ARC Research Hub for Protected Cropping

Research capabilities for transformative application to the Australian hemp industry

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ARC Protected Cropping Hub
La Trobe Institute for Sustainable Agriculture and Food

AHC Hemp-Connect Forum
26 June 2025

Australian Government
Australian Research Council

LA TROBE UNIVERSITY

ARC Protected Cropping Hub: Cannabis research

Cultivation Inputs & Practices

Tissue Culture

Plant Selection & Breeding

Phenotyping

Genetic diversity → Genetic yield potential

Analytical Technologies & Extraction

Molecular Discovery

Biosecurity

Biomass Utilisation

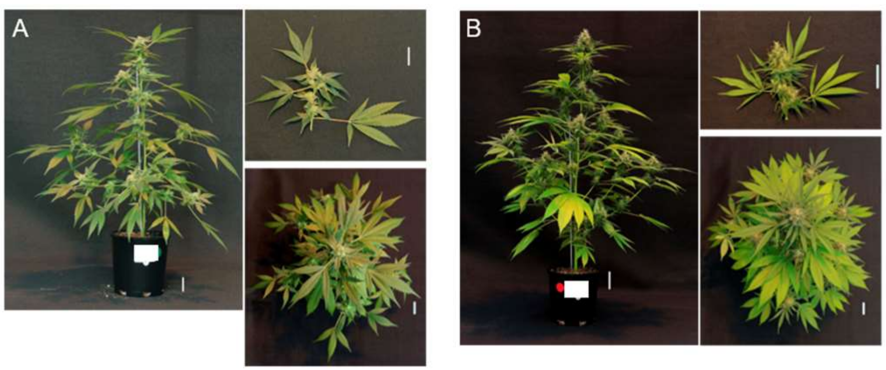
Germplasm screening, plant breeding and growth optimisation

Desirable traits:
- Zero THC
- Optimal plant architecture
- Autoflowering
- Disease resistance
- Genetic transformability

