

2010-11 TWRI Mills Scholarship Program Application

Student

Ann Conrad

Committee Chairs

Dr. M. Edward Rister

Department of Agricultural Economics

318E Blocker, 2124 TAMU, College Station, TX 77843-2124

e-rister@tamu.edu

(979) 845-3801

Dr. Ronald D. Lacewell

Department of Agricultural Economics

306B Blocker, 2124 TAMU, College Station, TX 77843-2124

r-lacewell@tamu.edu

(979) 845-8476

Proposed Research

The United States Department of Energy and Department of Agriculture, along with the Environmental Protection Agency, are interested in increasing the role of bioenergy in the United States. The "Vision for Bioenergy and Biobased Product in the United States" states the goal is to secure 20 percent of the market share for transportation fuels by 2030 with biofuels, which is forecasted to equal about 51 billion gasoline-equivalent gallons (U.S. Department of Energy 2006).

The objective of this research is to find a least-cost method of producing and providing a 30-million gallon cellulosic bioenergy refinery with high energy sorghum and/or switchgrass in the Rio Grande Valley of Texas. A linear programming model will be used and will incorporate both capital budgeting and enterprise budgeting. Capital budgeting evaluates net cash flows of an investment over their economic life (Penson and Lins 1980). Enterprise budgets compare costs and returns of alternative crop activities and evaluate technology, resources, and management practices used (Kay et al. 2003). The multiple-period, 12-month model will evaluate different alternatives for feedstock and production practices. This model will include periods when field operations (including harvesting, hauling, and storage) can be done, machinery and labor required with sensitivity analysis to capture the most sensitive factors impacting cost to deliver biomass feedstock to a conversion facility.

The high energy sorghum and switchgrass grown will be irrigated, and will replace acres of other, currently grown irrigated crops, such as corn or cotton. Water scarcity, an important factor in the Rio Grande Valley, will be addressed in this research. The Rio Grande is the primary water source for most agricultural, municipal, and industrial users in the Middle and Lower Rio Grande Valley area. Water rights were adjudicated in the late 1960s for this region so that domestic, municipal, and industrial rights have the highest allocation priority. There are 29 irrigation districts that hold irrigation water rights on the available water, the amount of which is determined by inflows, reservoir levels, and municipal allocations (Robinson et al. 2010).

The purpose of this research is to discover methods for minimizing the cost of supplying a 30-million gallon ethanol conversion facility with sorghum and switchgrass. The results will give information on the per ton cost data for biomass feedstocks produced and delivered from the field to the conversion facility, as well as comparisons with other feedstock sources. The results will also evaluate land, machinery, water, and labor requirements to supply to the 30-million gallon plant with feedstock. In collaboration with soil and crop scientists, the base analysis and accompanying sensitivity scenarios will evaluate the impact of alternative levels of irrigation on feedstocks yields and resulting total logistics

cost to supply the conversion facility year round. Valley-wide irrigation demand impacts associated with growing of feedstocks to accompany development of cellulosic conversion facilities in the region will be recognized. Implications for acreage of other crops and water prices also will be considered.

References

- Kay, R.D., W.M. Edwards, and P.A. Duffly. 2003. *Farm Management*, 5th ed. New York, NY: McGraw-Hill Companies, Inc.
- Penson, J.B., Jr. and D.A. Lins. 1980. *Agricultural Finance*. Eaglewood Cliffs, NJ: Prentice-Hall, Inc.
- Robinson, J.R.C., A.M. Michelsen, and N.R. Gollehon. 2010. "Mitigating water shortages in a multiple risk environment." *Water Policy* 12: 114–128.
- U.S. Department of Energy. 2006. "Vision for Bioenergy and Biobased Product in the United States." Available at http://www1.eere.energy.gov/biomass/pdfs/final_2006_vision.pdf. Accessed on May 7, 2010.

Academic

B.S., Animal Science and Industry Kansas State University
GPA:
M.S., Agricultural Economics Texas A&M University
GPR:

GRE:

Relevant Classes

Water Resource Economics
Global Food and Agribusiness Policy
Agribusiness Analysis and Forecasting

Other Qualifications

Researched and co-authored: "Distillers Grain Industry: Production, Use, Structure and Trends." *North American Institute for Beef Economic Research*. 2009 and "Distillers Grain Industry Price Discovery & Risk Management" *North American Institute for Beef Economic Research*. 2010.

Proposed Use of Funds

The funds will be used for papers, posters, and travel to present research at UCOWR, Southern Agricultural Economics Association, and Agricultural and Applied Economics Association meetings over the next academic year.

Intended Career Path

After finishing my Master's degree, I plan to work either towards a Ph.D. in Agricultural Economics or go into government work, focusing on water and other resource economics research.