

Boosting Pasture Production

Feed costs represent half of the production costs of a cow herd, but increased grazing days significantly reduces feed costs. Beef cow producers should always look for ways to increase the productivity of their pasture acres. Some of the most practical ways to boost pasture production are fertilization, overseeding, and improved grazing management.

Pasture fertilization

Fertilization is just as important for pasture production as it is for crop production. Pasture fertilization may be one of the easiest and most economical solutions to increasing pasture productivity.

Pastures respond well to fertilizer and lime nutrients, particularly to nitrogen (N). Grass-based pastures generally respond very efficiently to the first 40-50 pounds per acre (A) of N. Kentucky Bluegrass will continue to respond to N applications up to 150-180 lbs/A annually, but at a decreasing rate of response. Kentucky bluegrass, bromegrass, and orchardgrass are cool-season grasses, and their greatest growth rates are in April, May, and June. Growth is more at a standstill during hot weather and dry conditions, which typically occur in July through August. As the weather cools in late summer, and the moisture supply improves, cool-season grasses increase their growth again, which continues into October. Adequate N must be available during spring to early summer and late summer to fall for best growth and grass yields. Consequently, splitting these applications throughout the year will likely give the best results and optimize forage growth with rainfall and nutrient demand. Tall fescue is also a cool season grass that responds well to additional N fertilizer; however, high rates of fertilization increase the risk of fescue toxicosis.

Suggested Single Application

Kentucky Bluegrass	April 60-100 lbs N/A
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Tall Cool Season Grasses	April: 80 to 120 lbs N/A
Warm Season Grasses	late April to early May: 80 to 150 lbs N /A

Suggested Multiple Applications

Kentucky Bluegrass	<ul style="list-style-type: none"> — Early spring (March and April) 60-80 lbs N/A — Late spring (May to early June) (Optional) additional 30-40 lbs N/A — And/or late summer (August to September) (optional) additional 30-40 lbs N/A
Tall Cool Season Grasses	<ul style="list-style-type: none"> — Early spring (March and April) 80-120 lbs N/A — Late spring (May to early June) (optional) extra 40-60 lbs N/A — And/or late summer (August to September) (optional) extra 40-60 lbs N/A
Legume-Grass Mixed Pastures	<ul style="list-style-type: none"> — If less than 1/3 legume, treat as a grass pasture — If more than 1/3 legume, no nitrogen is recommended

High or frequent applications of N (particularly spring N applications) to legume-grass mixed pastures will make the grass component of pastures more competitive and limit the amount of legumes in the mixture. To encourage a greater legume presence: use modest N 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 P and K are not dramatic or consistent, however grass responds to N more

efficiently when P and K levels are adequate. P fertilization also increase the P concentration in the plant, which increases the nutritional value of the grazed forage to livestock. The P and K rates in recommendations for grass pastures are based on soil tests and expected removal from the field. Forage plants will respond to added P and K when applied to soils with “low” or “very low” soil P and K test levels. Some yield response can be achieved by fertilizing to raise soil P and K test index from “low” or “very low” to at least the “optimum” index. Additional P and K will likely be needed for pastures that also have a hay cropped removed. For example one ton of bromegrass hay removes 7.9 lbs P₂O₅ and 41 lbs K₂O. More information on nutrient removal by forages can be found in A General Guide for Crop Nutrient and Limestone Recommendations in Iowa, PM 1688. Timing of P and K applications can be flexible when soil-test values are in the optimum category. If soil-test values are very low or low, fertilizing with P and K in the fall or early spring is recommended to help enhance early growth during favorable environmental conditions.

Table1. Annual phosphorus and potassium application rates for grass pastures.

Soil Test Category	Bluegrass		Tall grass*	
	P ₂ O ₅	K ₂ O	P ₂ O ₅	K ₂ O
	----- lb/acre -----			
Very Low	40	50	60	85
Low	30	35	40	65
Optimum	0	0	25	50
High	0	0	0	0
Very High	0	0	0	0

* Smooth bromegrass, orchardgrass, tall fescue, reed canarygrass, switchgrass, big bluestem, Indiangrass, Eastern gamagrass. Sudangrass, and sorghum x Sudangrass hybrids.

From Fertilizing Pasture, PM 869

Legumes are more responsive to moderate to high levels of pH than are grasses. For grass-based pastures, try to maintain pH of 6.0 to 6.5. To encourage and maintain legumes, try to maintain a pH of 6.5 for clovers, grass, and birdsfoot trefoil, and for alfalfa a soil pH of 6.9 is recommended. Test pasture soils every 3 to 5 years to determine lime, P and K needs. More information on soil testing and pasture fertilization can be found in PM869: Fertilizing Pasture or PM1688: A General Guide for Crop Nutrient and Limestone Recommendations in Iowa, and CROP 3108: Take a Good Soil Sample to Help Make Good Fertilizer Decisions.

Overseeding

Frostseeding and interseeding, sometimes called oversowing, are all 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 N 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 N needs of the site and lead to similar yield increases that would be seen from moderate N fertilizer rates. When interseeding forages be sure to allow adequate time for the new seeding to get established prior to grazing. 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. More information on overseeding can be found in: PM 856 Improving Pasture by Frost Seeding and PM 1097: Interseeding and No-Till Pasture Renovation.

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 rotation 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 percent. Dividing and managing six to 10 paddocks can often lead to an additional 5-10 percent 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 increase the productivity of 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. Productivity and quality gains can be attained by introducing some new forage species into the existing sod; 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.

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