



Sustainable agriculture is the new upstream

Using camelina for renewable fuel production

Camelina produces ultra-low carbon renewable diesel fuel, propane, butane and naphtha that are a drop-in equivalents to traditional petroleum-based fuels but with fewer contaminants and emissions.

About Camelina sativa

Camelina produces many small, oily seeds that are desirable for renewable fuel production. Camelina is a resilient oilseed that provides quick soil cover and improves soil structure.

- ◆ Our proprietary camelina varieties and farm-to-fuel pathway yield Renewable Diesel with a lower lifecycle Carbon Intensity (CI) than other feedstocks:
- ◆ Camelina-based renewable diesel has an estimated CI score of ~24 (without meal credit) and an estimated CI score of ~7 (with meal credit).

Camelina
~7g/MJ

Canola
~52g/MJ

Soy
~60g/MJ

Traditional Diesel
~100g/MJ

- ◆ Camelina has the potential to receive the lowest CI score of plant feedstocks on the market.
- ◆ Renewable diesel and other renewable fuels produced with Global Clean Energy's patented camelina varieties have the potential to achieve a Net Zero or below CI score.
- ◆ Global Clean Energy was granted a first-of-its-kind feedstock-only LCFS pathway by the California Air Resources Board for the production of renewable fuels produced from our proprietary camelina varieties.



Camelina: Protects like a cover crop and pays like a cash crop.

- ◆ Camelina is grown on fallow land and land left idle between crop cycles
 - Provides revenue for farmers from otherwise empty acres
 - Utilizes farmers' existing agricultural equipment
- ◆ Low water crop
 - Grows on dryland farms with limited water
- ◆ Nonfood
 - Targeted on acres not growing a food crop
 - Does not result in land use change
- ◆ Short season
 - 80-100 days to maturity
- ◆ Frost tolerant
- ◆ Camelina can yield ~2,000 pounds or greater of grain production per acre
- ◆ Camelina grain yields 38% to 42% percent oil content
- ◆ Each acre can result in ~100 gallons of Renewable Diesel equivalent

Tolerance to Pests and Diseases

A Canadian investigation confirmed that camelina resists five common pests in canola, including crucifer feeding specialist flea beetles, root maggots or diamondback moth. Camelina is also not a nematode host.

Citation: Soroka et al. (2014), 'Interactions between Camelina sativa (Brassicaceae) and insect pests of canola', Cambridge University test.

Nutrient Uptake and Utilization

Camelina is an effective way to mitigate the loss of soluble nutrients in the soil such as nitrogen.

Citation: Thom et al. (2018), 'Reduced-nutrient leachates in cash cover crop-soybean systems', Journal of Environmental Quality.

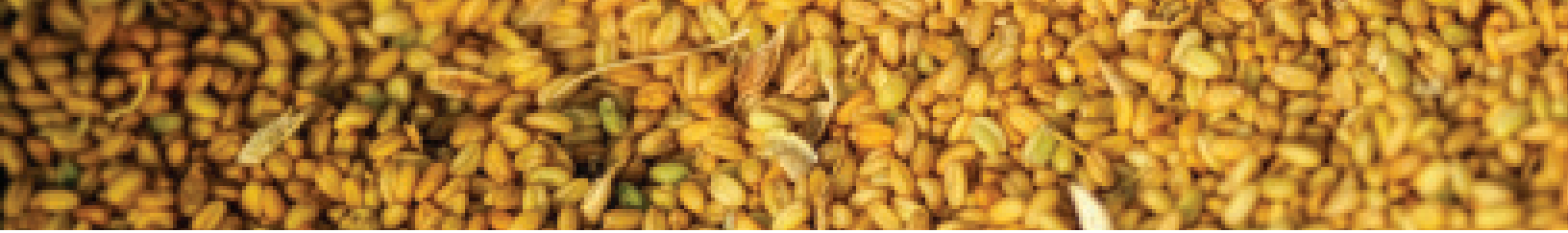
Benefits for Bees

Camelina is a flowering species that provides a source of nectar and pollen to bees. A USDA study confirmed that camelina is beneficial for bee populations.

Citation: Gesch et al. (2015), 'Camelina Holds Promise for Biofuel and Bees', AgResearch Magazine.

Meal co-product

Camelina has no waste. After oil is extracted, it produces an FDA approved meal for livestock feed.



