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AVIATION

Aviation biofuel takes flight



IFT photo by Zoe Martin

Iowa Corn Growers Association District 6 Director Jim Greif, a pilot, took an interest in developing biofuel for the aviation industry.

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MONTICELLO — After years of research, biofuels in the aviation industry are almost ready for take off.

The requirements to replace jet fuel at 40,000 feet present a challenge, but airplane manufacturers such as Boeing have set goals for sustainable air travel by the end of the decade.

Midwestern commodity groups are along for the ride.

“We’re not funding research directly, but we’re monitoring the developments and participating to see what role corn can play in all of this,” said Rod Williamson, Iowa Corn Growers Association (ICGA) director of research and development.

ICGA District 6 Director Jim Greif has represented the group at Commercial Aviation Alternative Fuels Initiative meetings as a farmer and a pilot.

The coalition, started in 2006, gathers major engine manufacturers such as GE and Pratt & Whitney along with the U.S. military.

The global aviation industry uses 60 billion gallons of fuel a year. It takes about 40,000 gal. of fuel to fill up one 747.

"You couldn't grow enough corn in the world to supply enough fuel for all the cars and planes, but we can sure augment it," said Greif, who farms near Prairieburg.

There are special considerations for aviation biofuels. Small piston-engine planes burn gasoline. Large commercial airliners burn jet fuel.

But, it's a matter of figuring out whether new fuels will survive the altitude. As you go up, the temperature goes down drastically — to about 80 degrees below 0.

"You go up to 40,000 feet, and diesel fuel turns into lard," Grief said.

"There's more to it than just burning biodiesel in a airplane. It's got to be able to run at all altitudes. That's why the FAA (Federal Aviation Administration) is so slow to move on stuff."

Where are they now?

Technology to enable ethanol use in planes is still about three to five years out, Greif predicted. Renewable diesel for aviation is here. Several commercial test flights are running blends of biofuel and jet fuel.

"We have made great progress in less than a decade, but it will be a long journey to create an entirely new fuel supply for aviation," said Jessica Kowal with Boeing's environment policy communications team.

The industry has had the most success with green diesel, chemically different from biodiesel but manufactured from some of the same fat and oil sources.

It's a "drop-in" fuel that can be blended directly with traditional jet fuel without changes to airplanes.

If it's approved, that will reach Boeing's goal to have enough biofuel available to address 1 percent of global jet fuel demand by 2015, Kowal said in an email.

Boeing has an "all-of-the-above" strategy for biofuel development, she added.

"Ongoing research is looking at which plants may be more efficient than others to produce biofuel or other bio-energy products," Kowal said. "The list of potential feedstocks has expanded over time."

In the Midwest, Boeing is working with the Midwest Aviation Sustainable Biofuels Initiative on corn stover research. Algae is another option.

In the Pacific Northwest, leftover wood pulp works well. In China, the company is working on turning waste cooking oil into jet fuel.

"In the United Arab Emirates, a desert environment, we are looking at desert plants called halophytes, which look like tumbleweeds, that grow in sandy soil and can be irrigated with saltwater," Kowal said.

It's a global approach meant to provide the most abundant and secure supply of renewable fuels in different regions.

Now, cost is a major consideration. Petroleum Jet A has recently run about \$2.80-\$2.90/gal.

The cost of aviation biofuel varies depending on how and where it is produced, and it has typically been more expensive.

There is strong demand from companies, such as United Airlines, and an expanded supply of

renewable fuels will bring the price down, Kowal added.

“The alcohol side of the aviation business is small, but planes do burn a lot of fuel,” Greif said. “It’ll never be equal to what our automobile sector is, but it could be 10-15 percent of that.”

Corrected June 12.

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