THINK SOY

RESOURCEFUL › RELIABLE › RESPONSIBLE

THINKING SUSTAINABILITY ? THINK SOY

USB
UNITED SOYBEAN BOARD
Progress Powered by U.S. Farmers

THINK SOY

RESOURCEFUL • RELIABLE • RESPONSIBLE

LOOKING FOR A HIGH-QUALITY FEEDSTOCK THAT CAN:

- Reduce dependency on petroleum and associated price fluctuations for raw materials?
- Replace suspect carcinogens?
- Improve product performance?
- Seamlessly drop into your manufacturing process?
- Improve your corporate sustainability practices while reducing regulatory compliance and insurance costs?
- Make your products eligible for higher LEED credits?
- Improve production with an uninterrupted, abundant supply?

THINK SOY.

The use of soybean derivatives in manufacturing isn't new. In fact, Henry Ford and George Washington Carver shared a vision of using soybeans and other natural derivatives to make plastics, paint, fuel and other products.

Following World War II, petrochemicals replaced soy feedstock in many industrial products, due to their availability and cost. However times, and economics, have changed.

These days, renewable soybean feedstocks are helping manufacturers become less reliant on fluctuating petroleum prices and supplies. Use of soybean ingredients is growing because soybeans are a reliable, sustainable feedstock that is grown in both hemispheres of the world.

The United Soybean Board (USB) supports innovative research that leads to the development and commercialization of sustainable products containing soy.

Soybean oil has been proven to be an effective and economical alternative to petroleum-based feedstock in hundreds of products ranging from polyurethane foam to thermoset plastics, paints, coatings and solvents.

Soybean meal is also being used as a filler in plastics, rubber, synthetic fibers, resins and adhesives.

You'll also find soybean feedstock in detergents, candles and personal-care products – and the list of new uses for soy-based components keeps growing.

Ford Soybean Processing Plant at the River Rouge Complex

THINK RESOURCEFUL ... AND ADAPTABLE.

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When soybeans are crushed, they yield meal, which is a high-protein ingredient necessary for the efficient production of poultry, livestock and fish. As world demand for meat, poultry, eggs, dairy products and seafood increases, the demand for soybean meal, which makes up 80 percent of the soybean, will continue to increase.

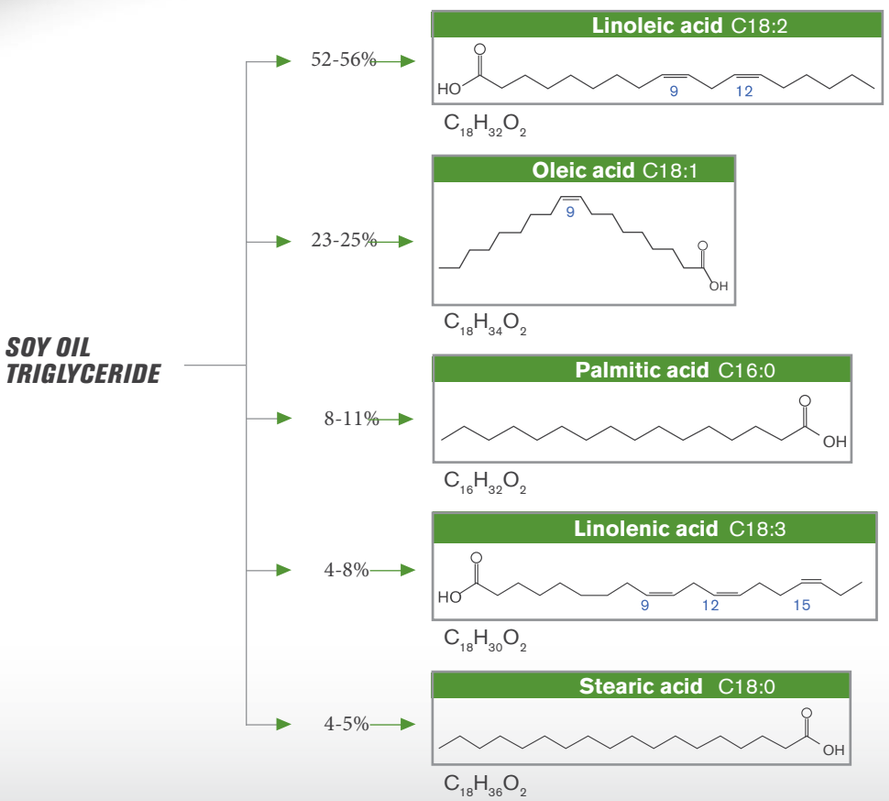
Cooking oil is still the largest use of soybean oil. However, soybean oil is finding its way into other uses in various industries, including biodiesel and as a direct raw material substitute for petrochemicals in manufacturing.

