

BIOMASS PRODUCTION FROM NATIVE WARM-SEASON GRASS MONOCULTURES AND POLY CULTURES MANAGED FOR BIOENERGY

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Switchgrass monocultures grown for bioenergy lack plant species diversity and may not optimize ecosystem services. However, switchgrass monocultures are generally perceived to be more productive and provide fewer establishment and management challenges than polycultures. Our objective was to compare the dry matter production and persistence of monocultures and polycultures of native warm-season grasses managed for bioenergy in the Great Plains. This study was conducted in 2004, 2005, 2006, and 2007 at Mead and Clay Center, NE. Five native warm-season grasses (big bluestem, indiangrass, switchgrass, little bluestem, and sideoats grama) were seeded in monocultures and polycultures. Monocultures of each species were compared with polycultures consisting of each species at 20-percent increments in the seeding mixture. Sixty-eight mixtures were seeded in 2004 and 2005 in four replicates at each location for a total of 1,088 plots. Species composition for each plot was determined in autumn 2007. Dry matter production was determined at peak production during the seeding year and for 2 or 3 years after seeding, depending on planting year. Stand persistence was measured in spring 2008. Biomass production patterns will provide guidance regarding what native warm-season grasses should be grown to optimize long-term production and potentially increase plant species diversity in stands managed for bioenergy.

KEY WORDS: herbaceous perennials, switchgrass, genetics, feedstocks

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