

PF22000

National Passionfruit Breeding & Evaluation Program Update

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The project - funded by Hort Innovation through the passionfruit R&D levy with co-investment from the Australian Government - has moved into its second year of delivery. Led by Dr Mobashwer Alam and the QAAFI team at The University of Queensland, it is rapidly developing a passionfruit varietal pipeline that will produce high-quality passionfruit varieties tailored to Australian conditions.

In the past 12 months the team has:

- submitted or published three research articles centred around understanding and evaluating current Australian passionfruit germplasm
- identified two standout selections (PF102 and PF110)
- launched multi-location on-farm trials
- sown and evaluated more than 700 progeny seedlings from an initial 15 cross pairing
- conducted an extensive crossing program in 2024-2025 season generating 90+ new crosses

These activities keep the program on track to deliver quality, resilient passionfruit cultivars to growers nationwide.

Fresh science driving smarter selections

Breeding team member Ms Sun Xinhang has just published a research article on genetic diversity in Australian passionfruit breeding program. This study was conducted based on 189 Australian scion and rootstock accessions from previous breeding program projects (PF15000 and PF19000) and distinguished six rootstock clusters (Figure 1) and two scion sub-populations (Figure 2). The analysis showed the high genetic diversity of Australian rootstocks and less diversity in the scion germplasm. Although the current breeding program (PF22000) has access to most of the scion accessions, we extended international collaboration to increase genetic diversity.

New varieties on the radar

Over the last year, we reinvestigated the performance of ten priority accessions, spanning six selections from the previous breeding programs, and the four commercial cultivars (Sensation, ED19, Sweetheart and Misty Gem).

All ten were assessed in field trials. One variety developed by the breeding program **PF102** (breeding program) and Sensation (**PF115**), consistently produced strong yields while maintaining desirable fruit quality traits, and variety ED19 (**PF101**) stood out for its extended shelf-life.

Early data from our Nambour, Beenham Valley, Northern NSW and Moorland trial sites suggest two of our early selected varieties PF102 and PF110 as having commercial potential. We are still collecting data from all these sites aiming to provide detailed characteristics and comparative performance of the elites in the next edition of The Passion Vine.

To see real-world validation, if you would like to host a small-block trial (1–2 whole rows) of either line, please contact the team. Every extra location improves the accuracy of our recommendations.

This year we evaluated >700 new progeny at our Nambour, Yandina, Woombye and Gympie sites. Based on preliminary observations on fruit quality, we have included ~30 new accessions (purple and Panama type) in our varietal pipeline.

We would like to evaluate these selections in multi-location trials across the passionfruit growing regions. In each trial, we aim to plant 15 clones of each accession along with two comparators (PF02 and PF110). If you would like to see the performance of the new selections in your orchard, please contact the team (by mid-August 2025) with the following information:

**Name | Farm Address | Phone number |
Email Address | Number of accessions |
Passionfruit type: Purple/Panama/Yellow |
Tentative planting time**

Over the last year, we generated over 90 new families aiming to generate >5,000 new progeny. This year, we aim to screen 1,500 new progeny. To evaluate this large number of progeny vines, we have established new trellis at Nambour (Figure 3).

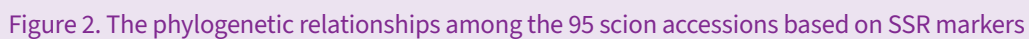
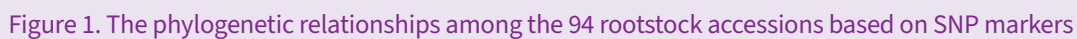




Figure 3. New trellis installed at the Maroochy Research Station at Nambour *Photo credit: Jane Richter*



Patrick harvesting ripe fruit at one of the trial sites for Mo to check the brix levels (sweetness) using a refractometer *Photo credit: Hanna Millard*

Multi-location trials – status and next steps

Trial cohort	Sites	Accessions	Progress
2023-24 cohort (PF102, PF110 + 3 industry standards)	Moorland (Ross Brindley), Nambour (Maroochy Research Facility) & Northern NSW (Ian Constable)	5	First season of yield and quality data collected; year-two assessments to begin in November 2025
2025-27 cohort (new elite selections from 2024-25 progeny, from ~700 accession)	Bundaberg (Q. Springham), Woombye (Keith Paxton), Beenham Valley (Brad Millard) + 1 NSW site (TBC)	5–10 plus two comparators	Final Selections to be made in next month Scion to be grafted; planting planned for late Sep – Oct 2025



Ms Imas Rita Saadah, New PhD student (Passionfruit Sensory genomics for improved productivity), QAAFI, UQ. Funded By Indonesian Government *Photo credit: QAAFI*

National engagement

In June 2025 the Passionfruit breeding team attended the Australasian Plant Breeding Conference in Perth. Dr Alam outlined the overall passionfruit breeding program strategy, while Ms Sun Xinhang presented her work and future plans in the passionfruit space, including the genomic diversity work, elite accession evaluation and development of a predictive breeding platform. Both talks generated strong interest from a number of experts in breeding.

Exposure to the latest breeding strategies presented at the conference will help us implement the program to best-practice standards. Dr Mason also met with WA grower Mitch East (Willara Gold) to discuss WA production challenges and options for hosting western-region trials of elite passionfruit lines from our breeding program, an exciting step toward truly national evaluation.

New expertise on flavour front

We're happy to welcome Imas Rita Saadah, a PhD student focusing on the sensory chemistry and genomics of passionfruit. Imas is developing rapid analytical methods to detect and quantify the key compounds that drive passionfruit's signature flavour profile. Working with Prof Heather Smyth's sensory team at QAAFI, she will pair these chemical fingerprints with an expert tasting team to develop a clear understanding of consumer preference. The resulting tools will help us clearly and rigorously identify passionfruit with outstanding flavour and help us develop tools to predict the seedlings that have tasty fruit even before the fruit has set!

Thank you to our partners and opportunities to host new trials

The program is indebted to the passionfruit community for their time, land and expertise especially Megan & Dave Crowhurst (Arbour Grove Nursery), Brad Millard, Jim Gordon, Keith Paxton, Ian & David Constable, Ross Brindley and the wider QAAFI/UQ teams. Several new growers have already expressed interest in on-farm trials; please reach out if you'd like to be involved. Hosting a trial is the fastest way to see tomorrow's varieties on your farm under your management and to shape the traits we target next.

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