

Variation among the 192 locations was greatest compared to variation within the locations for blue grama, wolftail, and New Mexico feathergrass. Variations among locations were only about 3 times as great as that within locations for purple threeawn and winterfat. Explanations for these differences are not completely understood at this time.

GROWTH PATTERNS AND DEFOLIATION RESPONSES OF MESA DROPSEED AND LEHMANN LOVEGRASS

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(Key Words: Clipping, Plant Development, Phenology)

Mesa dropseed (*Sporobolus flexuosus*) is a native perennial grass species while Lehmann lovegrass (*Eragrostis lehmanniana*) is an introduced perennial grass. Both species have increased in abundance during recent favorable growing seasons in southern New Mexico. Studies were initiated in 1993 to determine growth patterns and their relation to precipitation and soil water content for both species. Additional studies were aimed at determining response of the two species to defoliation patterns.

These studies should provide clues to the mechanisms involved for Lehmann lovegrass to become established in the Chihuahuan desert and why mesa drop seed is successful in these environments. Such information should improve our management of area where these two species occur. Data will be collected for at least one more growing season under different climatic regimes.

PIÑON-JUNIPER ECOLOGY IN WESTERN AND CENTRAL NEW MEXICO

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(Key Words: Woodlands, Wildlife, Herbage Response)

Based on pellet group numbers, elk utilized the *Pinus edulis-Juniperus deppeana/Bouteloua gracilis* habitat type and the *Pinus edulis/Cercocarpus/Bromus anomalus* habitat more extensively than other habitats types in the Gila National Forest in western New Mexico. Mule deer, on the other hand, utilized a wide variety of habitat types. These data suggest that elk are more restrictive in habitat selection than mule deer. Both elk and mule deer responded to mechanical treatment and fire in these piñon-juniper woodlands, but the response was not uniform from season to season or from area to area.

Herbaceous response to mechanical removal of trees in piñon-juniper woodlands in central New Mexico also was not consistent. Blue grama (*Bouteloua gracilis*) was only poorly represented on one site but had a higher basal cover on untreated areas compared to treated areas on another site. Sideoats grama (*Bouteloua curtipendula*) and wolftail (*Lycurus phleoides*) both

responded to the mechanical treatment on one site but not on the other. Soil differences and time of the treatment may have contributed to the different responses in 1993. Studies on a variety of manipulations within piñon-juniper woodlands to improve multiple uses are being continued at several locations.

BRUSH CONTROL USING GOATS

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(Key Words: Goats, Creosotebush)

Pastures previously grazed by either 4 or 8 Spanish or Angora wether goats were rested until 6 Aug 85 when 6 Angora and 6 Spanish wether goats were moved into pasture one of an 8 pasture (5 acres each) rotation system. Goats were rotated weekly among pastures dominated by creosotebush until 11 March 86 when grazing was stopped due to loss of goats. Angora goats maintained weight and produced 3.2 pounds of mohair while Spanish goats gained 6.4 pounds during the period. Four Spanish and 4 Angora wether goats were rotated through the pastures from September 1987 to June 1988 when coyote predation terminated grazing again. In March, Angora goats sheared 4 pounds of mohair. In October, 9 mature Angora wether goats were placed on the study and rotated weekly through the pasture until termination of project. Goats maintained weight and produced 6.3 pounds of mohair. Creosotebush canopy cover was reduced 23 and 24% in two grazed pastures that were monitored in each rotation cycle (every 8 weeks) during the project. Total herbaceous cover was reduced by 94 and 96%. In a control pasture, creosotebush canopy cover was reduced 31% while herbaceous cover was reduced 77% during the same time period. Goat grazing had little or no influence on creosotebush dominance.

RANGE FERTILIZATION

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(Key Words: Fertilizer, Forage Production)

Past research at the Fort Stanton Experimental Ranch indicated positive results from range fertilization. Responses for the new ranch at Corona, representing different soils and vegetation patterns are unknown. Replaced fertilizer response plots were established on shallow calcareous and deep sandy soils at the Corona Range and Livestock Research Center in 1991. In 1992, application rates of 0, 30, 60, and 90 lb/ac of actual N in the form of urea were evaluated. On shallow calcareous soils, the 60 lb/ac rate resulted in the greatest production increase (1773 vs 877 lb/ac). Broom snakeweed also increased nearly 500 lb/ac with this application rate. On deep sandy soils, little benefit to N fertilization was noted. Grass production was similar in all application rates. No response was observed in snakeweed