

NATIONAL PASSIONFRUIT BREEDING & EVALUATION PROGRAM

PF19000 is an investment under the Hort Innovation Passionfruit Fund using the Passionfruit R&D levy and contributions from the Australian Government.



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What's been happening with the breeding program? [I hear you ask]. I will attempt to run through the main points below.

Basically, we have first stage vines to assess this year and crosses have been made for future seasons.

Still plenty to do though, with seed to clean and select for germination and then grafting, planting out for another round of first stage trials. Then there are the promising second stage vines to assess that were planted out last year. Here's a bit more:

CONTROLLED POLLINATIONS

- Controlled pollinations for the next cycle of 1st stage trial vines were carried out starting in December 2020 and concluding in February 2021.
- Additional pollinations, for example for purple Panama selection and Lilikoi (*P. edulis f. flavicarpa*) crossing, have been carried out in March, April and May.
- In total, 215 bagged control pollinations have been carried out with just over 50% success rate overall.

BREEDING MANAGEMENT SYSTEM

SCU staff attended a three-day training course to learn how to use the Breeding Management System software that we will be using to store all the seed bank, trial data and pedigree information for the passionfruit breeding program.

PHD STUDENT

A PhD scholarship funded by SCU to work on the passionfruit breeding program has been advertised.

If anyone in the industry knows of someone who may be interested, the scholarship has a 3-year duration with the 2021 rate being \$28,597 per year.

www.scu.edu.au/graduate-school/scholarships/#headingpassionfruit



Passionfruit breeding & evaluation PhD Scholarship

Southern Cross University is offering a fully funded PhD scholarship in passionfruit breeding and evaluation. Passionfruit (*Passiflora edulis*) is cultivated commercially in subtropical and tropical regions of Australia to produce fresh fruit for domestic markets.

The growing industry is based on scion varieties that have been clonally propagated for over a decade and are experiencing declines in fruit size and yield.

TRIAL VINE ASSESSMENTS

Assessments of trial vines will commence in earnest starting from early June. Some initial checks have been carried out and there is the usual hope that one or two vines will have potential as future commercial varieties.

There are 300 first stage (year) vines to be assessed. In addition, we will assess 22 different second stage selections (114 vines planted) and another four that are on their third grafting (12 vines).

The 1st stage trial vines will be scored for vine health, shell colour, fruit size, pulp fullness, juiciness, flavour, shell thickness and firmness, fruit disease, shell blemishes, buds & flowers and productivity. Most of these characters are scored as acceptable or not acceptable, with usually only a few percent making it through to second stage. A subset of vines will have additional scores recorded if a suitable PhD student is found.

First stage trialing uses more project resources than anything else. Because of the seasonality of passionfruit growing, in effect, it takes two years to go through the whole process of completing a first stage trial.

This involves carrying out controlled pollinations (usually at the start of the calendar year), collecting the control pollinated fruit, processing the seed, selecting the seed lots to be planted, planting out the seed, growing the young vines up, getting their tips grafted, planting out in the trial sites, then the next year assessing vines and selecting those few for second stage trialing and removing the old vines.

There are two overlapping cycles occurring at the same time except for a gap of a couple of months at the end of the year. The table below shows the activities involved in the first stage trialing that are relevant to the project at the moment. Note the two overlapping generations top row (2020-2021 season) and lower row (2021-2022 season) that are current.

THE CURRENT TWO-YEAR SEQUENCE OF CROSSING AND TRIALING OF 1ST STAGE VINES

SEASON	JAN-MAR 2020	APR-MAY 2020	JUN-AUG 2020	SEP-NOV 2020	DEC 2020-MAR 2021	APR-MAY 2021	JUN-AUG 2021	SEP-NOV 2021
2020 – 2021	Cross pollination to produce seed for 2020/2021 trials	Cleaning seed and selecting seed lots to propagate	Seed germination and growth	Grafting of seedlings and planting out grafted vines for trialing	—	Early vine assessments	Main vine assessments for 1st stage vines	Grafting selections of 1st stage and removal of unselected vines
2021 – 2022	—	—	—	—	Cross pollination to produce seed for 2020/2021 trials	Cleaning seed and selecting seed lots to propagate	Seed germination and growth	Grafting of seedlings and planting out grafted vines for trialing



We hope that you get a good winter crop with even better prices with whatever passionfruit variety you are growing.