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Grasshopper responses to fire and postfire grazing in the Northern Great Plains

Written by: Lance Vermeire and Carol Baldwin

INTRODUCTION

Grasshoppers in the northern Great Plains periodically experience population outbreaks. While insecticides are available to help control these outbreaks, prescribed burning and livestock grazing, alone or in combination, may offer range managers another method of control.

LOCATION

The study was conducted on an upland loam site in southeastern Montana. Vegetation on the site was mostly grass (needle-and-thread, western wheatgrass, threadleaf sedge, blue grama, and Sandberg bluegrass), along with prairie sagewort and big sagebrush. The migratory grasshopper (*Melanoplus sanguinipes*) and white whisked grasshopper (*Ageneotettix deorum*) were two of the four most common species on site.

TREATMENTS

Two experiments one year apart were conducted. Plots were either unburned and ungrazed, or burned in late summer and grazed by sheep for one year after the fire at one of 3 stocking rates: ungrazed, 17% of forage weight grazed off, and 50% of forage weight grazed off. Grasshopper density was sampled every 2 weeks stating the year of the fire and for two years afterwards from the time of hatching in late spring until the population declined in the late summer.

RESULTS

Grass production was not affected by fire the first year after burning and grass production increased the second year after the fire. Western wheatgrass increased while annual grasses decreased. Fire reduced overall grasshopper density 43%, and the effect lasted for at least 2 years after the fire (as long as the experiment was conducted). Fire reduced white whisked grasshopper density by 80% with grazing after fire further decreasing density in one experiment, but there was no effect of fire or grazing in the second experiment, possibly due to different fire conditions. Fire plus grazing reduced migratory grasshopper density 40-60%, with the higher stocking rate resulting in lower densities.

MANAGEMENT IMPLICATIONS

Late summer fires will reduce densities of some species of grasshopper species in the northern Great Plains. Burning adjacent pastures in different years may reduce grasshopper outbreaks as overall populations are reduced by each burn.

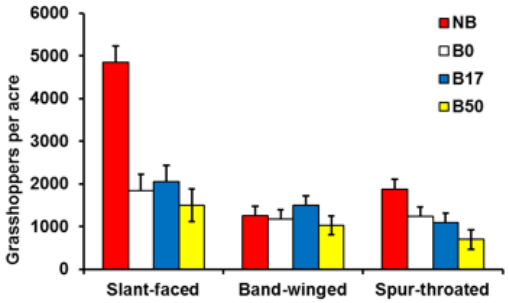

Figure 1. Treatment effects on grasshopper density by subfamily. Treatments are nonburned, nongrazed (NB), summer-burned, nongrazed (B0), and summer-burned, grazed first year after fire (B17), or utilization, nongrazed second year after fire (B50.

Original publication:
Branson, D.H. and L.T. Vermeire. 2015. Grasshopper responses to fire and post-fire grazing in the Northern Great Plains vary among species. Rangeland Ecology and Management 69(2):144-149.