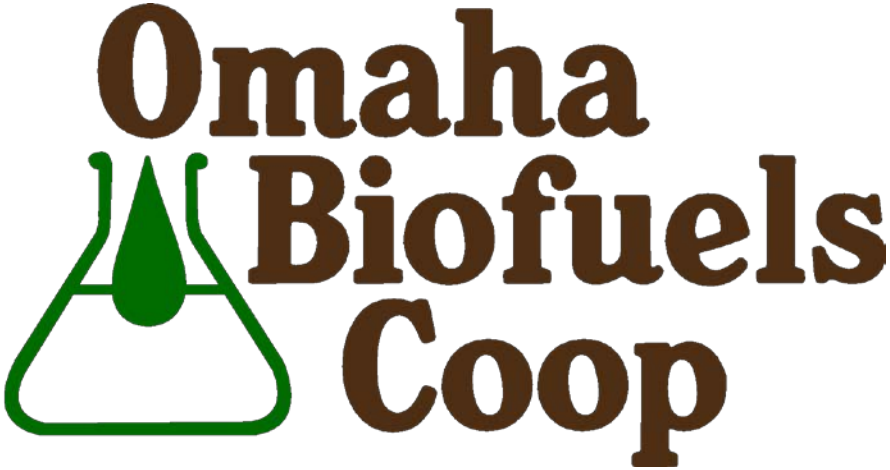


To produce, use, and promote biofuels

Eric Williams
President, Omaha Biofuels Coop
2013-11-13
CC BY-NC-SA 3.0

Omaha Biofuels Coop

About the Coop

- Founded June 2008
  - Producer / Consumer License
- Not-for-profit, cooperative
- Biodiesel, WVO, others…

Omaha Biofuels Coop

Dues, Finances

- Members pay initial dues when joining
- Cost of production recovered
- Oil, chemicals, road fuel tax, equipment
- Looking for a new production location

Omaha Biofuels Coop

Outreach

- Creative Commons, open information
  - "Free as in speech" not "Free as in beer"

    www.CreativeCommons.org
- Ignite Baltimore
- Talking points aren't always a bad thing
  - "no silver bullet, silver buck shot"

Omaha Biofuels Coop

Outreach

- Omaha Biofuel**s Coop** → *Scoop*
- Our Lady of Lourdes, Earth Day Demonstration

Omaha Biofuels Coop

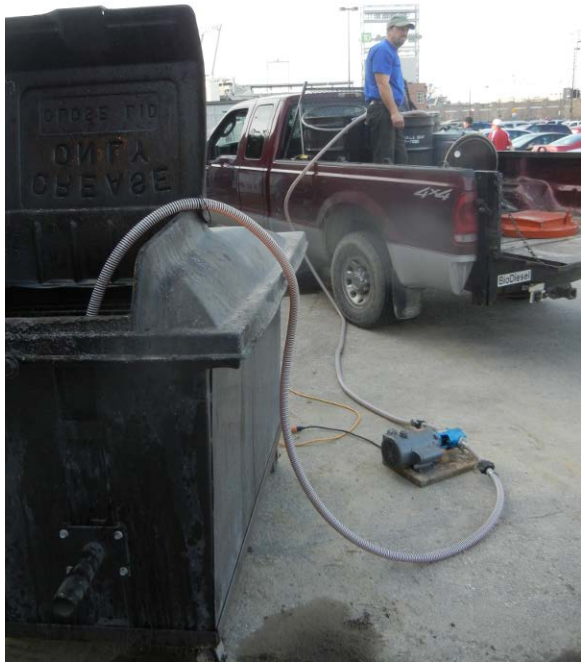
Outreach

- Presentations archived on our website
- Creighton, *CHM 515 - Green Chemistry*
  - Education, research, and production lab

Omaha Biofuels Coop

Experiment, Learn, and Adjust

Waste Vegetable Oil (WVO) can be messy stuff



Omaha Biofuels Coop

Experiment, Learn, and Adjust

Up through the ground came a bubblin' crude.

Vegetable oil that is. Green gold.

