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U.S. Department of
Agriculture-NIFA



Project Title: Enhanced Biofuels Production with Genetically Optimized Feedstocks by Multistage Pyrolysis with Catalytic Upgrading

DR. LAURA BARTLEY

Project Goal

The long-term aim of this program is to develop an optimal thermochemical biorefinery platform by optimizing biomass feedstock characteristics, with switchgrass and sorghum as the primary foci of this project.

Specifically, we will: a) identify biomass compositional features that improve pyrolytic conversion (product quality and yield) and design strategies for engineering grasses (switchgrass and sorghum) to enhance these traits, b) conduct multi-temperature (staged) pyrolysis experiments, and c) use selective upgrading reactions (light oxygenate condensation, furan, anhydro sugar condensation, mild deoxygenation) along with extension of the pyrolysis process to two stages.

Expected Project Outcomes

The projected outcomes from this project will be understanding of the relationships between plant structure and composition with yield, quality and refinability of bio-oil produced from diverse switchgrass and sorghum genotypes. This understanding will direct research toward the development of optimal feedstock-conversion biorefineries. Optimal includes not only economics, but as importantly, sustainability. This will be achieved by maximizing the production of biofuels while minimizing the required agricultural resource inputs, acreage, water, fertilizer, etc.

Other Sources of Funding:

The University of Oklahoma and Texas A&M University covered the matching requirements.



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