

BerryQuest International 2022

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AUSTRALIA**



25–28 July
Sea World Resort
& Conference Centre

**BQI
22**

BerryQuest International 2022

WEDNESDAY 27 JULY 2022

Berry Breeding: DNA Informed Breeding for Better Aussie Strawberries

Dr Jodi Neal & Dr Katie O'Connor, QDAF



berries
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DNA Informed Breeding for Better Aussie Strawbs

Jodi Neal
Katie O'Connor

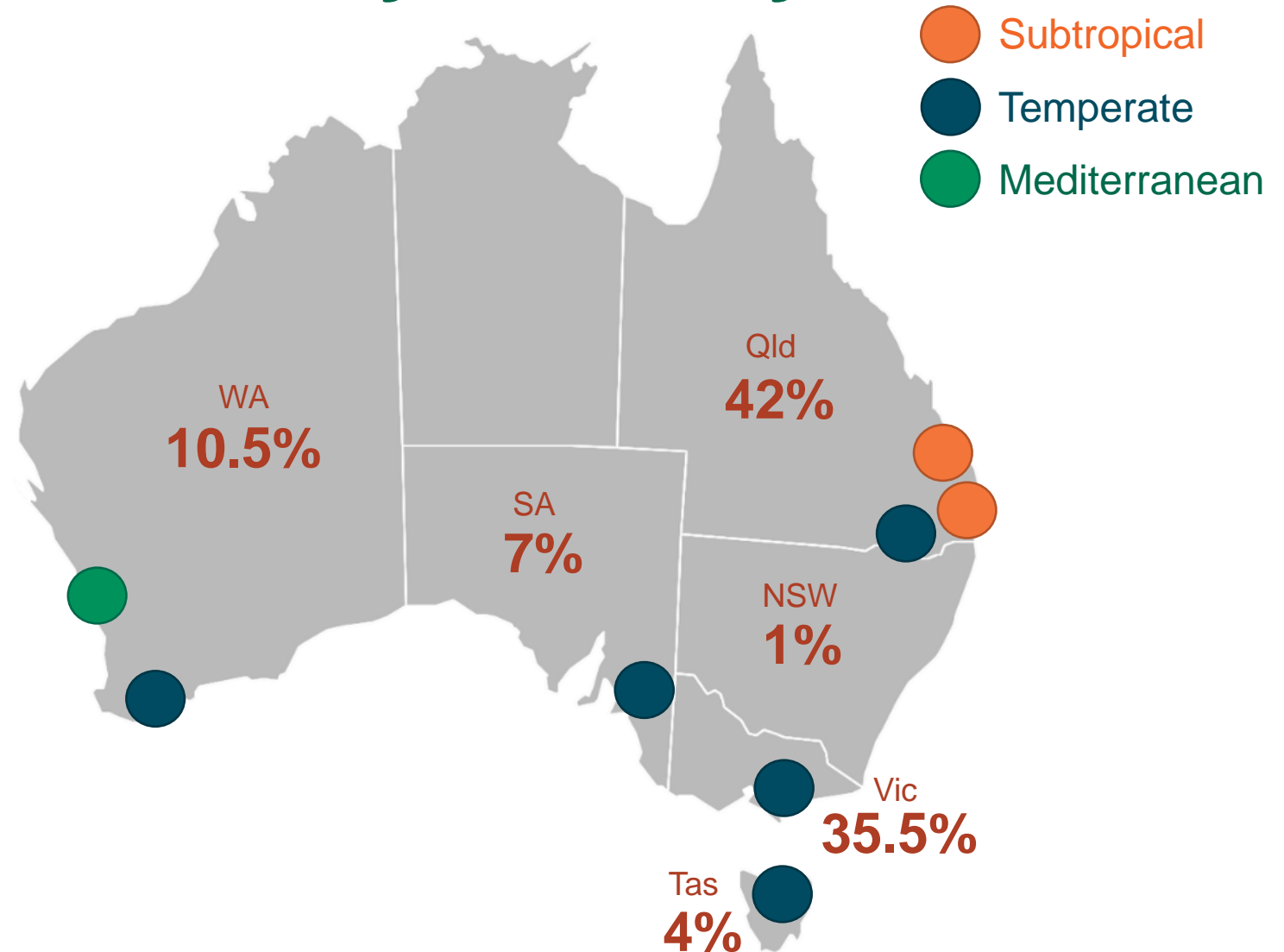
Australian strawberry industry

82,310 tonnes in 2019/20

\$435 million farm gate

Three climatic zones

Year-round production



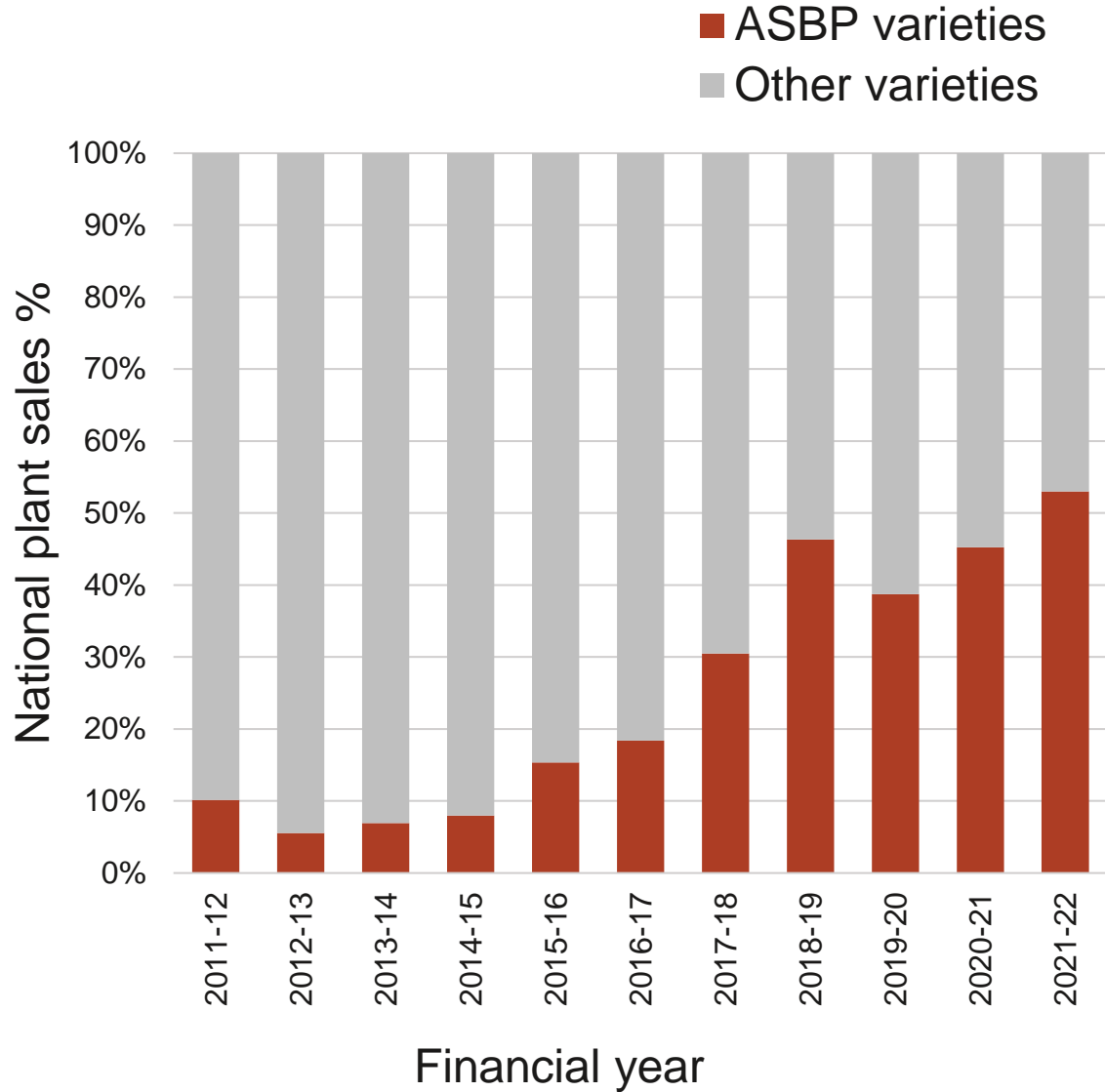


Australian Strawberry Breeding Program

Develop new varieties with superior production traits, disease resistance, and fruit quality

