



Cherries Traceability Pilot Final Report



Table Of Contents

What is Traceability?	3	Traceability Export Marketing Campaign	21
Cherries Traceability Pilot.....	4	Unique QR Code Results – Scan Rates	22
Summary of Results.....	5	Scan Rates Evaluation.....	23
Why is Traceability important to the Cherry Industry?	8	Counterfeit Report	25
Why is Traceability important to Cherry Growers and Exporters?	9	Counterfeit Evaluation	26
Traceability Implementation Framework	10	Consumer Surveys.....	27
Traceability On Farm: RFID Systems	11	Consumer Survey and Microsite Evaluation.....	28
RFID Results.....	14	Enterprise Resource Planning (ERP) System Integration	29
RFID Evaluation.....	15	Data Revealed versus Data On Record	30
Traceability For Export: Unique QR Code Systems.....	16	Temperature Tracking.....	31
Scan the QR Code	18	Supply Chain Data Standards.....	32
Traceability Marketing Campaign	19	Supply Chain Data Evaluation.....	34
Traceability Domestic Marketing Campaign.....	20	Communications	35
		Acknowledgments	36



What is Traceability?

Traceability systems track the journey of food from 'tree to table'.

Drivers for traceability include food safety, biosecurity, market access, provenance authentication, consumer engagement, automation and digitisation to support production growth, supply chain efficiency, integrity assurances and sustainability.

This diagram shows the traceability systems and standards implemented in the Cherries Traceability Pilot from Australian cherry orchards, through supply chains, to domestic and international consumers.



Cherries Traceability Pilot

Cherry Growers Australia (CGA) partnered with Agriculture Victoria, to conduct a traceability pilot, to enhance traceability for the cherry industry.

The pilot ran through the 2022 and 2023 cherry harvest seasons, aiming to:

Year 1: develop on-farm RFID traceability systems

Year 2: build, diversify and protect exports by developing unique QR Code producer-to-consumer traceability systems.

The technology developed has the potential for future use across the cherry industry.

Pilot Partners



Summary of Results 1/3

Overview

RFID systems were used for traceability of “bulk items” – fruit bins and pallets in transit on forklifts, where the RFID labels were detected by RFID readers on gantries at the orchards and packing house. This used radio frequency identification of data.

Unique QR Codes were used for traceability of “individual retail items” – handheld boxes and shippers, where QR Code labels were scanned by consumers with their smartphones in retail stores, or by any other supply chain partners such as logistics, importers, customs officials or retailers. This used optical identification of data.

Both were integrated with CherryHill’s Enterprise Resource Planning (ERP) system, and GSI global standards and GSI Digital Link were used to harmonise, capture and share data.

These traceability systems have given CherryHill real-time visibility of their product from orchard, to processing, to dispatch, to export.

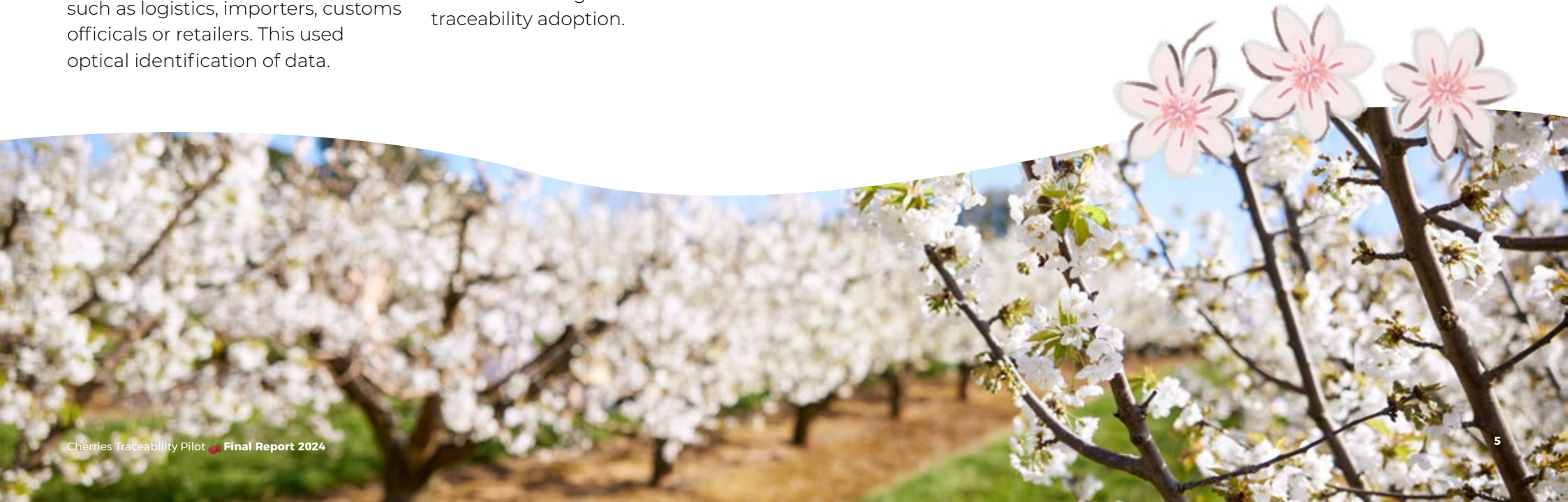
The 2-year pilot ran at CherryHill Orchards in Victoria, Australia, with a communications program led by Cherry Growers Australia (CGA) to share learnings and to foster traceability adoption.

RFID Systems

CGA commented that initial hopes for RFID for the cherry industry were high for several reasons:

- To bring increased automation that could support increased production in coming years.
- To check multiple labels within a load (e.g. boxes in a pallet) that may be positioned in multiple locations, including hidden in the middle or any side.

However, the challenges demonstrated by this pilot mean that current levels of scanning accuracy at 73.9% to 85.9% are not adequate for the cherry industry and further refinement is necessary. To achieve optimal performance, there is potential for improvement through changes such as RFID label positioning on bins or pallets in relation to RFID readers.



Summary of Results 2/3

Unique GSI Digital Link QR Code Systems

The project team felt consumer scan rates of 7.22% (2023-2024) in Cherries were high and successful, and likely supported by the extensive CherryHill marketing campaign, and the post pandemic effect of high consumer familiarity with QR Code scanning. These demonstrate a steadily increasing trend in consumer scanning when compared with previous results from similar pilots; 1.43% (2022) GSI Digital Link QR Codes in Citrus, 0.05% - 0.58% (2021-2022) GSI Digital Link QR Codes in Table Grapes, 0.1% (2020) Laava codes in Citrus.

Scan rates for wholesale products at 0.35% (2023-2024) in Cherries, by supply chain partners, reflect the consistently low scan rates in

wholesale products seen across all previous Citrus and Table Grapes projects (0.14% - 0.87%). This remains a key potential area to change standard operating procedures in supply chains. However, even in the absence of regular supply chain scanning, the benefits of digital product traceability become immediately evident in a crisis.

21 products were counterfeited during the pilot, but CherryHill found the solution highly valuable in giving rapid visibility of products of concern. It allowed CherryHill to quickly identify counterfeit labels that had not been printed by CherryHill and to take action, most often through commercial, rather than regulatory measures.

