

IMPACTS OF INORGANICS ON THE THERMAL BEHAVIOR OF SWITCHGRASS

Thomas Elder, Nicole Labbé, Chet Greer, Neal Stewart, Holly Baxter and Mitra Mazarei

USDA-Forest Service, Southern Research Station, Auburn, AL

University of Tennessee, Knoxville, TN

telder@fs.fed.us

Funding Agency-Sun Grant and IBSS

ORAL PRESENTATION

Switchgrass is a major bio-energy crop, but its thermochemical utilization can be negatively impacted by relatively high levels of ash in the biomass. The current study has been undertaken to evaluate the variation in ash levels with cultivar, age and upon extraction with water and ethanol. Ash levels have been quantified and evaluated using inductively coupled plasma spectroscopy for the determination of specific elemental composition. Thermogravimetric analyses were performed to compare the thermal behavior and pyrolysis gas chromatography-mass spectrometry results have been used as the input for multivariate statistical analysis. Initial results indicate decreases in overall ash content with both extraction and age. Similarly, thermal sensitivity as evidenced by thermogravimetric analysis decreases with decreases in ash content. Principal component analysis also indicates that samples can be categorically separated by age and extraction and therefore demonstrating that ash content and composition impact the thermal profile of switchgrass during pyrolysis.