

FORB SPECIES ESTABLISHMENT INCREASES WITH DECREASING GRASS SEEDING DENSITY AND WITH INCREASING FORB SEEDING DENSITY IN AN EXPERIMENTAL PRAIRIE RECONSTRUCTION

*TIMOTHY L. DICKSON, Ecology, Evolution, and Organismal Biology, Iowa State University, Ames, IA 50011, USA

WILLIAM H. BUSBY, Kansas Biological Survey, The University of Kansas, Lawrence, KS 66047, USA

Abstract: Most prairie reconstructions fail to produce the diversity of species (mostly forbs) found in unplowed remnants. This lack of diversity is hypothesized to be partly due to the inhibition of forb species by high seeding densities of dominant grasses and partly due to the low seeding densities of forbs used in many reconstructions. We tested this hypothesis by sowing various densities of forb and warm-season grass seeds into a reconstruction begun on bare soil. This is the first replicated reconstruction experiment we are aware of that varies grass seeding densities to examine the effects on forbs. Four years after seeding we found that higher densities of grass seeds decreased forb cover, biomass, and species richness, and higher densities of forb seeds increased forb richness. Surprisingly, we found only slight effects of grass or forb seed density on weed abundance. These results suggest forb diversity can be increased by decreasing grass seeding density, by increasing forb seeding density, or both. However, forb seeds are generally expensive, and increasing forb seeding density across the entire area of a reconstruction may be prohibitively expensive. We therefore recommend a low seeding density of dominant grasses. We also recommend reducing competition from grasses by spatially separating forbs from dominant grasses. Spatial separation can occur by adding most forb seeds to areas with little to no dominant grasses, and by adding the rest of the forb seeds to areas with a low density of dominant grasses.