

Biodiesel Fuel

Using Biodiesel Fuel in John Deere Engines



JOHN DEERE

Working together for
a cleaner environment



Biodiesel is here

Biodiesel is a renewable, oxygenated fuel made from a variety of agricultural resources such as soybeans or rapeseeds.

One of the primary advantages of biodiesel is its renewability. As a renewable, domestic energy source, biodiesel can help reduce dependence on petroleum imports.

Biodiesel is nontoxic, biodegradable, and suitable for sensitive environments. Biodiesel contains no petroleum but can be blended at any level with petroleum diesel to create a biodiesel blend. Biodiesel refers to the pure alternative fuel before blending with petroleum-based diesel fuel. Biodiesel blends are denoted as "BXX," with "XX" representing the percentage of biodiesel contained in the blend. For example, B20 fuel is a blend of 20 percent biodiesel with 80 percent conventional diesel. B100 is pure biodiesel.

Biodiesel is the result of a chemical process that separates cold-pressed product into methyl esters (biodiesel) and glycerin (a valuable co-product with numerous uses). Raw vegetable oil is not considered biodiesel. Much of the biodiesel produced in the U.S. comes from soybeans. It also can be made from other new and recycled oilseed crops, animal fats, and grease.



What does biodiesel mean for John Deere engines?

John Deere Power Systems has a strong commitment to the environment, energy security, and technological advances that have a positive impact on both.

Biodiesel certainly meets these criteria. While B5 blends are preferred, biodiesel concentrations up to 20 percent (B20) blended in petroleum diesel fuel can be used in all John Deere engines providing the biodiesel used in the fuel blend meets the standards set by the American Society of Testing Materials (ASTM) D6751.

We recognize the importance of biofuels to our customers and to the environment. Use of quality biodiesel in John Deere diesel engines has economic and environmental benefits, boosts development in rural areas, and helps provide energy security.

John Deere was one of the first off-highway engine manufacturers to factory-fill biodiesel in North America, and we approved B5 biodiesel in 2001. Since then, John Deere has continued to conduct biodiesel research and has performed lab and field tests using biodiesel fuel. We have also developed a fuel conditioner that is recommended when using lower biodiesel blends and required when using B20 blends and above.

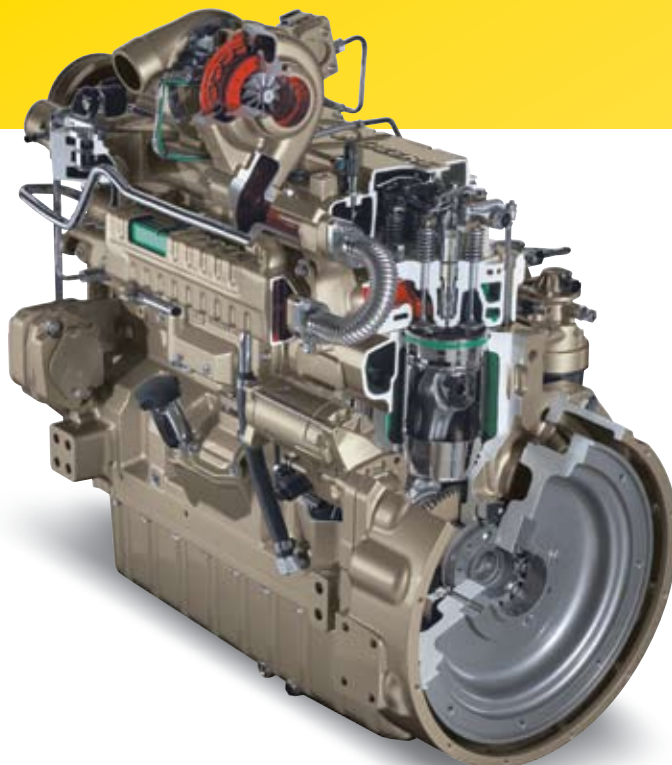
A closer look at biodiesel


As a major manufacturer of diesel engines, we have a vested interest in a consistent, high-quality supply of diesel fuel.

