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Presenter Information

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Effects of supplemental feed and white-tailed deer density on vegetation

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Introduction Southwestern Texas is at the xeric edge of the range of white-tailed deer (*Odocoileus virginianus*) in North America. Land managers commonly provide dry, pelleted feeds to increase white-tailed deer nutritional status. Provision of pelleted feeds may alleviate constraints on foraging time, enabling herbivores to selectively feed on the most palatable plants, potentially resulting in habitat degradation (Murden and Risenhoover 1993). We tested the hypothesis that compared to no supplemental feeding, provision of pelleted feed results in habitat degradation. We predicted an interaction between increasing density of white-tailed deer and feeding treatment, in which high density and supplemental feeding reduces canopy cover of forbs and shrubs eaten by deer and reduces forb species richness compared to low density and no supplemental feeding.

Materials and methods The experimental design was a randomized, complete-block with a block at each of 2 locations 37 km apart. Two 486 ha sites were subdivided into six 81 ha paddocks separated by 3.1 m tall fences. Pelleted feed (~20% crude protein) was randomly assigned to 3 of the 6 paddocks at each location. In 2004, 10, 25, or 40 white-tailed deer were randomly assigned to an enclosure with pelleted feed provided *ad libitum* and an enclosure with no pelleted feed. Twenty 50-m transects were randomly established within each enclosure. We estimated canopy cover of forbs and shrubs and forb species richness during summer 2004-2007. Plants palatable to deer were determined in bite count experiments. Data were analyzed using repeated measures analysis of variance with the difference between mean canopy cover and species richness from 2005-2007 and these values on the initial sampling date as the dependent variables. Supplemental feeding treatment, white-tailed deer density, and the feeding x density interaction were independent variables.

Results There was no treatment x density interaction ($P > 0.05$) for any of the dependent variables. Canopy cover of palatable forbs declined about 4% in paddocks with no supplemental feed, averaged across sampling dates and densities, but did not decline relative to canopy cover at the beginning of the study in paddocks with supplemental feed (Figure 1). Differences in canopy cover of shrubs and forb species richness between 2005-2007 and 2004 were similar ($P > 0.05$) between feeding treatments (Figure 2). None of the dependent variables differed significantly ($P > 0.05$) among white-tailed deer densities, averaged across feeding treatments and sampling dates.

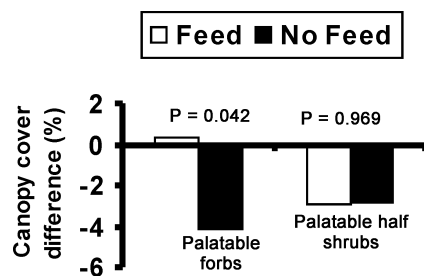


Figure 1 Difference in canopy cover of palatable forbs and half shrubs between the mean of the subsequent sampling dates and the initial sampling date, averaged across densities.

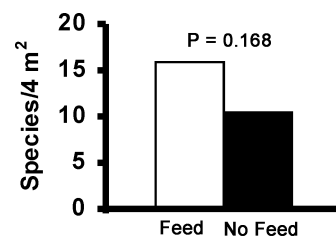


Figure 2 Difference in herbaceous species richness between the mean of the subsequent sampling dates and the initial sampling date, averaged across densities.

Conclusions In contrast to our hypothesis, supplemental feeding appeared to alleviate foraging pressure on palatable forbs. Our results should be considered preliminary because extreme annual variation in rainfall may have ameliorated impacts of supplemental feed and white-tailed deer densities on vegetation.

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Reference

Murden, S. B. and K. L. Risenhoover (1993). Effects of habitat enrichment on patterns of diet selection. *Ecological Applications* 3, 497-505.