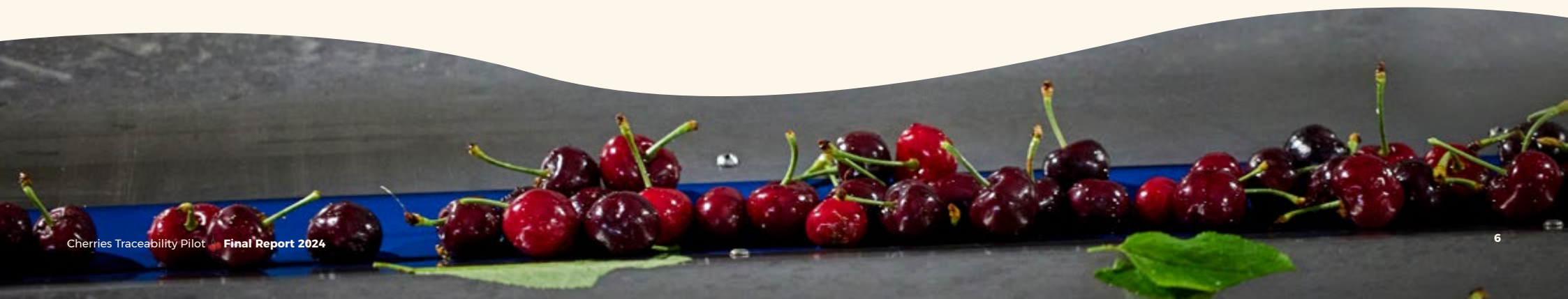
Scanning the GSI Digital Link QR Codes with their smartphones gave consumers access to a microsite with product authentication and

CherryHill's farm story. Consumers also had the opportunity to provide product feedback through a tailored survey on the microsite, with 774 consumer responses across 4 survey questions. This large amount of data is highly valuable to operational and marketing activities.

CherryHill reported feedback from retail partners that consumers who had scanned the product had been pleased with the tracing and farm origin information they had received from the microsite. CherryHill also reported that overseas consumers had been encouraged by the QR Code scanning process to purchase larger boxes of fruit, enabling the launch of new products into overseas markets, with traceability and sustainability benefits.

Enterprise Resource Planning (ERP) Integration

ERP integration was undertaken with the RFID and unique GSI Digital Link QR Code systems. Overall project partners agreed that the ERP integration had been very successful. It needed collaborative work by all technology providers and CherryHill to reach a stable, reliable state, to achieve stable APIs to RFID and QR Code systems, and to resolve some issues. However, partners were agreed that it is now fit for purpose going forward.



Summary of Results 3/3

GS1 Standards for Supply Chain Data

CGA supported the value of GS1 standards for traceability in supply chains. More generally, CGA noted it is essential that the cherry industry tries to standardise any procedures that relate to international supply chains, and utilise standards also used in export countries. Many different standards and procedures have evolved and continue to evolve over time, and these present ongoing obstacles. CGA feels that any traceability project not incorporating GS1 standards in future has the potential for major issues.

Marketing

CherryHill ran an extensive online and in store marketing campaign in Australia, Vietnam, Singapore and other key markets. They publicised the 'Scan, Play, Win' activities on Facebook, Zalo and via influencers, achieving a reach of over 13,000. They had close to 30 competition winners internationally. They ran unique farmgate events around their Blossom and Cherry-Picking Festivals, leveraging consumer engagement and sales of fresh cherries, cherry products and CherryHill merchandise.

Communications

Cherry Growers Australia produced a range of communications for their members, which were also available to wider audiences in horticulture, other primary industries and government. These include media releases, an animation, videos, a demonstration QR Code with a link to the microsite app and this final report. The pilot launch achieved 17 national and international media articles. Pilot social media posts and videos achieved over 10,000 views and impressions on YouTube, LinkedIn and Facebook. These communications generated overwhelmingly positive awareness

about the pilot. Shared learnings from the pilot will enable other growers and supply chain participants to understand the importance of traceability and adopt traceability systems.



Why is Traceability important to the Cherry Industry?

Australian cherries are a highly valued fresh horticulture export. The Australian cherry industry has a total value of \$190 Million and exports worth \$80 Million, to over 30 countries annually.

Traceability On Farm: RFID Systems

Transitioning to automated on farm traceability is important for our industry. Automated on farm traceability allows growers to gather detailed data about their orchard's production, harvest packing and dispatch systems. It's vital that the cherry industry develops automated on farm traceability to support increased production in the future. Automated on farm traceability can help with farming techniques, plant health and quality assurance. It can also pinpoint issues such as quality, food safety or biosecurity incidents back to the packing shed or a specific orchard block.

Radio frequency identification or RFID is a technology with potential to make automated traceability a reality in the horticulture industry. We need to continue to investigate and test the technology, so its application becomes more

affordable and easier to use to the point it becomes more widely adopted by the whole industry.

Traceability For Export: Unique QR Code Systems

We have built a strong export market based on the quality and safety of our world class fruit. So, maintaining our reputation is critical. International governments and food retailers are increasingly demanding enhanced traceability through regulation and customer requirements.

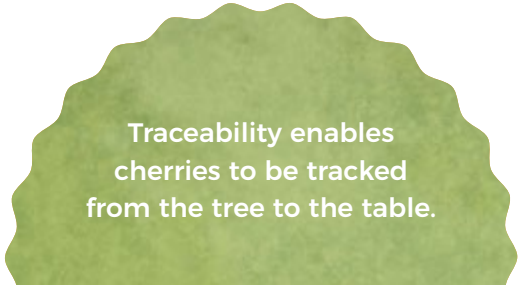
Traceability is the ability to track a product from the farm, through the supply chain, to the consumer. Producers want to supply premium products at maximum value and consumers want to feel confident that they are buying genuine products. International governments and food retailers want to be able to trace food

quickly in the event of food safety outbreaks and to prevent exotic pests and diseases from entering their countries.

So, it's important that Cherry Growers Australia empowers the industry with world class traceability as we compete against other suppliers in international markets.

Traceability Standards: GS1

GS1 standards enable our products to be tracked and traced using an international common language for data. These standards enable organizations to identify, capture and share information smoothly, creating a common language that underpins systems and processes all over the world.



Cherry Growers Australia has partnered with Agriculture Victoria to run a traceability project for the cherry supply chain on behalf of our industry.



Patrick Ulloa

Why is Traceability important to Cherry Growers and Exporters?

Our family has been serving up premium, Australian cherries since 1940.

We search the world for the best cherry varieties that deliver on quality, firmness and flavour. These varieties, and the combination of our different growing regions, give us the longest possible growing season so that you can enjoy CherryHill cherries from November right through to February.

We sell our cherries domestically through supermarkets, independent grocers and via online and farmgate stores. CherryHill grows, packs and markets cherries for export. Key markets include Hong Kong, Singapore, China, Vietnam, Malaysia and India. In a typical season, we export over 100,000 boxes of cherries.



Traceability On Farm: RFID Systems

In this pilot, we've implemented several new traceability measures. In trialling RFID technology, we're aiming to automate the tracking of our fruit from harvest packing and dispatch processes. Automation helps us with the increased volume year on year that we're producing.

We aim to automate and streamline what was an otherwise manual process.

Traceability For Export: Unique QR Code Systems

Unique QR Code GS1 Digital Link labelling on our products gives us traceability for engaging with supply chain partners and our consumers. Scanning the unique QR Codes enables a two-way flow of information. We can tell the story of our products and our consumers can tell us about their experience of our fruit. Through the scanning

experience, we are also able to deliver marketing promotions, including prizes and giveaways to our customers. This project will enhance our exports by developing full supply chain traceability, with the flexibility to be used with different varieties in multiple pack types and many different markets.

Traceability Standards: GS1

GS1 traceability standards are being used in this project to future-proof our export products. Traceability requirements are increasing from governments and businesses around the world, and the GS1 standards enable our products to be tracked and traced using an international common language for data.

