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Tissue culture partnership driving innovation for the sugarcane industry

Sugar Research Australia (SRA) has commenced a partnership with Lowes TC to test new technology that promises a step change reduction in the cost of tissue culture plants.

Lowes TC is a commercial tissue culture company based on the NSW Central Coast and has a long-term relationship with SRA producing tissue culture plants supplied to growers across the industry. Tissue culture is a reliable source of disease-free planting material and has an important role in providing growers with rapid access to the newest varieties of sugarcane.

In a game-changing step forward, Lowes TC has developed a new system for tissue culture production including automation technology. The new system creates greater quantities of tissue culture plants using less laboratory chemicals and reduced labour requirements.

Greg Lowe from Lowes TC said the company had patents pending in Australia and overseas for both Lowes TC growing and automation systems and was excited about the potential of this new technology, which was developed with the assistance of a grant from the Department of Industry, Innovation and Science Business Entrepreneurs' Program.

“We had to come up with a new type of liquid media bioreactor so it could be used with our automation technology,” Mr Lowe said.

“It is different to existing temporary immersion bioreactors because it does not use pressurized air to move the liquid media up into the plant growing chamber but a novel ‘no pressure’ method that does not break the sterile seals of the bioreactor and does not have any moving parts, which are common issues with other systems. This liquid media waters

and fertilises the plants before draining away again. The plants therefore remain in a dry environment so that they can grow normally," Mr Lowe said.

Initial commercial testing of the technology has been completed by Lowes TC using ornamental plant species which are a major segment of the Australian tissue culture market. The new partnership will result in SRA testing the technology for sugarcane, optimising culture conditions for major and emerging varieties, with the potential to make the technology available to other tissue culture companies who supply the sugarcane industry.

SRA Executive Manager for Variety Development and Processing, Dr Jason Eglinton, said the new technology had the potential to reduce the cost to growers by half.

"Tissue culture can provide more rapid availability of new varieties. Cheaper prices for growers with this technology has the potential to accelerate adoption of new sugarcane varieties," Dr Eglinton said.

"Productivity services organisations provide clean planting material through approved seed plots. Tissue culture can be used to supply these plots and is also used directly by growers. Clean planting material is a key component in managing significant plant diseases in our industry such as ratoon stunting disease (RSD)."

"Successful application of the bioreactor technology to sugarcane will reduce the cost of clean planting material and encourage greater use of tissue culture. Reducing farm input costs and control of RSD are significant opportunities for SRA to improve the outcomes on the ground for growers and millers."

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