

WWW.SUNGRANT.OKSTATE.EDU



U.S. Department
of Transportation



Title: Assessing and Predicting Switchgrass and High-Biomass Sorghum Yields and Economic Viability

DR. FELIX FRITSCHI

Project Goal

The goals of this project are:

- 1) To predict and evaluate switchgrass and biomass sorghum bio-fuel feedstock productivity in diverse production environments using crop growth models
- 2) To incorporate, calibrate and validate algorithms to predict nitrogen and phosphorus removal in the harvested biomass
- 3) To develop a spreadsheet-based decision tool for calculating production costs and breakeven biomass prices.

Expected Outcomes

- Existing field sites located in a region spanning from northern Louisiana to central Missouri and from eastern Arkansas to Oklahoma, were leveraged for collection of crop growth and development, biomass yield, and nutrient removal data. The metadata generated based on these sites are used for model development, calibration, and validation.
- The models ALMANAC (switchgrass) and DSSAT (biomass sorghum) were calibrated and validated based on these sites and used in prediction of yields and nutrient removal in a site-specific manner across this region.
- The output from the crop models were linked to an economic model that calculates annualized, prorated breakeven prices for the two species across a range of weather and soil conditions. The team is currently developing decision support tools to facilitate the selection between switchgrass and biomass sorghum based on economic evaluation of yields and input costs.
- By the end of this project, producers, consultants, industry representatives and policy makers will be able to access and run crop and economic models to aid them in their decision-making processes.



PI: Dr. Felix Fritschi

University of Missouri
Plant Sciences

Co-PIs: Dr. Montgomery Alison

Louisiana State University
AgCenter

Dr. Vijaya Gopal Kakani

Oklahoma State University
Plant and Soil Science

Dr. Michael Popp

University of Arkansas
Ag Economics

Dr. Chuck West

Texas Tech University - *Crop, Soil & Environmental Sciences*

Associate PI: Dr. Jim Kiniry

USDA-ARS - *Grassland, Soil, and Water Research*

Funded: \$367,158

Start Date: 07/01/11

End Date: 06/30/15