

Progress and Promising New Varieties

National Passionfruit Breeding Program
PF22000

| Dr Patrick Mason

3 July 2026



Breeding team: Dr Mobashwer Alam (Project Leader/Principle Breeder), Dr Patrick Mason, Dr Pragya Dhaka Poudel, Dr Dinh Cao, Bishal Giri, Dr Janine Conway, Xinhang Sun

Presentation Summary

- 1 Breeding Program Update: How did we get here?
- 2 Breeding Program Update: What have we achieved since last meeting?
- 3 Breeding Program Update: Future work
- 4 Breeding Program Update: Additional experimentation that is supplementing the breeding program
- 5 Tasting Session/Break
- 6 New Variety Factsheets



How did we get here?

PF22000 · Hort Innovation Passionfruit Breeding Program

From program award to a functioning breeding pipeline in under two years.

2023

2023-2024

2024-2025

2025-2026

Funding secured

Mo secured PF22000 project funding through Hort Innovation.

Germplasm rebuild

Seed and clonal material source from USA, Europe, Australia, China, public contributors, Keith Paxton and Jim Gordon.
Pragya joined the team

First progeny trials

Initial crosses germinated and planted at Woombye, Yandina, Gympie and MRF.
Patrick joined the team

Multi-location and Progeny Trials

New progeny trial at MRF (2025 Stage-1) and new multi-location candidate trials established (2024 Stage-2).

>300

Germplasm transferred in January 2024
Had access to only 8 accessions
Hand crossed- >10 families

>10

>700

2024 stage-1 progeny evaluated across the first trial network. Hand crossing generating ~80 new families

~80

4

new Multilocation trial sites by end of 2025

What have we achieved since last meeting?

PF22000 · Hort Innovation Passionfruit Breeding Program

The program has moved into active selection, validation and next-generation progeny development.

Completed / established in 2025

- Finalised fruit quality and field evaluations for progeny (2024-stage-1) across Woombye, MRF, Beenham Valley and Northern NSW.
- Selected the best 20 (2024 stage-1) accessions for further evaluation.
- Established (2024 stage-2) multi-location trials at Woombye, Beenham Valley, South Kolan and Northern NSW.
- Germinated ~4,000 seedlings from 2024 crosses and planted ~600 seedlings into the new dual-trellis A block at MRF.

20

best (2024 stage-1) selections
advanced

4

multi-location sites (2024-
stage 2)

~600

new seedlings planted at MRF
progeny planting (2025-stage 1)

~200

2024 stage-1 progeny
genotyped and grafted for
follow-up phenotyping

Active focus in 2026

- Evaluate stage-2 multi-location trials for fruit quality at all sites and yield at Woombye, with expansion to other sites next year.
- Evaluate the new progeny population planted in the dual-trellis A block.
- Evaluate ~200 grafted (2024 stage-1) progeny at MRF, planted as two grafted plants each.
- Support bench-top fruit quality and expert taste testing through the newest PhD project.

PhD projects: developing an integrated varietal-choice platform

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Four linked projects cover the pathway from genetic improvement to grower performance, consumer acceptance and supply-chain quality.

All underpinned by the work of PhD student Khusboo Fulara (Murdoch University), who has developed a range of very high-quality reference genomes (to be published in 2026-2027)



Together, these projects support better varietal choice for industry: breeding value + consumer appeal + farm performance + postharvest resilience.

Scope: selecting varieties that are productive for growers, preferred by consumers and reliable throughout the supply chain.

Future work

PF22000 · Hort Innovation Passionfruit Breeding Program

Priorities through the funded program finish in 2027.

1. Validate and Release selections

- Continue fruit quality, yield and field-performance evaluations through 2026–2027.
- Expand yield capture from Woombye into the broader multi-location network.
- Use grafted stage-1 material to confirm fruit and field quality before release decisions.
- Meet industry needs: Liase with industry to release best new varieties



2026
evaluation

2. Build advanced pipelines

- Use statistical and genomic work to develop genomic prediction and marker-based selection pipelines.
- Keep building the germplasm and progeny base needed for the next breeding cycle.
- Link field data, fruit-quality data and genomics into a more repeatable selection framework.