Tissue culture

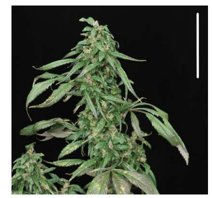
Image: Dr Martin O'Brien

Nutrient optimisation



Images: Dr Ricarda Jost

Breeding



♀ **Early flowering parent**

X

♀ **Late flowering parent**

Male flower induced on a genetically female plant

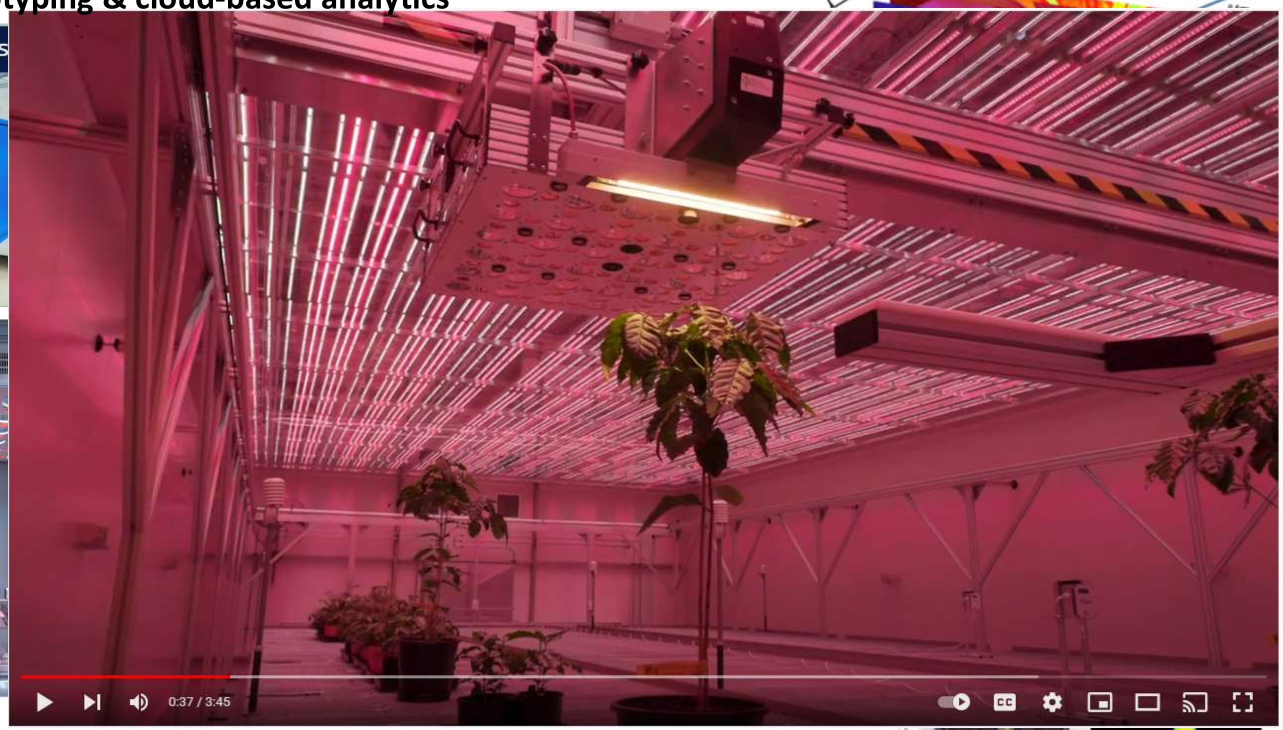
♀ **F1**

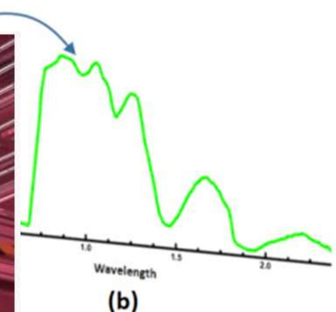
F2 feminised seed

Images: Dr Matthew Welling

Controlled plant growth and phenotyping

2D, 3D phenotyping & cloud-based analytics





ystems Engineering 2017 164:49-67

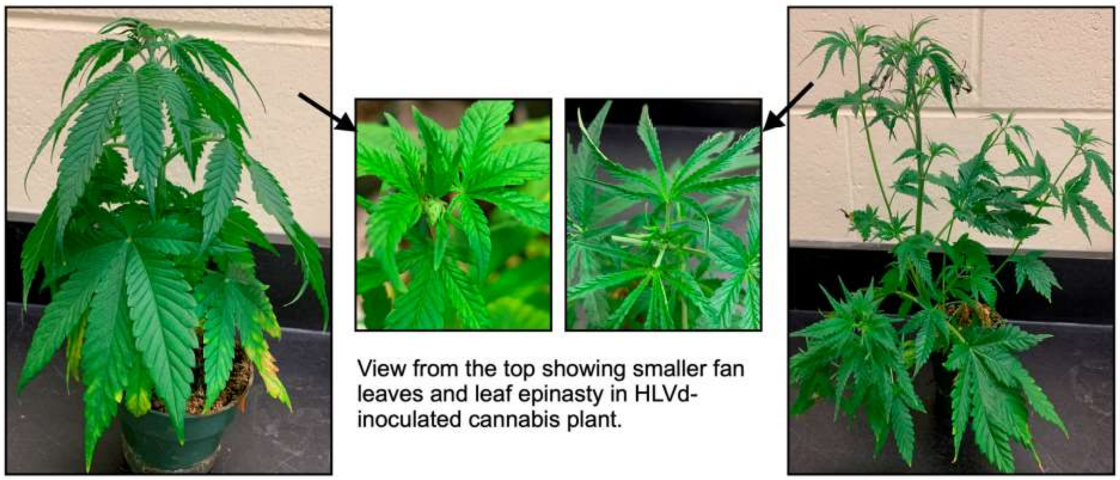
http://plantphenotyping.com/products/plantscreen-compact-system/#gallery

Real-time image data to monitor plant morphology, health (nutrient status, disease, pests) and yield

Humplik et al, *Plant Methods* 2015 11:29

Biosecurity

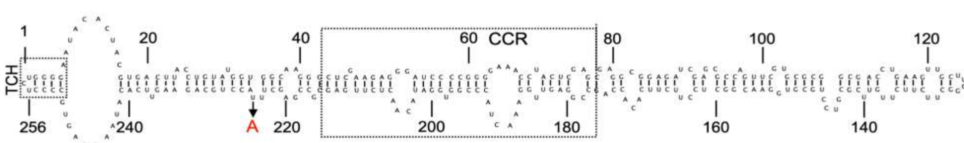
Hop Latent Viroid (HLVd) testing

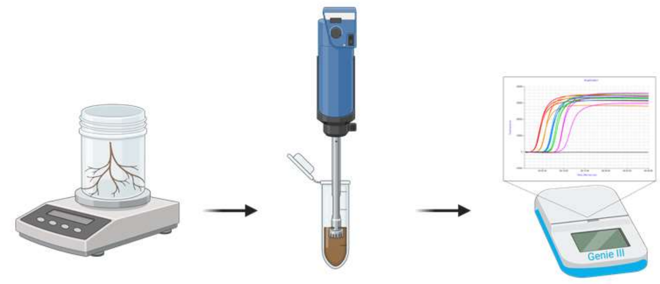


Mock-inoculated

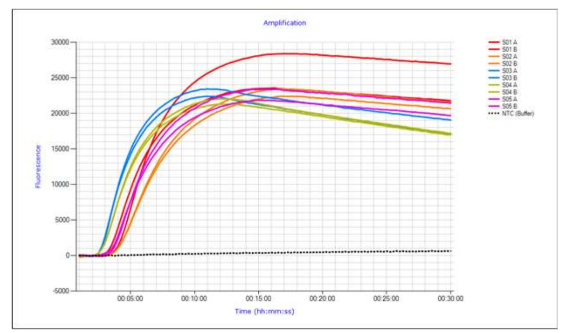
HLVd-inoculated

Adkar-Purushothama *et al*, 2023 *Viruses* 15





LAMP Genie II output



Sample	Tp 1 (min:sec)	Tp 2 (min:sec)
S01	04:59	04:21
S02	05:14	05:14
S03	03:36	03:34
S04	03:48	03:51
S05	04:27	04:40

