

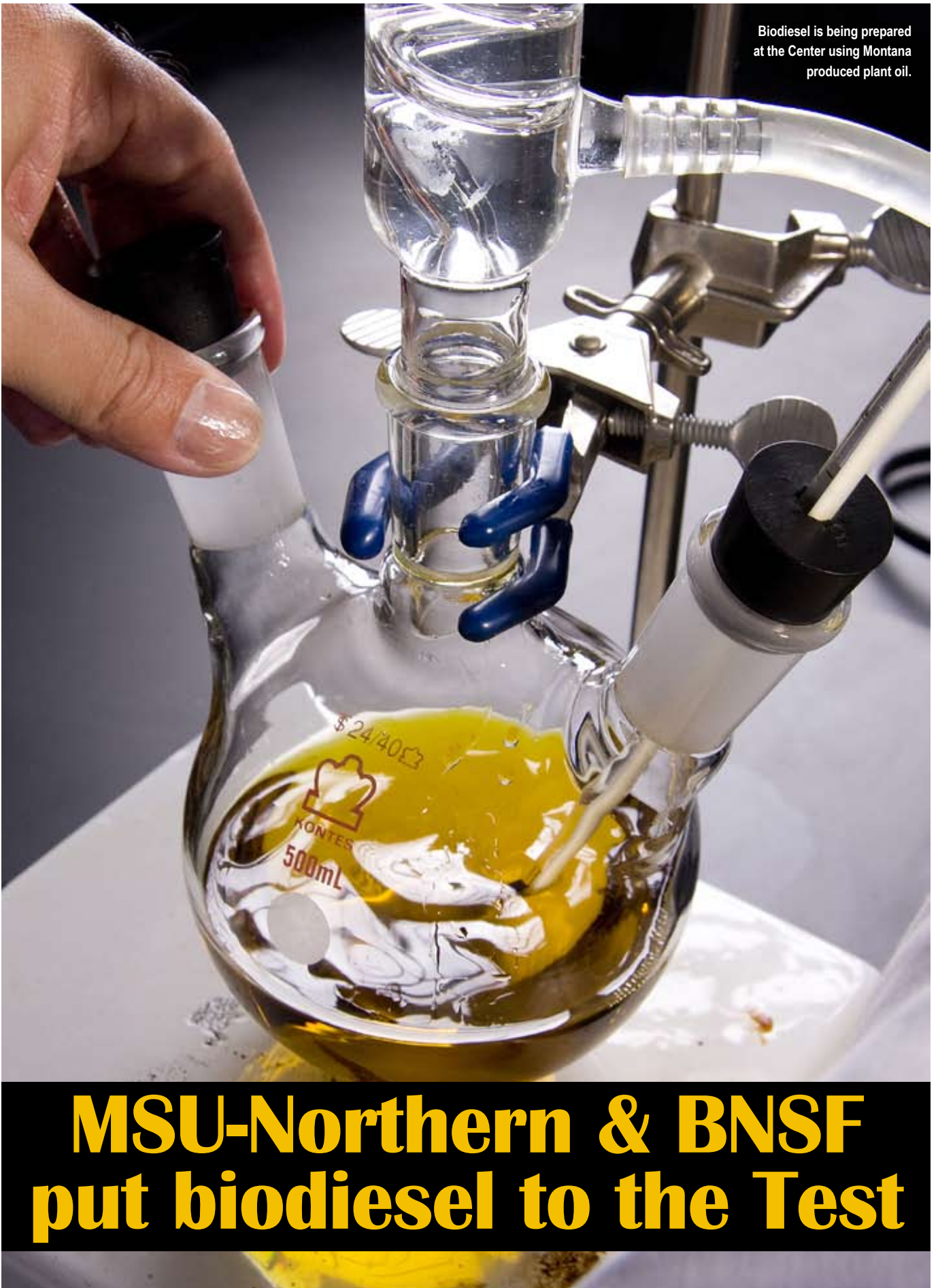
FALL 2010

P GREAT LAKES AIRLINES LEAKS & PLAINS

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Biodiesel is being prepared at the Center using Montana produced plant oil.



MSU-Northern & BNSF put biodiesel to the Test

Montana State University-Northern's Bio-Energy Center is one of the best kept secrets of the West. The unique focus of the Center is on biofuels

and heavy duty diesel engines. The Center is able to conduct comprehensive studies on biofuels, from the seed to fuel processing, fuel testing, engine testing and real time emissions monitoring. The state of the art lab facilities include oilseed pressing, biodiesel pilot plant, oil analysis lab, fuel chemistry lab, engine performance lab and emissions testing facilities.

The Center and its partners play an important role in realizing the vision of harvesting clean energy from rural America to fuel our nation's economy. Their research includes trying to develop bio-jet fuel from waste streams of ethanol and wood products, developing fuel additives to support wide use of biodiesel, in all extreme weather, to studying the changes of emissions from different biofuels.

Recently, the Center partnered with Burlington Northern Santa Fe Railway (BNSF) to conduct a comprehensive test to utilize 20 percent biodiesel blend for fuel in a switcher engine. BNSF is the second

largest diesel fuel user in the United States and consumes 30 million gallons a year in Havre, Montana alone. This is a year-long project that would demonstrate the performance of biodiesel under adverse weather conditions in Montana. The locomotive engines will undergo the standard maintenance check every 92 days starting July 1, 2010 including oil analysis, fuel analysis, injector evaluation, engine performance, fuel consumption and durability.

During the last phase of the project, real time emission data will be collected through the Center's partnership with National Renewable Energy Laboratory. All data will be compared against a locomotive engine dedicated to run using regular diesel fuel. It is estimated that in a year the use of B20 in one switch engine will reduce greenhouse gases emissions by up to 720,000 tons considering the entire life cycle of biodiesel compared to that of petroleum diesel. All biofuel will be grown and processed in Montana, thereby a closed cycle for biodiesel utilized in the project. **P&P**

If you are interested in more information about MSU-Northern or their Bio-Energy testing center call 1-800-662-6132 or visit them on the web at www.msun.edu.



Typical oilseed grown in Montana for biodiesel production (sunflower, camelina and safflower seeds).

Benefits of Biodiesel fuel:

- **REDUCED EMISSIONS:** Biodiesel produces 48% less carbon monoxide than conventional diesel.
- **RENEWABILITY:** Biodiesel is made from crops which can be grown annually.
- **BIODEGRADABLE:** The USDA also confirms that biodiesel biologically degrades in the environment as fast as dextrose (a form of sugar).
- **LONGER ENGINE LIFE:** Even biodiesel levels as low as 1% can provide up to a 65% increase in the lubricity in distillate fuels, leading to lower wear and tear on engine parts.
- **CO-PRODUCTS:** Several useable products are produced during the production of Biodiesel. Meal is obtained from crushing the seeds and it can be used for livestock feed (very high in Omega 3). There is also a glycerin produced that can be used in the production of other industrial materials.

◀ (L to R) Greg Kegel, Senator Jon Tester and Beau Price exchange a small sample of Biodiesel fuel to mark the beginning of a year of testing with BNSF.



Photo by Nikki Carlson