2027 candidate
decisions

3. Expand research depth

- New PhD focus: postharvest attributes of passionfruit selections.
- New PhD focus: multi-location trials, management and environmental effects on yield and fruit quality.
- Continue to support and progress commercial trials with partner farmers



Next breeding
cycle

Our Big Breeding Team

Investigators:

Dr Mobashwer Alam - Project Leader
Prof Bruce Topp
Professor Heather Smyth
A/Prof Craig Hardner
A/Prof John Thomas

Support Team:

Dr Patrick Mason- Research Fellow
Dr Pragya Dhaka Poudel- Post Doctoral Research Fellow
Dr Janine Conway- Senior Research Assistant
Dr Dinh Cao- Research Assistant
Dr Sachini Manatunga- Research Assistant
Ms Palakdeep Kaur- Technical Assistant
Mr Bishal Giri- Technical Assistant

Students:

Ms Khushboo Fulara- PhD- Sequencing
Ms Xinghan Sun- PhD – Breeding strategy
Ms Imas Rita Saddah- PhD – Flavour genetics
Ms Ananya Khatun- PhD – Post Harvest



Dr Mobashwer Alam

Students (Continued):

Mr Taohao Mou- MSc- Fusarium
Ms Kruthi Chikkanjinappa- MSc- tissue culture- awarded
Ms Zinalkumari Patel- MSc- Fruit quality genetics- awarded

Project Collaborators:

Department of Primary Industries, Queensland
Professor Rajeev Varsheny – Murdoch University- Sequencing
Dr Chris O'Brien- QAAFI- Cryopreservation and tissue culture
Dr Thi Thao Ninh- QAAFI- Gene editing
Dr Sundar Kalaipandian- SAFS_ - Tissue culture
Dr Vivian Rincon Florez- QAAFI- Diseases
Mr Quinlan Barthelme- QUT- AI- Phenotyping

Farmers:

Keith and Judith Paxton
Brad and Hannah Millard
Ian and David Constable
Ross Brindley
Jim Gordon
Quinten Springham
Jim Walker

Nurseries:

Arbor Grove Nursery: Megan and Dave Crowhurst
Beenham Valley Passions: Brad and Hannah Millard

Questions?

Thankyou



Tea break and tasting session.

Fact Sheet: For Commercial Release UQP1

1. Selection snapshot

- Med to Large fruit, ranged colour: red/purple with some green
- Consistently good flavour all year round
- High yielder with long consistent drop pattern

2. Preliminary fruit quality (SIMPLE GENOTYPE MEANS)

Length:	70.5 mm	Brix:	17.3 °Brix
Diameter:	71.6 mm	pH:	3.3
Fruit weight:	122.4811 g	Skin thickness:	6.3 mm
Firmness:	6.45 N	Skin weight:	72.36 g
Pulp recovery:	41%		

Based on 6 replicates and 18 fruit collected in April 2026 from Woombye.

3. Strengths

- One of the top yielders at multiple trial sites (Woombye, NNSW, Bundaberg) since 2023
- Fruit taste seems to be stable throughout year
- Bigger fruit
- Progressive dropper – fruit drops consistently throughout the season
- Strong vine observed throughout multiple years, has been requested by multiple farmers for expanded commercial trials