Meet changing demands

Targeting temperate, subtropical and Mediterranean regions



2021-22

~50% of Australian plants

~\$230M farm gate

~8500 production jobs

Generate diversity

Seedling selection

Early stage selection

Advanced stage selection

On-farm selection

Year 1

Year 2
2,000 to 14,000 seedlings

Year 3
100 to 200 selections

Year 4
10 to 20 selections

Years 5 & 6
1 to 10 elite clones

Define targets
in consultation
with industry

Select crosses

Generate
seed through
cross-
pollination

Germinate and
plant seedlings

Evaluate for
highly heritable
traits

Make selections

Clonally
propagate
selections

Plant clonal
field trial

Weekly harvest
and evaluation

Analyse data

Make selections

Plant clonal
field trial

Weekly harvest
and evaluation

Disease
resistance
screening

Analyse data

Make selections

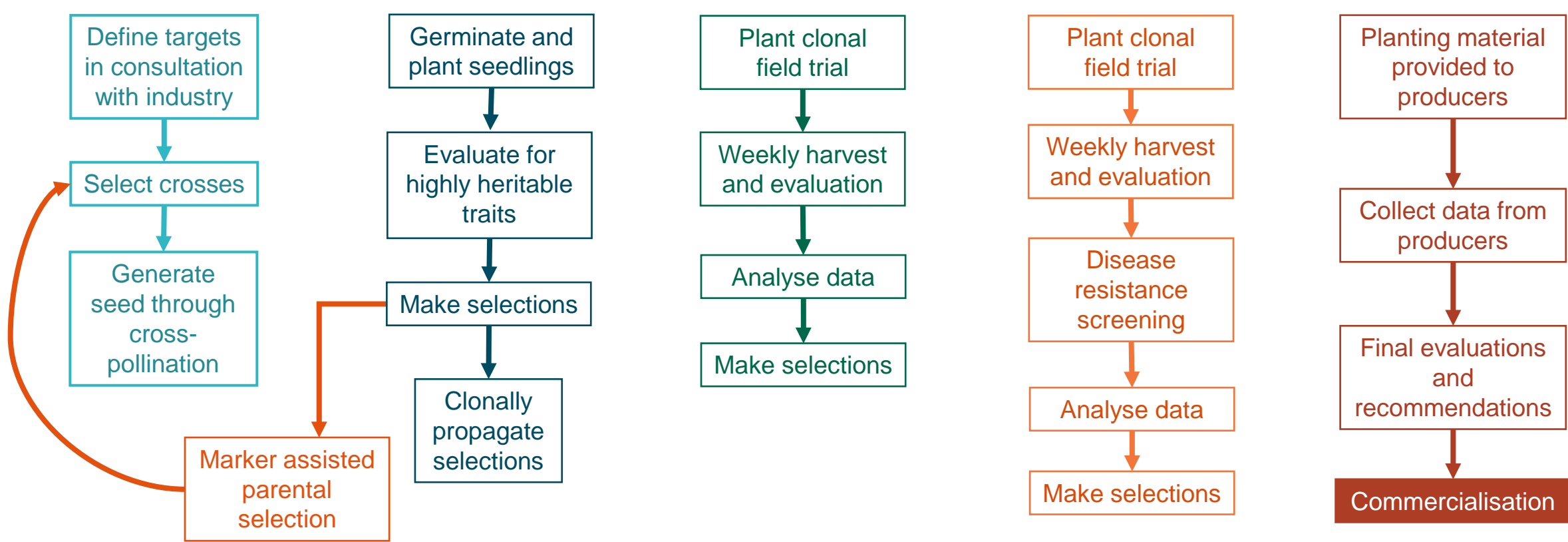
Planting material
provided to
producers

Collect data from
producers

Final evaluations
and
recommendations

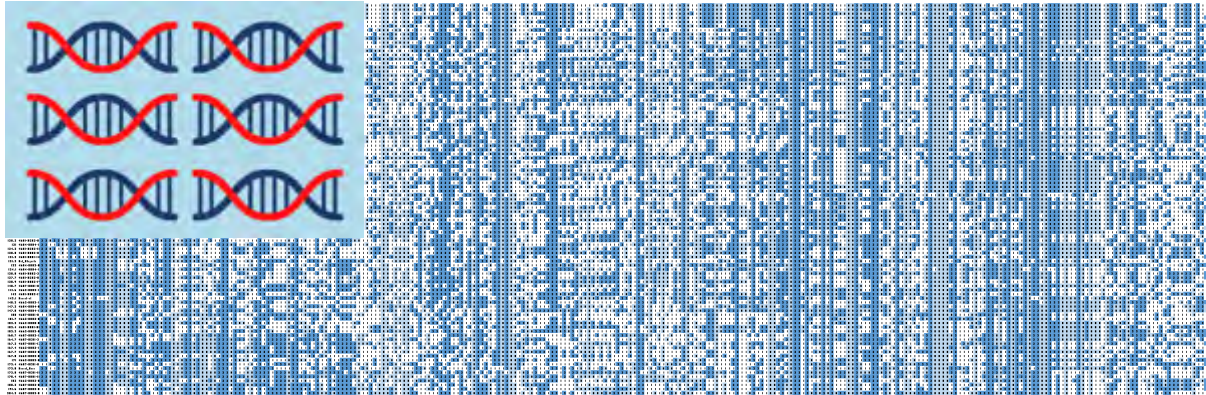
Commercialisation

Marker assisted
parental
selection

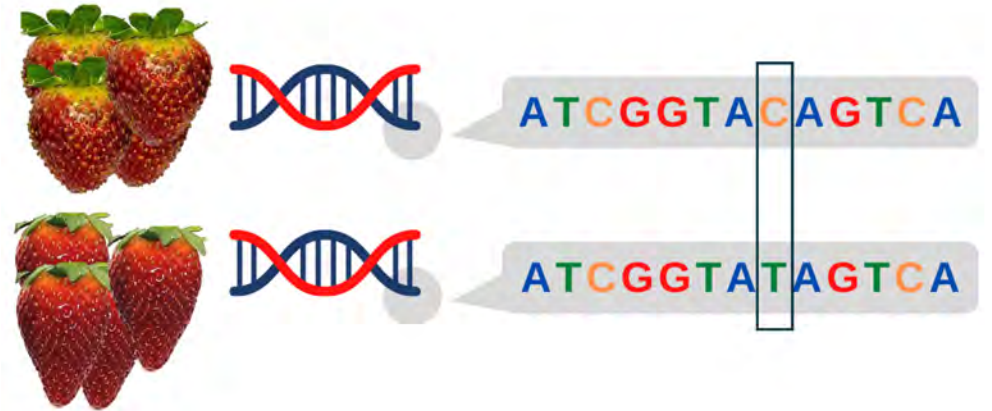


