

## INFLUENCE OF BOVINE SALIVA ON GRASS REGROWTH IN THE GREENHOUSE

Grazing animals are an elementary environmental factor in the ecology of grasslands (Ellison 160). The logical consequence of grazing by animals is successive depletion of some desirable plant species or group of species. But pristine grasslands apparently were not depleted and, in more recent times, light grazing has become a range improvement tool. Has grazing a beneficial effect that in some way counteracts its harmful effects on vegetation?

Cattle (Bailey 1961) and sheep (Kay 1960) secrete large quantities of saliva, of which appreciable amounts may be deposited on range vegetation during the act of grazing. Saliva contains inorganic salts and several nitrogenous compounds, particularly urea (Bailey and Balch 1961), that might influence regrowth of grass after grazing. The purpose of our study was to determine the effects of bovine saliva on regrowth of grass plants clipped to different heights in the greenhouse.

Plants of *Festuca scabrella* Torr. and *F. idahoensis* Elmer grown in the greenhouse were clipped every 4 weeks for 16 weeks; clipping intensities simulated light, moderate, and heavy grazing (Table 1). Foliage of one-half of the individually potted, paired plants in each clipping group was sprayed with 5 ml per plant of freshly collected bovine saliva immediately after each clipping; the other half was sprayed with an equal amount of distilled water. Each treatment had four replicates. Saliva was obtained from a rumen-fistulated Ayrshire cow.

There were no significant differences in yield of tops or roots or in final tiller numbers at any clipping height between plants of *F. scabrella* and *F. idahoensis* whether sprayed with water or with saliva (Table 1). Browning of leaf tips characterized saliva sprayed plants of both species; leaves of *F. idahoensis* turned a distinct yellowish-green. Bovine saliva has a pH of about 8.4, a salt content of

Table 1. Effects of bovine saliva on growth of *Festuca scabrella* and *F. idahoensis* plants in the greenhouse (average of four replicates)

Treatments	Cumulative DM yield (g/plant)				No. of tillers			
	Tops		Roots		Initial		Final	
	Water	Saliva	Water	Saliva	Water	Saliva	Water	Saliva
<i>Festuca scabrella</i>								
Clipped every 4 weeks to 4 cm	4.0 a*	3.0 a	0	0	136	140	0	5
Clipped every 4 weeks to 13 cm	4.9 a	5.0 a	1.2 a	1.4 a	140	140	126	138
Clipped every 4 weeks to 18 cm	6.0 a	5.9 a	3.3 a	2.5 a	145	144	178	161
<i>Festuca idahoensis</i>								
Clipped every 4 weeks to 2 cm	0.7 a	0.4 a	0.2 a	0.1 a	124	122	17	4
Clipped every 4 weeks to 8 cm	1.3 a	1.5 a	0.3 a	0.8 a	126	126	122	100
Clipped every 4 weeks to 12 cm	2.6 a	2.2 a	1.5 a	0.9 a	123	126	135	111

\*Means followed by the same letter do not differ significantly ( $P = 0.05$ ).

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about 0.9%, and a urea content of 2–12 mg/100 ml (Bailey and Balch 1961). It is possible that either the pH of the saliva or certain of the solutes exerted an affect on the leaves that caused browning. Also, some of the ingredients of the saliva may have entered the plants by osmosis.

Thus it is difficult to identify any benefit conferred on vegetation by grazing animals. Our study produced no evidence that bovine saliva affected the regrowth of clipped grass plants in the greenhouse. Our results were at variance with those of Reardon et al. (1972) who reported increased forage and root yields of seedling plants of *Bouteloua curtipendula* after treatment with 0.2 ml bovine saliva per seedling.

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**This article has been cited by:**

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