

Turning corn fiber into ethanol

June 1 2006

Tony Pometto held up a laboratory flask swimming with little balls of mold. This, said the Iowa State University professor of food science and human nutrition, is the kind of fungus that Iowa State researchers have used to successfully convert corn fiber that's typically used for animal feed into ethanol.

And that could boost ethanol production by about 4 percent or 160 million gallons a year, said Hans van Leeuwen, an Iowa State professor of civil, construction and environmental engineering.

"I believe this is a breakthrough," said van Leeuwen, the leader of the research project. "But I also want to caution that we need to do a lot more research."

So far, the researchers have demonstrated they have a process that can convert corn fiber -- a byproduct of the wet milling process that produces corn syrup -- into fuel-grade ethanol on a very small scale. With additional research they'd like to at least double the amount of ethanol their process produces. They would like to try it on a larger, pilot scale. And they would like to try it on other byproducts of corn processing.

Van Leeuwen said the next step is to see how the process works on distillers dried grains, a byproduct of the dry milling process that's typically used to convert corn kernels into ethanol.

The research project is supported by a \$150,000 grant from the U.S.

Department of Agriculture through the Iowa Biotechnology Byproducts Consortium, \$130,000 from the Iowa Energy Center and materials from the ethanol industry. In addition to van Leeuwen and Pometto, the research team includes Samir Khanal, an Iowa State research assistant professor, and Iowa State graduate students Mary Rasmussen and Prachand Shrestha.

And let's not forget the mold.

The mold produces enzymes that break down corn fiber into the simple sugars that are fermented into ethanol. And that's not an easy thing to do.

Pometto said corn fiber -- which, like all lignocellulose, forms the structure of a plant's cell walls -- is very tough stuff.

"There's a reason it's very hard to degrade," he said. "It needs to be tough because nature wants to have growing plants. Without growing plants we'd all be dead."

The researchers' techniques for working with mold and corn fiber to produce ethanol are now being reviewed for a possible patent. And van Leeuwen thinks their discovery has lots of potential for the ethanol industry.

After all, van Leeuwen said, "We're not using harsh chemicals, high temperatures, high pressure or expensive enzymes to do this."

Source: Iowa State University

Citation: Turning corn fiber into ethanol (2006, June 1) retrieved 1 May 2024 from <https://phys.org/news/2006-06-corn-fiber-ethanol.html>

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