4. Commercial fit

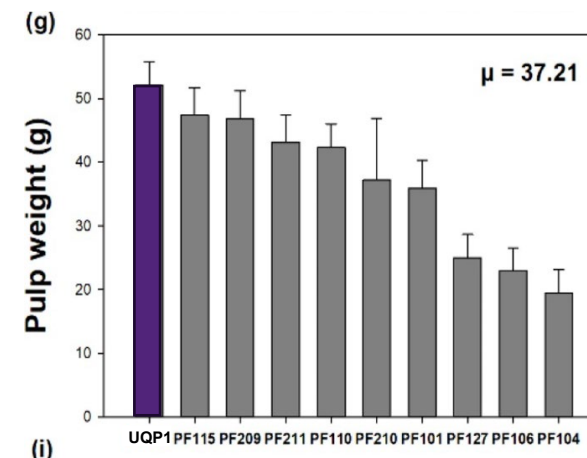
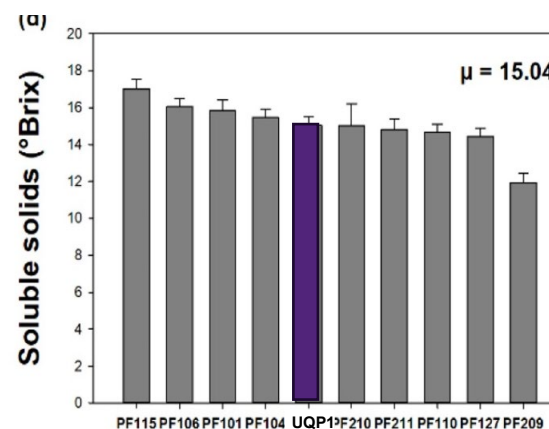
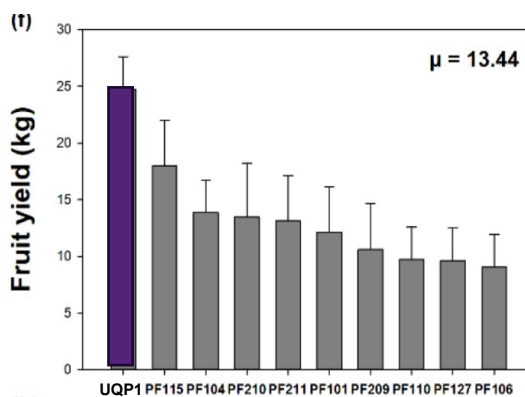
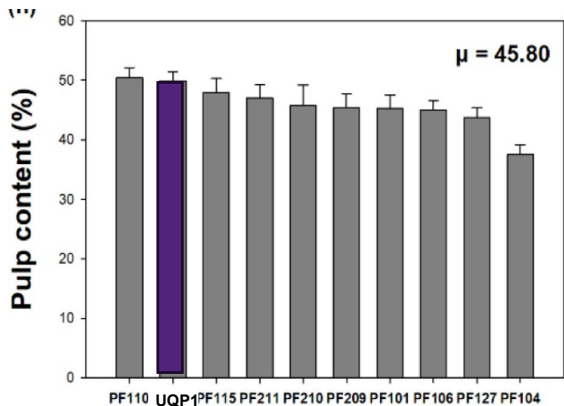
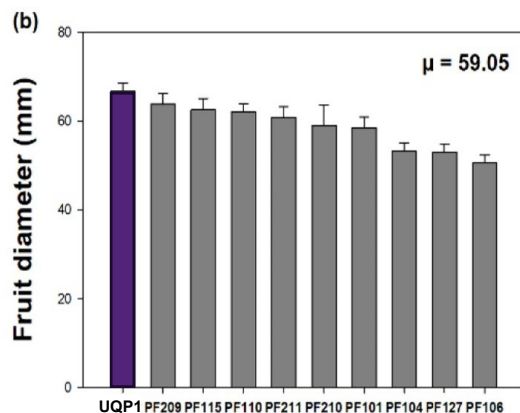
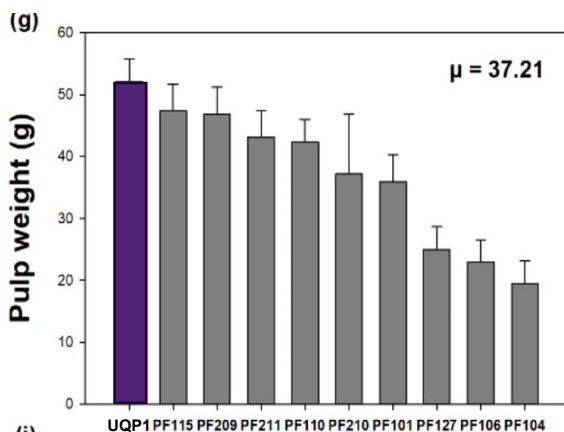
- Fruit colour is not always uniform
- Fruit firmness appears softer than some accessions (softer), so handling/postharvest/disease resistance/suitability should continue to be assessed



Fact Sheet: For Commercial Release

UQP1

Additional variety information (from previous Woombye trial)



ELSEVIER

Scientia Horticulturae

Volume 351, September 2025, 114411



Research Paper

Selecting superior genotypes to enhance yield and fruit quality in Australian passion fruit

Xinhang Sun ^a ✉, Vivi Arief ^b, Paul Gauthier ^a, Pragya Dhakal Poudel ^a,
Patrick Mason ^a, Rajeev Varshney ^c, Bruce Topp ^a, Mobashwer Alam ^a ✉

■ UQP1

Fact Sheet: Advanced Selection UQP2

1. Selection snapshot

- Lighter purple shell with attractive appearance
- Tasty fruit, relatively stable throughout the season

