



Cherries Traceability Pilot **Solution Architecture**

www.cherrygrowers.org.au

© 2024



Contents

- 1 Introduction
- 2 Final Report – Cherries Traceability Pilot
- 3 Conceptual Architecture – Farm to Packhouse
- 4 Areas of Improvement
- 5 Implementation Considerations
 - Hardware (RFID, printers)
 - Consumables (labels)
 - Systems (software, middleware)
- 6 Conceptual Architecture – Packhouse Production
- 7 Areas of Improvement
- 8 Implementation Considerations
 - Hardware (RFID, printers)
 - Consumables (labels)
 - Systems (software, middleware)
- 9 Conceptual Architecture – Packhouse Dispatch
- 10 Areas of Improvement
- 11 Implementation Considerations
 - Importer / Wholesalers
 - Hardware (RFID, printers)
 - Consumables (labels)
 - Systems (software, middleware)
- 12 Summary of Success Factors
 - Direct benefits to food producers
 - Indirect benefits
- 13 Conclusion



1 Introduction

This document provides a conceptual overview to assist Australian cherry growers approach and plan their own produce traceability systems. It highlights the steps, technologies and skills needed to deliver a successful and beneficial outcome to both the cherry producer and their customers.

ASSUMPTIONS

- This document is targeted at non-technical decision makers within the cherry industry.
- Each producer will be using different software applications.
- Each producer will be utilising different hardware and assets.
- Not all producers will be involved in the complete end to end process.
- Different approaches to deploying a solution will be required.

The following process flowcharts are designed to represent the actual core processes that growers / packers follow now and provide them with a framework for adopting new technology and methods to transform and improve the way they capture production and traceability data.



2 Final Report – Cherries Traceability Pilot

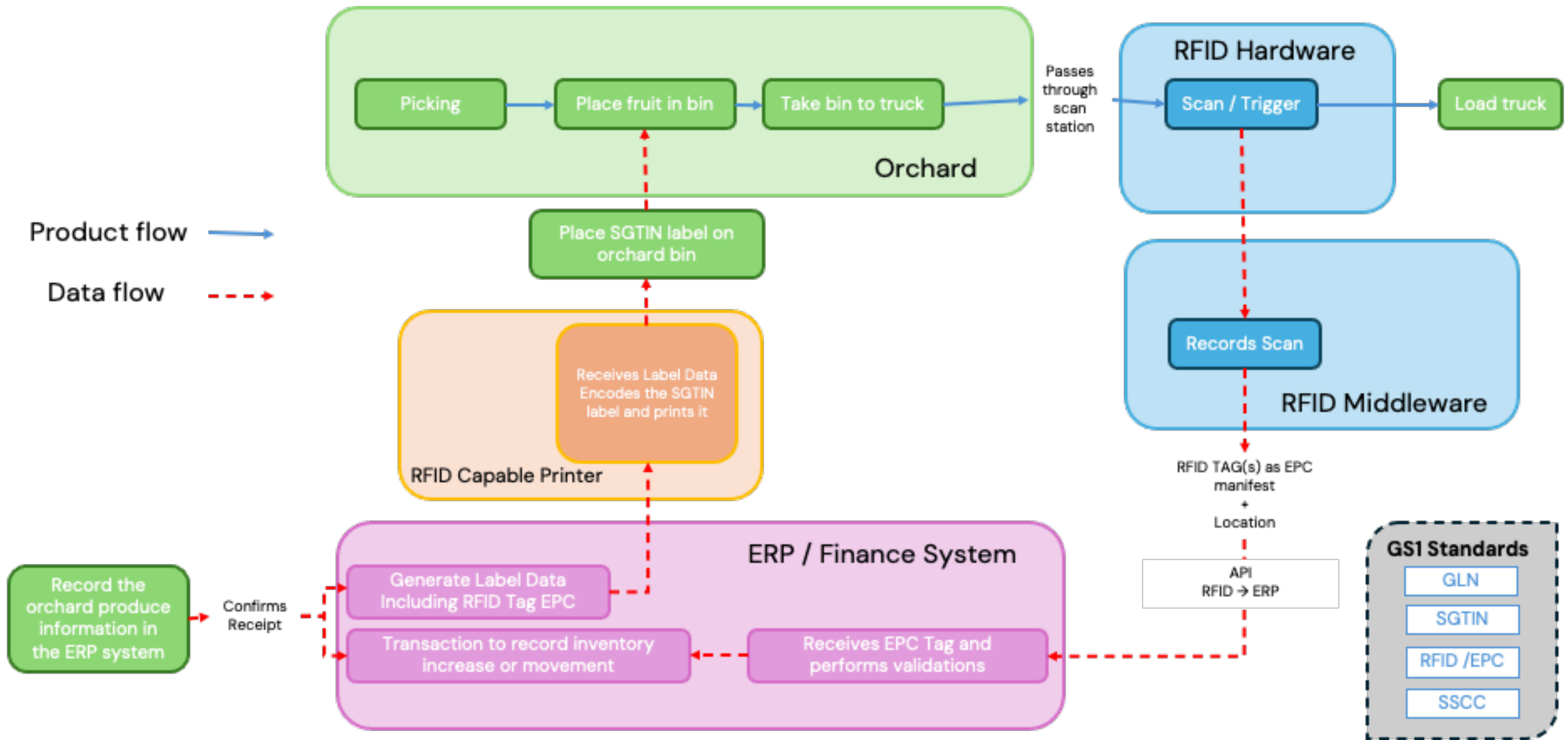
This document is a supplement to the Cherries Traceability Pilot Final Report. It is recommended that this document be read in conjunction with the final report.

