

Fire and grazing to improve wildlife habitat on introduced grass monocultures in Texas

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Introduction Guineagrass (*Urochloa maxima*) and bermudagrass (*Cynodon dactylon*) were introduced into the USA with the objective of improving forage production for cattle . However , these grasses became invasive and replaced native plant communities valuable for wildlife . Invasive plant species are considered the second most important threat to conservation of biodiversity (Zalba et al . 2000) . Prescribed fire can be used to stimulate regrowth , and improve quality and preference by grazing animals as well as to increase insect abundance , wildlife and cattle usually concentrate on burned areas due to these factors . This phenomena provides an opportunity to use prescribed fire , followed by grazing , to reduce stands of invasive exotic grasses and allow native plants an opportunity to recolonize these areas .

Materials and methods We conducted two companion projects in Willacy and Bee counties , Texas , to test the idea that prescribed fire followed by cattle grazing can reduce the amount of invasive exotic grasses present . In the first study (Willacy County) we evaluated the effect of a summer (June) burning and intensive cattle grazing on guineagrass density and native plant species richness . Guineagrass density and native plant composition were monitored monthly for 7 months post-burning . Four treatments with three replications resulting from the combination of prescribed burning (burning and no burning) and intensive grazing (grazing or no grazing) were evaluated . In the second study (Bee County) we evaluated the effect of prescribed burning (November) and overseeding of armadillo burr medic (*Medicago polymorpha*) on cover of forbs and insect abundance . Four treatment combinations with three replications were evaluated : seeding or no seeding , and burning or no burning , all treatments were grazed by cattle . In both studies a randomized complete block design with a factorial arrangement of treatments was used to analyze the information . Main effects and interactions were considered significant at $\alpha < 0.05$.

Results and discussion At the Willacy County site , prescribed burning reduced ($P < 0.05$) guineagrass density with an average of 58,667 plants/ha compared to 93,333 plants/ha in non-burned areas . These results agree with Skovlin (1971) , who indicated that guineagrass is susceptible to hot fires . Native plant species richness in the burning—grazing treatment increased from 1 to 4.3 species/0.25 m² , an increase of 330% at the end of the study . Contrasting information has been reported by Drawe and Kattner (1978) , indicating that percent composition of grasses and forbs was affected by early summer burns when combined with mowing . Ten important forbs used by white-tailed deer (*Odocoileus virginianus*) and six used by northern bobwhite (*Colinus virginianus*) were newly recorded or increased 1 yr after application of the burning treatments . Cattle and white-tailed deer preferred burned areas .

At the Bee County site , cover of forbs in general was greater ($P < 0.06$) in the burned areas with more than 60% compared to less than 33% for the unburned areas . Overseeding armadillo burr clover did not affect the cover of forbs ($P > 0.05$) , however , insect abundance of three different families was higher ($P < 0.05$) in the burned and seeded areas . Abundance of insects is very important for diets of birds such as northern bobwhite .

Conclusions The results of these studies suggest that prescribed burning and cattle grazing can lead to an increase in native plant species richness reducing guineagrass density and increasing insect abundance , both of which are desirable for wildlife .

References

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