



**Western SARE**

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# TESTING CAMELINA AS FEED, FUEL

**Situation**

Rising fuel prices are hampering the economic viability of agricultural producers. At the same time, producers on the northern High Plains would like to identify an ecologically and economically sustainable alternative to the traditional winter wheat-fallow production systems.

Camelina, an underutilized crop that can be produced in the semi-arid environment of the High Plains at lower cost and higher yield than other vegetable oil crops (canola, for example), could meet both challenges.

Camelina (*Camelina sativa*) can:

- Yield an oil that produces a low-pour-point biodiesel competitive in price and performance with traditional petroleum products

**Research & Education Grant**

**Title:** Evaluation of *Camelina sativa* as an Alternative Seed Crop and Feedstock for Bio-fuel and Developing Replacement Heifers

**Project Number:** SW07-049

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**Amount Funded:** \$155,000



Camelina fed to heifers in feeding trials.

- Serve as an alternative to fallow in winter wheat-fallow systems
- Generate co-products from oil processing that provide nutritious feeds for livestock

The biodiesel industry is still in its infancy. Supply is limited by availability and cost of feedstocks. Demand is limited by consumer lack of



Camelina pre-harvest.

knowledge. Developing synergies between agricultural producers and the biofuels industry could help producers financially, stimulate the industry and help reduce U.S. dependency on oil imports.

**Objectives**

1. Evaluate field production of camelina in Montana and Wyoming
2. Evaluate camelina oil for production of biodiesel
3. Evaluate camelina co-products in diets of developing replacement beef heifers
4. Evaluate the ecological impact and economic potential of camelina

**Actions**

To evaluate the production potential of camelina, the research team set up trials to assess yield, quality, growth patterns, climate and soil properties:



*Western SARE, a USDA organization, funds grants for research and education that develop or promote some aspect of agricultural sustainability, which embraces*

- *profitable farms and ranches*
- *a healthy environment*
- *strong families and communities.*

*The Western Region, one of four SARE regions nationwide, is administered through Utah State University.*

**Western SARE:**  
<http://wsare.usu.edu>

**National SARE**  
[www.sare.org](http://www.sare.org)

## TESTING CAMELINA AS FEED, FUEL

- 10- to 20-acre plots on grower fields in Wyoming and Montana
- A 10-acre plot at the Montana State University Experiment Station
- A plot at the University of Wyoming Sustainable Agriculture Research and Education Center (SAREC), Lingle

Over three years, at each site, four cropping rotation systems are being assessed:

1. (Traditional) Yr 1, winter wheat, Yr 2, fallow, Yr 3 winter wheat
2. (Traditional) Yr 1, fallow, Yr 2, winter wheat, Yr 3, fallow
3. Yr 1, winter wheat, Yr 2, camelina, Yr 4, winter wheat
4. Yr 1, camelina, Yr 2, winter wheat, Yr 3, camelina

To evaluate camelina oil for production of biodiesel, Energy Fuel Dynamics LLC and Blue Sun Biodiesel are processing the camelina and manufacturing biodiesel, which will be sent to a commercial lab for quality testing.

The feed trials are being conducted at the UW R&E Center in Laramie. In randomized complete block designed experiments:

- camelina meal is replacing soybean meal as supplemental protein
- glycerin is replacing corn as supplemental energy

Agriculture economists will develop enterprise budgets showing units costs and returns for cropping systems and supplemental feeding, extrapolating economic inferences for small- and medium-size farms as well as for rural communities.

The ecological sustainability of cropping systems will be compared by calculating an annual Soil Conditioning Index, a tool for measuring soil organic matter trends.



The oil press, below, yields oil, above from camelina seed, bottom.

### Results

Cooperators have met to assure consistent methods and procedures at all sites. Industry partners have helped identify varieties and growers who can test them.

Seed grown in Wyoming in 2006 was purchased for crushing at a Nebraska biodiesel facility. The resulting oil was used to produce biodiesel and the meal was shipped to the University of Wyoming, where it and the crude glycerin were used in the first of two heifer feeding trials.

### Potential Benefits

If camelina can be economically produced and processed in the High Plains region:

- It could impact as many as 37 million acres of cropland and yield as much as 10 million gallons of biodiesel a year.
- Producers could achieve net returns per acre greater than those for wheat and canola.
- Livestock operations would have access to



locally produced sources of protein (camelina meal) and energy (glycerin).

- Soil quality would be improved and erosion reduced by replacing summer fallow.
- Disease and insect cycles could be broken.
- Residual N in the soil could be taken up, potentially reducing ground and surface pollution.