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Local farmer gains some energy independence with homemade fuel

Organic farm makes biodiesel from used oil

BY DAVE HODGES
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 • MARCH 17, 2008

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After two years of work, trial runs and tests, farmer Jack Simmons believes he is close to what many people may be dreaming about these days — no more trips to the neighborhood filling station.



A jar of biodiesel fuel (teve Cannon /Special to the Democrat)

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With crude oil for April delivery at \$110 last week and diesel fuel now at \$3.99 a gallon in Tallahassee, the signs are everywhere that energy independence, at least for a small organic vegetable farm, is more a necessity than a wish.

Simmons, whose 40-acre Crescent Moon Organic Farm is in Sopchoppy, produces biodiesel from waste vegetable oil he obtains from restaurants that buy the farm's produce. Each batch he produces is 150 gallons, and he uses the homemade fuel in Crescent Moon's tractors and other machinery.

"We are trying to get something together here that meets the needs of this little farm and the people that live here on this farm," Simmons said.

He estimates he has spent between \$600 and \$700 on the containers, small electric pumps, test equipment and piping for the biodiesel-production system that occupies a wooden shed at the farm. He does have ongoing expenses for potassium hydroxide and methyl alcohol, which are used in the fuel-making process.

On the other hand, it wasn't uncommon for the farm to spend \$1,000 a month on fuel in the past. And pump prices keep rising.

Simmons stresses that fuel-making isn't for everybody.

"Everybody shouldn't make biodiesel. It should be the ones that are willing to learn. There is some chemistry involved here," he explained.

That didn't discourage him, however.

"I had good people teaching me," he said.

Among those teachers is Piedmont Biofuels from Pittsboro, N.C., which has teamed up with Florida A&M University's Statewide Small Farm Programs and Cooperative Extension Service to present workshops on biofuel production at Crescent Moon and other locations. The most recent class was in February. More are planned.

According to Jennifer Taylor, program coordinator at FAMU, the workshops' main objective is to demystify biodiesel production, emphasizing methods for producing high-quality fuel and proper safety precautions.

"We are now formally a Florida A&M small organic farm, so we are officially now connected with FAMU," Simmons said.

He produced his first batch of biodiesel in 2006. He follows a carefully scripted process to measure the fatty acids in the vegetable oil, then exposes them to a blend of the

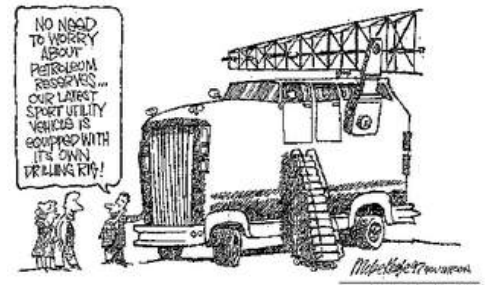


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potassium hydroxide and methyl alcohol. The reaction causes the formation of glycerin, which sinks to the bottom of the reactor and is drawn off as a waste product.

Simmons intends to further process the glycerin to extract the residual methyl alcohol from the material. Once that is done, the alcohol can be recycled into the next batch of biodiesel, and the glycerin can be composted.

"This is experimental," he added. "Very few people are doing this. Very few are recovering the methanol from the glycerin."

Once the biodiesel is produced, it is "washed" and "dried" in separate steps to make certain there is no trace amounts of glycerin, alcohol or water remaining. At the end of the process, Simmons runs tests on the fuel to make certain that it conforms to the standards set by the American Society for Testing and Materials.

In similar backyard fashion, Piedmont Biofuels started making small quantities of biofuels in North Carolina, following the model of a local provider using community resources to meet the fuel needs of people in that community.

"We are kind of in the hometown security racket around here. And we really believe in collecting local resources and turning them into local fuel," said founder and vice president Lyle Estill, author of the book "Biodiesel Power: The Passion, the People and the Politics of the Next Renewable Fuel."

Piedmont Biofuels, in fact, has switched to another raw material from local industry — the chicken fat that is a waste product of the poultry processing businesses in the region.

Estill was a speaker in February at the Sustainable Biodiesel Summit/National Biodiesel Board Conference held in Orlando. He reminded his audience that, "Sustainability means putting as much into the pot as we take out of the pot."

He also noted that nationally, the biodiesel industry has a combined output capacity of 1 billion gallons a year but only shipped about 400 million gallons in 2007. Big commercial producers, many of them relying on agricultural feedstocks like oilseed crops, are closing and tearing down their facilities.

They simply got too big.

"Scale down," Estill told the conference attendees. "Sustainable biodiesel technology means appropriate scale. Community scale. And biodiesel needs to be served up with a huge dose of conservation, couched in an overall conversation about renewable energy and delivered to the public in a way that is different from business as usual."

Back on the farm, Jack Simmons is looking ahead to producing sugar cane on his land. He would grind the cane to make syrup and process the waste from that to make ethanol for the few pieces of equipment still requiring gas to run. He's committed, he says, to using resources and making Crescent Moon self-sufficient.

State agricultural officials see Florida's farms playing a bigger role in producing crops with potential uses in fuel production. In 2006, the Florida Legislature established the "Farm to Fuel" grants program, which is administered by the Department of Agriculture and Consumer Services. The program provides money to stimulate investment in projects that produce renewable energy from Florida-grown crops or biomass.

The annual Farm to Fuel conference is set for July 30 to Aug. 1 in Orlando.

"We will have another big summit this summer and we think this has tremendous potential," department spokesman Terence McElroy said.

Renewable-fuel crops give growers another reason to keep their land in agriculture, and supporting renewable fuel production lessens the reliance on foreign petroleum, he added.

Agriculture Commissioner Charles H. Bronson also serves on the national steering committee for "25 by 25", the initiative to have the nation's farms produce 25 percent of U.S. energy needs from renewable sources by 2525.

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