than 370 troughs from 11 western states found that more than 45 percent had obstacles that might restrict access to bats such as fencing and bracing and more than 40 percent had water levels less than 6 inches below the trough rim. We conducted controlled experiments on the effects of water levels and obstructions such as bracing and fencing on bat drinking success. Bats required 3-6 times the number of passes to approach the water surface at troughs with fences or support braces over the waters surface. This effect increased with reduced water surface area, indicating obstacles at smaller troughs would have a larger effect. The ratio of successful to unsuccessful drinking attempts by bats changed from 3:1 to 1:3 when water levels were lowered by 12 inches in two, one meter by four meter rectangular troughs and one 2.5 meter diameter round trough. These effects may be energetically expensive for bats, especially during periods of high-energy demands such as pregnancy and lactation. We recommend that where possible, bracing and fencing be placed in such a way that the maximum amount of unobstructed water surface area be maintained for bat access.

Sheep and goats as tool to suppress juniper encroachment: Influence of stocking density and mixed grazing during summer.

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Grazing trials were conducted to evaluate the use of prescribed grazing by sheep and goats to suppress one-seed juniper (Juniperus monosperma Englem. Sarg.) sapling reinvasion. A 2x2 factorial experiment was conducted with Goats (G) or Goats + Sheep (G+S) at high or low stocking densities (SD). Ten crossbreed Angora nannies (1.1 AU) or 5 nannies of the same breed mixed with 4 Rambouillet ewes (1.1 AU) grazed either 1 juniper invaded plot of 20 x 30 m for 6 days (LD) or 6 similar subplots of 10 x 10 m for 1 day (HD) in each of 2 blocks. Animals grazed from sunrise to sunset, were penned at night and received a protein supplement (45% CP) at a rate of 0.4% BW, daily. No effect of SD, herbivore (G, G+S), or their interaction was found on juniper utilization. Animals removed on average 38.3% of the length of marked juniper sapling branches. Understory grazing intensity differed between G or G+S (P=0.02) and SD (P=0.05) treatments. G+S removed 71.3 % of the available herbaceous biomass whereas G removed 64.7 %. Greater understory grazing intensity was observed under LD (70.4 %) compared to HD (65.0 %). Goats spent more time feeding on juniper compared to sheep (Goats: 24.5%, Sheep: 7.7%, P< 0.01). Stocking density did not influence time spent feeding juniper or herbaceous understory (P=0.08). Goats in HD and LD grazing treatments spent similar time feeding on juniper (P=0.09).
Prescribed high density grazing with goats alone, rather than goats and sheep, could promote acceptable juniper sapling use along with lower damage on herbaceous vegetation. Juniper sapling responses to the treatments imposed in this study will be monitored through time.

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One seed juniper intake by sheep and goats supplemented with degradable or by-pass protein.

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Successful prescribed grazing of one seed juniper (Juniperus monosperma Englem. Sarg.) with sheep and goats may depend on identifying times of the year when juniper terpenoid levels are less likely to deter herbivory and could be contingent on the use of protein supplements to help animals detoxify terpenes and boost intake. We conducted pen trials with sheep and goats to determine if individual juniper intake varied seasonally (summer, fall, winter, or spring) or was affected by the amount and kind of crude protein (CP) in the diet. Twelve Ramboullet ewes and 12 Spanish-Boer goats were offered a basal diet of sudangrass or bermudagrass hay with either no protein added (Control diet: 5% CP), or with soybean meal (degradable CP: DCP) or fishmeal (by-pass CP: BPCP) to achieve two treatment diets with 12.5% CP each. Diets were offered at 1.6% of body weight (BW) to each animal for 10 days of adaptation and 10 day of data collection in each season. Juniper trials were a 30 min feeding bout on juniper branches (175g) attached to wooden stands (0.8 m height). Juniper intake per unit of BW (JI) varied among herbivore species (P<0.01 vs. Sheep: 0.25g kgBW⁻¹). JI varied among diets (P=0.02) and was highest for animals receiving the DCP (0.50g kgBW⁻¹) and BPCP (0.46g kgBW⁻¹) supplements and lowest for control animals (0.27g kgBW⁻¹). JI also varied among seasons (P<0.01), intermediate in spring (0.49g kgBW⁻¹) and summer (0.40g kgBW⁻¹) and lowest during the fall (0.23g kgBW⁻¹).

Sheep and, especially, goats could be used in prescribed grazing programs to suppress juniper re-invasion. Greater suppression could be expected from goats browsing during winter, provided that protein levels are sufficient to allow animals to detoxify terpenoids.

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Using the National Research Council (NRC) Model as Tool in Beef Nutrition analysis on Tobosagrass Rangeland.