



Biomass Program

A Second Generation Dry Mill Biorefinery

While dry mill processing plants tend to be easier to build and maintain than wet mill plants, wet mills traditionally produce more products. This project, headed by Broin, aims to combine the relative simplicity of dry mills with the varied output of wet mills by developing a dry mill biorefinery process.

In this “2nd Generation” dry mill, Broin will fractionate the bran, germ, and endosperm in the incoming corn feed using proprietary processes and equipment. This revolutionary mechanical separation will enable flexibility in feedstock utilization, substrate conversion, and the fermentation process, while expanding options for value-added co-product production.

With the assistance of the National Renewable Energy Laboratory (NREL), Broin will investigate at bench and pilot-scale the technical and economic feasibility of converting the hemicellulose and cellulose fractions of the extracted corn bran to ethanol, and upgrading the bran and endosperm fermentation residues to high protein animal feeds.

Successful development of dry mill biorefinery processes could enhance the economics of existing ethanol dry mills by creating

additional co-products and increasing yields.



Photo: NREL

R&D Pathway

Project activities will mainly center on technology barriers related to pretreatment, processing, and conversion of corn feedstock. Activities include studying methods of converting pretreated bran to ethanol and feed products, converting bran to value-added products, and a preliminary economic evaluation of bran conversion. The ultimate objective is the design, engineering and construction of a pilot-scale pretreatment and fermentation facility based on bench-scale results.

Integrated Biorefineries R&D

Benefits

- **Improved economics for existing ethanol dry mills**
- **Increased yields and value-added coproducts**

Applications

This project will enhance dry mill flexibility in feedstock utilization, substrate conversion, and fermentation processes, while expanding options for value added co-products such as high protein feeds.

Project Participants

Broin and Associates, Inc.
National Renewable Energy Laboratory
South Dakota State University

Project Period

FY 2003 – FY 2007

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