

Boosting Pasture Production

As productive pasture acres are converted to profitable row crops, beef-cow producers look for ways to increase remaining pasture productivity through fertilization, overseeding and improved grazing management.

by Iowa Beef Center staff

Pasture fertilization is often not a high priority for beef cattle producers. However, when considering how to carry cows on fewer acres, pasture fertilization may be one of the easiest and most economical solutions.

Do pastures respond to fertilizer and lime nutrients? Yes, particularly to nitrogen (N). Grass-based pastures generally respond very efficiently to the first 40-50 pounds (lb.) per acre of nitrogen. Bluegrass will continue to respond to nitrogen applications up to 150-180 lb. per acre annually, but at a decreasing rate of response.

Tall cool-season grasses (bromegrass, orchard grass, tall fescue) respond to nitrogen levels of 250 lb. to more than 300 lb. per acre, but at a decreasing rate of response.

Fertilizer recommendations

Nitrogen recommendations for grass-based pastures are greater than the minimal amounts, but at still-modest, yet efficient, rates:

Kentucky bluegrass

- ▶ Early spring (March and April), 60-80 lb. per acre
- ▶ Late spring (May to early June) (optional), additional 30-40 lb. per acre
- ▶ And/or late summer (August to

September) (optional), additional 30-40 lb. per acre

Tall, cool-season grasses

- ▶ Early spring (March and April), 80-120 lb. per acre
- ▶ Late spring (May to early June) (optional), extra 40-60 lb. per acre
- ▶ And/or late summer (August to September) (optional), extra 40-60 lb. per acre

Legume-grass mixed pastures

- ▶ If less than one-third legume, treat as a grass pasture
- ▶ If more than one-third legume, no nitrogen is recommended

For legume-grass mixed pastures, high or frequent applications of nitrogen (particularly spring nitrogen applications) will make the grass component more competitive and limit the amount of legumes in the mixture. To encourage a greater legume presence, use modest nitrogen rates and limit application to summer or fall; maintain optimum soil pH, phosphorus (P) and potassium (K) levels; improve grazing management; and consider oversowing legumes (interseeding or frostseeding).

Yield responses to phosphorus and potassium are not dramatic or consistent. Forage plants will respond to added phosphorus and potassium when applied

to soils with “low” or “very low” soil phosphorus and potassium test levels.

Some yield response can be achieved by fertilizing to raise the soil phosphorus and potassium test index from “low” or “very low” to at least the “optimum” index. Grass responds to nitrogen more efficiently when phosphorus and potassium levels are adequate.

Legumes are more responsive to moderate to high levels of pH than are grasses. For grass-based pastures, try to maintain a pH of 6.0-6.5. To encourage and maintain legumes, try to maintain a pH of 6.5-7.0.

Test pasture soils to determine lime, phosphorus and potassium needs.

For beef-cow producers looking for ways to maintain or increase the productivity of limited pasture acres, there are several practical strategies.

Overseeding

Frostseeding and interseeding, sometimes called oversowing, are seeding methods used to add more productive or higher-quality forages into an existing sod. Their contribution to stand productivity is much slower than that achieved from nitrogen fertilizer, so expect a gradual production increase. Both grasses and legumes may be added to existing

pasture sods. However, the success of this is generally better when done on a thin or less-competitive sod and when follow-up clipping and grazing management are directed at reducing competition from weeds and existing pasture species.

One important step in frostseeding and interseeding is to control broadleaf weeds before introducing legumes into the pasture. When done successfully, added legumes can contribute to the nitrogen needs of the site and lead to similar yield increases that would be seen from moderate nitrogen fertilizer rates.

A word of caution, though — the benefits of frostseeding or interseeding may be short-lived, unless grazing management is used to allow for “rest” and expression of the yield potential of the new pasture components. Continuous stocking at high stocking rates will erase any seeding gains within a few years.

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Improved grazing management

Improved grazing management can lead to some very practical gains in forage and livestock productivity on the same site. For forage plants to express their yield potential, some level of rotational grazing should be practiced that will allow rest and recovery of the plants following grazing.

By dividing an existing pasture into three to five smaller paddocks and using

thoughtful rotation and rest, one can increase productivity by 10%-15%. Dividing and managing six to 10 paddocks can often lead to an additional 5%-10% in productivity.

Some of this increase will be evident within a few months, but realistically, it will take two to three years to reach its full benefit.

Summary

For beef-cow producers looking for ways to maintain or increase the productivity of limited pasture acres, there are several practical strategies. Nitrogen fertilizer will give the most immediate increase, but it requires some common sense about rates and timing.

Introducing some new forage species into the existing sod can attain productivity

and quality gains; however, the benefits will occur more slowly and can be easily erased by improper or abusive follow-up grazing management.

Longer-term benefits often happen with improved grazing management. Changing grazing management may require some added cost and learning some new skills.

The other two strategies, fertilization and oversowing, can be done in conjunction

with improved grazing management for an even faster and more sustained pasture production improvement.



Editor's Note: Iowa State University's Iowa Beef Center first published this series of fact sheets titled "Cows & Plows" in October 2007. The articles evaluated the management and economics of alternative feed and grazing systems in a time of skyrocketing land values

and rental rates, soaring grain prices, and high feed and forage costs. While exact costs represented in the series may differ from today's even higher prices, the derived principles remain pertinent, if not more so.