The final report provides a comprehensive overview of the project's findings, insights and recommendations. It also summarises the key outcomes and learnings from the pilot, presenting valuable data and analysis that showcases in detail the traceability process and importance of traceability in the cherry industry. It is important to look at the photos of labels and processes to better understand them in relation to this document.

[ACCESS FINAL REPORT HERE](#)



3 Conceptual Architecture – Farm to Packhouse



ERP – Enterprise Resource Planning (system)
RFID – Radio Frequency Identification

EPC – Electronic Product Code
SGTIN – Serialized Global Trade Item Number

API – Application Programming Interface
GLN – Global Location Number

SSCC – Serial Shipping Container Code

4 Conceptual Architecture – Farm to Packhouse

BASIC FARM TO PACKHOUSE FLOW

The farm to packhouse flow is the process that 95% of growers currently follow to produce and move produce to the packhouse. They will pick the fruit, put it in some type of bin and take it to the packhouse. The bins may be different, the type of vehicles will be different and how they record it into the packhouse will use different tools, scanners, robots etc.

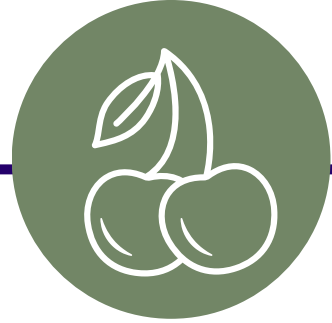
AREAS OF IMPROVEMENT

Utilisation of different integrated tools, systems and procedures in this process can lead to efficiency gains in the following areas:

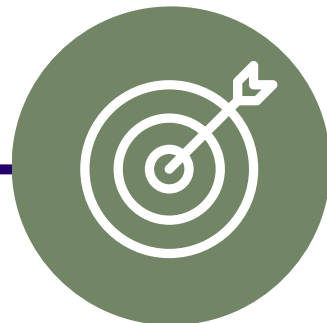
- Generation of label data for use on orchard bins within the ERP system.
- Bins will be scanned on to trucks for dispatch to the packhouse. This may be a simple scan and will require integrated RFID middleware depending on the type of scanning being used.
- Bins receipted into the packhouse and updated in the ERP solution using RFID scanners to confirm receipt.
- Receipts validated into the ERP inventory stock for improved warehouse management.



