

Biodiesel Basics

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Member, National Biodiesel Board

A guide to this
fast-growing, high-quality
American-made fuel.

What is biodiesel?



- Renewable fuel for any diesel engine
- From renewable resources such as soybeans
- Used in pure form (B100) or blended with petroleum diesel at any level
- Made in the USA
- Available in 50 states

What is biodiesel?

❑ **General Definition:**

Biodiesel is a domestic, renewable fuel for diesel engines derived from natural oils such as soybean oil, and which meets the specifications of ASTM D 6751.

❑ **Additional Information:**

Biodiesel can be used in any concentration with petroleum-based diesel fuel in existing diesel engines with little or no modification. Biodiesel is not raw vegetable oil. It is produced by a chemical process that removes glycerin from the oil.

What is biodiesel?

□ Technical Definition:

Biodiesel, n—a fuel composed of mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats, designated B100, and meeting the requirements of ASTM (American Society for Testing & Materials) D 6751.

Biodiesel Blend, n—a blend of biodiesel fuel meeting ASTM D 6751 with petroleum-based diesel fuel, designated B \underline{xx} , where \underline{xx} represents the volume percentage of biodiesel fuel in the blend.

Biodiesel Production



100 lbs. of soybean oil

+

10 lbs. methanol

=

100 lbs. soy biodiesel
(B100)

+

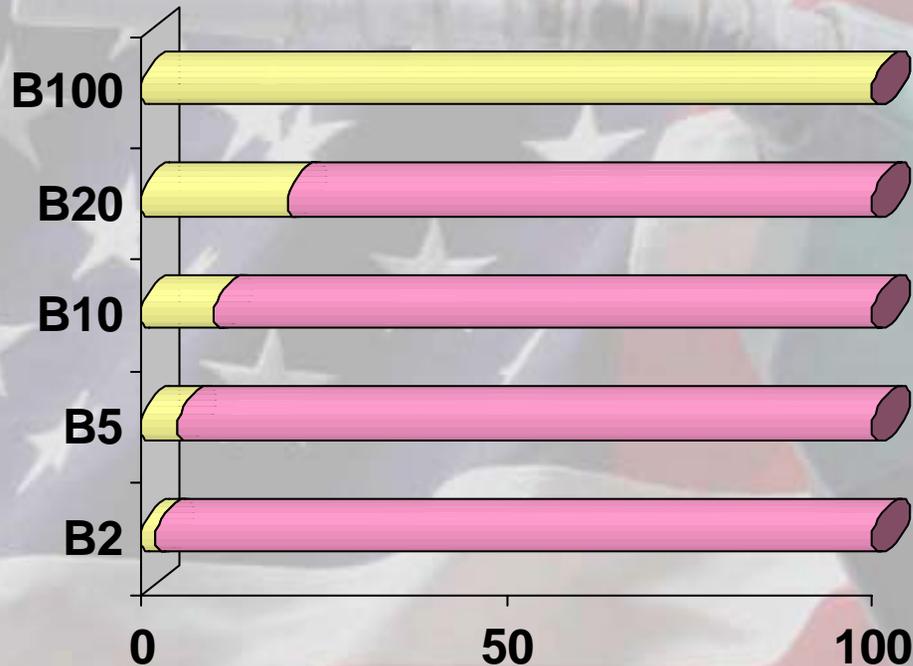
10 lbs. of glycerin



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Biodiesel Blends

■ Biodiesel ■ Petroleum diesel



B100 = 100% biodiesel

B20 = 20% biodiesel + 80% petroleum diesel

B10 = 10% biodiesel + 90% petroleum diesel

B5 = 5% biodiesel + 95% petroleum diesel

B2 = 2% biodiesel + 98% petroleum diesel



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Rudolf Diesel



- ❑ Designed diesel engine in 1894 to run on peanut oil
- ❑ *“The use of vegetable oils for engine fuels may seem insignificant today. But such oils may become in the course of time as important as petroleum and the coal tar products of the present time.”*

–1912

Soybean Checkoff & biodiesel



- ❑ **1992:** Soybean checkoff funds soy biodiesel research

PHOTO: South Dakota farmer-leaders show former Sen. Tom Daschle an early soy biodiesel demonstration vehicle in Washington, D.C.