CherryHill
ORCHARDS



Stephen Riseborough

Traceability Implementation Framework

	On Farm Traceability		Supply Chain Traceability	
Consumer Engagement			Microsite/Dashboard Site Wireframes	Gamification wireframes
			Tracking/Dashboard Analytics	Microsite widgets
Supply Chain			Supply Chain Data	Tracking/Dashboard Analytics
			Pallet Tracking	Location Tracking
Operations	Inventory Transfer	RFID label Validation	Serialized Case Printing	Dispatch Tracking
	RFID Scan Stations	Batch Grading Traceability		
Technology	Network Architecture	Hardware	Network Architecture	Hardware
	RFID Software Design	Grower System Integration	Print Software Design	Grower System Integration
Project	Vendor Selection	Project Plan	GSI Standards	Reporting

Key:	RAMP Deliverable	DIALOG Deliverable	Trust Codes Deliverable	CherryHill Deliverable
------	------------------	--------------------	-------------------------	------------------------

Traceability On Farm: RFID Systems

RFID Definition and Function

RFID stands for radio frequency identification. At a simple level, it is made up of RFID labels, RFID hardware or readers, and RFID software. For this pilot, we've introduced our RFID traceability solutions at CherryHill Orchards. RFID traceability on the farm enables automated capture of harvest fruit data together with its picking location and variety. Information collected from the RFID labels by the RFID readers is transferred to the specialised software. We have worked with Dialog to integrate this data with the Enterprise Resource Planning ERP system where the data can be stored, displayed and analysed.

On farm traceability enables you to access real time data, giving you instant visibility into the assets and product locations. This improves quality control; it's easier to isolate and address issues, ensuring that all products are packaged and labelled correctly based on their grading, ensuring premium product quality. We also have the benefit of sustainability; data driven insights that can help reduce waste and improve resource use.

Traceability isn't just about tracking, it's a compass guiding you to better decision making and a more sustainable operation.

Traceability On Farm: RFID Systems: Stage 1: Orchard to Packing Shed

Orchard: Fruit is harvested in the orchard. RFID labels are attached to the bins. RFID labels on the bins are read by RFID readers at the orchard gantry, before being loaded onto the truck.

Packing Shed Receive: When the harvested fruit bins arrive at the packhouse receive shed, the RFID labels are read by RFID readers, which are mounted on portals at the receiving dock. RFID traceability on arrival at the packhouse receive shed enables cross-checking of the previous farm data.

Traceability On Farm: RFID Systems: Stage 2: Packing Shed Robot Loading and Pallet Dispatch

Packing Shed Robot Loading: At the robot loading docks, RFID labels on the bins are read by RFID readers. This checks that the bins are associated with the current batch being processed. If the RFID labels on the bin relate to the correct batch,

the status is automatically updated and then the bins are used for the current production order.

Fruit is then boxed and palletised (see QR Codes systems).

Packing Shed Dispatch: RFID labels on pallets are read by the RFID readers at dispatch. Firstly, this tracks the pallets according to the batch and the sales orders. Secondly, when the pallet leaves the packhouse the RFID system confirms that the pallets have left the facility.

Traceability Standards: GS1

We use GS1 standards to identify locations and items within the supply chain. GS1 Standards are very important for globally harmonising the supply chain from the farm here in Australia all the way through the supply chain to international customers. Using GS1 standards will future-proof the cherry industry to meet the evolving traceability requirements in export markets as well as helping with efficiency and quality within the supply chain.

Peter Reinke

Ramp



Traceability On Farm: RFID Systems

Stage 1: Orchard to Packing Shed

1. ORCHARD



2. HARVEST



3. BINS



4. RFID LABEL ATTACHMENT



5. WASHING



6. ORCHARD RFID READER



7. ORCHARD RFID BIN READING



8. BINS ON TRUCK



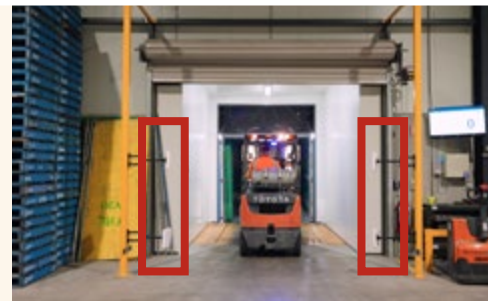
9. TRANSPORT TO PACKING SHED



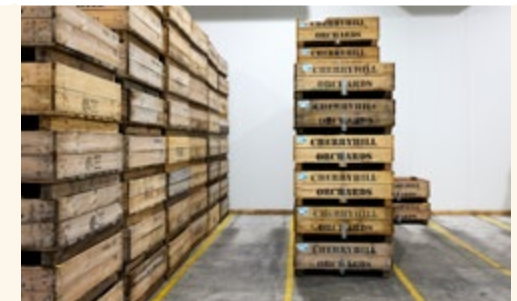
10. RECEIVAL AT PACKING SHED



11. PACKING SHED RFID BIN READING



12. PACKING SHED BINS STORAGE



Traceability On Farm: RFID Systems

Stage 2: Packing Shed Robot Loading and Pallet Dispatch

13. ROBOT LOADER RFID READER



14. ROBOT LOADER RFID: CHECKING BIN BATCHES



15. ROBOT LOADER RFID: COMPLETING PRODUCTION ORDER



Fruit is then boxed and palletised (see QR Codes systems)

16. RFID LABELS ON PALLETS



17. RFID PALLET READING AT TRUCK LOADING DOCK



18. TRUCK DISPATCH



RFID Results

Duration: These results show RFID product labelling and scanning that occurred 16 October 2023 to 17 January 2024

Number of Shipments from farms to Packing House	76
Total RFID Bin Labels printed at Farms (note: not all printed labels were applied to bins)	10127
Total RFID Bin labels read at Farm departure gates gantries	8383
Total RFID Bin labels read at RFID Receival Dock Packing House	8696
Percentage successful RFID reads at Receival Dock Packing House (note: based on overestimated count of labels applied to bins)	85.9%
Total RFID Bin labels read at Robot Loading Dock	8688
Total RFID Bin labels printed across all CherryHill systems (note: not all printed labels were applied to bins or pallets)	15716
Total SSCC RFID pallet labels printed at Packing House (note: not all printed labels were applied to pallets)	4985
Total SSCC RFID pallet labels read at Dispatch Dock Packing House	3683
Percentage successful RFID reads at Dispatch dock Packing House (note: based on overestimated count of labels applied to pallets)	73.9%

Note: percentages of successful RFID reads somewhat understate the accuracy of the system, as these figures reflect labels that were printed, not that were actually used, and there was some label wastage.



RFID Evaluation

RFID implementation presented several challenges and required several trial-and-error adjustments in different farm locations including:

- RFID antenna types (wide range versus narrow range)
- RFID reader location (loading dock and truck metal surfaces in particular caused RFID signal reflection and over-reading, therefore positioning RFID readers well inside the receival shed away from the loading dock and truck achieved best results)
- Distance of forklift trucks from RFID readers (if forklifts were too distant from the RFID reader, reading of RFID labels on bins were missed, therefore paint lines on the floor are recommended as pathways to guide forklift drivers in the correct distance to pass RFID readers)
- Forklift speed (if forklifts were too fast past the RFID trigger and RFID reader, reading of RFID labels on bins were missed. Forklifts must first pass the RFID trigger, which switches on the RFID reader for an 'RFID reading time window'.

This reading window gives more control and precision, compared to having the RFID reader on constantly. It minimises the possibility of over-reading from other RFID labelled bins in transit on different forklifts or stacked nearby. There is a slight lag between the trigger activation and the RFID reader coming on. The full time period of the trigger activation and the RFID reading must be incorporated into the forklift driving circuit.)