Soybean oil is one of the most versatile of the natural oils. Its molecular structure and suitable fatty-acid profile can be readily modified for many applications.

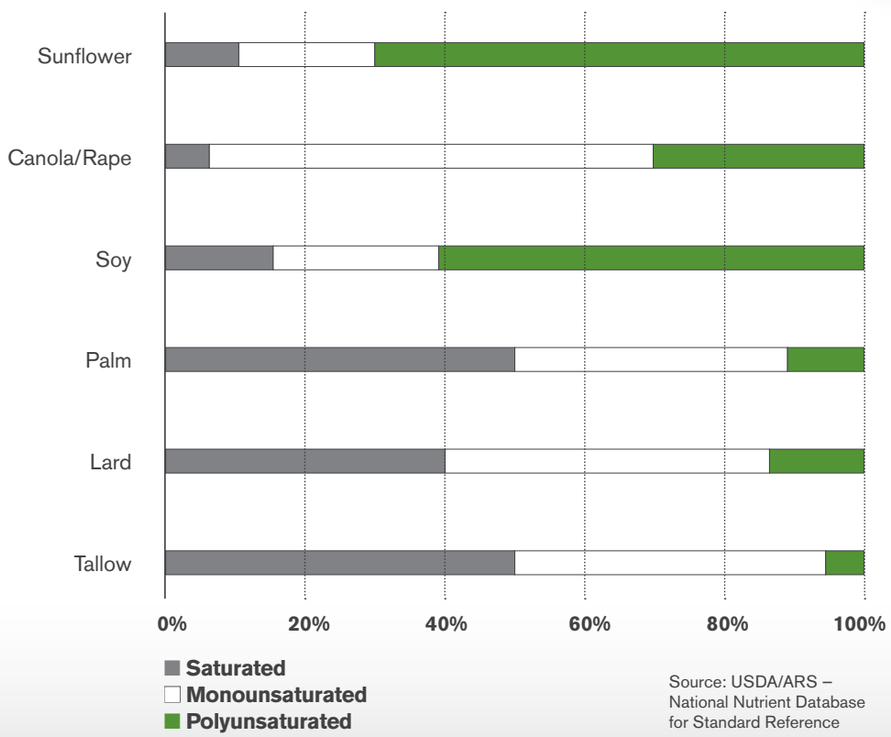
All natural oils have a place in industry, but unlike palm oil and animal fat, soybean oil is low in saturated fats and high in monounsaturated and polyunsaturated fats, which provide reactive sites for chemical modification.

Soybean oil is more readily available and typically lower in cost than other highly unsaturated natural oils.

SATURATED AND UNSATURATED FATTY ACIDS IN SEED OILS



FATTY ACID PROFILES OF MAJOR VEGETABLE OILS AND ANIMAL FATS



Source: USDA/ARS – National Nutrient Database for Standard Reference

THINK RELIABLE ...
AND ABUNDANT SUPPLY.

THINK SOY
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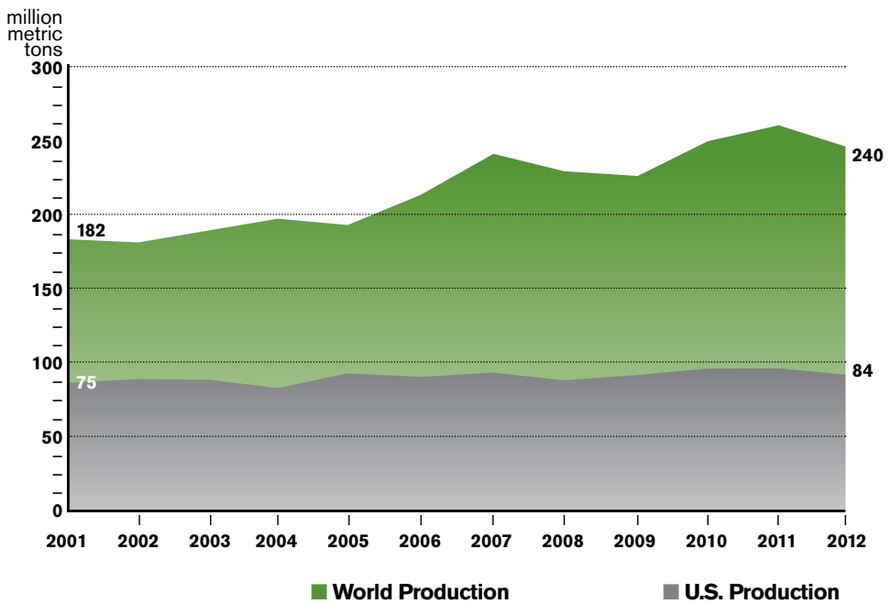
Since 2001, world production of soybeans has increased by more than 40 percent. In the U.S., this growth has largely been the result of higher yields, not new land coming into production. Advances in agriculture ensure the rate of soybean production growth is sustainable for the future.

