

SMALL-SCALE, ON-FARM BIODIESEL PRODUCTION

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On-Farm biodiesel production has gained interest in the past few years as volatile energy costs impact Wisconsin farmers. Dairy and other livestock production continues to be very important in western Wisconsin and on-farm biodiesel production may be one way for livestock farmers to lower their costs both of fuel and protein inputs. Very little, if any, applied research is available for farmers regarding production, costs or safety of biodiesel production. University of Wisconsin Cooperative Extension Agriculture Agents in the Western District have developed a complete system for evaluating small scale on-farm biodiesel production including growing different oilseed crops to processing the oil into ASTM quality biodiesel. On-Farm Biodiesel Options for Livestock Farms is a program the extension agents have designed to provide farmers with unbiased information to make informed decisions regarding production of biodiesel. Information gathered from the program also includes quality and economics of feeding the protein meal byproduct to dairy cattle and other livestock.

The On-Farm Biodiesel Options for Livestock Farms program combines the need for applied research on oilseed production and biodiesel production with the desire of farmers to get hands-on experience in the field. Demonstration plots and yield results of oilseed (sunflower, soybean and canola) production have been developed at three locations. An oilseed press has been purchased to demonstrate crushing needs and variability of oil output. Finally, a biodiesel processing unit is established at a local farm cooperator to provide hands-on demonstrations to small groups of farmers.

An emphasis for the project has been the safe production of on-farm biodiesel. Many farmers are attempting to produce biodiesel with equipment not designed for biodiesel production. The use and handling of methanol is a huge safety concern on the farm. A major goal of the project is to discover the true cost of producing ASTM certified biodiesel safely.

Objectives of the On-Farm Biodiesel Options for Livestock Farms:

1. Producers (crop and livestock) will understand the profitability of producing oilseed crops in western Wisconsin soils.
2. Producers will understand the basics of small scale biodiesel production including regulatory and safety requirements.
3. Producers will understand the economics of small scale on-farm biodiesel production.
4. Producers will make an informed decision on starting their on-farm biodiesel production operation.
5. Producers will have a streamlined process available to meet necessary federal, state and local regulations.

Funding for the project has been obtained from a number of sources. Start up costs for a complete system from bin to fuel tank is about \$25,000.

Costs for basic equipment incurred for making biodiesel include:

Swedish Type 70 press	\$7700	Biodiesel processor	\$10,500
Boiler system	\$5470	Donated bulk bin and Augers	

Currently, oil yields of canola, soybean, and sunflower have been collected during the 2007 and 2008 growing seasons. 2008 data are currently being processed. UW-Extension publication A3654 Wisconsin Soybean Variety Test Results provides data of variety oil content. Data from canola trials in Chippewa Falls are available at:
<http://osbornlab.agronomy.wisc.edu/research/results.html>

Sunflower Variety Results 2007
 From 2 locations (Sparta and Alma)

Company	Variety	Yield lb/acre	% crude protein	% fat	Gallons oil/acre
Croplan	544	1550	18.4	29.4	54
Garst	4596	3001	14	38.4	141
Garst	4668	1914	18.1	32.2	73
Garst	4682	2321	16.7	35.6	99
Garst	4704	2591	16.4	34.8	108
Pioneer	63M52	2843	17.4	34.8	118
Pioneer	63M91	2392	17.3	34.8	99
Mycogen	8N358	1776	18.8	36.1	76
Mycogen	8N386	2357	20.2	36.8	103

Soybean Variety Results 2007
 Across 3 locations (Sparta, Tomah, Alma)

Variety	yield	% oil	% protein	Gal/acre
Brunner 2101 rr	46.6	19.7	33.9	76
Croplan 2020	46.5	20.1	34.2	77
Dahlco 9213	47.5	19.5	33.8	76
Kruger K195 rr/scn	43.9	20.1	33.9	73
Latham E1950 r	48.4	19.5	33.2	78
NK S21-N6	57.8	20.2	33.2	96
Pioneer 92M32	48.2	19.5	33.6	77
LSD 0.10	7.9	0.3	0.7	

For more information or questions about the On-farm Biodiesel Production project contact:

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Funding sources:

UW-CALS
UW-Western District Ag Agents
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UW-Extension Western District
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