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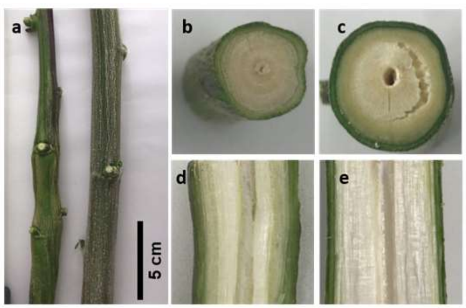
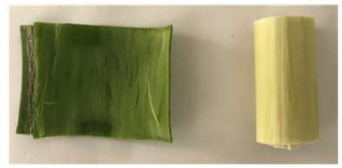
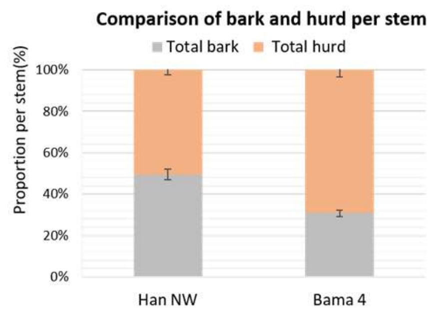
Biomass utilisation

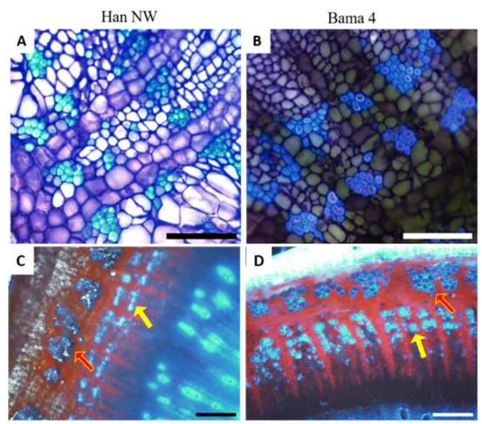
Hemp variety characterisation:

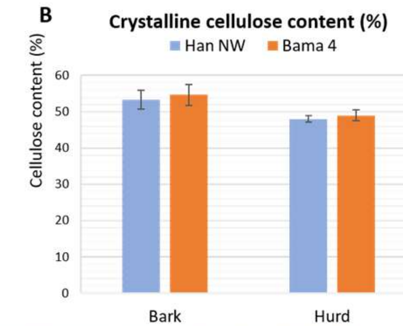


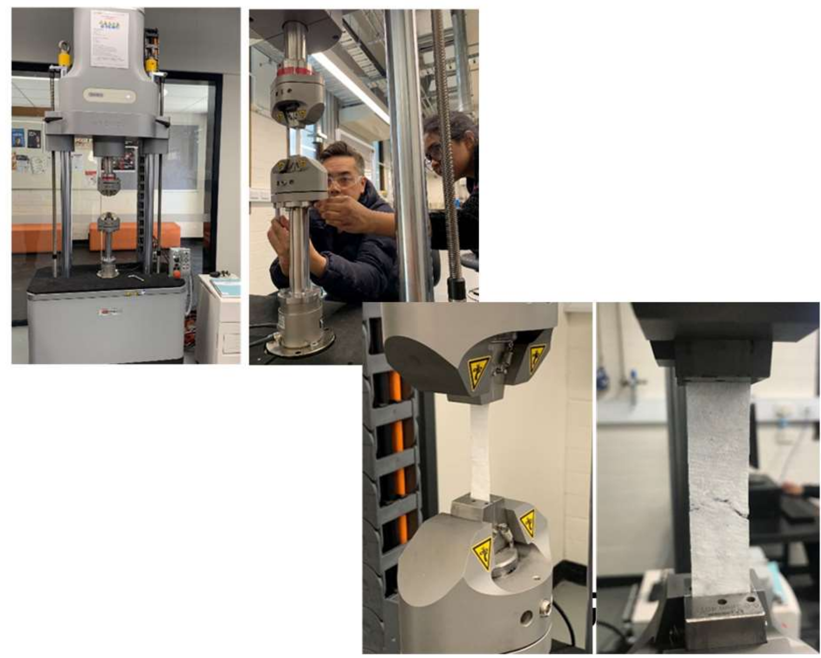
Data: Ms Nitheeka Muthunayake











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Thank You

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