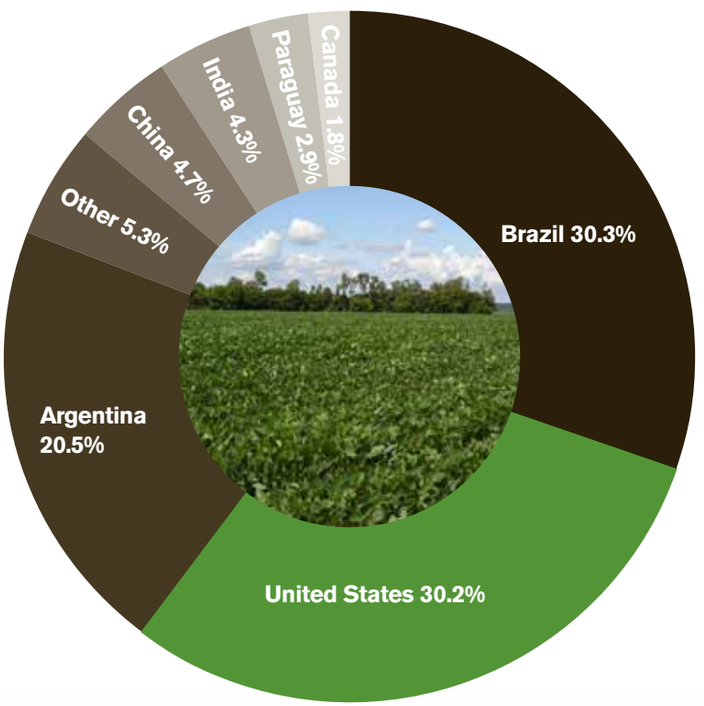
Soybeans are a global feedstock. In fact, soybeans are the only major agricultural crop grown in equal amounts in the Northern and Southern hemispheres. There is a new crop being planted and a new supply being harvested twice each year, which helps moderate the potential for supply swings.

Today the U.S. grows and reliably delivers approximately 30 percent of soybeans in the world.

U.S. & WORLD SOYBEAN PRODUCTION



Source: United States Department of Agriculture Foreign Agricultural Service
Approved by the World Agricultural Outlook Board/USDA
Circular Series FOP 04-11
Oilseeds World Markets and Trade December 2012, Table 7



Source: United States Department of Agriculture Foreign Agriculture Service
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THINK RESPONSIBLE ...
AND ENVIRONMENTALLY SUSTAINABLE.

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Unlike fossil carbon sources, soybeans capture carbon dioxide from the atmosphere.

Soybeans also fix their own nitrogen for plant food. This provides an initial life cycle advantage over other oilseeds that require nitrogen fertilizer mostly made from natural gas. In the U.S., most soybean acreage uses conservation tillage, which disturbs less soil and reduces fuel usage.

