

## Plant and Animal Performance in Mixed Tall Fescue/Legume Pastures

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T.J. Bingham, B.L. Waldron, J.E. Creech, D.R. ZoBell, and R. Miller



Tall fescue is the one of most used grasses in irrigated pastures throughout the Intermountain West. Two limitations of tall fescue are decrease in productivity during hot summer months and the need for supplemental nitrogen (N). The objective of this research is to examine the efficacy of tall fescue+alfalfa (TF+ALF), tall fescue+birdsfoot trefoil (TF+BFT), tall fescue+nitrogen fertilizer (TF+N), and tall fescue without nitrogen fertilizer (TF-N) on forage quality, forage quantity and livestock performance.

Research plots were planted at the Utah State University Pasture Research Facility in Lewiston, UT in 2010 and grazed in 2012.

Treatments were arranged in a randomized complete block design with four replications and divided into four paddocks per replication. Three Angus crossbred steers with an average starting weight of 850 lbs were placed on each treatment and rotated to a new paddock every 7 days. A put-and-take method was used throughout the growing



season such that each paddock received 80% utilization. Four forage samples were collected from each paddock just prior to grazing using a .5-m<sup>2</sup> quadrat for determination of forage yield and nutrient content. Steers were weighed every 28 days.

Forage yield was similar among the TF+N (5062 lbs/acre), TF+BFT (4942 lbs/acre), and TF+ALF (4688 lbs/acre) treatments. Whereas, DM in TF-N treatment was lower (3639 lbs/acre)(Table 1). Steer average daily gains (ADG) were also similar among the TF+BFT (1.63 lbs/day), TF+N (1.39 lbs/day), and TF+ALF (1.33 lbs/day). However, ADG on TF-N treatment was much lower (0.81 lbs/day)(Table 2). TF+BFT and TF+ALF had similar total digestible nutrients (TDN) values with TF+N being better than TF-N but not as good as the legume mixtures (Table 3).

### **Key Points**

- Forage Yield: TF+N = TF+BFT = TF+ALF > TF-N (Table 1.)
- ADG: TF+N = TF+BFT = TF+ALF > TF-N (Table 2.)
- TDN: TF+BFT = TF+ALF > TF+N > TF-N (Table 3.)
- Overall, adding N via fertilization or legume increases steer ADG, forage yield, and forage quality
- ADG 's are low possibly due to high starting weight and/or abnormally hot season. Year two of project is currently in progress

**Table 1. Forage Yield (lbs/acre dry matter)**

Treatment	Days 1-28	Days 29-56	Days 57-84	Days 85-112	Season Total
TF+N	1784 a	1084 a	1017 b	1063 b	5062 a
TF+BFT	1577 a	1017 ab	1116 a	1168 a	4942 a
TF+Alf	1746 a	939 bc	960 b	1026 b	4688 a
TF-N	1274 b	857 c	757 c	699 c	3639 b

**Table 2. Average Daily Gains (ADG) (lbs/day)**

Treatment	Days 1-28	Days 29-56	Days 57-84	Days 85-112	Season Mean
TF+BFT	2.86 a	0.80 ab	1.63 a	1.26 a	1.63 a
TF+Alf	2.77 a	0.98 a	0.57 b	1.06 a	1.33 a
TF+N	2.84 a	0.95 a	0.64 b	1.11 a	1.39 a
TF-N	2.52 a	0.01 b	0.71 b	0.00 b	0.81 b

**Table 3. Total Digestible Nutrients (TDN%)**

Treatment	Days 1-28	Days 29-56	Days 57-84	Days 85-112	Season Mean
TF+Alf	62.8 a	58.7 a	59.2 a	59.9 a	60.1 a
TF+BFT	62.1 ab	58.5 a	59.1 a	58.9 a	59.4 a
TF+N	60.9 ab	56.6 b	53.3 b	58.7 a	57.3 b
TF-N	60.5 b	51.8 c	52.3 b	56.1 b	55.4 c

\*Numbers with the same letters within a single column are not statistically different

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