Omaha Biofuels Coop

Experiment, Learn, and Adjust

Omaha Biofuels Coop

Research

- Dry Wash Towers
- Vacuum methanol recovery
- 3/27 test, 90/10 test

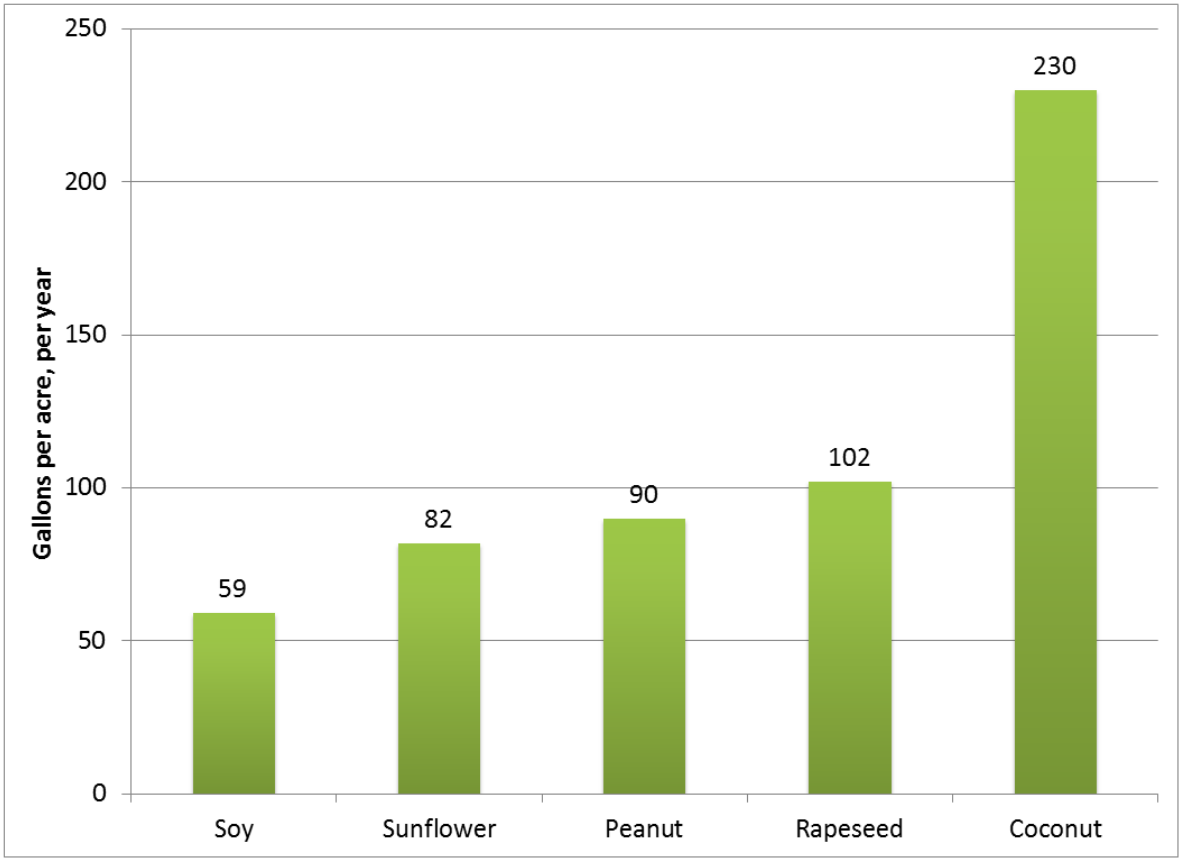
Omaha Biofuels Coop

Current Oil Sources

- Oil produced from farm crops
- Limited land area, energy/resource intense

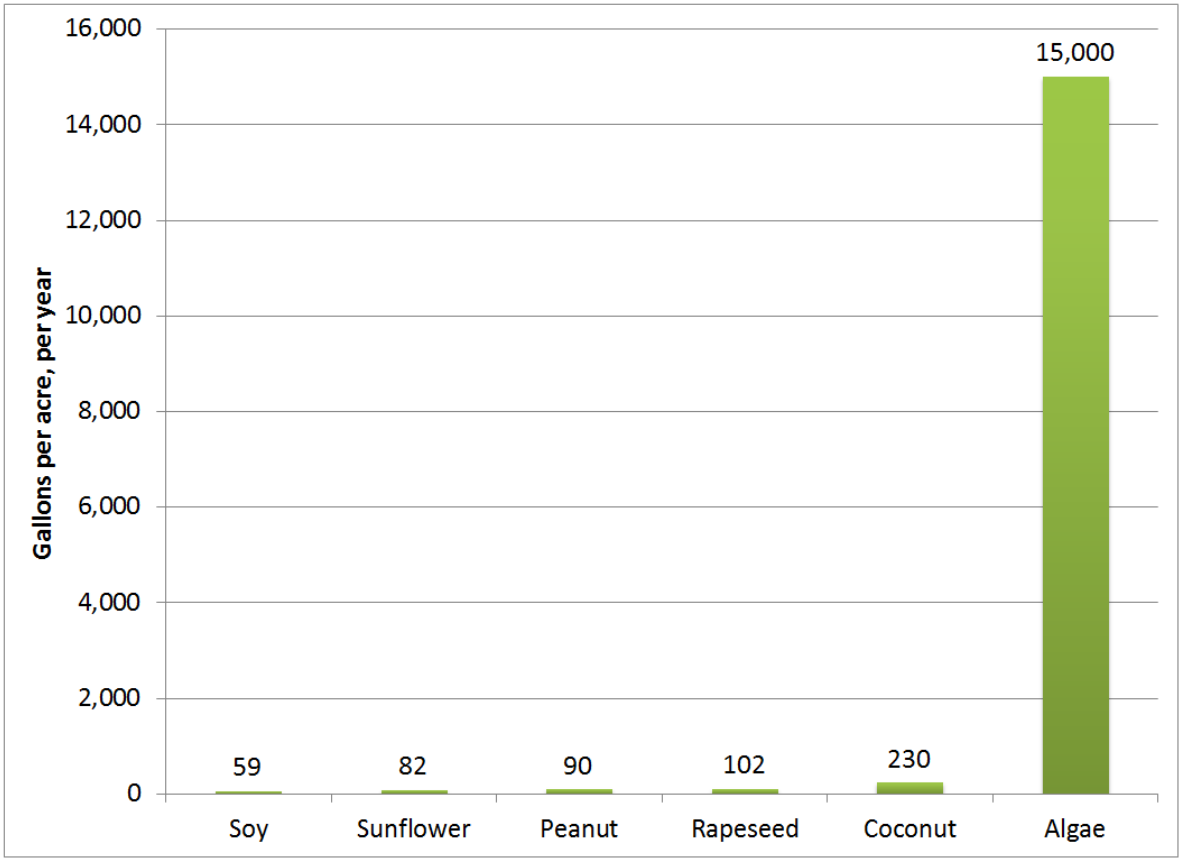
Omaha Biofuels Coop

Current Oil Sources…



Omaha Biofuels Coop

…Future Oil Sources



Omaha Biofuels Coop

…Future Oil Sources

Omaha Biofuels Coop

<u>Two routes to process microalgae biomass</u>

-Whole Algae Hydrothermal Liquifaction (HTL)

- Adv: High fraction of total carbon in "oil" phase
- Dis: High fraction of oxygen, nitrogen in oil

-Lipid Extraction (liquid-liquid solvent sep.)

- Adv: Higher quality oil
- Adv: Possible co-products (protein feed, fertalizer)
- Dis: Additional processing step(s)

Omaha Biofuels Coop

Algae biomass separation

-Dry solvent extraction (e.g hexane)

- Adv: Similar to agricultural processes (soybean oil)
- Dis: Drying so much H2O is **energy intense** ($$$)
- Dis: Drying causes algae to form cysts, "shells"

