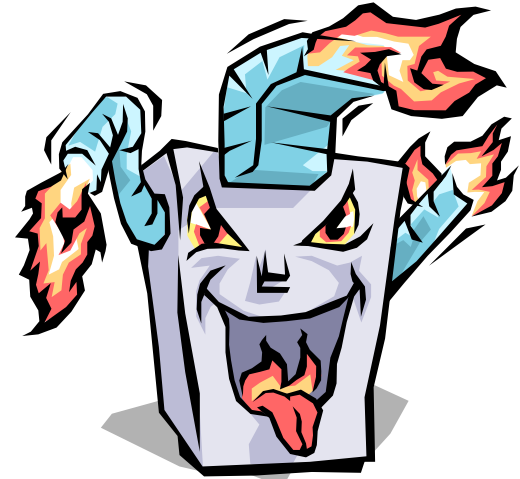
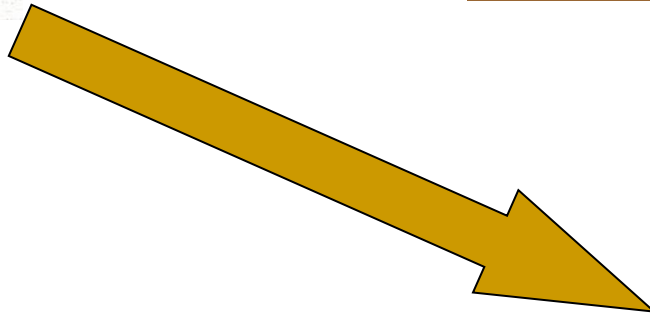
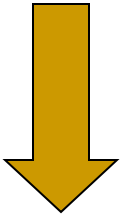

2010 On-Farm Small Scale Biodiesel Update



Steve Huntzicker, Bill Halfman, Jerry Clark, Jon Zander ,
Trisha Wagner, Bob Cropp & Carl Duley

La Crosse, Monroe, Chippewa, Trempealeau, Jackson, Pepin
& Buffalo County Agriculture Extension Agents

LW
Extension



Biodiesel Project - Purposes

- Evaluate the feasibility of on-farm scale, biodiesel production
 - Grow the oil crop, press and refine
 - Factor in fuel quality and safety
 - Use the fuel in machinery and for heating the home and or shop
 - Feed the meal to the livestock
-

First decide your purpose



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BIODIESEL

“Unleashing the power of the bean!”

Sunflower Challenges:

- Lodging – **Poor ground – limit fertilizer**
- Weed Control – **excellent (little pricey)**
- Birds – **early variety seem better**
- Unknowns – insect and disease control – **watch out for white mold**
- Harvest equipment – **corn head –OK**
- Drying – **don't use dryer (field dry)**
- Storage - **???? Haven't dealt with**

Canola Challenges:

- Lodging - **not a big issue to date**
- Weed Control - **Round-up Ready**
- Birds - **not an issue**
- Unknowns – insect and disease control - **?**
- Harvest equipment - **field loss significant**
- Drying – **don't use dryer (field dry)**
- Storage - **???? Haven't dealt with**

FARM SCALE BIODIESEL PLANT CAPITAL INVESTMENT

| Asset | Notes | Cost |
|----------------------------|---|-----------------|
| Press | Swedish Type 70 | \$7,700 |
| Furnace | Multi-Fuel | \$6,410 |
| Hp-100 Biodiesel Processor | Includes scale and testing equipment | \$10,500 |
| Dry Wash Tower | Includes pump and calculator | \$1,034 |
| Building | 20'X40' pole barn w/ concrete floor | \$12,000 |
| Building Modifications | Wiring, augers, storage, grain hoppers, fans, etc | \$1,500 |
| Other | Pumps and misc | \$400 |
| Total Investment | | \$39,544 |

System Operating Assumptions

| ISSUE | AMOUNT |
|--|----------------|
| Operation - Days/Year | 182.5 Days |
| Canola or Sunflower Seed Biodiesel Production/Year | 7,300 Gallons |
| Plant Labor Required/Year | 91.25 Hours |
| Gallons of Vegetable Oil Required/Year | 7,811 Gallons |
| Pounds of Vegetable Oil Required/Year | 60,145 Pounds |
| Pounds of Canola or Sunflower Seeds Required/Year | 150,708 Pounds |
| Tons Of Canola or Sunflower Meal Produced | 52 Tons |

OILSEED CROP OPERATING ASSUMPTIONS

| ISSUE | AMOUNT |
|---|--------------|
| Canola Yield/Acre | 1,945 Pounds |
| Canola Acres Required/Year | 77.5 Acres |
| Total Cost (\$293/acre) To Produce The Canola Needed | \$22,708 |
| Sunflower Seed Yield/Acre | 2,500 Pounds |
| Sunflower Seed Acres Required/Year | 60.3 Acres |
| Total Cost (\$314/acre) To Produce The Sunflower Seeds Needed | \$18,934 |

Estimated Cost to Produce Canola and Sunflower BioDiesel

| Item | Canola (\$/gal) | Sunflower (\$/gal) |
|-----------------------------|-----------------|--------------------|
| Oil Seed | \$2.97 | \$2.70 |
| Prod cost including labor | \$0.43 | \$0.43 |
| Overhead | \$0.79 | \$0.79 |
| Opportunity cost of capital | \$0.39 | \$0.39 |
| Estimated cost | \$4.58 | \$4.31 |
| Credit for Co-Product | \$1.58 | \$1.18 |
| BioDiesel Cost | \$3.00 | \$3.13 |

Challenges to Date:

- Flash Point too high
 - Safety – methanol vapor levels - \$\$
 - Regulations
 - Dept of Commerce - ??
 - DNR – no problem w/ methanol recovery, water wash
 - Local – no problem
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