

UI scientist studies biodiesel issue

Reducing costs of fuel products key aspect of research underway

Associated Press

MOSCOW, Idaho — A University of Idaho scientist is researching how to get more economic benefit from the byproducts generated from the process that makes biodiesel fuel.

The technology to turn vegetable oils into clean-burning fuel has been around for years. The problem is that it costs \$1.50 just for the raw materials to produce one gallon of it, said Brian He, a biodiesel researcher at the university.

"On top of that, you have the operating costs and the labor costs. Eventually, we are talking about \$2.50 to \$3 per gallon," he said.

Add transportation costs and taxes

to the mix, and it becomes an unmarketable product.

He (pronounced "huh") believes the waste and byproducts can be transformed into valuable commodities that can be sold to offset production costs.

Biodiesel is made by combining vegetable oil, usually from crushed rapeseed or mustard seed, at high speed with methanol or ethanol. The result is a fluid with two layers, biodiesel on top and impure glycerol on the bottom.

The glycerol has little economic value since it is too costly to purify by conventional means.

But He is testing a bacterial fermentation process that could cheaply convert it into propanediol, one of the valuable raw materials used to make common polyester.

"I realized in the fermentation process of converting glycerol into propanediol, there is also ethanol produced," He says. Then the bonus ethanol can then be cycled back into the production process.

"In that case we utilize the byproduct and make it valuable to the process. The overall cost can be reduced," He said.

He also is exploring ways of increasing the value of the seed meal left over from the crushing process.

By using solvents to extract toxic chemicals like cyanide from the meal, He can transform it from its current use as fertilizer into much more valuable animal feed.

"(The meal) contains about the same amount of proteins as soy meal, about 40 percent. They are also quite balanced proteins. To use it as ferti-

lizer is kind of a waste."

Another high-value product contained in the seed oil is a fatty acid called erucic acid.

He wants to isolate the erucic acid and sell it separately. It is used in more than 200 different products, He says, including plastics, pharmaceuticals, lubricants and ink.

While all these methods have been accomplished elsewhere, he says, they have never been integrated into a biodiesel production line.

One of his next projects will be the construction of a model production line to squeeze every last cent from the tiny seeds.

Charles Peterson, the scientist who pioneered biodiesel research at the university in 1979, says He's research is critical to the future of biodiesel.