Using genomics technologies

Genomic selection

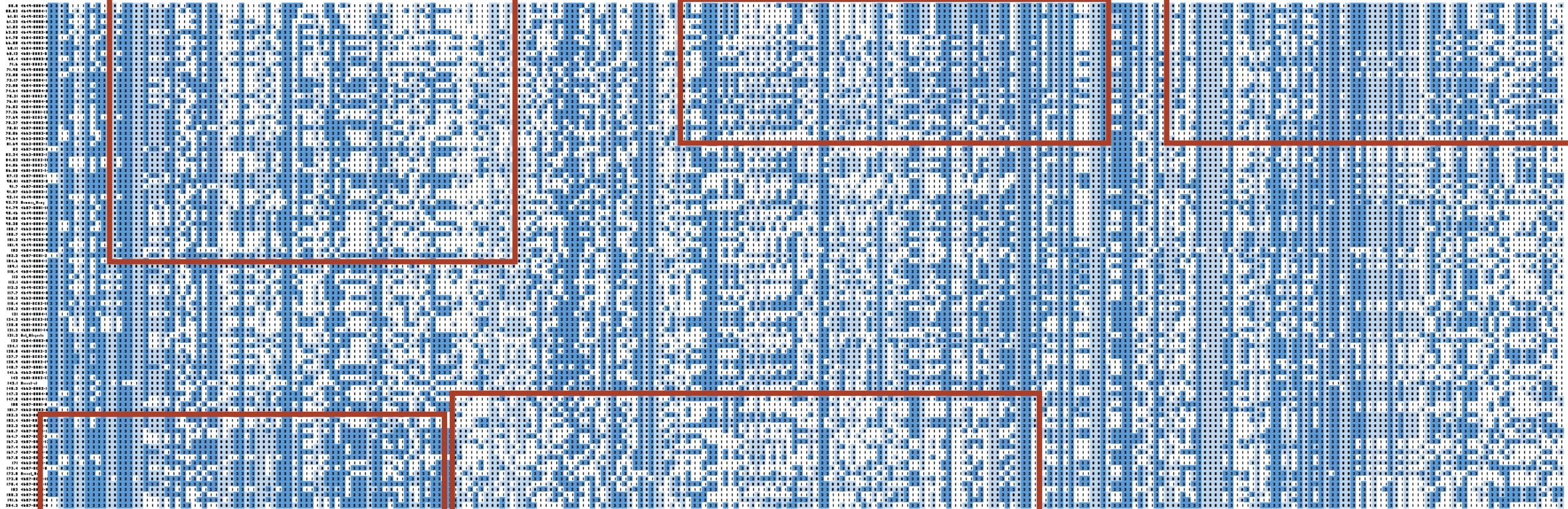


Large gene effects

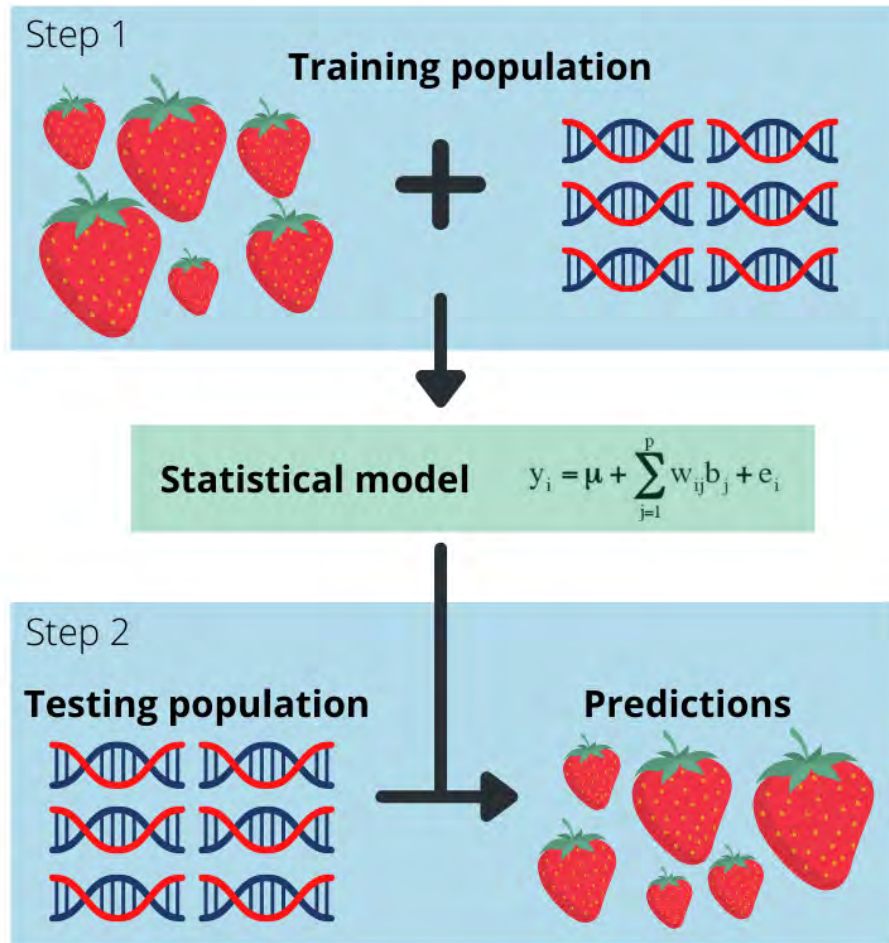


Genomic selection: whole genome

Tolerant
Moderate
Susceptible



Genomic selection: whole genome



- Total yield
- Early yield
- Fruit size
- Brix
- Acidity
- Bruise resistance
- Abrasion resistance
- Rain damage resistance
- Bush size
- Fruit display
- Truss branching

Large gene effects



A T C G G T A C A G T C A



A T C G G T A T A G T C A



Large gene effects

Two routinely screened:

- Volatile (flavour) marker
- Day neutrality marker

New QuantStudio5 rtPCR machine

- Expand marker set
- Develop new markers

Genetics of Fruit Sensory Preferences



- Consumer preferences
- Trained panel
- Volatiles
- Genetic markers

Specialty varieties



Thank you

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**Queensland
Government**



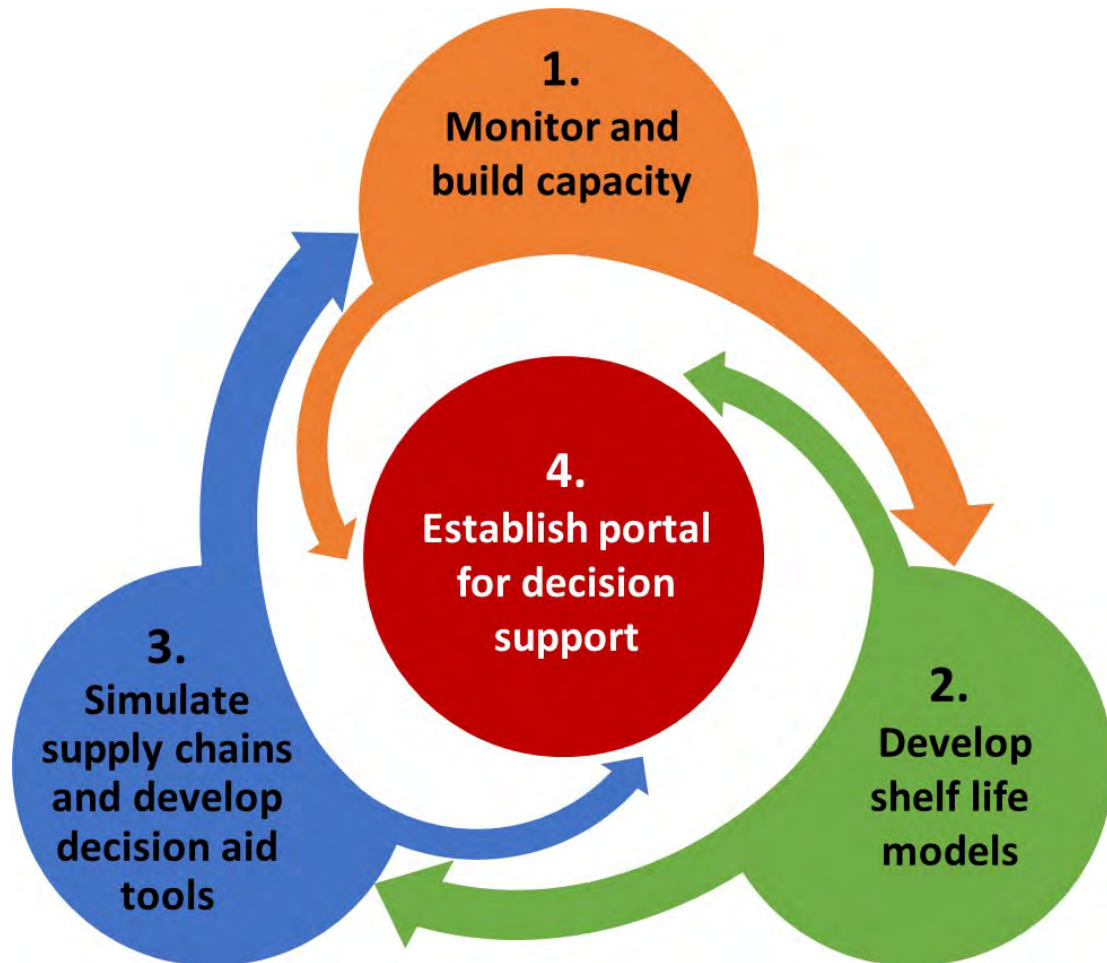
Introducing Serviced Supply Chains II (AM21000)

A 3.5-year, \$8.5m initiative that seeks to...

provide growers and exporters with the decision support to successfully manage supply chain risks and deliver more consistent quality fresh produce



Serviced Supply Chains II – Strawberry program



Adoption:

Work with Berries Australia, innovators and key influencers

Year 1

- Monitor and analyse domestic supply chains
- Capacity building

Year 2&3


- Simulate supply chain improvements/options (domestic and export)
- Monitor chain improvements
- Capacity building




Deliverables:

- Best practice resources
- Case studies
- Online decision support portal
- Decision support tools
- Industry communications