To ensure the quality of B20, the National Biodiesel Board awards the BQ-9000 certification to those marketers and producers who meet strict quality criteria in the areas of storage, sampling, testing, blending, shipping, distribution, and fuel management. Biodiesel users in the U.S. are strongly encouraged to purchase biodiesel blends from a BQ-9000 Certified Marketer and sourced from a BQ-9000 Accredited Producer (as certified by the National Biodiesel Board). Certified Marketers and Accredited Producers can be found at www.bq-9000.org.

Besides its environmental and energy-security benefits, quality biodiesel results in improved lubricity, minimal sulfur emissions, and reduced aromatics. Biodiesel has a high cetane content for faster ignition. It also produces less visible smoke and lowers the amount of particulate matter, hydrocarbons, carbon monoxide, and life-cycle carbon dioxide emissions produced by an engine.

At 3.2 to 1, biodiesel has an energy balance ratio higher than most alternative fuels. This means a gallon of biodiesel provides users with 3.2 times the energy it takes to produce it.





What every biodiesel user needs to know

While B5 blends are preferred, biodiesel concentrations up to 20 percent (B20) blended in petroleum diesel fuel can be used in all John Deere engines providing the biodiesel used in the fuel blend meets the standards set by ASTM D6751. However biodiesel impacts all diesel engines – no matter what brand. In an effort to ensure every John Deere engine user enjoys a positive experience, we want you to know the benefits as well as the cautions of using biodiesel. Every potential user should know the following when considering the use of biodiesel.

Material compatibility

- Through repeated exposure, biodiesel can seep through certain seals, gaskets, hoses, elastomers, glues, and plastics. This is more of a problem in older engines.
- Natural rubber, nitrile, and butile rubber are particularly vulnerable to degradation.
- Brass, bronze, copper, lead, tin, and zinc can accelerate the oxidation of biodiesel and create deposits in the engine.

Performance

- Compared to conventional petroleum diesel fuel, B20 will result in slight reductions in power and fuel economy.
- Biodiesel can accelerate the degradation of crankcase oil.
- When using biodiesel fuel, the engine oil level must be checked daily.
- In no instance should the fuel dilution of the oil be allowed to exceed 5 percent. OILSCAN™ can be used to verify fuel dilution levels.
- Fuel should be sampled periodically to ensure a consistent percentage of biodiesel.
- Biodiesel can reduce water separator efficiency.
- Biodiesel can cause cold weather flow degradation.

Storage and handling

- To ensure a stable product, a quality B20 should be used within 90 days of the date of biodiesel manufacture because biodiesel is biodegradable. Storage tanks should be protected from direct sun, frost, and other extremes.

- To improve storage of biodiesel fuels, John Deere recommends the use of a fuel stabilizer. To be effective, the stabilizer needs to be added to the fuel when it is fresh (close to the time it was produced). Testing the fuel to ensure it continues to meet specifications is recommended.
- Tanks should be kept as full as possible to minimize condensation because water accelerates microbial growth.
- Acceptable storage tank materials include aluminum, steel, fluorinated polyethylene, fluorinated polypropylene, Teflon®, and most fiberglass.
- Sedimentation and water should be removed on a routine basis.
- John Deere-approved fuel conditioners containing detergent/dispersant additives are required when using blends of B20 and are recommended when using lower biodiesel blends.
- Fuel conditioners can improve pour points during the winter and oxidation stability in the summer.
- New fuel filters should be installed when biodiesel is introduced to older or used engines. For the first two changes, the fuel filter life will be half the standard.
- Biodiesel might cause corrosion and deposit formation due to higher acidity.

Emissions

- Users are responsible for compliance with local emissions regulations limiting the use of biodiesel in emissions-certified engines.
- Biodiesel tends to increase NOx emissions while reducing smoke.

This list of considerations is not intended to be all-inclusive. Consult your engine Operators Manual, your local John Deere engine distributor or equipment dealer, or visit www.JohnDeere.com/biodiesel for more information.