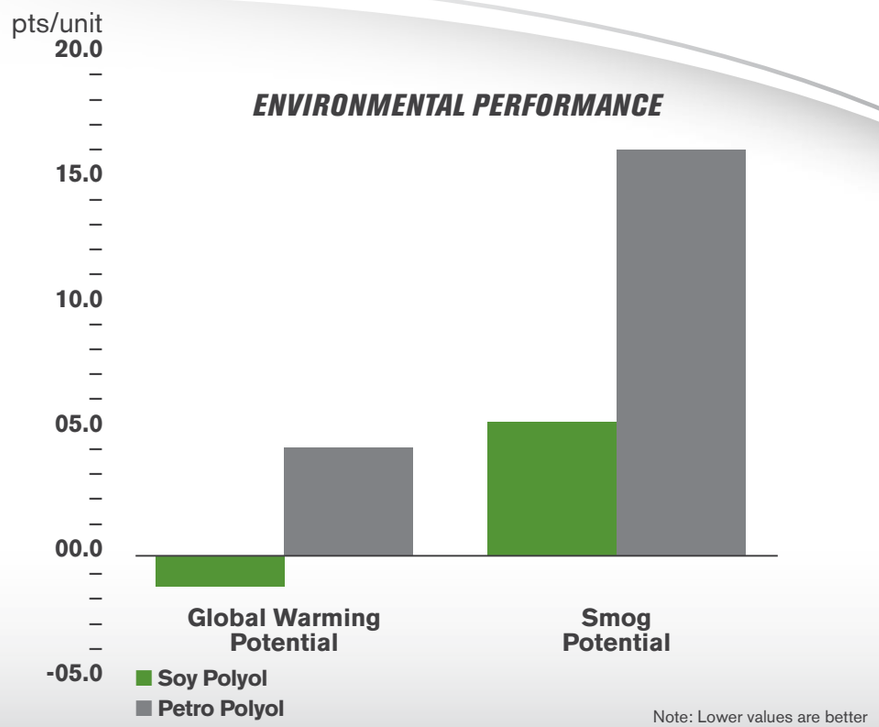
Many independent life cycle assessment studies have been conducted for soybean production, processing and feedstock. The most recent peer-reviewed study, completed in 2010, shows a number of positive environmental benefits of using soybean oil to produce soy polyols.

For example, producing one kilogram of soy polyol results in a net removal of 1.4 kg of CO_2 from the atmosphere, even after including the energy used and emissions produced in soybean cultivation and processing. By comparison, producing one kilogram of petroleum-based polyol emits a net release of 4.1 kg of CO_2 into the air. For more information and to review the life cycle assessment study, visit ***www.SoyNewUses.org***.

Life cycle assessment studies show environmental benefits for manufacturers using soy feedstock, including:

- Lower carbon dioxide emissions during production
- Less energy production costs
- Lower VOC content of products
- Reduced exposure to toxic chemicals
- Supply chain sustainability
- Earning credits toward LEED certification

U.S. soy polyol also shows more favorable environmental impact results for acidification, eutrophication, fossil fuel depletion, water intake, criteria air pollutants, total fuel energy, ecotoxicity and human toxicity. The complete soy life cycle report and comparisons can be accessed at ***www.ThinkSoy.com.***



THINK ... PRICE ADVANTAGE.

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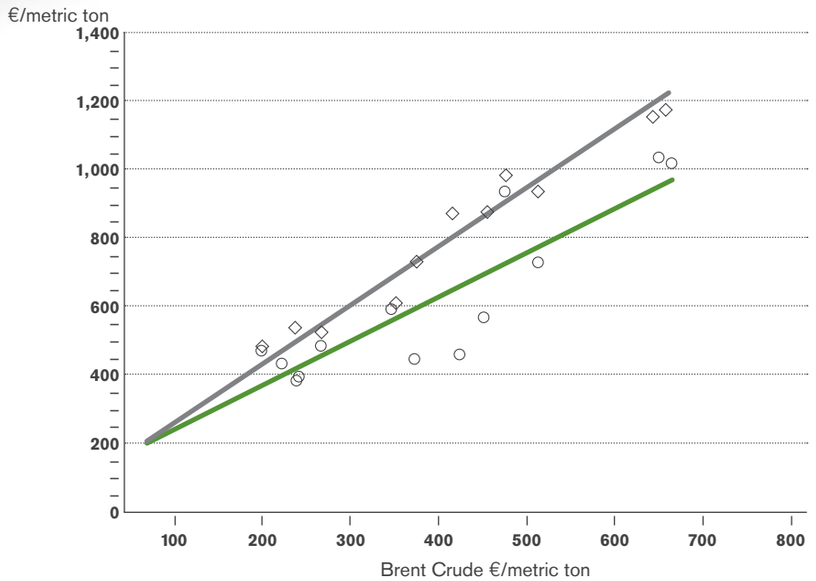
Companies using soy feedstock save millions of dollars each year in chemical costs by substituting soy for common petrochemical materials.