Delivering mango decision support

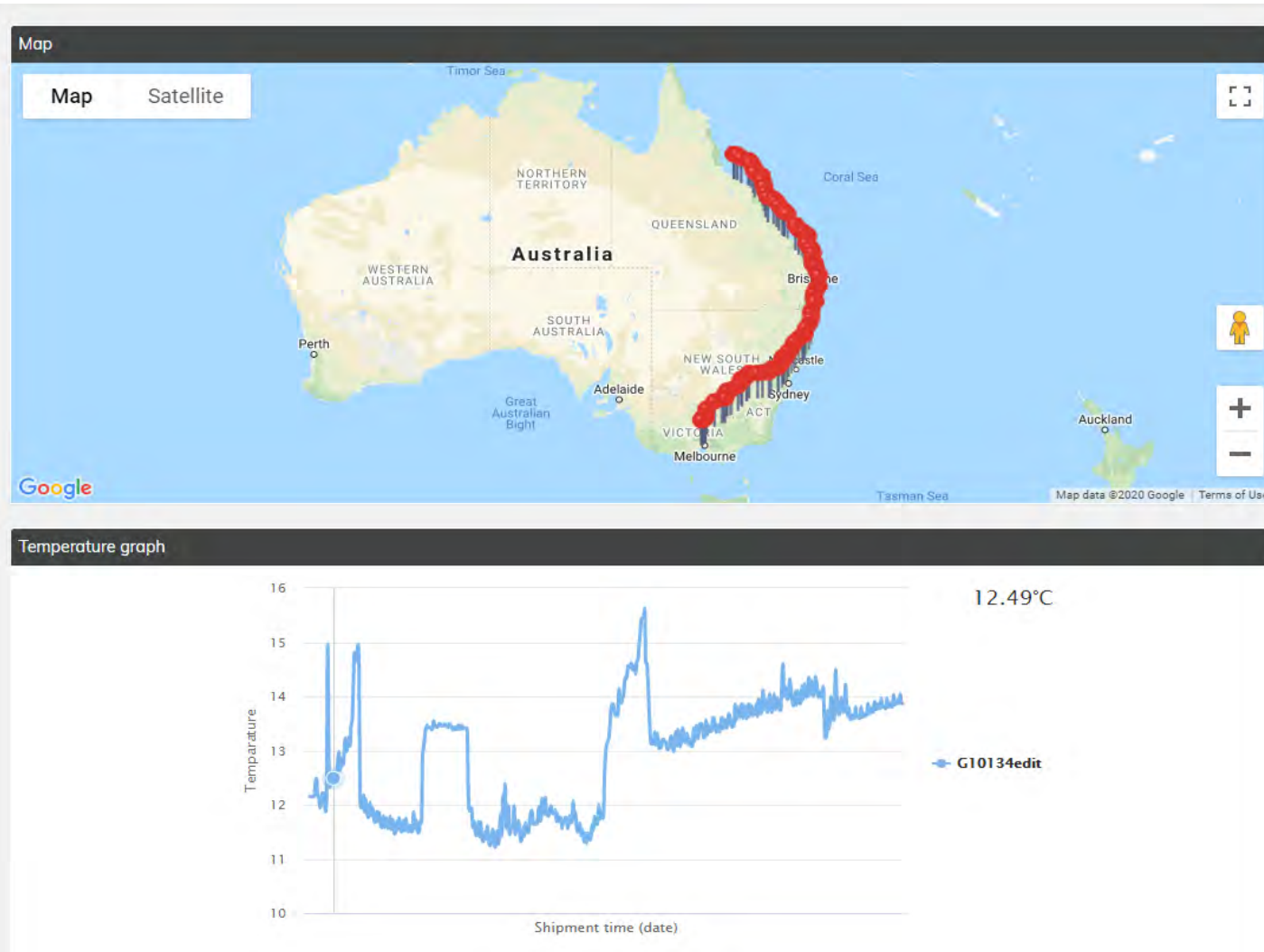


Queensland Government
Department of Agriculture and Fisheries



Hello, Andrew

- Dashboard
- Manage user
- Manage device
- Manage shipment
- Settings



Monitoring to improve quality

Mango exporters embrace real-time shipment monitoring

Several mango exporters trialled the use of loggers for real-time (RT) shipment monitoring this past season, two of them embarked on a more planned program of activity to identify and manage risks in their supply chains.