2. Preliminary fruit quality (SIMPLE GENOTYPE MEANS)

Length:	65.4 mm	Brix:	16.6 °Brix
Diameter:	64.8 mm	pH:	3.7
Fruit weight:	86.09 g	Skin thickness:	8.06 mm
Firmness:	6.1 N	Skin weight:	46.1 g
Pulp recovery:	44.1%		

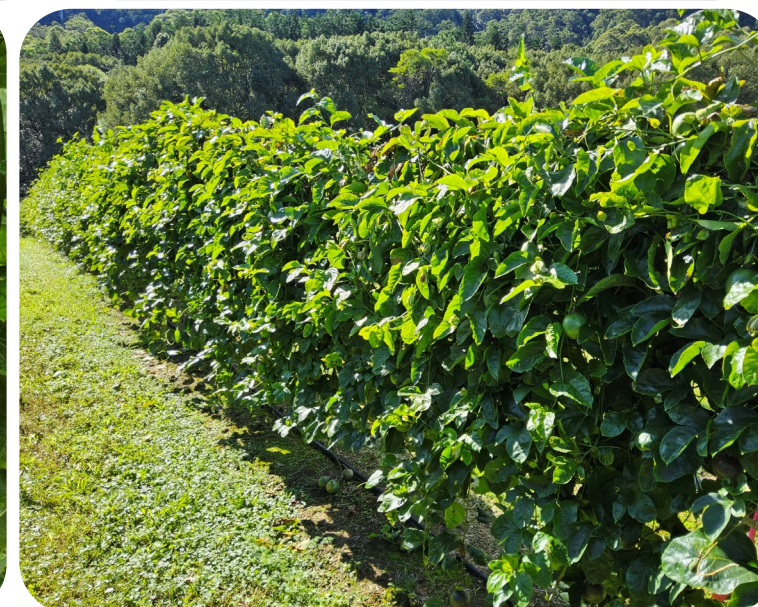
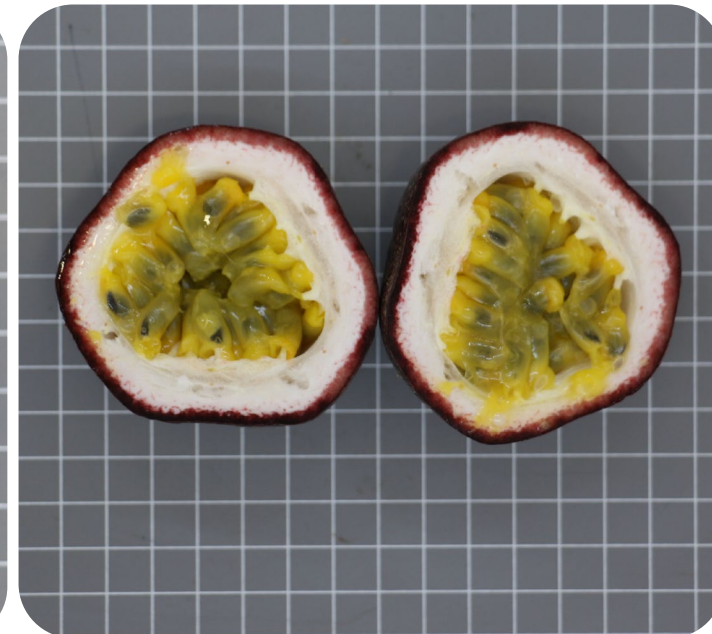
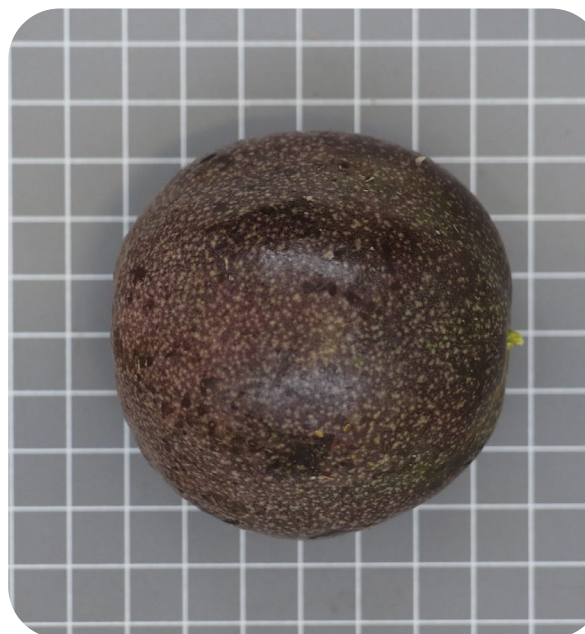
Based on 6 replicates and 18 fruit collected in April 2026 from Woombye.