- RFID power settings (power settings that were too low were too insensitive and led to under-reading of RFID labels on bins; power settings needed to be adjusted accordingly)
- Moisture content of fruit may cause some interference with radiowaves, leading to RFID reading issues
- Positioning of RFID labels on bins in relation to RFID readers (standard operating procedures for label placement may need adjustment to achieve optimal performance: see diagram)

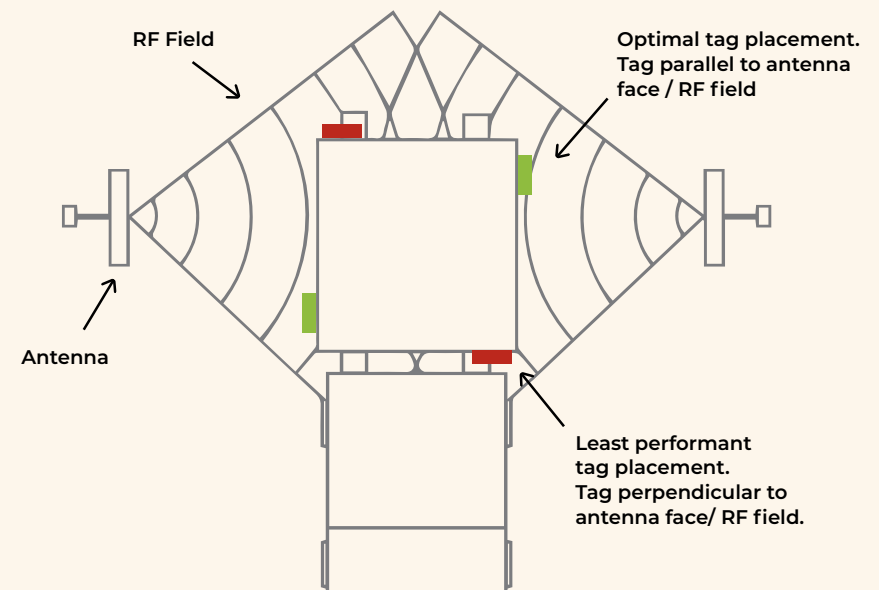
CGA commented that initial hopes for RFID for the cherry industry were high for several reasons:

- To bring increased automation that could support increased production in coming years.
- To check multiple labels within a load (e.g. boxes in a pallet) that may be positioned in multiple locations, including hidden in the middle or any side.

However, the challenges demonstrated by this pilot mean that current levels of scanning accuracy are not adequate for the cherry industry and further refinement is needed to achieve optimal scanning accuracy.

Future options to investigate include

- Use of permanently attached reusable plastic / metal labels such as GS1 Global Returnable Asset Identifier (GRAI) RFID labels on bins and pallets. These may be useful in wet environments and enable versatile label positioning on bins and pallets.
- As an alternative to RFID, optical reader labels such as QR Code labels on bins and pallets, however these would require direct line of sight with reading devices such as video cameras.



Traceability For Export: Unique QR Code Systems

Unique QR Codes Definition and Function

Unique GSI Digital Link QR Codes have been applied to CherryHill products. Each QR Code is different from the next. It's really easy for consumers with a smartphone to read a QR Code. It's a ubiquitous technology. It puts the power of validation in the consumer's hands. Consumers are really interested in the authenticity and provenance of the products they buy. Supply chain participants can use it in exactly the same way.

Within the microsite is game that consumers play and it's really fun, entertaining and the consumers spend more time with CherryHill Orchards when they're playing the game. The game allows them to share scores on social media for example, to win prizes. And of course, the game means it's really hard for counterfeiters to copy that technology.

Traceability for Export

GSI Digital Link empowered QR Codes allow for the collection of scan data across the supply chain. We use machine learning and artificial intelligence to identify patterns of food fraud.

Food fraud is more common than people realise, and consumers are becoming more alive to the risks of food fraud. Australian producers are looking for technology that helps protect reputations, protect intellectual property and reassure consumers of authenticity.

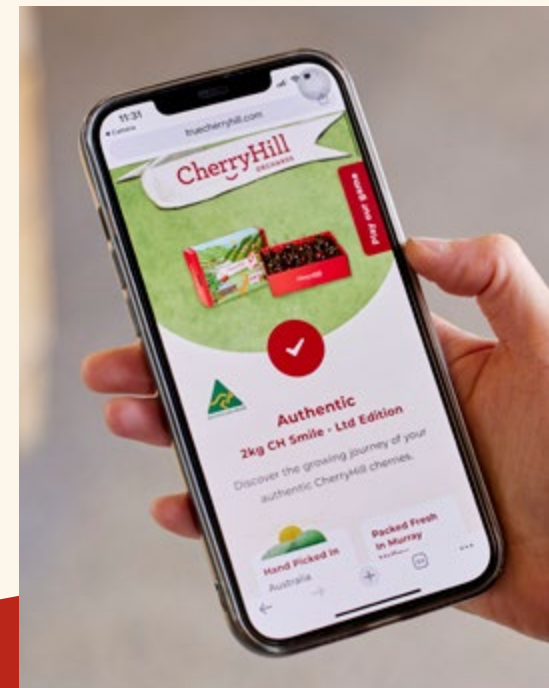
We have developed the product cloud that allows us to uniquely identify every CherryHill Orchards product and track it through the supply chain. The Trust Codes dashboard allows our customers to see all of their data in one place. Brand owners also use the dashboard to receive alerts of unusual patterns of behaviour, see what's going on in markets, and monitor temperature data of

products received from Escavox temperature loggers. Brand owners can deal with regulatory or other crisis management requirements through the dashboard data.

Traceability Standards: GSI

Using GSI standards future-proofs the cherry industry for evolving traceability requirements. GSI Digital Link empowered QR Codes allow supply chain participants and the consumer to validate that the product is safe, of high quality and of genuine origin. The GSI Digital Link empowered QR Codes also allow us to share fruit traceability information such as the variety, date of picking and who picked it.

Paul Ryan



Traceability For Export: Unique QR Code Systems

18. SCAN, PLAY, WIN LABELS



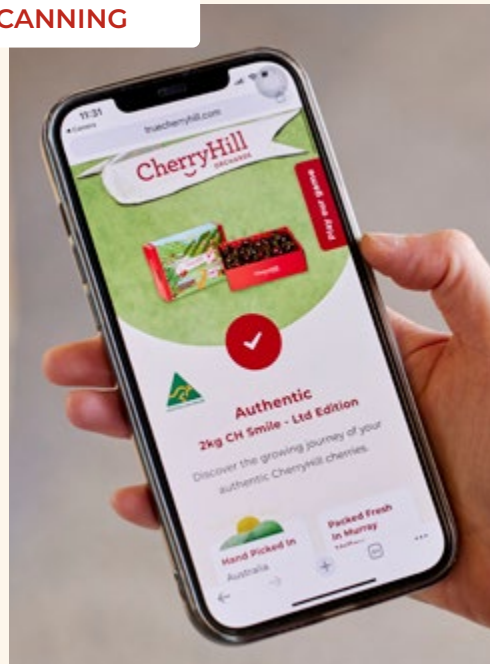
19. RETAIL – UNIQUE QR CODE BOX LABELS



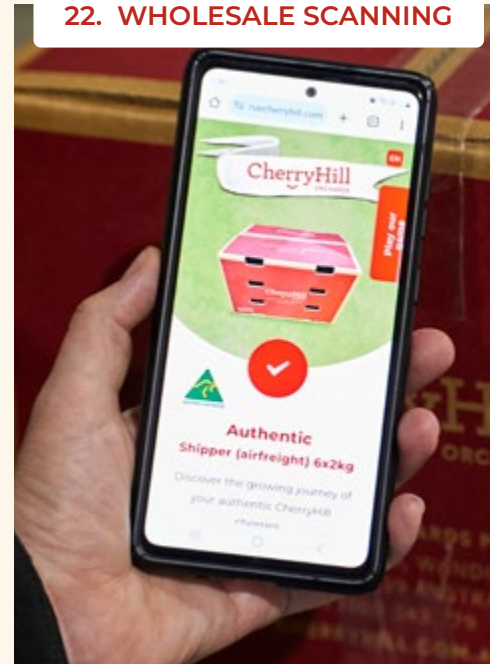
20. WHOLESALE – UNIQUE QR CODE SHIPPER LABELS



