

BIO-BASED FUELS

Advancing Bio-Based Chemicals and Next-Generation Fuels from Montana's Agricultural Crops

Principal Investigators:

- Randy Maglinao · Advanced Fuels Center · MSU Northern
- Eleazer Resurreccion · Civil Engineering Technology · MSU Northern
- Andrew Sullivan · Process Plant Technology · MSU Billings City College

Funding Amount: \$800,000

Brief:

Although camelina, a rotational cover crop, grows well in the “Golden Triangle” and does not interfere with wheat production, it currently has no market. The Advanced Fuels Center and MSU Billings City College are creating a fuel additive from Montana-grown camelina to replace lead in aviation gasoline, the only fuel still allowed by the U.S. Environmental Protection Agency to use lead. This project will ultimately create a market for camelina as well as a “green-collar” industry in the Hi-line region.

Objectives and Progress:

1. Analyze economic feasibility as well as renewability of production process:
 - A. Preliminary life cycle analysis data has been collected and is being presented at the American Center for Life Cycle Assessment Conference in Charleston, SC.
2. Create efficient methods for production of aviation gasoline additive from camelina:
 - A. Mechanism validated through experiments and results were presented at the 106th American Oil Chemists' Society Annual Meeting in Salt Lake City, UT.
 - B. Proposals were submitted to National Science Foundation and U.S. Department of Agriculture.
3. Develop efficient green manufacturing processes to lower the cost of production:
 - A. Proposed method for creation of a catalyst is close to confirmation.
4. Create a marketable byproduct from manufacturing side products:
 - A. Small scale pelletization plant to upgrade byproduct has been commissioned at City College and automation techniques are in development.



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continued

Return on Investment:

- **Jobs**
 - Research scientists: 2 (1.0 FTE) and 2 (0.25 FTE)
 - Research technicians: 1 (1.0 FTE)
 - Research associate & assistants: 1 (1.0 FTE)
 - Undergrad & Graduate Assistants: 15
- **Connections—private sector partnerships:**
 - Calumet Refining—Great Falls
 - Elevance Renewable Sciences, Inc.—Illinois
 - Omega Grains, LLC—Bigfork
 - Old Dominion University—Virginia
 - Story Mill Oils—Laurel
- **Leverage—additional grant funds received:**
 - In progress
- **Output**
 - Successfully produced high octane hydrocarbons from camelina oil.
 - A pilot-scale pelletizing plant with a capacity of 3,600 lbs/day was commissioned.
 - Patent applications are in progress.

