N depends on the source and rate of N used. Urea N is converted to ammonia gas by bacteria on the grass and soil. If rain does not move urea into the soil within a few days, much of the N will vaporize into the air. It takes about a quarter-inch of rain to get the urea into the soil. Research conducted in Virginia shows fescue's response to different N sources. Even without N fertilization, you will have some production for fall

Table 1. The cost of feeding hay depends on the cost per bale of hay, the weight and dry matter content of the hay in the bale, and how much wastage occurs in feeding.

	Low feeding loss \$20.00	High feeding loss \$20.00
Bale Weight	700 lbs.	700 lbs.
Bales/Ton	2.86	2.86
Cost/Ton of Hay	\$57.14	\$57.14
Feeding Waste	0.20%	0.50%
Hay DM	0.85%	0.85%
AUD/Ton	54.4	34.0
Cost/AUD	\$1.05	\$1.68

Table 2. Nitrogen fertilizers differ in cost per ton of fertilizer and in the amount of N per pound of fertilizer, resulting in different costs per pound of N.

Nitrogen Source	Cost/ton	Lbs N/ton	\$/lbs N
Urea 46-0-0	\$418	920	\$0.45
Ammonia Nitrate 27-0-0	\$346	540	\$0.64
Ammonia Sulfate 21-0-0	\$390	420	\$0.93

Table 3. Fescue production for winter grazing is determined by the rate of N fertilization, the N source, and fall weather.

Nitrogen Source	Base production lbs/a	Response Lbs DM /lbs N	N rate lbs/a	Production lbs/a
No Nitrogen Fertilizer	2,500	0	0	2,500
Urea 46-0-0	2,500	7.1	100	3,210
Ammonia Nitrate 27-0-0	2,500	13.3	100	3,830
Ammonia Sulfate 21-0-0	2,500	11.1	100	3,610

Table 4. The effect of different fertilizer sources applied at 100 lbs N/a on the production cost of stockpiled fescue harvested under strip and continuous grazing in the late fall, when leaving 800 lbs DM/a.

<i>Nitrogen Source</i>	<i>Production lbs/a</i>	<i>AUD Strip</i>	<i>AUD continuous</i>	<i>Cash cost/a</i>	<i>Cost strip</i>	<i>Cost/AUD Continuous</i>
No Nitrogen Fertilizer	2,500	68	41	\$0	\$0.00	\$0.00
Urea	3,210	96	58	\$45	\$0.47	\$0.79
Ammonia Nitrate	3,830	121	73	\$64	\$0.53	\$0.88
Ammonia Sulfate	3,610	112	67	\$93	\$0.83	\$1.38

grazing (in this case, 2,500 lbs/a). If the stand has significant legume content, the base production will be higher than for stands with no legume and the N response will be lower, resulting in less return per dollar spent on N.

Grazing efficiency affects cost per AUD

When using N fertilizer to extend the grazing season, it is important to use rotational or strip grazing since continuous grazing provides only 60 percent of the grazing days compared to strip-grazed fescue (Table 4).

This evaluation shows that even with high N prices, using fertilizer N to grow more forage for winter grazing is less expensive than feeding purchased hay. Even though fescue is less responsive to urea than to ammonia nitrate or ammonia sulfate, urea produces stockpiled forage at a lower cost per AUD since it is a less expensive N source.

To get the most out of each dollar spent on N, the producer should limit the livestock's access to the stockpiled forage by rotationally grazing small paddocks or strip grazing pastures to ensure good utilization. This will also keep the animals from muddying up the forage on wet winter days.

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