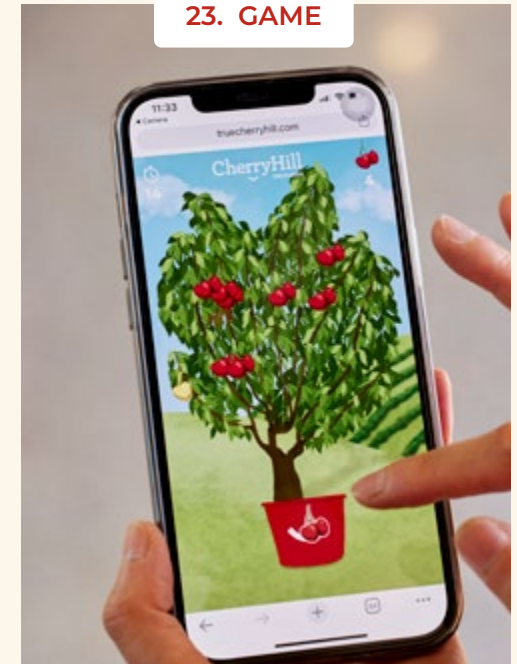
21. RETAIL SCANNING



22. WHOLESALE SCANNING



23. GAME



Scan the QR Code

Access the demonstration microsite app and authentication.



TRACE THE ORIGIN OF YOUR CHERRIES

Scan the QR code to authenticate Australian cherries

Traceability Marketing Campaign

CherryHill delivered a highly organised marketing campaign to support the traceability implementation.

Within Australia, CherryHill sells cherries through supermarkets, independent grocers and via online and farmgate stores. CherryHill also grows, packs and markets cherries for export. Key markets include Hong Kong, Singapore, China, Vietnam, Malaysia and India.



Traceability landing page on CherryHill website



“How it works” Animation



“How it works” Video

Traceability Domestic Marketing Campaign

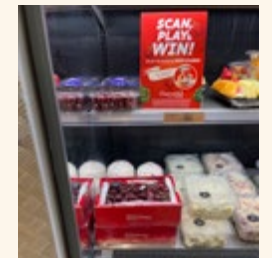
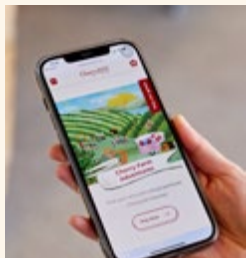
CherryHill Farmgate Stores



CherryHill Blossom Festival and Cherry Picking

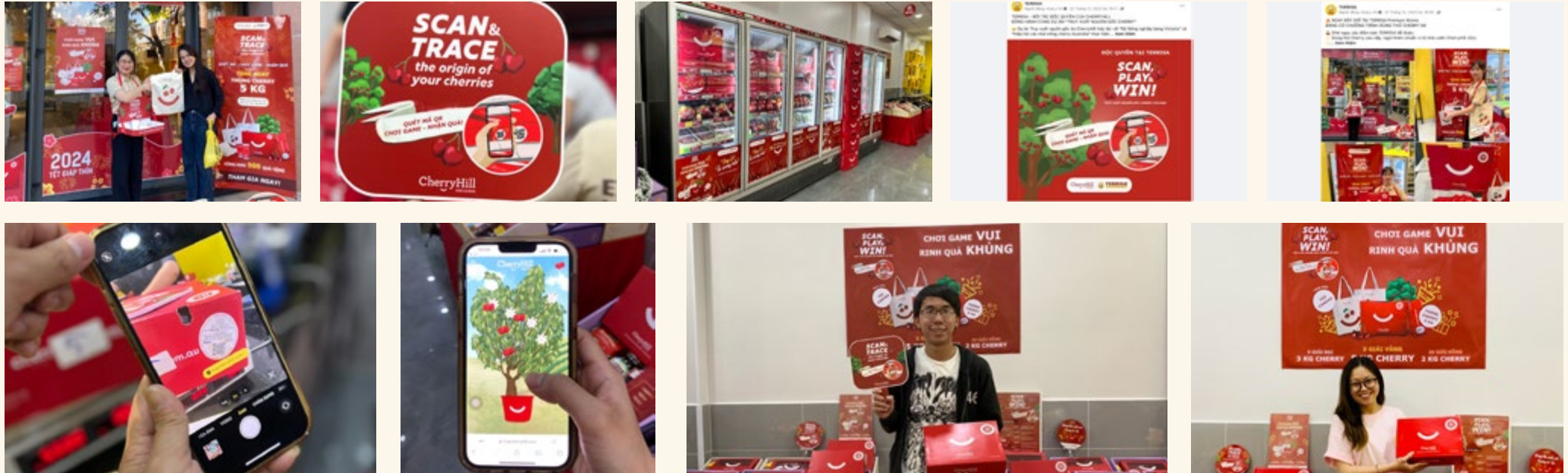


'Scan, Play, Win' Microsite Game Online and In Store activation with Australian Retailers, Facebook (3867 reach), Influencers (8692 reach)



Traceability Export Marketing Campaign

Vietnam Online and In Store activation with Retailers, 'Scan and Trace' Fruit Tastings, Facebook, Zalo and 'Scan, Play, Win' Microsite Game yielding 28 winners



Singapore In Store activation with Retailers and 'Scan and Trace' Fruit Tastings



Unique QR Code Results – Scan Rates

Duration: These results show unique QR Code product labelling and scanning that occurred 16 October 2023 to 17 January 2024

Scan Rate = Total Scans divided by Total Activated Labels

Fruit Varieties: 9 retail SKUs and 1 wholesale SKU were labelled

Labelled Fruit Units	
Total activated labels	92619
Retail (consumer boxes)	
Total activated labels	81274
Total Scans – including * and **	5868
Scan rate – note * and **	7.22%
Unique users (consumers performing scans)	3290
Wholesale (shippers)	
Total activated labels	11345
Total Scans	39
Scan rate	0.35%
Unique users (supply chain partners performing scans)	22
Scans per Market – including 355 caution scans of counterfeit codes*	
Australia	4281
Vietnam	869
China	440
Singapore	57
New Zealand – including some test scans by Trust Codes technology provider**	113
United States	55
Other	159

Pallets	
Pallet activated labels	3980
Pallet Temperature Loggers	76
Microsite Game	
Game user total	595
Game average score	142
Game highest score	4615



Interestingly, some genuine scans occurred in countries where fruit was not exported to by CherryHill. This suggests small scale commercial or personal transport of product across country borders.