3. Strengths

- Strong vine at most sites
- High Ph, tasty fruit
- Produces consistent colour at certain times in the year.

4. Commercial fit / still evaluating

- Slow started, takes some time for fruit bearing in first season
- Fruit colour can be inconsistent
- Lower end of yielders when compared to others



Fact Sheet: Advanced Selection UQP3

1. Selection snapshot

- Dark purple rind with attractive appearance
- Yellow pulp and small to medium-sized, heavy round fruit
- Promising soluble solids in preliminary Woombye testing

2. Preliminary fruit quality (SIMPLE GENOTYPE MEANS)

Length:	71.0 mm	Brix:	17.63 °Brix
Diameter:	68.9 mm	pH:	3.56
Fruit weight:	114.6 g	Skin thickness:	6.20 mm
Firmness:	6.20	Skin weight:	61.0 g
Pulp recovery:	48.4%		

Based on 9 replicates and 10 fruit collected in April 2026 from Woombye.

3. Strengths

- Top 3 for yield at the Woombye trial site
- Very sweet fruit / high soluble solids
- High yield and strong pulp yield
- Relatively high pulp recovery (highest in Woombye trial)
- Attractive dark purple rind with yellow pulp
- Progressive dropper – fruit drops consistently throughout the season
- Seems to maintain sweetness into winter

4. Commercial fit / still evaluating

- Some defoliation going into winter; needs evaluation in the second season
- Fruit colour can become less striking into winter
- Fruit firmness appears softer than many accessions (softer), (same as UQP1) so handling/postharvest suitability should continue to be assessed



Advanced Selection Fact Sheet

UQP4



1. Selection snapshot

- Purple shell with attractive appearance
- Tasty fruit, with high sugar (Brix), high pH
- Large Fruit



2. Preliminary fruit quality (SIMPLE GENOTYPE MEANS)

Length:	70.6 mm	Brix:	18.95°Brix
Diameter:	75.4 mm	pH:	3.78
Fruit weight:	130.41 g	Skin thickness:	6.9 mm
Firmness:	6.43 N	Skin weight:	81.1 g
Pulp recovery:	37.4 %		

Based on 1 replicate and 3 fruit collected in April 2026 from Woombye.



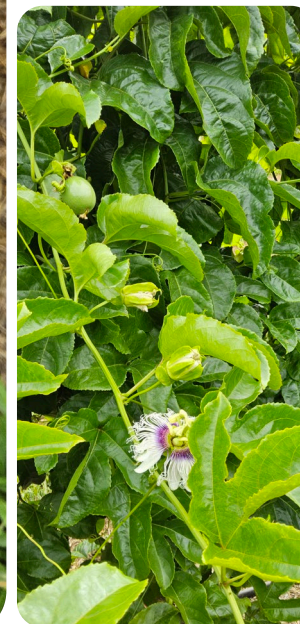
3. Strengths

- Strong vine into winter, evidence of early flowering
- Big Fruit (heaviest fruit in trial)
- High Ph, Highest Sugar in Woombye Trial, tasty fruit
- Fruit seems to have nice taste in winter



4. Commercial fit / still evaluating

- Slow starter, takes some time for fruit bearing in first season
- Need more fruit drop data for this season
- Lower end of yielders when compared to others (so far)



Advanced Selection Fact Sheet

UQP5

1. Selection snapshot

- Light purple/red/green shell
- Tasty fruit
- Large Fruit (largest volume, second heaviest)

2. Preliminary fruit quality (SIMPLE GENOTYPE MEANS)

Length:	75.1 mm	Brix:	16.6°Brix
Diameter:	70.9 mm	pH:	3.5
Fruit weight:	126.6 g	Skin thickness:	7.2 mm
Firmness:	7 N	Skin weight:	67 g
Pulp recovery:	43.8 %		

Based on 3 replicates and 9 fruit collected in April 2026 from Woombye.

