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**Distribution of switchgrass aboveground biomass in response to N addition and harvest dates**

Perennial grasslands are a potential biofuel feedstock, but little is known about the effects of harvesting frequency.

**The Science**

To help identify better management practices for more productive bioenergy cropping systems, we used two switchgrass sites to investigate the causes of biomass loss over time, and identified plant components contributing to nitrogen (N) loss or retention at different harvest times.

**The Impact**

Perennial native grasses such as switchgrass have been identified as a significant source of cellulosic biofuels feedstock. In addition to being high-yielding and efficient in nutrient-use, if properly managed switchgrass can provide environmental, economic, and societal benefits, including creating habitat for wildlife, sequestering carbon and increasing soil organic matter, decreasing erosion, and retaining nitrogen on site.

**Summary**

We used two sites in Wisconsin to investigate the effects of harvest timing and nitrogen addition. First, we compared mechanical versus hand harvesting of switchgrass to estimate yield loss associated with field operations. Then we investigated how biomass and N-allocation in different plant parts changed through senescence across time using: 1) three levels of N additions, and 2) four farm locations in hand-harvested plots. We found that harvestable yield decreased over successive harvest dates as a result of the physical loss of leaves and inflorescence biomass (i.e., biomass that starts flowering). Although N addition increased total aboveground biomass, it also increased the proportion of biomass occurring as leaves and inflorescence. Leaf and inflorescence biomass decreased over time and during harvest operations; however, this biomass became incorporated into the litter pool and increased on-site N retention.

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**Publications**

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