Scan Rates Evaluation 1/2

The project team felt scan rates were high and successful, particularly when compared to the results of previous Agriculture Victoria traceability pilots in table grapes and citrus industries, as demonstrated in this table:

Year	Traceability Project	Retail Scan Rate (Consumers)	Retail Marketing Program	Wholesale Scan Rate (Supply Chain Partners)	Wholesale Marketing Program	Pandemic Timing	Technology
2023-2024	Cherries	7.22%	Extensive	0.35%	No marketing program: scans reliant on supply chain partner's awareness generated by the label alone	Post	GSI Digital Link enabled QR Codes
2022	Citrus (2)	1.43%	Some	0.87%	No marketing program: scans reliant on supply chain partner's awareness generated by the label alone	During	GSI Digital Link enabled QR Codes
2021-2022	Table Grapes	0.05% - 0.58%	No marketing program: scans reliant on consumer's awareness generated by the label alone	0.14%	Some: 1. Supply chain partner SOP instruction sheets 2. Small pallet posters	During	GSI Digital Link enabled QR Codes
2020	Citrus (1)	0.1%	No marketing program: scans reliant on consumer's awareness generated by the label alone	Not differentiated from retail scan rate	No marketing program: scans reliant on supply chain partner's awareness generated by the label alone	During	Laava codes



Scan Rates Evaluation 2/2

Retail: The high retail scan rate by consumers in this cherries pilot was likely due to the following activities which raised customer awareness about QR Code scanning:

- A highly organised and multifaceted marketing campaign by CherryHill.
- An evocative, cohesive storyline for marketing which brought great awareness through the animation, video, social media posts, microsite, online, in store and influencer promotions.
- The effect of the prior Covid 19 pandemic, which provided a global “training course” in QR Code scanning for consumers and has shaped consumer behaviour patterns worldwide.
- Adding an extra “Scan, Play, Win” label for consumers, in addition to the QR Code label. This gave the consumers “ownership” of the QR Code label. (Consumers have given feedback in previous pilots that they mistakenly understood the QR Code label to be for the use of supply chain partners only).

The CherryHill team commented that managing prizes for different promotions through the microsite was complex and needed attention in future years to reduce glitches and streamline processes in target markets.

Wholesale: Scan rates for wholesale products, by supply chain partners, have been consistently low across all projects. Consumers are always more enthusiastic scanners than supply chain partners. There is much scope for building awareness with supply chain partners on the benefits of product scanning as part of standard operating procedures to acknowledge goods receipt, manage inventory, increase efficiency of supply chains, support market access and to ensure product authenticity, safety and quality. However, even in the absence of regular supply chain scanning, the benefits of digital product traceability become immediately evident in a crisis.



Counterfeit Report

During the period 16 October 2023 to 17 January 2024, 21 cherry product items were counterfeited, as outlined below:

Product Items: Box Sizes	Brand	Destination	Batch Number	Activated Date (Activation of genuine labels on boxes by producer)	Warning Date (Warnings are generated by caution scans of counterfeit labels on counterfeit product)	Number of Days taken to generate counterfeit	Number of Caution Scans (Scans by consumers of counterfeit labels on counterfeit product)
1kg box - domestic	1	Domestic	1	20/12/2023	10/01/2024	21	8
5kg	2	Overseas	2	24/12/2023	1/01/2024	8	44
2kg	3	Overseas	3	11/12/2023	28/12/2023	17	49
5kg	2	Overseas	4	17/12/2023	27/12/2023	10	4
2kg	3	Overseas	5	13/12/2023	22/12/2023	9	8
1kg	4	Overseas	6	15/12/2023	18/12/2023	3	8
2kg	3	Overseas	7	15/12/2023	18/12/2023	3	5
2kg	3	Overseas	8	13/12/2023	18/12/2023	5	18
2kg	3	Overseas	9	12/12/2023	17/12/2023	5	10
2kg	3	Overseas	10	30/11/2023	16/12/2023	16	60
2kg	3	Overseas	11	9/12/2023	12/12/2023	3	25
1kg	4	Overseas	12	5/12/2023	7/12/2023	2	7
2kg	3	Overseas	13	23/11/2023	3/12/2023	10	3
2kg	3	Overseas	14	22/11/2023	1/12/2023	9	5
5kg	2	Overseas	15	15/11/2023	25/11/2023	10	8
2kg	3	Overseas	16	11/11/2023	21/11/2023	10	11
2kg	1	Overseas	17	16/11/2023	20/11/2023	4	59
1kg box - domestic	1	Domestic	18	8/11/2023	14/11/2023	6	8
1kg box - domestic	1	Domestic	19	8/11/2023	12/11/2023	4	7
1kg box - domestic	1	Domestic	19	8/11/2023	11/11/2023	3	4
2kg	3	Overseas	20	6/11/2023	8/11/2023	2	4
Totals							
21 product items counterfeited	4 brands counterfeited	Counterfeit locations: 4 Domestic (Australia) 16 Overseas	20 batches counterfeited	16 Oct 2023 – 17 Jan 2024	Warnings received on 19 different days of the harvest season	Average 8 days (range 2-21 days) taken to generate counterfeit	Average 17 caution scans (range 3 – 60) per product Total 355 caution scans

Counterfeit Evaluation

Counterfeiting events

- Caution Scans were generated by consumers scanning counterfeit labels on counterfeit products.
- During the period 16 October 2023 to 17 January 2024, there were 355 unique caution scans. These occurred mostly in export countries, but surprisingly, some were domestic within Australia. Caution scan rates were 6% of total scan rates for retail products.
- 21 products in total were counterfeited, each with an average of 17 (range 3-60) cross-linked scans, and these scans often occurred across a few countries. On the Trust Codes dashboard, the customer can check raw data for each alert, which shows each scan in granular detail.
- 3 different examples of copy labels were detected.
- No URL copy content was detected by the Trust Codes CURLI heuristic engine.

Actions taken to resolve counterfeiting

- When counterfeit scans were detected, this triggered a “caution” message for the consumer on their smartphone, warning them of non-genuine product. This seemed to stop counterfeiting activity fairly quickly: there were an average of 17 caution scans (range 3 – 60) per product before counterfeiting activity ceased.
- Resolution in some cases was achieved by highlighting the issue with some relevant supply chain partners, who took direct action locally.
- Stopping supply to some supply chain partners, proved to be a useful commercial control of some cases.
- The majority of counterfeit activity occurred in relation to one supply chain partner, and this was further resolved when they were reported to the relevant authorities.
- Strangely, one case of counterfeiting involved counterfeit CherryHill boxes and counterfeit labelling, but contained genuine CherryHill fruit.

The implications of counterfeiting for food producers

- CGA commented that counterfeit will be a never-ending challenge for the cherry industry and other horticulture producers with valuable brands.
- CherryHill found the solution highly valuable in giving rapid visibility of products of concern. It allowed CherryHill to quickly identify counterfeit labels that had not been printed by CherryHill and to take action, most often through commercial, rather than regulatory measures.
- CGA and CherryHill commented that they would consider additional anti-counterfeit mechanisms in future such as labelling that included invisible inks, and ‘scratch’ or ‘break’ labels for extra protection.
- The pilot used unique GS1 Digital Link QR Codes on each individual product. QR Codes are perhaps more susceptible to counterfeiting than other scan label symbologies, however CherryHill commented that they were strongly supportive of the technology used due to the instantaneous visibility of their product through the dashboard scan results, the rapid ability to detect counterfeit product and take action, and the high scan rates they achieved due to consumer familiarity with QR Code scanning.



Consumer Surveys



Consumers had the opportunity to provide product feedback through a tailored survey on the microsite.

Duration: These results show survey results from unique QR Code product label scanning that occurred 16 October 2023 to 17 January 2024.

Fruit Varieties: 9 retail SKUs and 1 wholesale SKU were labelled.

