Stockpiling Tall Fescue in the Mid-Latitude Region of the Eastern United States

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Abstract
Stockpiling grass is a method of growing forage for deferred grazing during winter. Tall fescue is the best adapted cool-season perennial grass available in the mid-latitude of the eastern United States (US) for stockpiling (accumulating growth of) forage for deferred grazing in the fall and winter. Thus it can provide much of the fall and winter feed for livestock. Grazing stockpiled tall fescue reduces winter feeding cost and better distributes nutrients compared to traditional hay feeding methods. This presentation focuses on how to stockpile tall fescue, how to graze stockpiled tall fescue, and benefits of stockpiled tall fescue compared to hay.

Introduction
Cool season perennial grasses make up the predominate functional group in pastures of the mid latitude region of the US. Cool-season grasses in this region produce approximately 60-70% of their annual growth from March through June and the remaining 30-40% from late August through November. Thus, in this region there are two distinct time periods when cool-season grass forage resources are in short supply; summer and winter. Stockpiling cool-season grass is a method of accumulating forage during late summer and fall for deferred grazing during late fall and winter (Fribourg and Bell 1984). This forage management practice extends the grazing season, reduces reliance on feeding stored forages, and mitigates overall winter forage shortage in the mid-latitude region of the U St.

Methods
How to stockpile tall fescue pasture for deferred winter grazing
In preparation for stockpiling tall fescue for late fall and winter grazing, animals must first be removed from pastures planned for stockpile in late July or early August. Pastures planned for stockpile may then be clipped to a residual height of 8 to 10 cm to "reset" the pasture, removing any reproductive growth from the cool-season grass. Nitrogen application should be made in early- to mid-August to increase yield potential of stockpiled tall fescue. Following N application, allow tall fescue pasture to accumulate for deferred grazing. Stockpiled tall fescue may be grazed throughout the fall and winter as forage supply allows.

Results and Discussion
How stockpiling tall fescue pasture extends the grazing season
Tall fescue is likely the most desirable cool-season perennial grass species for producing fall stockpiled forage in the mid-latitude region of the eastern US. This is because tall fescue produces a waxy cuticle that helps preserve cell contents by protecting leaves from environmental conditions associated with winter; thus tall fescue is an ideal species for deferred grazing throughout fall and winter.

In an effort to maximize stockpiled forage accumulation, nitrogen should be applied in mid-August, and can be applied as early as August 1st and as late as the end of August. However, yield potential of stockpiled tall fescue decreases with later N-application dates (Figure 1; Gerrish et al. 1994). Stockpiled forage production increases with increased N application, and can exceed 6000 kg ha^{-1} with adequate growing conditions. August N-application rates may vary depending upon forage production objectives. N-application rates for stockpiling tall fescue can be as much as 120 kg ha^{-1}. However, the rate of stockpiled forage production may increase at a decreasing rate beyond the initial 45 kg ha^{-1} of N applied (Figure 2; Gerrish et al. 1994).

