

THE EFFECTS OF CHRONIC NITROGEN APPLICATION ON A MATURE TALLGRASS PRAIRIE RESTORATION AND NITROGEN MOBILIZATION INTO ABOVE-GROUND BIOMASS OF *ANDROPOGON GERARDII*

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Abstract: The Upland Prairie Restoration was initiated on a 25-acre old field in 1993 in Upland, IN. Prior research on the site found that acute nitrogen enrichment inhibited the establishment of native prairie species and promoted weed cover. This current study examined the effects of nitrogen enrichment applied to a mature restoration. In 2002, a complete randomized block design experiment was implemented with annual nitrogen-urea fertilizer enrichment at 4 levels— 0g/m², 5g/m², 10g/m², and 20g/m². Density and percent cover of plant species was recorded annually over five years. In year five, leaf level nitrogen concentrations in *Andropogon gerardii* were measured. The objectives of this study were to: 1) quantify the effects of chronically applied nitrogen at various concentrations on the density and percent cover of native prairie species, and 2) quantify the fraction of nitrogen that moves into the above-ground biomass of *Andropogon gerardii* at various levels of applied nitrogen and its potential relationship to changes in community structure. Our results indicate that chronic nitrogen enrichment did significantly decrease prairie grass cover and increase weed cover in the 10g/m² and 20g/m² transects. However, nitrogen enrichment did not impact prairie forb cover. Correspondingly, we found a significantly higher amount of nitrogen in the above-ground biomass of *Andropogon gerardii* in the 10g/m² and 20g/m² transects, than in the control and 5g/m² transects. Our results suggest that *Andropogon gerardii* buffered the prairie restoration against the negative effects of nitrogen enrichment at lower concentrations, but that community structure degraded when nitrogen enrichment was 10g/m² or more.

Key Words / Search Terms: nitrogen fertilization, above-ground biomass, chronic nutrient enrichment, *Andropogon gerardii*, prairie restoration

Poster Presentation is requested

Presentation Needs: Easel or wall space, poster fasteners, must present either Monday and/or Tuesday.

Appropriate Session: Prairie Restoration