

Grazing Preference of Tall Fescue as Affected by Leaf Softness and Endophyte Infection.

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Many tall fescue forage breeding programs, including the ARS program in Logan, Utah, and the University of Kentucky program have selected for soft, lax-leaves. This trend is based upon the premise that soft leaves will increase livestock preference for tall fescue. In addition, new tall fescue cultivars that are endophyte-free or contain novel friendly endophytes have been shown to improve livestock performance, however, it not known if this is due to increased intake based upon improved preference. However, both soft-leaves and lack of endophyte may result in reduced biotic and abiotic stress tolerance in tall fescue. This research proposed to determine if soft leaves and endophyte status affected cattle preference for tall fescue.

Procedures used for this study followed those outlined by Shewmaker et al. (1997, *Agron. J.* 89:695-701). Tall fescue, meadow brome, orchardgrass, and meadow fescue (Kentucky only) cultivars and experimental populations were drilled into plots at Logan, UT, Lexington, KY, and Ardmore, OK. Plant materials included 40 breeding populations of soft-leaved tall fescue, standard cultivars, and wild- and novel-type endophyte infected, and endophyte free tall fescue series. Each location included four pastures separated by fences, each containing two or three replicates of plots arranged in an RCB design. The first pasture was used to condition animals and evaluators to the test pastures and procedures. The other three pastures were used to evaluate preference. Preference was determined by measuring the forage consumed as the difference between pre- and post-grazing. Pre-grazing forage yield and forage quality were determined by clipping one-half of each plot immediately prior to grazing. Post-grazing residual forage was determined by clipping the remaining one-half each plot following grazing. Grazing used a stocking rate designed to remove 50% of biomass within a 24-h period, with cattle conditioned to the experimental procedures for 24 h on pasture 1 and then sequentially grazed for 24 h on pasture 2 through 4. Grazing was completed in 2007, 2008, and 2009, and included up to four grazing events per year, depending upon location.

In general, there was little variation for preference among tall fescue entries. For instance, at the Utah location, amount of tall fescue consumed ranged from 59 to 44% with only the high and the low entries being significantly different ($P < 0.05$). Conversely, orchardgrass, meadow fescue, and meadow brome were always consumed at a higher level ($P < 0.05$) than tall fescue. Endophyte status had little effect upon cattle preference regardless of location. One exception was at the Kentucky location where both wild- and novel-type endophyte infected lines were preferred ($P < 0.05$) over endophyte free lines during the second grazing period. However, this was probably related to endophyte-infected lines having more surviving plants with higher moisture content and nutritional value during an atypically dry season. At the Utah location, the preference of tall fescue endophyte free, wild-type, or AR584 or AR542 novel-type endophyte infected entries was not significantly different ($P = 0.435$). Similarly, the degree of leaf-softness in tall fescue had little effect upon preference. In conclusion, endophyte-free status and soft leaves do not increase cattle preference of tall fescue, and overall there is little variation for preference among a wide variety of tall fescue germplasm-sources. These results suggest that tall fescue breeding programs should focus primarily on forage yield and nutritional quality.