How did you first learn about CherryHill cherries?		How frequently do you consume cherries in the season?		How likely are you to purchase CherryHill cherries again in the future?		How likely are you to recommend CherryHill cherries to others?	
Online advertisement	12%	Daily	20%	Extremely likely	65%	Extremely likely	66%
Social media	20%	Several times a week	32%	Very likely	28%	Very likely	28%
Word of mouth	37%	Once a week	13%	Somewhat likely	6%	Somewhat likely	5%
In-store promotion	31%	A few times a month	24%	Not very likely	1%	Not very likely	0%
Other (please specify)	0%	Rarely or never	10%	Not at all likely	0%	Not at all likely	0%
Total Consumer Respondents	169	Total Consumer Respondents	201	Total Consumer Respondents	203	Total Consumer Respondents	201

Consumer Survey and Microsite Evaluation

Consumer Survey Results

Consumers had the opportunity to provide product feedback through a tailored survey on the microsite, with 774 consumer response across 4 survey questions. This is a large amount of data that is highly valuable to operational and marketing activities.

Consumer surveys showed very positive feedback about their experiences with CherryHill products.

This is testament to the quality and packaging presentation of the fruit, but also indicates good cool chain management and rapid distribution within the supply chain. Conversely, if fruit quality had failed, poor survey results could be used to pinpoint poor areas of orchard harvest or supply chain failures.

Wider Consumer Engagement from Microsite Interactions

CherryHill reported feedback from retail partners that consumers who had scanned the product had been pleased with the tracing and farm origin information they had received from the microsite.

CherryHill also reported that overseas consumers had been encouraged by the QR Codes scanning process to purchase larger boxes of fruit. Asian consumers often prefer small packages of fruit (e.g. 500g) and this often leads Asian retailers to repackage fruit from CherryHill boxes into smaller containers. The engagement seen with QR Codes scanning has led to opportunities to sell 1kg CherryHill boxes in their original packaging. This opportunity to sell larger boxes of fruit, will enable the launch of new products into overseas markets, with associated traceability and sustainability benefits.

Enterprise Resource Planning (ERP) System Integration

ERP, RFID and GSI Digital Link QR Codes Integration

Dialog Information Technologies developed integration API software between the Enterprise Resource Planning(ERP) system 'LinkFresh' which is part of the Microsoft environment, and

- the RFID inventory tracking platform by RAMP
- the unique GSI Digital Link QR Codes platform by Trust Codes

These traceability systems have given CherryHill real-time visibility of their product from orchard, to processing, to dispatch, to export.

The ERP platform that we have used provides a single source of truth data to the business. An enterprise resource planning ERP software system helps you run your entire business, supporting automation and processes in production, inventory, supply chain services, finance and many, many more.

Automation of on-farm systems has enabled CherryHill to replace manual systems, which leads to

faster, more accurate processes that accommodate growth in the future. Export traceability systems give CherryHill and consumers visibility of their products and authenticated traceability as they travel through the supply chains to consumers in multiple export markets. This level of real-time traceability provides CherryHill and its partners with the tools to deal quickly, confidently and cost effectively with any quality or food security issues that may occur in the food supply chain.

Our solution provides full crop batch lot traceability from batch receipt to combining or splitting batches or lots to final packing and dispatch. This approach to traceability lends itself to meeting the requirements of multiple export markets with different rules and regulations such as Europe, China and the US.

GSI Digital Link and Standards

GSI Digital Link provides the missing link connecting a wealth of product information from multiple locations from the supply chain and from consumers, all from a single scan.

It not only provides authentication around basic product traceability, but provides the mechanism for additional information such as batch numbers, serial numbers, returns and refunds, expiry dates, discount pricing, location ID codes, asset codes, SSCC labels, promotions, instructions, reviews, certified goods and more.

We've been down this road a few times. QR Codes alone are not secure enough. You need to couple that with GSI Digital Link to protect against invalid redirect.

Standards are important for globally harmonising the supply chain from the farms in Australia all the way through the supply chain to international customers. Using GSI standards will future-proof the cherry industry for evolving traceability regulations in export countries and help the efficiency and quality management of supply chains.

Terence Ryan

Dialog }
INFORMATION TECHNOLOGY

ERP Integration Evaluation

Overall project partners agreed that the ERP integration had been very successful. It needed collaborative work by all technology providers and CherryHill to reach a stable, reliable state, to achieve stable APIs to RFID and QR Code systems, and to resolve some issues. However, partners were agreed that it is now fit for purpose going forward.



Challenges included

- the long time frames of the project, with associated turnover of personnel and loss of expertise.
- an aged and unreliable print server which caused label printing disruptions and required changeover during the course of season. In future projects, a new print server is recommended from the start.



Data Revealed versus Data On Record

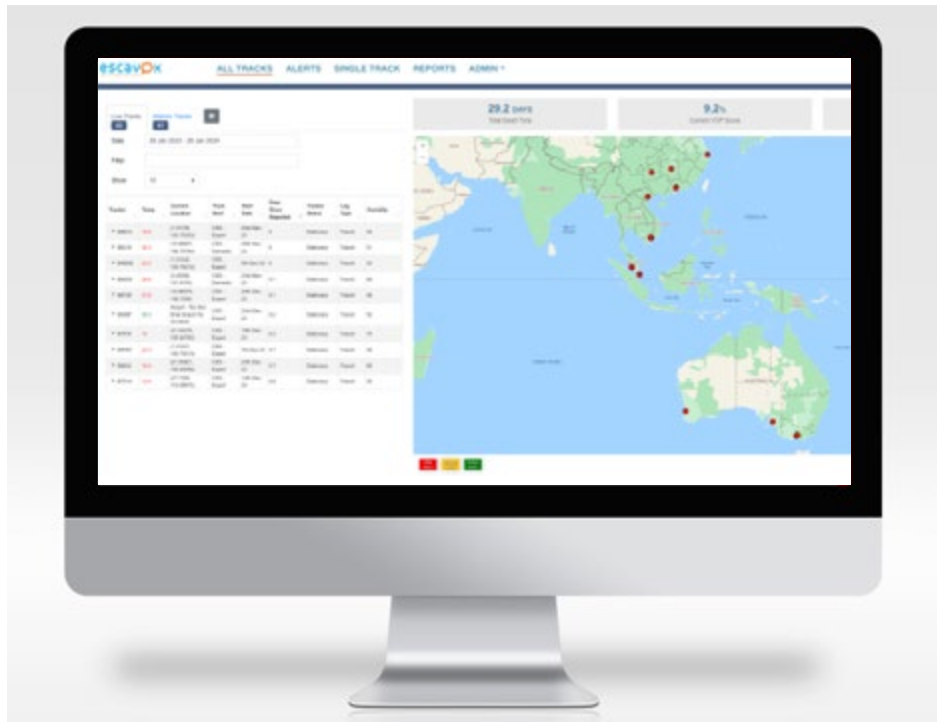
Data privacy is a common concern when sharing traceability information with supply chain partners and consumers. Businesses have control over their data. Businesses can choose the data they wish to reveal through the mobile phone microsite. Other information can be kept on record, behind the scenes, in the product cloud and accessed by the business through the dashboard.

Data Revealed	Data On Record
	
<p>Unique serialised GSI Digital Link QR Codes on product enable scanning and access to a B2B microsite (wholesale product) or B2C microsite (retail product).</p>	<p>A product cloud captures all product traceability data and this is available to view through a dashboard at the packhouse.</p>
<p>Everyone in the supply chain from farm to consumer can authenticate product origin and engage with the brand via phone scan.</p>	<p>GSI standards are used for traceability data.</p>
<p>Privacy is ensured through controlled data reveal.</p>	<p>Unit and pallet codes support inventory management.</p>
<p>B2C microsite data may include information such as marketing, promotions and feedback surveys. There is two-way flow of information, with surveys and scan data providing information back to the producer.</p>	<p>Scan data supports anti food fraud brand protection.</p>
<p>B2B microsite data may include information such as storage needs, certification, food journey, expiry dates and marketing.</p>	<p>Survey data from consumers can be used for marketing and product development.</p>
<p>Product alerts including food fraud notifications or recalls may be activated through the microsite.</p>	<p>Electronic traceability data can be used in times of crisis</p> <ul style="list-style-type: none"> • instantaneous regulatory compliance e.g. recalls • instantaneous commercial intervention e.g. food fraud

Temperature Tracking

Temperature loggers provided by Escavox were included in 76 airfreight consignments.

