GRASS AND BROOM SNAKEWEED RESPONSE TO FIRE AND HERBICIDE CONTROL ON THE NMSU CORONA RESEARCH RANCH

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Research was initiated in 1990 and continued to 2005 to investigate prescribed fire and herbicide applications for broom snakeweed (*Gutierrezia sarothrae* (Pursh) Britt. & Rusby) control on blue grama (*Bouteloua gracilis*) grassland. Treatments were compared from two study sites located on the NMSU Corona Range and Livestock Research Center in central New Mexico. This research evaluated, in part, the shrub response to treatments and resulting effects on grass yield and fragmentation of grass cover.

Herbicide (picloram) treatments eliminated snakeweed initially and sustained control for up to 7 years. Grass yield on herbicide treated areas increased significantly (42%) over untreated areas. Relative to controls aerial cover of winterfat at site-1 was about 43% lower on herbicide treated areas (1990-2005 average). Control plots at site-2 averaged 0.6% winterfat cover through the study, and herbicide treated plots recorded no winterfat cover.

From 1990 through 1993 when snakeweed populations averaged greater than 2 plants/ m^2 (on untreated areas), prescribed fires (single) in spring and summer reduced snakeweed cover by an average of 80% the first two years following fire. Grass yield however, did not increase significantly on burned areas relative to untreated areas. A burn frequency of once every 5 years or less resulted in snakeweed cover and yield similar to untreated areas, and overall grass yield reductions of 25%. Unburned areas averaged (years sampled from 1990 to 2005) 1.4% winterfat cover. Compared to unburned areas, areas burned repeatedly at intervals of less than 7 years reduced winterfat cover at each site by 72 to 100% in no less than 8 of the 9 years sampled.

By killing some of the individual grass clumps, fires increased the average size of interspaces (bare ground, litter, and non-grass vegetation). Interspaces on burned plots (single burn and repeated burn) were 40% larger (23 cm) than those on herbicide treated and untreated areas (16 cm). Average clump size of all grasses (as a group) as well as clump size of blue grama was affected very little by fire or herbicide.