Renewable Fuel on the Prairie: Prairie Sustainable Biofuel Project II

By Lawrence Aderinkomi, CERTs Research Assistant • April 2011

Tim Terrill from the Winona Soil & Water Conservation District Organization said he saw “an excellent example of how conservation and farming can work together to achieve environmental and economic benefits,” when he partnered up with Eric Kreidermacher from Pork and Plants, LLC and Professor Bruno Borsari from the Biology Department at Winona State University (WSU) on the Prairie Sustainable Biofuel Project. This ongoing partnership between local government, university, and business continues to offer unique opportunities for students while achieving advances in farm-based biofuel production.

Pork and Plants, LLC, a farm business in Altura, MN, began in 1985 with a single greenhouse, two large hog barns, and many acres of prairie grass. To offset the high heating costs associated with the greenhouse, the farm started burning shelled corn as a fuel source instead of propane to heat the greenhouse. However, removing the corn stover puts fields at risk of losing a considerable amount of top soil each time the organic material is removed, and it tied Pork and Plants to a volatile market and the ongoing food vs. fuel debate. In 2007, Kreidermacher began working with Winona State University to explore other sources of biomass that could be used to subsidize or even replace corn stover as a fuel source on the farm. Since then, Pork and Plants, the Winona County Soil and Water Conservation District, and Winona State University have expanded their efforts and have become a learning laboratory for students at WSU.

A grant from the Southeast Clean Energy Resource Team (CERT) in 2010 sent the project into its second iteration, the Sustainable Biofuel Project II. This project between Pork and Plants, Professor Borsari and his students at Winona State University, and Terrill is modeling how perennial grasses and forbs can be pelletized and produced at a farm-scale level on marginal land, and used as an alternative source of renewable fuel.

On-site renewable fuel can help reduce reliance on non-renewable fuels and assist in developing new market niches for farmers and landowners. Daniel Wilson, a student of Professor Borsari monitored the process and collected data. His findings were reported and accepted at the 2010 North American Prairie Conference at the University of Northern Iowa.

Project Snapshot

Purpose: Local government, university, and private farm research collaboration on biofuel production

Topic: Explore how perennial grasses and forbs can be pelletized and produced at a farm scale level on marginal land, and used as an alternative source of renewable fuel.

Partners: Pork and Plants, LLC; Winona State University; and Winona Soil & Water Conservation District

Grant: $5,000 Southeast CERT
With the guidance of Professor Borsari, Wilson and other students at Winona State University became involved in measuring and analyzing the biomass yields of the harvest. Wilson’s analysis was submitted and presented at the 2010 North American Prairie Conference in Iowa with promising findings. The paper reported that although the biomass yields from the mixed prairie grass and forbs were not as high as the yields from corn stover, corn has its own set of trade-offs and costs. Growing corn requires applying significant fertilizer, which can be energy intensive, contaminate nearby water sources, and can deplete topsoil and accelerate erosion. Growing mixed prairie grass and forbs can be done on marginal land without the fertilizing requirements of growing corn, and can actually increase the viability of the soil.

The partnership between the Winona County Soil and Water Conservation District, Winona State University, and Pork and Plants will hopefully continue to blossom. As Professor Borsari puts it, the Prairie Sustainable Biofuel Project “serves as a powerful vehicle for engaging students at Winona State University to learning about biofuels.” He continues, “The pellets from prairie biomass produced at Pork and Plants provide students with unique field experience. This research opportunity brings together issues of soil, water conservation, prairie ecology, and reconstruction.” The students are not the only ones directly benefiting from this project—all three parts of the partnership are beginning to see what can happen when the commercial sectors reach out to universities and organizations like the Winona Soil & Water Conservation District and the Clean Energy Resource Teams.

To date it is expected that the project’s use of biomass instead of natural gas will save about 65,000 gallons of natural gas a year and reduce 720,000 pounds of carbon dioxide annually. Professor Borsari says that “these findings have received a lot of visibility as information on the initial data has been presented both regionally and internationally”. For the idea to really catch on, however, Mr. Terrill thinks that “a thorough economic study needs to take place, so that people get the complete picture—ecological and economic”.

The Prairie Sustainable Biofuel Project II continues to grow, bridging the gap between sustainable farming and energy conservation and renewable energy. Kreidermacher continues to increase the awareness of biomass as a locally-supplied fuel by informing local farmers in Winona County about the project. Terrill said that one area landowner has already shown interest in this particular type of biofuel production, and asked how he could get in touch with Pork and Plants to research the possibility of harvesting and pelletizing his grasses and forbs. That’s one down, and many fields of prairie to go.

For more information, contact Eric Kreidermacher at Pork and Plants in Altura, MN at eric@porkandplants.com or call (507) 689-2678.