

Aviation biofuel proves itself in tests, but is there enough?

May 28 2009, By Les Blumenthal

Initial flight tests have found that jet fuel made partly of camelina, algae or other bio-feed stocks can reduce greenhouse gas emissions from airplanes by more than 50 percent, doesn't affect performance and presents no technical or safety problems, a top Boeing official said Thursday.

"It meets all jet fuel requirements and then some," said Billy Glover, who heads Boeing's environmental strategy group.

Glover said a full report on the test flights would be released next month and aviation biofuel could be approved for use as early as next year. Despite its promise, however, Glover said the real problem is how quickly growers can start producing and refiners processing enough biofuel to make it an alternative to the Jet A fuel used today.

Aircraft account for about 3 percent of the nation's [carbon dioxide emissions](#), the principal greenhouse gas, according to the federal [Environmental Protection Agency](#). Though Boeing doesn't expect much growth in aircraft carbon dioxide emissions, some have estimated they could triple by 2050.

Boeing, Virgin Atlantic, New Zealand Air, Continental Airlines and Japan Airlines, along with GE Aircraft Engines, have conducted four tests using a mixture of biofuel and regular jet fuel over the past 15 months. The planes involved included wide-body 747s and single-aisle 737s. The biofuels included blends of babassu, sustainably grown

coconut oil, jatropha, algae and camelina.

Babassu oil comes from a tree that grows in the Amazon region of South America. Jatropha is a scrub brush that grows on marginal farmlands. Camelina, which provided oil for lamps in the days of the Roman Empire but for centuries was dismissed as little more than a weed, also can be grown on marginal lands, perhaps in rotation with such crops as dry-land wheat.

Of all the crops, camelina, for now, holds the most promise, Glover said.

Molecular biologists at Targeted Growth, a Seattle company, have used genetic engineering to develop a super strain of camelina seeds that are being sown on tens of thousands of acres in eastern Washington, Montana, Idaho, North Dakota and South Dakota, said Thomas Todaro, the company's chief executive.

Eventually, camelina could be grown on more than 10 million acres in the U.S.

In addition to the five states where it's now grown, Todaro said, it could be grown in eastern Oregon, in high plains such states as Texas and Oklahoma, and even as far east as North Carolina and Georgia.

"This year, there were three times more requests for our seeds than we were able to provide," he said.

While reluctant to call camelina a wonder plant, Todaro said it could produce 100 to 200 gallons of camelina oil an acre, or about 1 billion gallons a year. The plant also grows well in Australia, Canada and central Europe. Todaro said it wouldn't compete with others crops, such as wheat and corn, because it can be grown on marginal lands or in rotation, and doesn't require irrigation or heavy use of petroleum-based fertilizers.

Although the world's airlines consume about 65 billion gallons of fuel a year, Todaro and Glover said that camelina would be a good start.

In addition, Glover said the test show a camelina blend of aviation fuel reduced [carbon dioxide](#) emissions by more than 80 percent, more than any other bio-feed stock.

"Camelina is very encouraging, but we need a portfolio of things," he said.

While algae may be the most promising biofuel, it's still eight to 10 years away from full-scale production, Todaro and Glover said.

"It could be the great savior, but it's in its early stages," Glover said of algae.

"I'd be very careful in hyping algae," added Todaro, whose company also works with algae.

The test flights lasted a total of less than six hours, but Glover said the biofuels have been thoroughly tested in the laboratory. The Air Force and Boeing competitor Airbus have also been working to develop aviation biofuel.

"As soon as it is approved, we just need to start getting it to the filing stations," Glover said.

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