Camelina turns idle acres into profit acres

Winter sowing: seeding in late fall or early winter with cold tolerant camelina allows for a late spring harvest.

Spring sowing: planting in early spring allows harvest in mid to late summer.

Summer sowing: can be planted in the summer following a cereal crop and harvested in the fall.

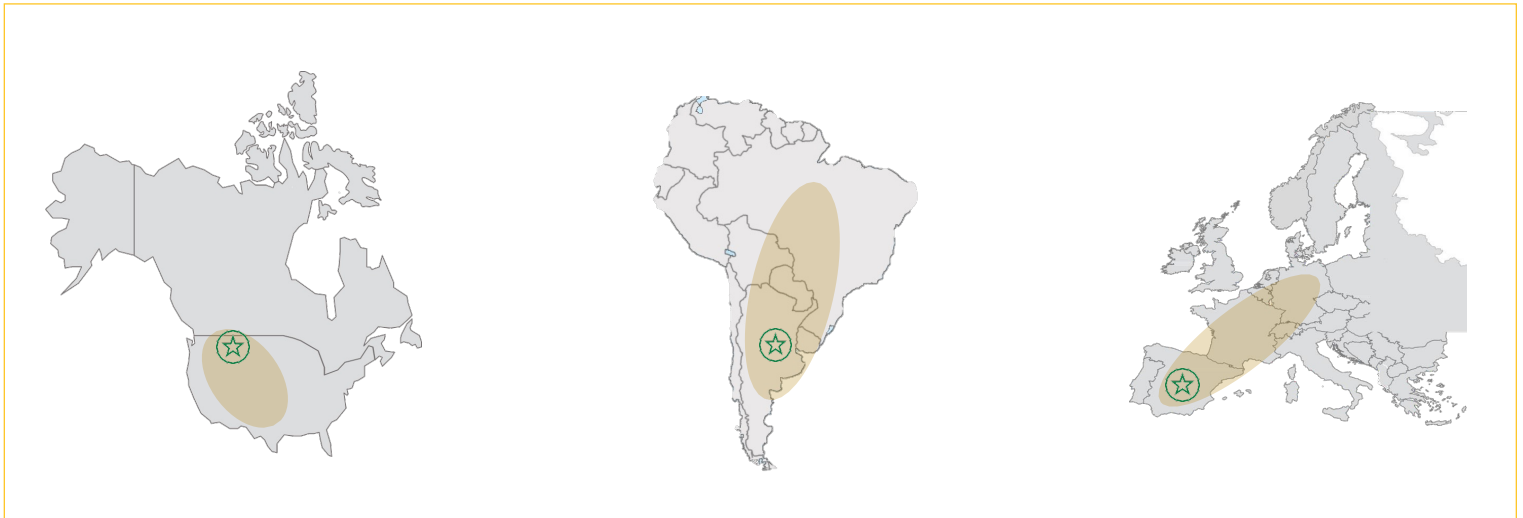
Double crop: winter sowing and summer sowing are opportunities for double cropping with with soybeans, sorghum and other summer crops to produce two crops in a single year on the same land.

Interseeding: can be grown on idle land in orchards between rows.

Camelina: Grown worldwide

Adaptable. Tolerant. Pest resistant.

Over 100 million camelina opportunity acres in targeted regions in North America, South America, and Europe.



Global Clean Energy owns the world’s largest portfolio of proprietary camelina varieties.

◆ 15+ years of plant science and R&D

◆ Our growing intellectual property portfolio protects our camelina varieties, which are bred for high yield, low water use, and quick maturity.

Global Clean Energy - The world’s leading camelina producer and developer.

Global Clean Energy’s camelina businesses:



Sustainable Oils, Inc., headquartered in Great Falls, Montana, is North America’s leading developer of camelina. Sustainable Oils owns an industry leading portfolio of intellectual property including patents and production know-how, to produce its proprietary varieties of camelina as a nonfood based ultra-low carbon renewable fuels feedstock.



Camelina Company España has developed a sustainable camelina value chain: from breeding and planting seed production to agronomic expansion and camelina processing for advanced biofuel production. CCE introduces camelina into existing crop rotations without any food displacement - as a cover crop or replacement of traditional fallow periods - employing its proprietary camelina varieties and prediction models to optimize its elite varieties in different cropping systems, primarily in Europe and South America.

