

Herbivore Diversity Alters Different Fitness Components of *Helianthus Maximilia*

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Abstract: Although it is known that herbivores influence plant fitness, there is relatively little information quantifying the combined effects of multiple herbivore groups on plant fitness and determining whether such effects may vary with plant nutrient status. *Helianthus maximiliani*, is a highly nutritious perennial plant sought after by a variety of organisms in prairies. To study the impact of herbivore diversity on the fitness of *H. maximiliani*, different herbivore groups (insects and mammals) were excluded from plots in a restored prairie at the Ninnescah Reserve near Viola, Kansas. Ninety-six, 3x4 m plots were randomly assigned to various herbivore exclusion treatments designed to protect plants from insect, above ground and below ground mammal activity. To test the potential effect of plant nutrient status on herbivory, each herbivore treatment was also assigned to either fertilized or unfertilized treatments. All treatment combinations were replicated eight times. Plants were significantly taller in plots with above ground cages compared to control plots but this difference was only apparent when plots were fertilized. This pattern suggests that large herbivores such as deer are selectively feeding on the most nutritious plants available and potentially limit the size of *H. maximiliani*. In contrast, seed production was reduced by the combined exclusion of insects and above ground mammals. Effects on seed production occurred regardless of plant nutrient status. These results suggest that different herbivore guilds influence separate components of plant fitness so that the combined effects of increased herbivore diversity may be to reduce individual plant success.

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