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Minnesota effort targets weeds as energy crops

Researchers at SarTec of Anoka are experimenting with weed crops to determine whether farmers can profit by growing oil-rich seeds and processing them into biofuel.

By **David Shaffer** (<http://www.startribune.com/david-shaffer/10645931/>) Star Tribune |

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ISANTI, MINN. - On the nagging question of whether growing crops to produce biofuel hurts the nation's food supply, Clayton McNeff hopes to find a practical answer — in weeds.

McNeff, the co-inventor of technology used to refine biodiesel at the Ever Cat Fuels plant in Isanti, has been working for two years with a team of scientists and farmers to commercially grow two seed-bearing weeds as energy crops.

Earlier this month, SarTec crushed its first oil seeds harvested from weeds. The oil will be refined into biofuel that works in diesel cars, trucks and tractors.

The goal of the project is to avoid using food crops like soybeans for fuel or displacing food crops with energy crops. So the research has focused on raising soybeans and weeds in the same fields and during the same growing season.

"You are double cropping on the same land," said McNeff, vice president for Isanti-based SarTec, an agricultural nutrients producer controlled by his family that expanded into biodiesel in the past decade.

After planting the weed crops Camelina or Pennycress in late fall or early spring, some participating farmers have harvested them early enough to grow traditional crops in the same growing season.

"You are able to get both an energy crop and a cash crop like a soybean crop," he said. "That way we can provide both the energy we need ... and the food."

The SarTec team recently began extracting Camelina oil at the plant in Isanti, but only after a frustrating year for researchers.

They struggled to screen out chaff — bits of leaves and flowers — so the sesame-sized Camelina seeds could be crushed in an oil press. Though small, the seeds' oil content can be as high as 40 percent. That's a better ratio than found in soybeans, the main source of biodiesel.

"The seed is so tiny we had to find a screen that had very, very tiny perforations and the supplier had a problem doing that," said Pete Greuel, SarTec's general manager as he stood near a machine that now squeezes out light-yellow weed oil. "We press the oil out, and take it over to Ever Cat Fuels and make biodiesel."

Biodiesel has been produced since 2009 at the 3-million-gallon-per-year Ever Cat Fuels plant. It now uses waste oils collected from restaurants and other inedible fats, but the company has kept looking for other nonfood oils to produce biodiesel.

Turning weed to profit

SarTec is not the first company to look at Camelina and Pennycress as fuel crops. Both weeds have been studied by the U.S. Department of Agriculture, seed companies and university scientists. Camelina meal, the oil-rich residue from seed pressing, has been approved as cattle feed by the U.S. Food and Drug Administration.

One of the Minnesota research team's goals is to master the practical steps for farmers to profitably grow such weed crops. McNeff said he aims to find out "what the value proposition is for the farmer."

Nine farmers and the Anoka-Ramsey Community College have been part of the effort, which is funded by a three-year, \$500,000 U.S. Energy Department grant and matching funds from SarTec. In a separate, related project, SarTec recently developed a portable



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ELIZABETH FLORES

Clayton McNeff, who co-invented technology used to refine biodiesel at the Ever Cat Fuels plant in Isanti, explained how a portable...

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produce fuel from weeds grown on the farm. ([HTTPS://USERS.STARTRIBUNE.COM/MEMBER_CENTER](https://users.startribune.com/member_center))

“We have to get farther away from food crops being used for fuel,” said Melanie Waite-Altringer, a biology faculty member at Anoka-Ramsey who maintains the project’s [website](#) () and has participated in the research with her students. “We have to go to different crops that will grow without a lot of nutrients, and this is definitely one of them. You don’t need a lot of fertilizer to grow it — it’s a weed.”

At a 25-acre plot on the college’s Cambridge, Minn., campus, researchers planted Camelina in May, followed by Roundup-ready soybeans in June. The Camelina soon developed seeds and stood taller than the soybeans. It was sprayed with Roundup and the Camelina was left to dry in July. The seed-bearing top of the Camelina plant was harvested by a combine in early August. The soybeans, now on their own, kept growing.

“We have about 1,200 bushels off the whole site,” Waite-Altringer said. Unfortunately, the Camelina harvest also contains other, unwanted weeds, she said. That may have been caused by late planting in the wet spring, the timing of the harvest or both, she added.

Roger Bergman, a farmer for 70 years near Isanti, has twice planted Camelina in the fall so it could be harvested in the spring. He has not gotten big yields, but plans to keep trying. Timing the planting and harvesting is critical, especially in Minnesota’s short growing season, he added.

“It is an ancient crop, used far back in history,” Bergman said of Camelina, which he suspects was once used as lamp oil. “It has never been domesticated in this country. ... Chemically it is a good fuel crop. It is better than almost anything else.”

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