- ❑ **2005:** Soybean checkoff continues to fund most soy biodiesel growth

PHOTO: South Dakota farmer Bob Metz, former NBB Chairman, welcomes the same vehicle back to Washington, D.C., 10 years and 300,000 miles later in 2002.


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Dominant feedstock: soybean oil



☐ Soy Biodiesel

- ✓ Thoroughly researched
- ✓ Road/Field-tested
- ✓ 10 years + of development & promotion funded by soybean checkoff

Biodiesel Users



□ Major Customers Include:

- ✓ U.S. Forest Service
- ✓ U.S. Postal Service
- ✓ MODOT, NJDOT
- ✓ Yellowstone Park
- ✓ City of Philadelphia
- ✓ Lambert-St. Louis International Airport
- ✓ Florida Power & Light
- ✓ Omaha Public Power
- ✓ Medford N.J. School District
- ✓ U.S. farmers
- ✓ More!


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Biodiesel Quality



- Registered with EPA
 - ✓ legal fuel
 - ✓ health effects testing
- National Fuel Standard
 - ✓ ASTM D 6751
- Convenient EPACT compliance option
 - ✓ federal, state and public utility vehicle regs.

Biodiesel Performance



- Similar to petroleum diesel
- Highest BTU content of any alternative fuel
- High cetane
 - ✓ Minimum cetane of 47, which is higher than most #2 diesel

Biodiesel Performance



- High lubricity
- Cold flow
 - ✓ B2 the same as #2 petroleum diesel
- High flash point
 - ✓ 260°F vs. 117°F for diesel
- Safest fuel to use, handle & store

Biodiesel Performance



- Many engine manufacturers support biodiesel blends
 - ✓ Caterpillar
 - ✓ Cummins
 - ✓ Detroit Diesel
 - ✓ New Holland
 - ✓ International
 - ✓ John Deere
- Position statements:
www.biodiesel.org

Biodiesel & Cleaner Air



- Decreases most EPA-targeted emissions
- Virtually free of sulfur & aromatics
- Soy B100 reduces lifecycle CO₂ by 78%

Biodiesel & Environment



- Highest energy balance of any fuel
✓ 3.2 - 1
- Biodegrades as fast as sugar
- 10 times less toxic than salt



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Biodiesel & Energy Security



Source: USDOE

- Petroleum imports projected to provide 68% of U.S. demand in 2025
 - ✓ up from 55% in 2001
- U.S. now consumes 20 million barrels of oil a day
 - ✓ 10+ million imported


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Biodiesel & Energy Security



Source: USDOE

- ❑ Top 10 nations with oil:
 - ✓ Saudi Arabia
 - ✓ Iraq
 - ✓ United Arab Emirates
 - ✓ Kuwait
 - ✓ Iran
 - ✓ Venezuela
 - ✓ Russia
 - ✓ Libya
 - ✓ Mexico
 - ✓ China



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Personal Use On Farm

- Used B20 for last five years on farm with All tractors, combines, trucks, pickups.
- No adverse effects, no powerloss, no economy loss.
- No black smoke – light grey and disapates.
- Used last five winters with a winter blend of 50% - #2, 20% - biodiesel, 30% - #1.

Biodiesel Action



- State governments
 - ✓ Minnesota, 2002
 - ✓ requires B2
 - ✓ Illinois, 2003
 - ✓ state tax incentive
- U.S. government
 - ✓ Executive branch
 - ✓ USDOD, USDA
 - ✓ Legislative branch
 - ✓ U.S. Congress
 - ✓ federal tax incentive

Biodiesel Action



- ❑ Federal tax incentive
 - ✓ Effective in 2005
 - ✓ Excise tax credit
 - ✓ taken at blender level
 - ✓ \$.01 per % blended for soy biodiesel
 - ✓ Should make soy biodiesel more affordable than ever!

