

USA TODAY SECURITY TIGHT AS RISK OF CLIMATE CHANGE

ALTERNATE FUEL

Gumweed as jet fuel interests military

UNR professor is leading the project

Marcella Corona

mcorona@rgj.com

A University of Nevada, Reno professor is leading the way on converting a native roadside weed into fuel that could help the military.

Glen Miller, an environmental sciences professor in UNR's College of Agriculture, Biotechnology and Natural Resources, has been working to convert gumweed into a biofuel, which could be used as jet fuel for the military, UNR officials said in a recent news release.

"We are looking at breaking it down because it uses less water and it's already acclimated to Nevada Conditions," Miller said in a statement. "It would be beneficial generating this arid-land crop because it doesn't compete with food or animal feed."

"The primary resource for diesel fuel is soy beans and ethanol for corn which are always in direct competition with food."

Miller is leading the project in the

This story includes mention of Darrell Lemaire (on page 2, because he did the first study (about 30 years ago), and gave his paper and samples to his friend, Glen Miller.

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Gumweed

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second year of a four-year, \$500,000 grant from the U.S. Department of Agriculture.

The final biofuel product could produce up to 122 gallons per acre on a biennial basis, attracting the U.S. Navy's interested in using it as jet fuel, Miller said in the news release.

"...Gumweed is native in Nevada and grows on the side of freeways and, more importantly, is an arid land crop that requires less water than other substitutes like alfalfa," Miller said in the statement. "Alfalfa takes five feet of water to grow while gumweed uses no more than a foot of water."

Gumweed was planted at the UNR's Valley Road Field Laboratory and the Main Station Field Laboratory. After it grew and was harvested, it was broken down to a liquid that smells like tar, UNR officials said.

The project received \$500,000 in grant funding from the United States Department of Agriculture. It has the potential to supply up to 20 percent of fuel demand for the military, UNR officials said.

Hongfei Lin is a professor of chemical and materials engineering, who is working with Miller on the project.

Lin is trying to find a more cost-effective way to convert biomass into fuel. Instead of adding hydrogen to biomass, he's exploring utilization of oxidation — the same process involved when substances come in contact with oxygen molecules, such as when a fresh cut apple turns brown or a copper penny turns green.

"It is estimated that if even 10 percent of sagebrush-covered lands in Nevada are used to grow gumweed for aviation biofuels, 400 to 600 million gallons per year of jet biofuels could be produced",



AP

The University of Nevada, Reno grows gumweed at a research farm in efforts to turn the roadside weed into a biofuel.

Lin, a College of Engineering collaborator, said in the news release. "That's definitely incredible. There's lots of potential."

Miller didn't know much about gumweed when **Darrell Lemaire**, a mining engineer, secured the DOE grant in 1980 and approached him about doing some research.

Lemaire was an interesting guy. "He read chemical abstracts for recreation," Miller recalled. "He built a big house up in the rocks (above campus) with a wine cellar 50 feet down. He gave me a couple bottles — of Gumweed Extract, 1981-82, 1982-83."

The two scientists began growing gumweed on campus about 10 years ago and their project evolved from the premise that biofuels shouldn't be competing with food crops in Nebraska and Kansas.

Gumweed, also known as tar weed, requires little water to grow.

"You could grow it in places like Nevada where you are not growing soybeans or corn," Miller said.

Lemaire, 89, published his findings in a 1982 book, *Cultivation of Hydrocarbon Producing Plants Native to the Western U.S.*, and the *Whole Plant Utilization of the Oils and Byproducts*.

"This was after the Carter years when Jimmy Carter wore sweaters whenever he addressed the nation from the White House to indicate to everybody we were run-

ning out of energy," Miller said.

Miller said UNR researchers have successfully produced fuel by extracting hydrocarbons from the weed's oil and are in the process of getting it tested as a diesel fuel. Now it's a question of refining the process to determine if farmers can make money on it.

In recent years, environmentalists have argued that ethanol adds to global warming by removing millions of acres of land from conservation reserve programs for use in corn production, and has led to higher food costs worldwide as more corn is used for fuel.

Bill Payne, dean of UNR's College of Agriculture, said the gumweed research addresses those concerns while anticipating low oil prices won't last forever.

"As prices once again reach \$80 or more per barrel, this type of technology will look increasingly attractive to an industrial world struggling to reduce its carbon emissions," Payne said.

Gumweed has been used many different ways historically. Native Americans used it for medicinal purposes and early pioneers chomped on it as a substitute for chewing gum.

"I have tried eating the stuff," Miller said. "It tastes terrible. I don't think there's any future in that."

Scott Sonner of the Associated Press contributed to this report.