



Semiarid rangeland is resilient to summer fire and postfire grazing utilization

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INTRODUCTION

Grazing immediately following a wildfire has been thought to be damaging to northern Great Plains grasslands, and delaying grazing is often recommended. This recommendation may be needlessly causing livestock producers extra work and loss of income, as these grasslands have been shown to be resilient to summer fire, grazing and drought. Measuring plant characteristics after prescribed fire and grazing may show if delayed grazing is necessary to protect rangeland health.

LOCATION

The study was conducted on an upland loam site in southeastern Montana. Vegetation on the site was mostly grass or sedges (needle-and-thread (*Hesperostipa comata*), western wheatgrass (*Pascopyrum smithii*), threadleaf sedge (*Carex filifolia*), blue grama (*Bouteloua gracilis*), and Sandberg bluegrass (*Poa secunda*)). The study site had been grazed by cattle for decades.

TREATMENTS

Two experiments were conducted, one in a drought year and one the next year which was very wet. Plots were either unburned and ungrazed, or burned in late summer and grazed by sheep at one of 4 stocking rates: ungrazed, 17%, 34% or 50% utilization (forage weight grazed off). Grazing occurred during the first growing season after fire starting in late June or early July. Stocking rate was set so that the desired utilization occurred by mid-July, after which sheep were

removed from the plots. Plots were sampled 3 times: immediately after being burned, the year after the fire and after grazing, and one additional year. Plants and roots (biomass) were clipped, dried and weighed.

	Non-burned Non-grazed	Burned Non- grazed	Burned Grazed
Fringed sage	31	33	37
Forb	168	118*	83
Grass	915	1072*	1063
Western wheatgrass	142	341*	369
Threadleaf sedge	125	135	159
Needle-and-thread	220	308	242
Cool-season grass	68	133	103
Warm-season grass	172	120	121
Annual grass	159	41*	80
Total	1113	1222	1183
Standing dead	241	247	198
Litter	618	379*	332
Root OM	7088	7040	7848

Figure 1. Average biomass (lb/ac) of aboveground herb-age components, old standing dead, litter, and root (30 cm) organic matter the first year following grazing and second year after fire. Asterisk indicates burned and non-grazed is different than non-burned and non-grazed.

RESULTS

Results varied, probably due to the vastly different weather conditions the year of the fire. . Roots were unaffected by any of the treatments in any year. Standing dead vegetation left from the previous growing season was reduced by fire.

RESULTS CON'T

When fire occurred in the drought year, neither fire nor grazing changed total or forb biomass the following year, with or without grazing. Most forb biomass was from non-native plants. Two years after the fire, there was less forb biomass on the burned plots, but grazing only affected forbs at the highest utilization level. Total biomass was the same or increased by fire and grazing.

Fire increased grass production 17% and more than doubled western wheatgrass biomass. Fire reduced forb

biomass 30% and annual grasses 74%. Grazing after fire had no effect on production of any measured component.

MANAGEMENT IMPLICATION

Grazing after fire does not reduce plant productivity. Standing dead plants are removed by fire and cannot be used for grazing, which may make reduced stocking rates necessary the year after the fire. Perennial grass biomass increased after burning.



Figure 2. Sheep, grazing a pasture post-fire.

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