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AGRICULTURE

Creating fuel from oranges

Scientists are researching how profitable and technologically feasible it is to extract ethanol from orange peels.

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Orange juice processors needed someone to invent the better mousetrap.

For decades, processors had made dry pellets out of the orange peels left over from juice production, selling them as cattle feed for a small profit, much of it to European farmers.

Then in the early 1990s, the bottom fell out of the feed market. Prices fell; production costs increased.

That's when juice processors approached U.S. Department of Agriculture researcher Karel Grohmann, based in Winter Haven, and posed a deceptively simple question: Can anything besides cattle feed be created from those messy orange peels?

NATURAL BIOFUEL

His solution was ethanol, a natural biofuel more commonly extracted from corn and sugar cane.

"The citrus peel was a natural to make ethanol," said Grohmann, who is now retired.

Today, USDA researchers partnered with a private ethanol company are in the midst of a large-scale experiment that scientists say is proving that ethanol extracted from citrus waste is a profitable, technologically feasible alternative for helping rid the industry of up to 3 tons of waste each year.

Bill Widmer, a chemist at the USDA Citrus and Subtropical Products Laboratory in Winter Haven, said the citrus industry could produce up to 55 million gallons of ethanol annually based on current citrus production figures.

That's a drop in the bucket compared with the 4.3 billion gallons of ethanol produced in the United States, mostly from Midwestern corn. But for citrus processors, it would provide revenue where they currently take a loss.

Up to 95 percent of all oranges grown in Florida are used to make juice.

"We view it as very promising," said Scott Stevenson, owner of Renewable Spirits, a Delray Beach ethanol company funding the USDA research. "It's very economically appealing with a return on an initial investment in just two to three years. Processors are just giving away [the waste] right now."

Widmer said processors would earn three times more money from ethanol than they currently get from selling waste product as cattle feed, which earns them from 2 to 4 cents a pound.

"They're just happy to get rid of it, even as cattle feed," he said. "It would cost them much more to take it to the landfill. And they've got to get rid of it somehow. They don't have a lot of choice."

The USDA research, headed by Widmer, has previously shown on a small scale that it was technologically viable and profitable to produce ethanol from citrus pulp. Now, they're proving it on a larger scale.

Earlier this year, the USDA built a 10,000 gallon pilot facility at a Bartow juice processor and surpassed a milestone that was the ethanol equivalent of the four-minute mile: The USDA produced four gallons of ethanol for every 100 gallons of liquid waste pulp. Widmer said the process is profitable at that level.

Smaller-scale tests have been even more encouraging, with five gallons produced from 100 gallons of waste pulp.

Widmer said he expects to reach five gallons in the 10,000 gallon facility. Tests earlier this year used grapefruit waste by-products, which don't produce as much ethanol as orange pulp, he said.

Late this year, the large facility will begin processing orange peels.

STARTUP COSTS

"In the last few months, we've heard processors talk a lot more about ethanol production," said Widmer, who said startup costs might be several million dollars. "And the value of the product is only going to go up, along with gasoline prices."

He said ethanol generally sells at about the price of gasoline. If gas prices were ever to plummet, the process might not be so attractive.

Florida Agriculture Commissioner Charles Bronson last month challenged Florida farmers to produce more ethanol.

"I know we can do it," Bronson told a gathering of stockholders for Farm Credit of South Florida, according to the Palm Beach Post. "We can have 2 million acres worth of crops for fuels if we can get enough plants built so we can turn it into ethanol."

Processors certainly have taken notice, said Dan King, who until recently was the interim executive director of the Florida Citrus Processors Association.

"They're in a wait-and-see mode," said King, who now works for the Florida Department of Citrus. "They need to see better evidence that there will be a positive return on any investment."