Darcy Holmes works for Perfection Fresh as their Vapour Heat Treatment (VHT) Authorised Officer (AO). Perfection Fresh are collaborating with the Department of Agriculture and Fisheries (DAF) on a Cooperative Research Centre for Developing Northern Australia (CRCNA) project to enhance cold chain monitoring and management of Calypso mangoes to China and South Korea.

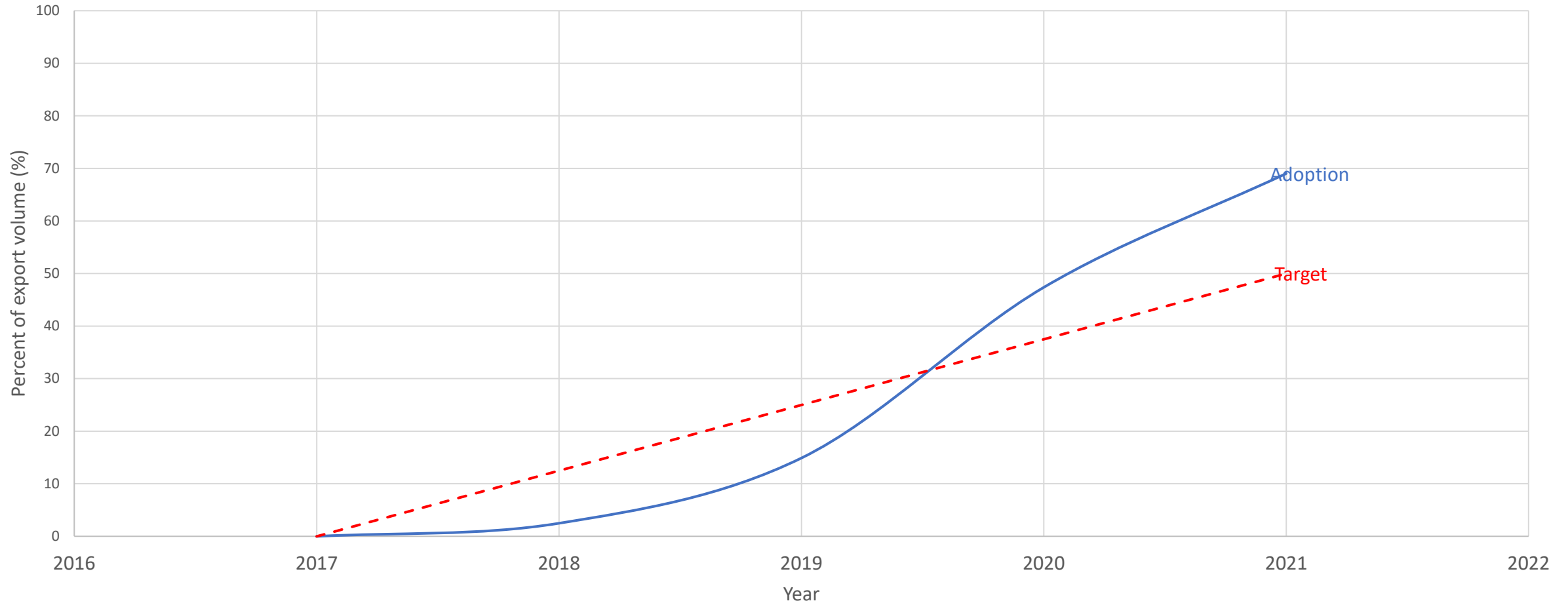
One of their aims is to understand and overcome cold-chain issues including those encountered with sea freight. Lower sea freight costs (relative to air freight) make Australian mangoes more competitive against our main export rivals (Peru and Chile) in China and South Korean markets.

Darcy has been testing two types of autonomous download temperature loggers. For export, he uses RFID (radio frequency identification) tags (single trip loggers) to transmit data from the shipment to receivers located at key points along the supply chain. The receivers then send the data to a cloud-based platform which is readily accessible to approved chain members using secure username and password access. This logger type is most suited to well established, high volume supply chains. It is suitable and approved for sea and air freight.



- Maintaining recommended temperatures
- Extending shelf life by 30-80%
- Growers are embracing the technology
- Reducing claims

Delivering mango industry SC results



Temperature monitoring

Industry adoption from close to 0 (2017) to 69-100% (2021) of export consignments.

Serviced Supply Chains II

Thank You

Follow up:

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**Queensland
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