3. Strengths

- Fast Starter: Produces fruit earlier than most varieties (at Woombye)
- Big Fruit
- Good taste in summer

4. Commercial fit / still evaluating

- Slows down in terms of production as season progresses (need more time to evaluate)
- Mid-Range yielder so far (at Woombye)
- Colour varies throughout season, and is not uniform



Advanced Selection Fact Sheet

UQP6

1. Selection snapshot

- Small to Medium Purple fruit with attractive uniform appearance
- Tasty fruit, with high sugar (Brix)
- Hardest shell (at Woombye)

2. Preliminary fruit quality (SIMPLE GENOTYPE MEANS)

Length:	70.4 mm	Brix:	17.9°Brix
Diameter:	64.3 mm	pH:	3.4
Fruit weight:	108 g	Skin thickness:	6.4 mm
Firmness:	7.26 N	Skin weight:	64.3 g
Pulp recovery:	40.1 %		

Based on 3 replicates and 9 fruit collected in April 2026 from Woombye.

3. Strengths

- Strong vine into winter, evidence of early flowering
- Has been requested by a farmer for expanded trial
- Hardest fruit of all selections (at Woombye), may suggest superior disease resistance and postharvest performance
- Fruit seems to taste and look good in winter

4. Commercial fit / still evaluating

- Slow starter, takes some time for fruit bearing in first season
- Need postharvest data to confirm
- Lower end of yielders when compared to others (so far)



Advanced Selection Fact Sheet

UQP7

1. Selection snapshot

- Small Purple fruit with attractive appearance
- Tasty fruit in summer
- Very high and consistent yielder

2. Preliminary fruit quality (SIMPLE GENOTYPE MEANS)

Length:	65.4 mm	Brix:	16.65°Brix
Diameter:	60 mm	pH:	3.2
Fruit weight:	95.2 g	Skin thickness:	5.8 mm
Firmness:	6.32 N	Skin weight:	49.6 g
Pulp recovery:	47.7 %		

Based on 3 replicates and 9 fruit collected in April 2026 from Woombye.

3. Strengths

- Highest yielder in trial with consistent dropping
- Nice tasting fruit into the summer
- Second highest pulp recovery values (at Woombye site)

4. Commercial fit / still evaluating

- Smaller fruit, will have to check the direction of the industry on this
- Soft skin, will have to check postharvest performance.
- Taste can be tart into the winter, monitor taste postharvest for improvements
- Some vine defoliation in winter



Advanced Selection Fact Sheet

UQP8



1. Selection snapshot

- Med Purple fruit with attractive appearance
- Very tasty fruit, with complex taste and high pH



2. Preliminary fruit quality (SIMPLE GENOTYPE MEANS)

Length:	66.2 mm	Brix:	16.5°Brix
Diameter:	62.5 mm	pH:	3.76
Fruit weight:	108.7 g	Skin thickness:	6.2 mm
Firmness:	7.23 N	Skin weight:	59.3 g
Pulp recovery:	45.1 %		

Based on 3 plants and 8 fruit collected in April 2026 from Woombye.



3. Strengths

- Hard Shell, which may suggest good postharvest performance
- High Ph, tasty fruit (best tasting fruit in progeny trial)
- Fruit seems to taste good in winter



4. Commercial fit / still evaluating

- Slow starter, takes some time for fruit bearing in first season
- Fruit tends to drop all at the same time, not a progressive dropper
- Some vine defoliation in the winter
- Fruit colour does fluctuate during the season



Advanced Selection Fact Sheet

UQP9



1. Selection snapshot

- Med Red Fruit
- High sugar (Brix)



2. Preliminary fruit quality (SIMPLE GENOTYPE MEANS)

Length:	68.4 mm	Brix:	18.2°Brix
Diameter:	68.3 mm	pH:	3.38
Fruit weight:	110.85 g	Skin thickness:	5.46 mm
Firmness:	6.11 N	Skin weight:	68.8 g
Pulp recovery:	38.3 %		

Based on 2 plants and 5 fruit collected in April 2026 from Woombye.



3. Strengths

- Strong vine into winter
- Second highest sugar content in Woombye Trial



4. Commercial fit / still evaluating

- Slow starter, takes some time for fruit bearing in first season
- Need more fruit drop data for this season
- Drops large quantities of fruit at the same time.
- Taste becomes tart in winter



Do you want to trial any of these varieties?
Please let us know.

Please call or email me:

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Ph: 0438886534

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Or email Mobashwer Alam: m.alam@uq.edu.au and Pragya Dhaka Poudel:

p.dhakalpoudel@uq.edu.au