Biodiesel & Farm Use



- B2 or higher is target blend level
- During winter, handle B2 just like #2 diesel
 - ✓ add pour point depressants
 - ✓ store vehicles indoors
 - ✓ or use block htrs.
- Shelf life for B2 is same as #2 diesel

Biodiesel & Farm Use



- Equipment benefits
 - ✓ superior lubricity
 - ✓ B2 has up to 66% more lubricity than #2
- EPA requires sulfur reduction in 2006
- No overdosing concerns
- Utilize U.S. crops

If every farmer used B2...



we could utilize:

- 53.8 million gallons of soy biodiesel annually
- 38.5 million bushels of U.S. soybeans annually

If every trucker used B2...



we could utilize:

- ❑ 742 million gallons of soy biodiesel annually
- ❑ 530 million bushels of U.S. soybeans annually

Biodiesel Action



- Our soybean checkoff helped develop soy biodiesel and continues to fund its growth



- Ask fuel suppliers and retailers to carry soy biodiesel



- Use soy biodiesel on your farm

Biodiesel Backers & Alliance



- Easy to join...do it!
 - ✓ www.biodiesel.org
- Individuals: “Backers”
 - ✓ farmers
 - ✓ consumers
 - ✓ other diesel users
 - ✓ fuel suppliers
- Orgs.: “Alliance”
 - ✓ agricultural
 - ✓ environmental
 - ✓ health
 - ✓ government

About the National Biodiesel Board

- The mission of the National Biodiesel Board is to increase the demand of commercially produced biodiesel in the United States through education, communication, and quality assurance programs and by serving as the national coordinating entity and clearinghouse of information.

About the National Biodiesel Board

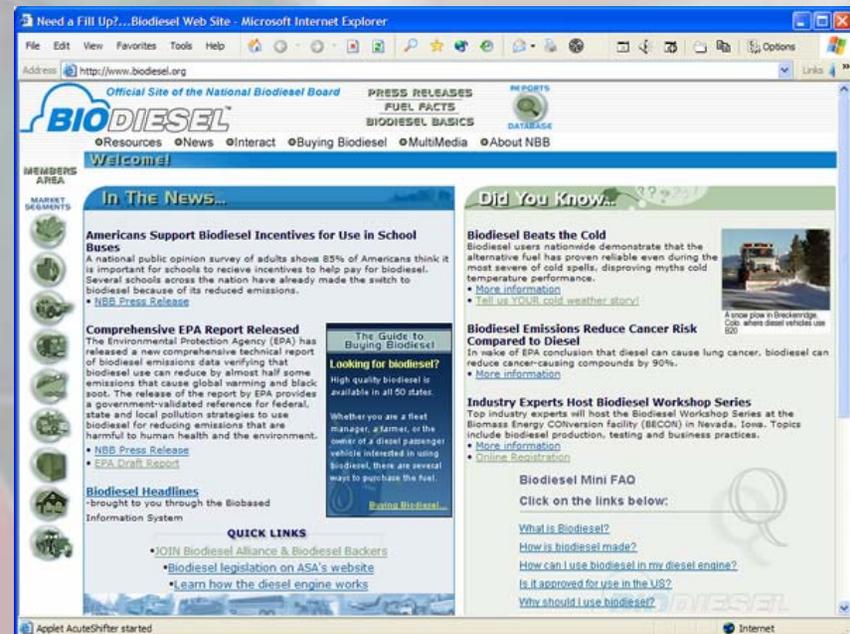
- Founded in 1992 in Jefferson City, MO as the National Soy Diesel Development Board
 - by state soybean commodity groups funding biodiesel development programs.
 - Research began at Univ. of Missouri
- Became National Biodiesel Board in 1994 to reflect preferred name for fuel
- Developed into a comprehensive industry association

About the National Biodiesel Board

- Members are:
 - state, national, and international feedstock and feedstock processor organizations
 - Biodiesel suppliers, fuel marketers and distributors
 - Biodiesel technology providers

NBB...A Resource for YOU!

- www.biodiesel.org is centerpiece of NBB's public information service
- Searchable database for reports and studies
- Fact sheets
- Market segment information (farming, marine, etc.)
- News releases, links to daily biodiesel news stories
- User testimony




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