RESEARCH UPDATES

SOUTH DAKOTA - Switchgrass Response to N Fertilizer Across Diverse Environments

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he Regional Feedstock Partnership is a collaborative effort between the Sun Grant Initiative (through Land Grant Universities), the U.S. Department of Energy, and the U.S. Department of Agriculture. One segment of this partnership is the field-scale evaluation of switchgrass (Panicum virgatum L.) in diverse sites across the U.S. Switchgrass was planted (10.0 lbs PLS acre⁻¹) in replicated plots in New York, Oklahoma, South Dakota, and Virginia in 2008 and in Iowa in 2009. Planting occurred in Alabama in 2010 following unsuccessful attempts in 2008 and 2009. Adapted switchgrass cultivars were selected for each location and baseline soil samples were collected before planting. Nitrogen fertilizer (0, 50, and 100 lbs N acre⁻¹) was applied each spring beginning the year after planting, and switchgrass was harvested once annually after senescence. Establishment, management, and harvest operations were completed using field-scale equipment. Switchgrass production ranged from 0.9-5.1 tons acre⁻¹ across locations and years (Figure 1). With the exception of the Iowa location, yields were lowest the year after planting. Yield increased with 50 lbs N acre⁻¹ at South Dakota and Virginia but did not increase further at the high N rate. There was no effect of N at Oklahoma or Iowa, and a negative response at New York. Initial soil N levels were lowest in South Dakota and Virginia (significant N response) and highest at the other three locations (no N response).

These results demonstrate the importance of proper N management in order to reduce unnecessary expense and potential environmental impacts of switchgrass grown for bioenergy across the U.S.

Biomass Yield (tons/acre)