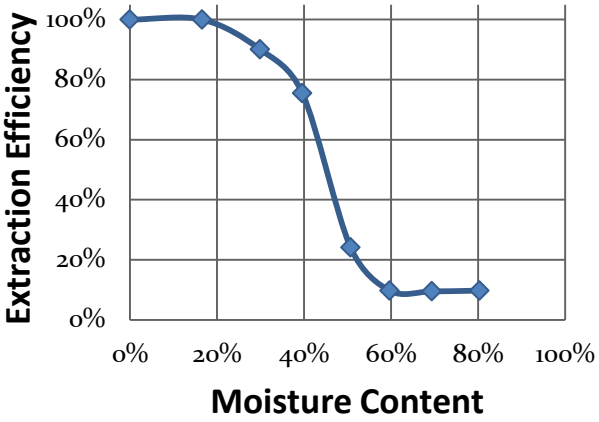
-Wet separation

- Adv: Algae are wet biomass
- Dis: Higher volume to process

Omaha Biofuels Coop

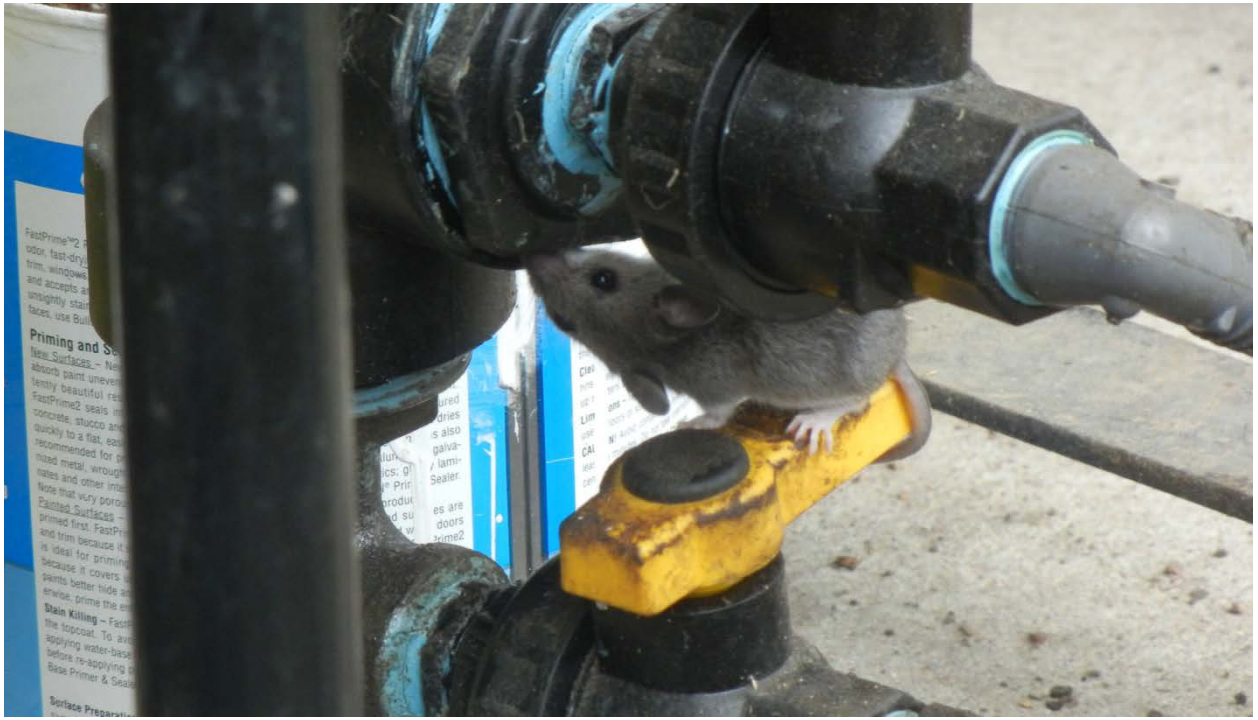
Wet algae separation

- Water presents a barrier
  - Traditional solvents (hexane) are water-insoluble
    - Good for phase separation
    - Bad for extraction
  - Alternate separating solvents are being researched and developed (Scott Williams)



Omaha Biofuels Coop

Everyone loves biofuels



www.OmahaBiofuelsCoop.org
www.facebook.com/OmahaBiofuelsCoop
@OmahaBiofuels, @algae