

## SCIENCE TO SOLUTIONS



# Economic and Production Performance of Grazing Native Grasses in the Fescue Belt

### In Brief:

Tall fescue is the primary forage grazed for a large portion of the United States, commonly referred to as the “Fescue Belt.” However, it can present some challenges for cattle producers during summer. Furthermore, this forage provides poor habitat for species like northern bobwhite. Recent studies have shown that native warm-season grasses could complement pastures with tall fescue by providing improved, cost-effective summer forage production while creating quality wildlife habitat.

## The ‘Summer Slump’

In the Fescue Belt, cattle production primarily relies on tall fescue, a cool-season grass that grows well in spring (April to early June) and fall (October to November). During summer, tall fescue growth slows, leading to a “summer slump” in forage production.

Furthermore, most tall fescue in this region is infected with an endophyte that can be toxic to cattle, especially during summer, and leads to reduced animal growth and reproductive success (Roberts and Andrae 2004). Fescue toxicity impacts over a quarter of the beef cows in the United States, resulting in the estimated loss of over \$1 billion annually to the cattle industry (Strickland et al. 2011). However, because tall fescue is adaptable, easy to establish, and persistent under adverse conditions, it is grown on more than 37 million acres.

One potential solution to this problem is to shift grazing cattle to warm-season grasses during summer. These heat- and drought-tolerant grasses grow well during summer and can address the summer slump with non-toxic forages. Incorporating these grasses into grazing systems can increase grazing days, reduce reliance on more costly hay and commodity feeds, and help improve all fescue pastures by allowing them to rest during summer.



The northern bobwhite is one of many species that benefit from grazing operations with warm-season grasses that are native to the region.

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## Not All Warm-Season Grasses Are Equal

The most commonly grazed warm-season grasses in this region are bermudagrass, a non-native perennial, and crabgrass, an annual. But there are also native options, including switchgrass, big bluestem, eastern gamma, and Indiangrass (Keyser et al. 2011). When comparing warm-season grasses for this region, studies have shown that natives can provide equal or greater weight gains than the non-natives (Burns and Fisher 2013; Backus et al. 2017) as well as positive net returns to grazing them (Lowe et al. 2015; 2016). Comparing beef cattle performance from grazing various warm-season grasses, Burns et al. (1984) compared steer performance when grazing switchgrass to the sequential grazing of tall fescue and bermudagrass (starting June 1) in North Carolina. They found average daily growth for steers grazing switchgrass during summer was 66% higher

than steers grazing the sequence of tall fescue and bermudagrass. Burns and Fisher (2013) compared average daily growth and total beef yield of steers grazing eastern gamma, switchgrass, big bluestem, and a sequence of tall fescue and bermudagrass in North Carolina. Steers grazing:

- » Eastern gamma gained 1.91 lb/day with a total beef yield of 671 lb/acre
- » Big bluestem gained 2.38 lb/day with a total beef yield of 653 lb/acre
- » Switchgrass gained 2 lb/day with a total beef yield of 749 lb/acre
- » Combination of tall fescue and bermudagrass gained 1.6 lb/day with total beef yield of 513 lb/acre

Steer performance was measured from April to September for all the forages, but steers on the tall fescue and bermudagrass were grazed on tall fescue in April and May and bermudagrass from June to September. Gains were higher from grazing on natives than the non-natives over the same time period.

## Expected Beef Yield and Net Returns

|                              | Beef Yield | Net Returns |
|------------------------------|------------|-------------|
| <b>Grand Junction, TN</b>    |            |             |
| Switchgrass                  | 229a*      | \$114a      |
| Big bluestem/<br>Indiangrass | 267a       | \$148a      |
| Eastern gamma                | 248a       | \$110a      |
| <b>Springfield, TN</b>       |            |             |
| Big bluestem/<br>Indiangrass | 370b       | \$267b      |
| Switchgrass                  | 436c       | \$342c      |

Expected beef yield (lb acre) and net returns (dollar/acre) for full-season grazing with weaned beef steers on three native warm-season grass forages at two locations in Tennessee, 2010-2012.

