



U.S. Department of  
Transportation



**ASSESSING THE BIOENERGY PRODUCTION CAPABILITY OF NATIVE GRASSES USING WET CHEMICAL TECHNIQUES AND BENCH-SCALE BIOCHEMICAL AND THERMO CHEMICAL CONVERSION APPROACHES**

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**Objectives and Expected Outcomes**

The main objective of this proposed research is to investigate the influence of biomass composition on the composition of bio-oil produced by a method called fast pyrolysis.

The Michigan State University plantations of the grass accessions and cultivars have been established at MSU since 2006. The research scope of this endeavor only includes chemical analysis and not stand establishment.

The specific objectives of the proposed research are to:

- 1) characterize the chemical composition of native plant ascensions established at MSU using wet chemical techniques, including carbohydrate, protein, lipid, Klason lignin, and ash analysis,
- 2) perform a set of bench-scale pyrolysis experiments for bio-oil production using native warm-season grasses, and
- 3) construct an economic model for performing a cost analysis of the system from cultivation through bio-oil generation.

Our research uses a thermochemical approach to convert native warm-season grasses found in the north central States to bio-oil. Cultivars and accessions under consideration for conversion include: switchgrass, *Panicum virgatum* L.; coastal panic grass, *Panicum amarum* Elliott; big bluestem, *Andropogon gerardii* V. titman; Indiangrass *Sorghastrum nutans* (L) Nash; deer-tongue *Dichanthelium clandestinum* (L.) L.; sideoats grama, *Bouteloua curtipendula* (Michx.) Torr.; and prairie sand reed grass, *Calamovilfa longifolia* (Hook.) Scribn.



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**Graduate students**  
A graduate student researcher (PhD Candidate) as well as undergraduate student workers are supported by this project.

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