

## New plant-based oil emerging for use in industrial products

🕒 July 22, 2016   📁 Features   👤 Hartley Henderson

*A new plant based oil is being developed to replace petrochemicals in industrial products ranging from fuels and lubricants to specialty chemicals and plastics, writes Hartley Henderson.*

In a joint project between the CSIRO and the Grains Research Development Corporation (GRDC) to establish the Crop Biofactories Initiatives (CBI), Safflower seed oil that contains over 92 percent oleic acid has been produced. This has been dubbed 'Super High Oleic Safflower Oil' (SHOSO).

According to the CSIRO's Dr Craig Wood, plants can produce a wide range of compounds that can be used as raw materials for making industrial chemicals and these crop biofactories have potential to sustainably supply the volume and price required for industrial products.

"SHO Safflower, from which SHOSO is produced, has performed well in field trials. The oil produced in the seed has significantly higher stability than conventional oils and performs as well or better than synthetic oils derived from fossil reserves. These properties will see SHOSO attain a higher market value than normal crop oils, which should be reflected in a higher farm-gate value for growers," he said.

"The stability of the oleic acid makes it especially suitable for high temperature industrial applications such as lubricants and transformer fluids, and it can also be processed to build a range of complex polymers for use in bioplastics and surface coatings.

"Safflower is an ideal crop for Australian conditions as it is a very hardy and adaptable crop that does well in warm-season conditions. The safflower crops can be grown in a number of farming regions, from southern Australia right through to central Queensland and in Western Australia."



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The role of GRDC was to fund the project via the CBI program which investigated the potential benefits of rotating safflower with other crops such as wheat and barley.

According to GRDC's General Manager Business Development, Ron Osmond, the aim was to fund the proof of concept element of the project, and to provide farmers with additional profitable options for crops.

"A major goal of the program was to develop crop options that address emerging markets, offering new alternatives for Australian growers," he said.

"We needed to demonstrate the extent to which the program could be market based, and that safflower could fit into existing cropping systems. It was found in trials that safflower crops could be easily expanded and that they have good drought resistance.

"There is a growing world market for renewables and we believe that this points to a substantial potential market for SHOSO. To that end, it is exciting to see the project reach this landmark stage, and to have attracted a commercial partner in GO Resources to take this technology through the next phases of development and commercialisation."

## **Commercialisation**

The technologies and safflower materials developed during CBI for the production of SHOSO have been licensed to GO Resources, which is a new Australian clean technology company with expertise in biotechnology, industrial lubricants and oleochemicals, deregulation of GM technologies, and the development of supply chains for GM products.

According to the company's CEO, Michael Kleinig, the necessary R&D has been completed by CSIRO and the main steps now towards commercialisation include deregulation of SHO Safflower, production of planting seed, and development of an agronomy package.

"First market development plantings will occur in 2018 and first commercial sales are scheduled for 2019. We anticipate 100,000ha of plantings in Australia by 2024 in southern Queensland, northern NSW and western Victoria where grain, cotton and rice is currently grown. Some 200,000ha of plantings are expected worldwide by 2026," he told *Manufacturers' Monthly*.

"The technology required to produce SHOSO from safflower is a standard cold press or solvent extraction process used currently to extract seed oil from sunflower, canola, soybean, and cotton.

"GO Resources target market is the industrial market for lubricants and oleochemicals. SHOSO's use as a raw material for bio-based feedstock includes industrial applications such as solvents, cosmetics, plastic additives, resins and polymers, biofuels, coatings, paints and inks.

"This new oil offers the significant benefit that it is biodegradable, sustainable and renewable. At up to 92 percent oleic acid, it has the potential to be used for the manufacture of totally synthetic oils that could match the specifications of the oils that are produced from petroleum-based raw materials. It could also be an alternative to palm oil.

"Its unique superior qualities give SHOSO a versatility of industrial applications and a competitive advantage over other currently available bio-based feedstocks in the target markets through increased performance and reduced processing costs.

“Demand for alternative feedstocks such as super high oleic safflower oil is being driven by an increasing push from consumers, producers and governments towards sustainable, renewable and biodegradable products.

“This oil combines purity with stability and biodegradability, and safflower is a hardy and adaptable crop that works well in rotational cropping and produces good yields under dry conditions.”

Michael says GO Resources has the exclusive worldwide licence to the IP generated from the CBI, and believes there will be major markets for SHOSO, particularly in Asia and the USA, with the potential to export up to 125,000 metric tonnes per annum valued at around AU\$340,200,000.

“SHOSO is a major advancement, both commercially and environmentally, as a raw material to meet the surging demand for bio-derived feedstocks for industrial applications. Our business strategy is to target the identified niche high value markets by establishing a fully vertically integrated secure supply chain,” he said.

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