CONSIDER THIS:

- Worldwide demand for petroleum continues to grow. This increases the cost of chemicals from crude oil and creates a shift toward chemicals from lower-cost natural gas. The result? Shortages and continuing high prices for some petrochemicals.
- The rise in crude oil prices – which are the basic raw materials for plastics – has impacted the price of petrochemical feedstocks, including ethylene, propylene and benzene, used to make polyurethane and unsaturated polyester resins.
- Soybean oil prices maintain a historic advantage over propylene and other petrochemical equivalents.
- Plus, soy can often reduce processing costs, reduce the cost of complying with environmental and worker-safety regulations and even reduce insurance costs due to improved fire safety.

Visit ***www.SoyNewUses.org*** to learn more about available soy-based products and USB's investment in and commitment to technology research.

HISTORICAL PRICING COMPARISON OF SOYBEAN OIL AND PROPYLENE, 2000 – 2012



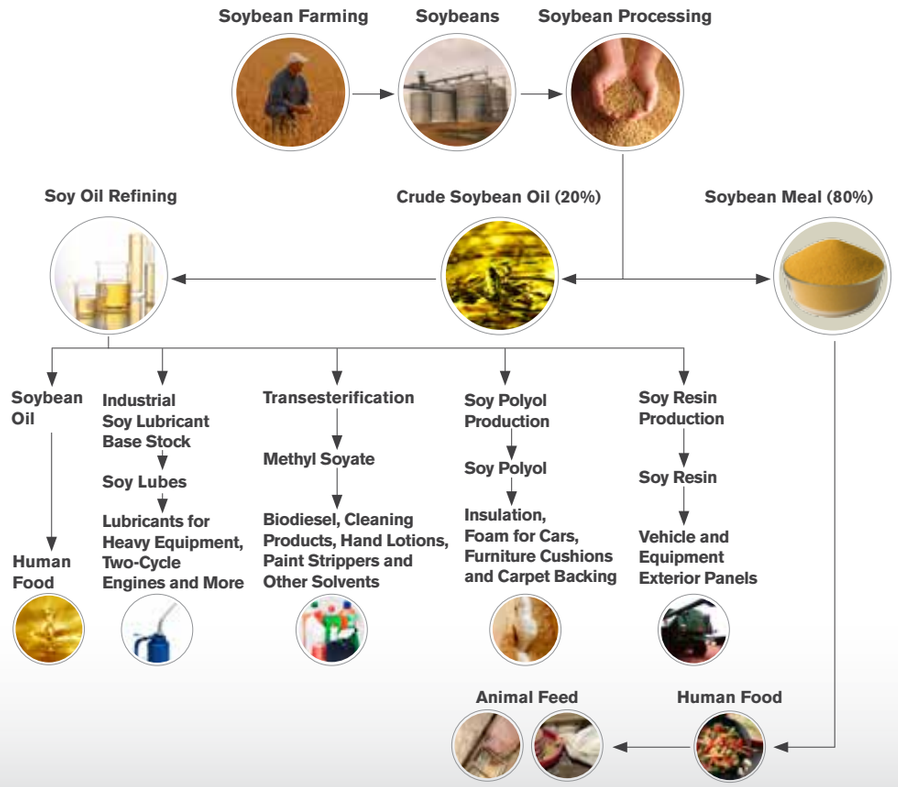
Soybean Oil:	$y = 1.1936x + 141.32$	$R^2 = 0.76109$
Propylene:	$y = 1.6017x + 136.27$	$R^2 = 0.97127$

$/Barrel	Euro/MT
50	290
100	575
150	865

Source: Brent Crude converted to Euros in same year, soybean oil per Rotterdam, propylene delivered to Western Europe expressed as yearly averages.

U.S. SOY PRODUCTS ARE TRUSTED, RELIABLE AND EFFICIENT.

CRADLE TO GATE (FARMER TO PRODUCT)



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THINK OF ALL THE WAYS YOU CAN MAKE YOUR PRODUCT:

- **MORE SUSTAINABLE,**
- **LESS EXPENSIVE,**
- **LESS TOXIC, AND**
- **LEAVE A SMALLER ENVIRONMENTAL FOOTPRINT**

WHEN YOU THINK SOY.

WWW.THINKSOY.COM

Funded by the United Soybean Board.

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