Boost for 'green plastics' from plants

April 28 2008

Compounds from oilseeds could be used to make plastics and other products. Image credit – CSIRO

Australian researchers are a step closer to turning plants into ‘biofactories’ capable of producing oils which can be used to replace petrochemicals used to manufacture a range of products.

Scientists working within the joint CSIRO/Grains Research and Development Corporation Crop Biofactories Initiative (CBI) have achieved a major advance by accumulating 30 per cent of an unusual fatty acid (UFA) in the model plant, Arabidopsis.

UFAs are usually sourced from petrochemicals to produce plastics,

paints and cosmetics. CBI is developing new technologies for making a range of UFAs in oilseeds, to provide Australia with a head start in the emerging 'bioeconomy'.

"Using crops as biofactories has many advantages, beyond the replacement of dwindling petrochemical resources," says the leader of the crop development team, CSIRO's Dr Allan Green. "Global challenges such as population growth, climate change and the switch from non-renewable resources are opening up many more opportunities for bio-based products."

The production of biofactory plants can be matched to demand and will provide farmers with new, high-value crops bred to suit their growing conditions. The technology is low greenhouse gas generating, sustainable and can reinvigorate agribusiness.

"We are confident we have the right genes, an understanding of the biosynthesis pathways and the right breeding skills to produce an oilseed plant with commercially viable UFA levels in the near future," Dr Green says.

The team will announce the successful completion of the first stage of the CBI on 28 April during the Fifth Annual World Congress on Industrial Biotechnology & Bioprocessing (WCIBB), being held in Chicago, Illinois, from 27-30 April 2008.

The team's selection of safflower as the target crop will also be announced.

"Safflower is an ideal plant for industrial production for Australia," Dr Green says. "It is hardy and easy to grow, widely adapted to Australian production regions and easily isolated from food production systems."

The CBI is a 12-year project which aims to add value to the Australian agricultural and chemical industries by developing technologies to produce novel industrial compounds from genetically modified oilseed crops.

The project focuses on three key areas; Industrial Oils, Complex Monomers and Protein Biopolymers. CBI project leaders will present the latest research findings in each of these three areas at the WCIBB in Chicago which will showcase innovations in the convergence of biotechnology, chemistry and agriculture.

Source: CSIRO