

THE EFFECT OF TALLGRASS PRAIRIE SPECIES COMPOSITION ON ABOVE-GROUND BIOMASS PRODUCTION.

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Abstract: Despite growing demand for alternative fuels, little research has focused on the potential utilization of mixed stands of tallgrass prairie species for energy production. A recent study by Tilman (et a. 2006) suggests that increasing species diversity of the stand increases above ground biomass. However, Tilman's research involved small plots, random species selection, high seeding rates, and the removal of the top 15 cm of soil. In 2008, the Tallgrass Prairie Center at the University of Northern Iowa initiated a research project to determine if Tilman's results could be applied at a field level scale, with selected species and without fertilizer or soil modification. In spring 2009, 98 acres within the Cedar River Natural Resource Area in Black Hawk County, Iowa were reseeded with 4 seed mixes: a monoculture of switchgrass (*Panicum virgatum*), a mix of 5 warm-season grasses (including switchgrass), a biomass mix of 16 species (including previous 5 species) and a 32 species prairie mix (including previous 16 species). Treatments were replicated across 3 different soil groups: a well-drained clay loam, and excessively drained sandy loam and a poorly drained clay loam. I hypothesize that when established, the most diverse plantings will produce the greatest above-ground biomass. Vegetative sampling was conducted in September 2009 to assess initial establishment and productivity. Initial analysis indicates that above ground native plant biomass was significantly ($p<.001$) lower in the excessively drained sandy loam soils than the other soil groups, but not significantly ($p<0.05$) different among seed treatments.