

## Nutrients management for biofuel production from switchgrass

Roland A. Holou and Gene Stevens

Due to the rising need to find alternative fuel sources, much attention has been given to biofuel in the recent past. Switchgrass (*Panicum virgatum*) is one of the prospective plants for cellulosic ethanol production. For a long time, most research focused on that plant was dedicated to its forage potential. It is only about 20 years ago that research started to be done on switchgrass as a bioenergy plant. Many advantages are associated to switchgrass use as a biofuel plant such as its low emission of greenhouse gases, its high yield, etc. Actually, the production of biofuel from switchgrass is impaired by some technological and agronomical problems. One of the needs is to lower the production costs and improve the biomass yield in a sustainable way. Reducing the input amount by managing the nutrient removal is a must. Indeed, because of the high cost of such nutrients and the scale of energy needed to face worldwide demand, it is very important to study how to make biofuel plants more efficient or how to create an environment that is better suited for their production. It is hypothesized that nutrient content in switchgrass decreases toward the end of the season. The overall goal of the current research is to test this hypothesis by studying nutrient partitioning in switchgrass during the year and therefore determine the best time to harvest the biomass in order to minimize nutrient removal and sustain the system. This project is part of an integral effort to develop a model of biomass utilization in Missouri. Data was collected on a 10 year old lowland switchgrass ecotype. Very promising results are obtained on the macro and micronutrient contents of leaves, stems, seeds, and roots. These data are being used to make important decisions on how to better produce switchgrass as a bioenergy plant.