

Processing Herbaceous Energy Crops into Fuel Ethanol



Switchgrass

Reed
Canarygrass

Alfalfa

What is this technology?

A suite of biomass samples and technologies related to converting herbaceous energy crops to fuel ethanol, centering on the pretreatment and enzymatic conversion steps.

What problem does it address?

- Plant breeders need convenient and cost efficient tools for screening large populations of genetic material to select for higher quality bioenergy cultivars.
- Prior methods for measuring ethanol yield are labor-intensive. This technique could be used either directly to select for higher quality genetic material, or indirectly by using the data to develop a near-infrared model.

How is this project different from or how does it enhance other projects?

- Medium throughput method allows for analysis of 100s of biomass samples for relative ethanol yields.
- Data sets are suitable for developing NIR models for even higher throughput of samples.
- Base set of samples is ideal for developing new pretreatment & enzyme technologies.

What are the potential benefits of partnering with ARS on this research?

- Access to field grown switchgrass, reed canary grass, and alfalfa stems that have been exhaustively analyzed for composition and fermentability.
- Access to a convenient technology that can be used directly to rank sets of biomass samples according to relative ethanol yield directly or for larger sets indirectly by near infrared analysis.
- Novel integrated technologies being developed that are suitable for converting herbaceous biomass to bioethanol with an emphasis on single-stream processing so as to limit capital costs and unit operations.
- Expertise in standard methods for evaluating and developing new sources of herbaceous biomass, carbohydrate hydrolytic enzymes, and fermentative microorganisms in a process-orientated research environment.

Who are the potential customers?

- Agricultural production companies interested in moving into the energy crop realm.
- Process engineering companies interested in developing advanced biofuels technology.

Moving Forward

Interested in developing cooperative research agreements with companies developing energy crops or engineering processes to convert herbaceous biomass to ethanol.

Contact Information

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