

Support for bioactive honey plant breeding in South Australia

The CRC for Honey Bee products has supported bioactive honey production in South Australia through research on the genetic variability, propagation and production of key *Leptospermum* species.

Leptospermum species are highly valued for their production of bioactive honey. Establishing plantations of *Leptospermum* to ensure the economical production of high-quality bioactive honey requires the development of elite plant genotypes from wild selections.

Plant improvement programs can be enhanced by ensuring that plants selected for improvement and cultivation represent a wide range of genetic diversity. Genetic diversity helps select superior traits and crossbreeding to target and improve traits of interest.

CRC researchers investigated options for *Leptospermum* species in South Australia that would thrive with minimal support. Researchers studied *Leptospermum scoparium* and *L. continentale* across the state under natural and plantation conditions. Research also tested *Leptospermum scoparium* and *L. continentale* across southern Australia for genetic diversity to determine their value in breeding programs. Data on growth and performance, flowering and nectar production were collected, and genetic analysis undertaken.



Leptospermum scoparium flowers with a natural pollinator (Image: THancox)



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breeding



bioactive
honey



genetic
diversity





The research showed that the tested populations of *L. scoparium* were sufficiently diverse to maintain overall diversity. Conversely, the *L. continentale* populations would require wider inclusion of genotypes at the pre-breeding stage.

Once selected, elite genotypes can be clonally propagated to ensure genetic integrity and reliability in the production of high-quality honey. To determine the most economical and reliable propagation method, CRC researchers tested *L. scoparium* propagation by cuttings.

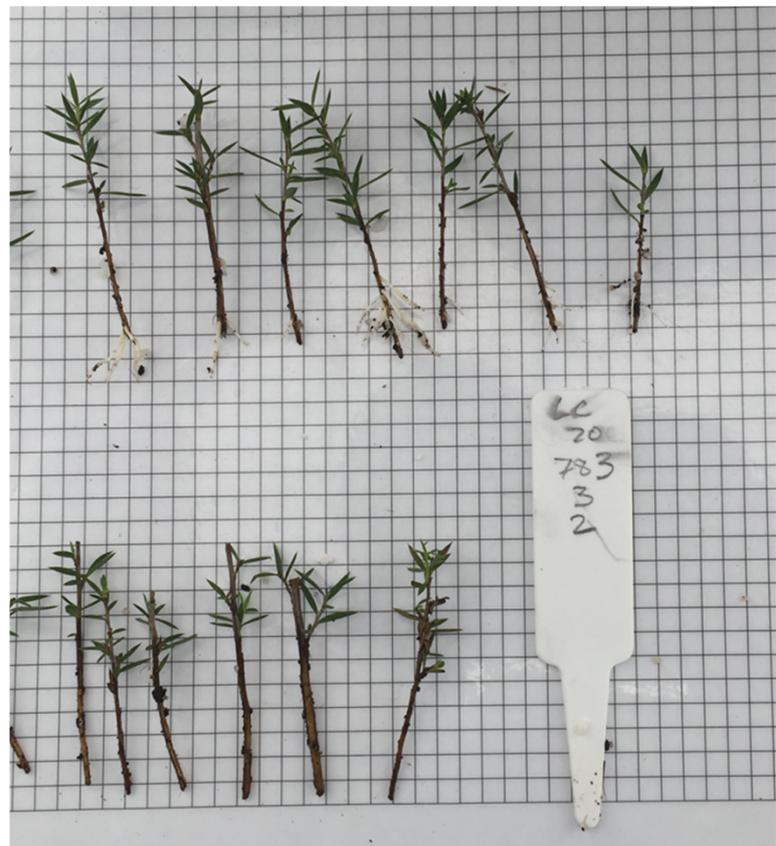
Propagation of *L. scoparium* and *L. continentale* by cuttings can be achieved using simple and commonly available materials and techniques, such as bottom heat, humidity and plant growth hormones.

Transplant and survival rates are influenced by root length and number. Planting media also plays a role, as does time in the propagation tent. The application of indole butyric acid gel (a plant growth regulator) to cuttings produced the greatest number of healthy plants.

CRC researchers tested environmental influences on *Leptospermum* growth. They monitored *Leptospermum* sites for four years, recording weather (rainfall and temperature) and plant survival and growth. Some sites were natural, and others were planted; some used irrigation while others survived on natural rainfall.

A stable and consistent water supply is essential for *Leptospermum* survival and subsequent plant growth, flowering, and nectar flow. Soil type and the daily temperature had a lesser effect, although temperature extremes can affect plants.

CRC research has created extensive information about *Leptospermum* genetic diversity, propagation and production in South Australia to fast-track improvement breeding programs and support the state's honey industry.



Leptospermum cuttings