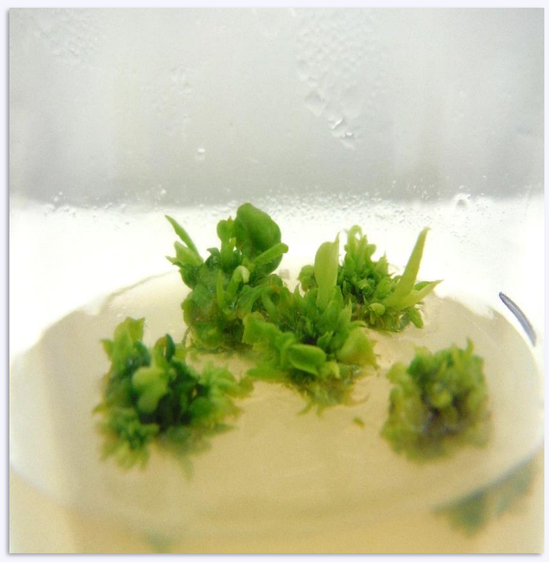
Tissue culture propagation of passionfruit to produce disease-free plants

Background

- A past NT DAF breeding project produced a range of hybrid passionfruit which are better adapted to the Top End region. These hybrids have been sold for commercialisation.
- Production of passionfruit is greatly constrained by viral diseases, leading to significant yield losses. It is important that the planting material is disease-free and true-to-type for sustainable production.
- Tissue culture is a method of propagation that is conducted under sterile conditions, to produce large numbers of clonal, disease-free plants.

Process

Nodal explant used for initiation stage



Establishment & shoot multiplication

Plant ready for root induction

Plant with developed roots ready for transfer to nursery

- The tissue culture process takes approximately 7 months
- Achieved good multiplication of shoots
- Plants with well-developed leaves and elongated shoots is critical for successful root development

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Outcomes

- An efficient Tissue Culture (TC) protocol developed to produce disease-free passionfruit plants.
- TC passionfruit plants have successfully flowered and fruited.
- TC plants have not exhibited any visual detectable variation to their mother plants.

Nursery & transplantation

De-flasked TC plants getting acclimatise to the environment in the mist-house

TC plants ready for transfer to nursery or field

Growing system

- There was a high survival rate for TC plants with well developed-roots in the nursery.
- After staged acclimation from the shadehouse, the plants were ready to be transplanted into the full sun hard stand after 3 months .
- The transplanted plants began flowering after 7 months, and set fruit.

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NORTHERN TERRITORY GOVERNMENT