These provided real-time temperature logging of product. Temperature logging data was integrated with the Trust Codes platform.



Supply Chain Data Standards

Traceability has become a really important factor in the supply chain, more so now than we've ever seen before.

And the reason is that governments, consumers, retailers and manufacturers themselves need to have the data that allows them to have complete visibility within their supply chain. And GS1 standards are the foundational piece that allows all that to happen.

In this pilot, the GS1 standards being used are the Global Location Number, the GLN, for identification of physical locations, the Global Trade Item Number known as a GTIN, for product identification, and the Serial Shipping

Container Code known as the SSCC for identifying logistical units. From the farm to the end product, there's a very, very long supply chain. So what is the product? Where's it been? What's happened to it? Where's it going? GS1 standards enable businesses to capture and share traceability data.

Maria Palazzolo



Supply Chain Data

This pilot used GSI global traceability standards to identify, capture and share data. These standards bring harmonisation to national and international supply chains. This pilot adheres to EPCIS v2.0, a GSI standard that achieves granular transparency of products throughout their lifecycle, from manufacture and distribution to their end destination.

Key Data Element	Cherryhill Pre-Existing Data		Gsi Standards Data			
	Arrival	Dispatch	Arrival	Dispatch	GSI standard	Data Carrier
Orchard	N/A	Cobram Orchard	N/A	9335135090024	GLN	Serialised RFID Label & EPC Tag
Trade Item Commodity	N/A	LT – 601750 00013590	N/A	09335135455052	GTIN	Serialised RFID Label & EPC Tag
Harvesting and Bin Assignment	N/A	LT – 601750 00013590	N/A	301639C57C2704000003516	SGTIN	Serialised RFID Label & EPC Tag
Dispatch (Orchard to Packhouse)	Cobram Orchard LT – 601750 00013590	Coldstream Packhouse LT – 601750 00013590	9335135090024 301639C57C2704000003516	9335130900031 301639C57C2704000003516	GLN SGTIN	Serialised RFID Label & EPC Tag
Packhouse	Coldstream Packhouse	Coldstream Packhouse	9335130900031	9335130900031	GLN	
RM Receiving (Packhouse)	Coldstream Packhouse LT – 601750 00013590	Coldstream Packhouse LT – 601750 00013590	9335130900031 301639C57C2704000003516	9335130900031 301639C57C2704000003516	GLN SGTIN	Serialised RFID Label & EPC Tag
Packing and Batch Assignment of Trade Item	No serialization. Batch number: 1023130	No serialization. Batch number: 1023130	https://truecherryhill.com/01/09335135000153/10/1023138/21/TpGoKyW5	https://truecherryhill.com/01/09335135000153/10/1023138/21/TpGoKyW5	SGTIN LGTIN	QR Code with GSI DigitalLink conformance to EPCIS 2.0
Logistics Unit and SSCC Assignment	N/A	310400B20DB6C0204A000000	N/A	9335130900031 (00)093351350200082645	GLN SSCC	GSI-128 Pallet Label using SSCC
Shipment Aggregation and SSCC Assignment	N/A	N/A	N/A	N/A	SSCC	GSI-128 Pallet Label using SSCC
Shipment	N/A	Coldstream Packhouse 310400B20DB6C0204A000000	N/A	9335130900031 (00)093351350200082645	GLN SSCC	GSI-128 Pallet Label using SSCC

Supply Chain Data Evaluation

Cherry Growers Australia supported the value of GSI standards for traceability in supply chains. More generally, CGA noted it is essential that the cherry industry tries to standardise any procedures that relate to international supply chains, and utilise standards also used in export countries. Many different standards and procedures have evolved and continue to evolve over time, and these present ongoing obstacles. CGA feels that any traceability project not incorporating GSI standards in future has the potential for major issues.

- Data in the pilot was designed to address the USFDA Food Traceability Rule, which is informed by GSI standards, as perhaps the most comprehensive example of global regulatory traceability requirements
- In this pilot, global GSI standards have been utilised to record Key Data Elements KDEs at Critical Tracking Events CTEs
- Compliance is due Jan 20 2026 for USFDA Food Traceability Rule. Current trends suggest that many other importing countries are increasingly likely to impose similar traceability requirements.
- Discover more here:



Communications

Cherry Growers Australia produced a range of communications for their members, which were also available to wider audiences; consumers, horticulture and other primary industries and government. These included media releases, an animation, videos, a demonstration QR Code with a link to the microsite app and this final report. We also shared a Traceability Cost Benefit Analysis Calculator to help growers assess the value of implementing traceability systems and make their own decisions. CGA, Agriculture Victoria and CherryHill also created dedicated webpage content. These communications generated awareness and shared learnings from the pilot to enable other growers and supply chain participants to understand the importance of traceability and adopt traceability systems.

CGA's communications offered a multifaceted approach and impact. Utilising platforms such as Facebook, LinkedIn, YouTube, and email marketing to our database, we effectively reached our members and broader audiences:

- Media articles: 17 national and international
- Launch campaign achievements: LinkedIn 2394 impressions 43% engagement, Facebook 5240 impressions 58% engagement
- Video releases: 3000+ views and impressions on YouTube, LinkedIn, Facebook

The reception of these initiatives has been overwhelmingly positive, affirming a significant interest and appreciation for the shared information. The videos created and this final report will stand as invaluable tools that will continue to serve our community. Housed on our website, they offer ongoing resources for stakeholders, ensuring accessibility and relevance beyond the project's duration. By strategically delivering content across these platforms and maintaining the collection of tools and resources on our website, we have not only generated awareness but also facilitated sustained knowledge sharing. The insights from the pilot serve as essential guides for our growers and supply chain partners aiding in their understanding of traceability's importance and encouraging the adoption of robust traceability systems within their operations.

Gita Ricca



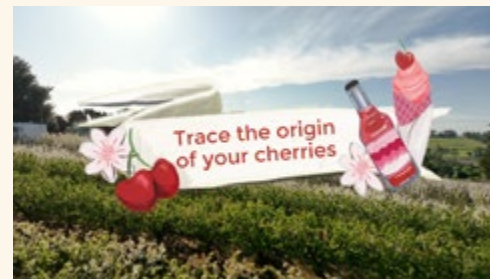
Traceability landing page:
Cherry Growers Australia website



QR Code: scan for link to microsite app



Animation



Consumer Video



RFID Video



QR Code Video






Montage Video



Cherry Growers Australia would like to thank:



Key Pilot Partners and Personnel			
	National Peak Body for Australian Cherry Industry		Patrick Ulloa, Gita Ricca, Kate McGilvray, Hugh Molloy
	Victorian Government Funding Partner		Caroline Barrett
	Cherry Grower & Exporter		Stephen Riseborough, Lisa Haywood, Sue Lynne, Phoebe Morley, Kathryn Mucha
	Technology Services Organisation		Terence Ryan, Renier Forster, Gideon Naude
	Traceability Technology Provider		Mark Beacroft, Kevin Cohen, Peter Reinke
	Traceability Technology Provider		Paul Ryan, Ken Yang, Emma Wheeler
	Global Traceability Standards Organisation		Maria Palazzolo, Marcel Sieira, Earl Lappen, Tracey Kelly-Jenkins
Valued Suppliers			
	Creative Agency		Dana Newell, Jeremy Pitman
	Temperature & Location Loggers Supplier		Luke Wood