\*For each column, if letters are the same across treatments and locations then values in the column are not statistically different (at the 0.05 level).

Source: Lowe II, J.K., C.N. Boyer, A.P. Griffith, P. Keyser, G.E. Bates, M. Waller, and W.M. Backus. 2015. "Profitability of Beef and Biomass Production from Native Warm Season Grasses in Tennessee." *Agronomy Journal* 107:1733-1740.

## Cost of Cattle Grazing on Native Warm-season Grasses



Source: Lowe II, J.K., C.N. Boyer, A.P. Griffith, J.A. Larson, P. Keyser, and G.E. Bates. 2016. "The Cost of Feeding Bred Dairy Heifers on Native Warm-Season Grasses and Harvested Feedstuffs." *Journal of Dairy Science* 99:634-643.

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### Wildlife Benefits from Warm-Season Grasses

Across this region, the northern bobwhite quail (*Colinus virginianus*) population has been in steady decline (Sauer 2013). One major factor in the decline is the regional adoption of non-native forages like tall fescue, which provide poor cover and food resources. Adoption of native warm-season grasses could not only increase summer forage production, but benefit wildlife populations, particularly the northern bobwhite (Harper et al. 2015). These grasses are bunch grasses and this structure allows ground-nesting and foraging birds to move more efficiently than in bermudagrass and fescue. Furthermore, the greater heights at which native warm-season grasses are managed (i.e., 12-28 inches for natives vs. 3-8 inches for bermudagrass) provide protective cover for nesting, foraging, and brood rearing (Harper et al. 2015). Therefore, replacing non-native perennial



Grasslands provide much-needed habitat for northern bobwhite.

grasses with native warm-season grasses could increase grassland-dependent bird populations like quail.

### Research Needed

Producers' reluctance to adopt warm-season grasses, and particularly native ones, in this region is likely due to the limited knowledge about how these forages fit into a fescue-based grazing system, what percentage of fescue pastures should be converted to warm-season grasses, and what mixtures of these grasses are a best fit. Tracy et al. (2010) estimated the cost of production for grazing annual warm-season grasses compared to the native warm-season grasses. Even with investment costs of establishing the native grasses, the initial savings of a system with annuals were offset by management costs of machinery and fertilizer associated with repeated annual establishment. They concluded that native warm-season grasses had a lower cost of production in the long-run than annuals.

Still, more science-based evidence about the benefits of native warm-season grasses is needed. Kurve et al. (2016) compared the carcass quality of steers that grazed bermudagrass and several native warm-season grasses in Mississippi. The study found no differences in the grade (choice or above), marbling score, carcass weight, and dressing



Native grass pastures, such as this switchgrass, provide good summer forage as well as suitable cover for species such as northern bobwhite.

percentage across the warm-season grasses. Further confirmation of this finding would be useful to producers. These are not simple questions to answer and the answers depend on each producer's objectives. However, results from such research could have important implications for sustainability of cattle farms (i.e., total pounds of beef produced and profitability) and conservation of at-risk grassland wildlife populations in the Fescue Belt.

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### Assistance Available

Through the Farm Bill, USDA's Natural Resources Conservation Service (NRCS) is able to assist agricultural producers in making improvements to their grazing systems. The Environmental Quality Incentives Program and Conservation Stewardship Program can provide financial assistance to help cover the cost of implementing conservation practices, such as prescribed grazing, brush management, biomass and forage planting, and fencing. To accelerate quail conservation, NRCS is focusing resources through a project that is part of the Working Lands for Wildlife (WLFW) partnership, a collaborative approach to conserving habitat for declining species on farms and working forests.

### Contacts

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### Cite as

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### Additional Resources

To learn more about the Natural Resources Conservation Service's Working Lands for Wildlife partnership, visit [nrns.usda.gov/wildlife](http://nrns.usda.gov/wildlife).

To find your local NRCS Service Center, visit the NRCS website at [farmers.gov/offices](http://farmers.gov/offices).

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