

Advancing Bioenergy Innovation: Developing an Agave-Based Bioproduct Industry in Queensland

QUT-led research demonstrates commercial viability of agave as a sustainable feedstock for the production of biofuels

As global demand for decarbonised fuels and energy intensifies, agave is emerging as a sustainable alternative that complements traditional feedstocks like sugarcane - particularly in regions affected by water scarcity and land degradation.

Professor Mark Harrison and Doctor Gabriel Fraga at QUT have led pioneering work to assess the commercial potential of agave for bioethanol and bioenergy production in Australia. Drawing on QUT's expertise in tropical crop processing, the team conducted laboratory-scale processing of agave stalk and leaf and developed juice extraction and fermentation techniques compatible with commercial yeast strains.

This research underpinned a Queensland Government and MSF Sugar-funded pilot project, which planted approximately 3,000 agave plants on unused land near the MSF Sugar Tablelands Mill in 2017.

Impact highlights

- Demonstrated the commercial viability of agave as a feedstock for bioethanol and bioenergy in Australia
- Planted ~3,000 agave plants in 2017 through a partnership with MSF Sugar and the Queensland Government
- Developed methods for extracting sugar-rich juice and fermenting with commercial yeast strains
- Anticipated contributions to Queensland's sustainable fuel sector for motor vehicles

While the findings remain commercial in confidence, the results have directly informed the strategic direction of leading agave technology companies, including early adopters Top Shelf International and bio-energy focused Agave Resources Australia.

Looking forward, agave holds significant promise as a climate-resilient feedstock for sustainable ethanol for vehicles and sustainable aviation fuels (bioSAF), particularly in Queensland's emerging bioeconomy. The work forms part of QUT's broader commitment to agricultural diversification and decarbonisation of the transport sector through advanced bioproducts research.



Image: Blue Agave. Source: Wikimedia



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