

Safflower with modified oil profile closer to market

A genetically modified safflower variety with high levels of oleic acid is expected to be available commercially in 2018 if it continues to perform well in field trials. The so-called super-high oleic safflower (SHOS) was developed by CSIRO with GRDC support using RNA interference (RNAi), also known as gene silencing technology.

“Trial yields have been good, ranging from 1.5 to 2 tonnes a hectare in dryland conditions to 3t/ha on irrigation,” says Michael Kleinig, managing director of GO Resources, the company bringing the GM safflower to market.

According to CSIRO, gene silencing is a way of reducing – or turning down – the activity, or expression, of single genes. CSIRO’s research led to the discovery of this naturally occurring process in plants in the 1990s.

The gene silencing works to increase levels of oleic acid and decrease levels of other fatty acids in the GM safflower seed oil profile. Results to date have seen the GM safflower lines produce seeds where 92 per cent of the total oil content is oleic acid. This high-purity oleic oil has potential as an industrial raw material and could offer an alternative to petroleum-based oils in the manufacture of plastics, lubricants and cosmetics.

SHOS is the result of the Crop Biofactories Initiative, an initiative by CSIRO and the GRDC established in 2004 to develop commercially viable plant-based industrial oils.



A GM safflower variety developed as part of GRDC-funded CSIRO research.

PHOTO: Craig Wood, CSIRO

Safflower was selected as the delivery crop for industrial oil production because it is not a major food crop in Australia. Safflower has been commercially cultivated as a minor crop in Australia since the 1950s, for the edible oil and industrial oil markets and for the birdseed market. After oil is extracted from the seeds, the remaining meal can also be used as stockfeed.

Although the industrial market is the primary focus, high oleic oil is also a stable frying oil with a high burning point, so approvals will be sought from Australia's food regulator, Food Standards Australia New Zealand, before the product is planted commercially, Mr Kleinig says.

GO Resources hopes to see 100,000 hectares of the crop planted nationally by 2020, putting it on track to be the next GM commodity available to Australian growers.

The GM safflower project is just one of the modified oil projects in field trials in Australia. CSIRO, the GRDC and Nuseed Australia are also looking to commercialise long-chain omega-3 canola oil, a GM canola with an oil profile typically only seen in fish.

The field trials of both the GM safflower and the GM canola research are licensed by the Office of the Gene Technology Regulator.