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Biomass Program

Sugars R&D

Pretreatment Applications for Corn Dry Mills

Starch from corn grain provides the primary feedstock for today's existing ethanol industry as well as for emerging sugar-based bioproducts. There are two corn processing routes: dry-milling and wet-milling. Corn wet milling currently produces a variety of products including starch, syrup, oil, fiber, and gluten meal. Dry milling, on the other hand, currently produces two products: ethanol and distillers grain. The corn fiber and distiller grains from these processes are currently sold as animal feed. However, new technologies are being developed that can potentially create additional value from these products.

The goal of this project is to enhance the economics of ethanol processing by using the lignocellulosic carbohydrates and/or residual starch in corn fiber to increase the ethanol yield per bushel of corn. This could also lead to the development of new co-products.

R&D Pathway

Current technologies under consideration include those that separate corn fiber from its starch component through soaking or through mechanical de-germing. Specific pretreatment approaches are being compared for their ability to liberate sugars from residual starch and/or hemicellulose along with the enzymatic digestibility and ethanol production from the pretreated corn fiber. Corn fiber conversion is being demonstrated at the Aventine Renewable Enegy Inc. ethanol facility in Pekin, IL, to determine the robustness of the process as well as the process economics.

Dried fiber feed, photo courtesy of Aventine REI

Benefits

- **Improve economics of corn mills producing fuel ethanol and co-products**
- **Enable further utilization of fiber and spent grain products**

Applications

Improve the economics of existing ethanol plants by increasing the ethanol yields per bushel of corn through fiber conversion and potentially creating new co-products.

Project Participants

Purdue University
Aventine Renewable Energy, Inc.
National Renewable Energy Laboratory

Project Period

FY 2002 – FY 2005

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