5 Implementation Considerations



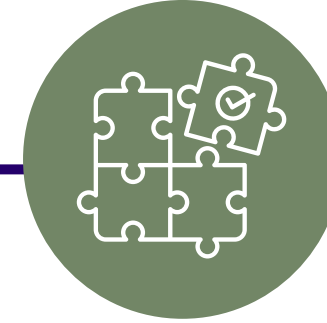
Type of orchard & management



Tools to use



Harvesting & labour considerations



Type of containers in use

HARDWARE (RFID, PRINTERS)

- Barcode readers or scanners are required in the orchard to record where product is being picked, when its being picked and who is picking it.
- How is it being tracked: by location, by bin, case, item?
- How is it being transported between orchards and farms?
- Scanners and readers being used in the warehouse.
- RFID gateway.

CONSUMABLES (LABELS)

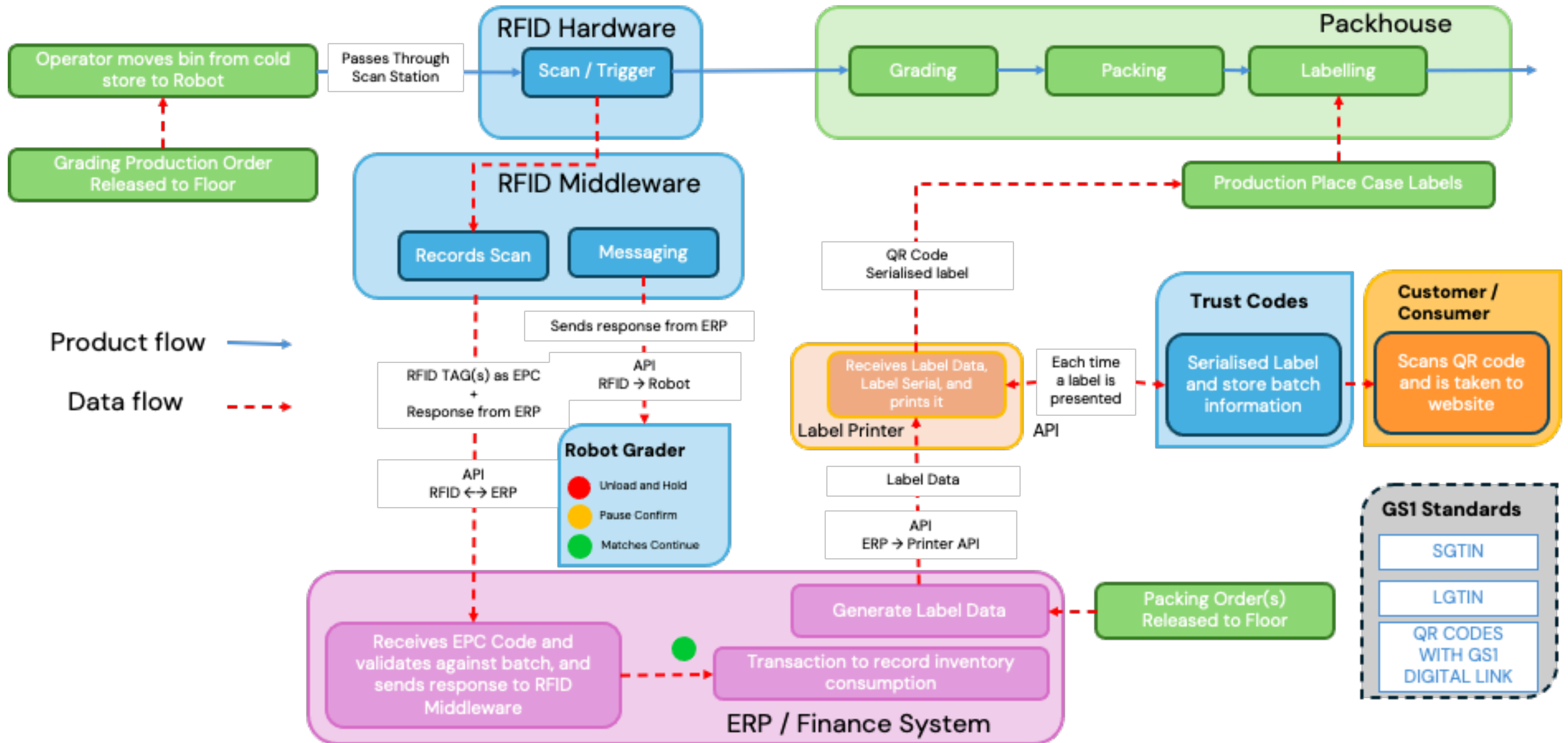
- Type of labels in use.
- Type of RFID tags in use.