Warranty

- The John Deere warranty covers only defects in material and workmanship as manufactured and sold by John Deere. Failures caused by poor quality fuel of any type cannot be compensated under our warranty.



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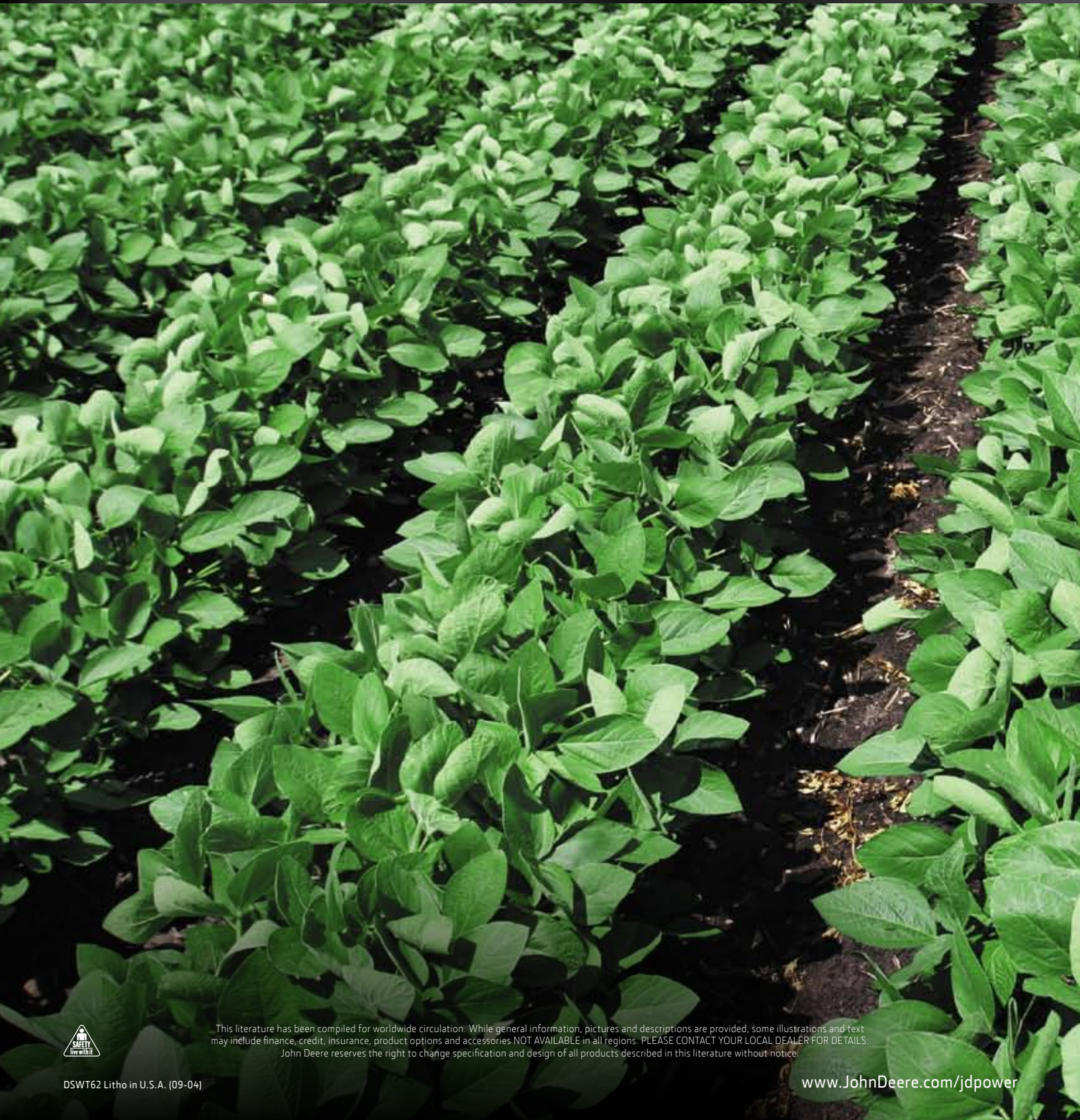
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