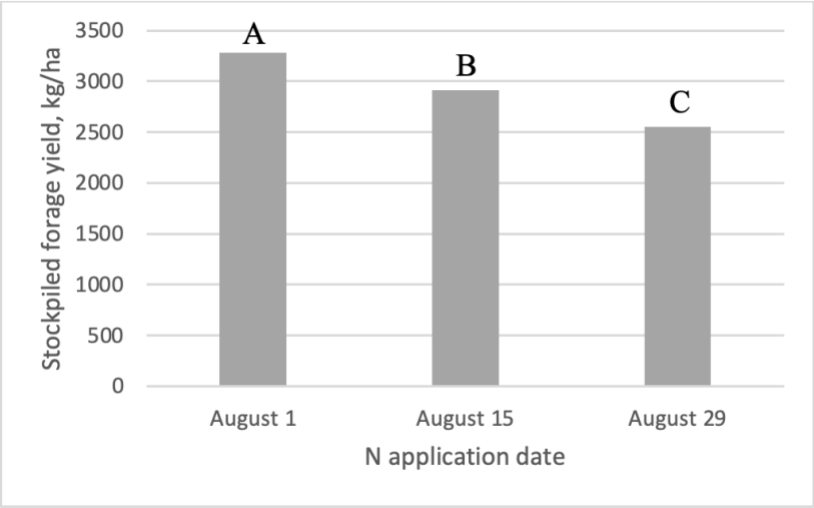

Figure 1. Effect of N (90 kg/ha) application date on forage yield of stockpiled tall fescue in Missouri. Data represent 3-yr averages (1989, 1990, 1991). Data adapted from Gerrish et al. 1994.

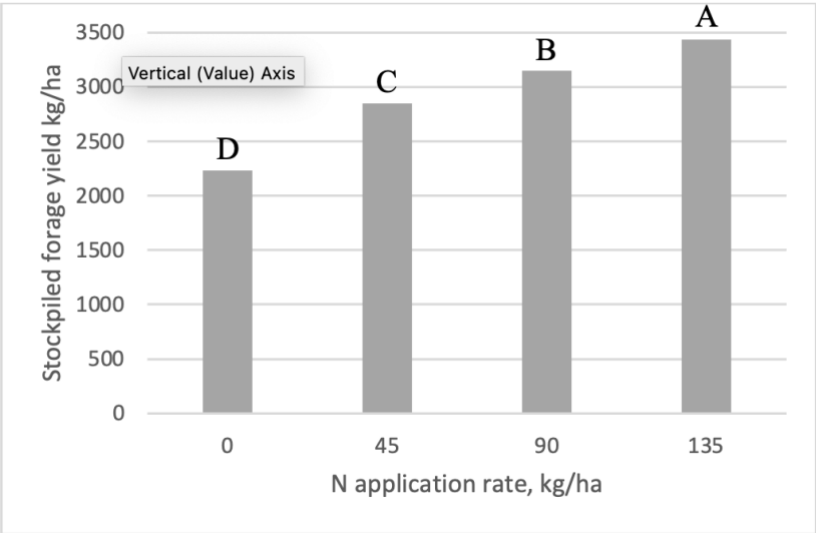

Figure 2. Effect of N application rate on forage yield of stockpiled tall fescue in Missouri. Data adapted from Gerrish et al. 1994.

Another consideration when applying N for stockpiling tall fescue is ergot alkaloid production by the toxic endophyte (*Neotyphodium coenophialum*). As N application increases beyond 56 kg ha^{-1}, total ergot alkaloid production increases (Kallenbach et al. 2017), which may have a detrimental effect on animal performance. Grazing steers on K-31 tall fescue has resulted in average daily gains (ADG) ranging from as little as .14 kg/d (Nave et al. 2016) to as much as .46 kg d^{-1} (Poore et al., 2006). These minimal ADG may have been the result of ergot alkaloids produced by the endophyte in K-31 tall fescue.

Stockpiled tall fescue may be grazed throughout fall and winter as forage supply allows. Research suggests however, that deferred grazing of stockpiled tall fescue should be conducted prior to January if managing for optimum nutritive value and DM yield (Kallenbach et al. 2017). To maximize the use of stockpiled tall fescue for extending the grazing season to the greatest extent possible, budgeting forage for maximum utilization is necessary. To achieve the greatest utilization, strip graze stockpiled tall fescue with grazing periods less than or equal to 1 day.

Stockpiling tall fescue can contribute significant cost savings to the winter feeding operation when compared to feeding hay. Based on an analysis conducted at the University of Missouri, the average cost of feeding hay on a per-cow-per-day basis is $1.76. Compare this to an average cost of $0.86 for deferred grazing of stockpiled tall fescue, and the realized cost savings is $0.90 per cow per day.

Conclusions and/or Implications

Stockpiling tall fescue for deferred grazing in fall and winter is a low input and low cost solution to winter feeding compared to hay.

Acknowledgements

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