SYSTEMS (SOFTWARE/MIDDLEWARE)

- Systems (software/middleware).
- Websites – consumer microsite and dashboards.
- Network – for farms and warehouse.
- ERP solution – for recording supply chain data, inventory transfers, locations, pallet tracking, reporting and analysis.
- RFID label recognitions.
- Physical operations.
- Moving stock through RFID scan stations to warehouse locations.



6 Conceptual Architecture – Packhouse Production



ERP – Enterprise Resource Planning (system)
RFID – Radio Frequency Identification

EPC – Electronic Product Code
SGTIN – Serialised Global Trade Item Number

API – Application Programming Interface
GLN – Global Location Number

SSCC – Serial Shipping Container Code

7 Conceptual Architecture – Packhouse Production

BASIC PACKHOUSE PRODUCTION PROCESS FLOW

This process begins with the grading production order being released to production. The product is then passed into the grading packing process and labelled ready for dispatch.

AREAS OF IMPROVEMENT

Utilisation of different integrated tools, systems and procedures in this process can lead to efficiency gains in the following areas:

- Using a single source of truth like the ERP solution to manage the packhouse production process from production orders through to fully traceable consumer labels.
- Warehouse inbound transaction scanning integrated to the ERP system.
- Correct traceability of production input to production outputs.
- Enhanced RFID scanning and labelling including trust codes and end consumer QR code feedback via websites.



8 Implementation Considerations



Type & number of packhouses



Receipting process



Stock location & picking management



Production, grading & packing lines in use



Dispatch & logistics processes

HARDWARE (RFID, PRINTERS)

- Readers or scanners are required for stock movement and production, grading, packing and dispatch.
- How is stock being stored and tracked: by bin, case, item etc?
- How is stock being moved in the packhouse between receipt and dispatch?
- Scanners and readers being used in the warehouse.
- How are labels being printed?
- Type of RFID gateways for receipts and dispatch.

CONSUMABLES (LABELS)

- Type of labels in use.
- Type of RFID tags in use.
- Bins, pallets, cases and items.

SYSTEMS (SOFTWARE/MIDDLEWARE)

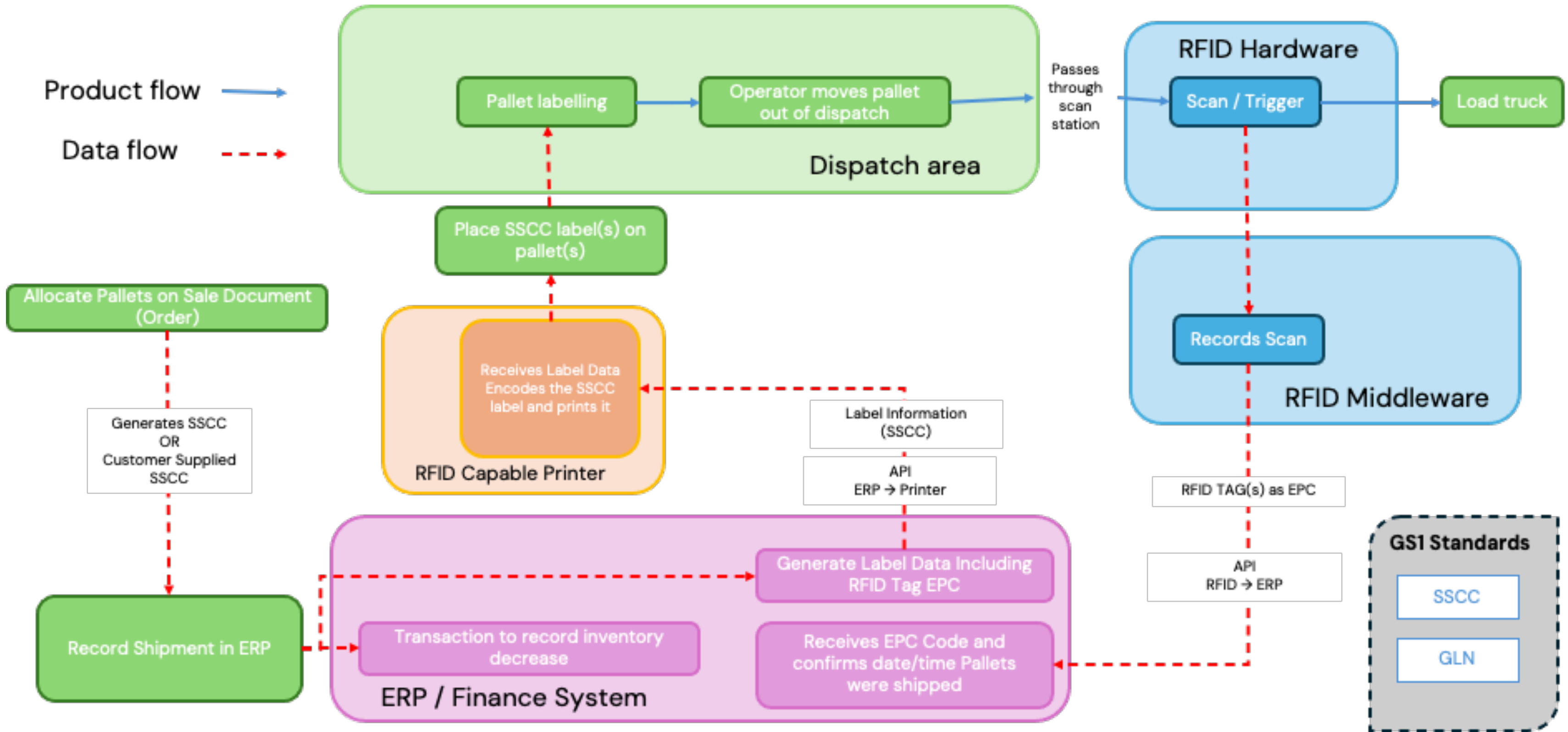
- Integration protocols (APIs, REST, Wsdl etc).
- ERP solution.
- Warehouse management solution (WMS).
- RFID solution data capture and readers.
- Barcode scanner systems (including smartphones).
- Label print solutions.
- Transport logistics solution.
- Business intelligence reporting and analysis.

GS1 STANDARDS

- Global Location Identification (GLI).
- Unique trade item identification – product / lot# / serial #.
- Logistics unit / shipment identification.
- RFID/EPC.
- QR codes with GS1 Digital Link.



9 Conceptual Architecture – Packhouse Dispatch



ERP – Enterprise Resource Planning (system)
RFID – Radio Frequency Identification

EPC – Electronic Product Code
SGTIN – Serialised Global Trade Item Number

API – Application Programming Interface
GLN – Global Location Number

SSCC – Serial Shipping Container Code

10 Conceptual Architecture – Packhouse Dispatch

BASIC PACKHOUSE DISPATCH PROCESS FLOW

This process begins with pallets being allocated to sales orders within the ERP system and identified with SSCC labels. The pallets are then transferred to dispatch; ready for shipping.

AREAS OF IMPROVEMENT

- Using a single source of truth, like the ERP solution, to allocate pallets to sales orders, manage stock levels and generate labelling.
- Utilise RFID printing for pallet labelling.
- Pallet warehouse location scanning managed in the ERP system.
- Verification of allocated pallets to actuals sent.
- Dispatch pallet scanning for dispatch updates to ERP.
- Dispatch data integration to loading and logistics solutions.



11 Implementation Considerations



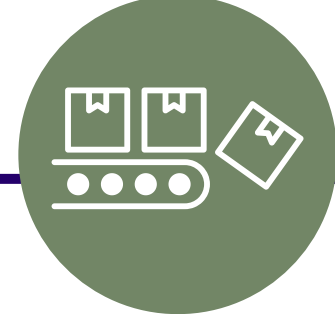
Type & number of packhouses



Receipting process



Stock location & picking management



Production, grading & packing lines in use



Dispatch & logistics processes



Import & export markets

IMPORTER / WHOLESALERS

- Unique QR codes are used for traceability of 'individual retail items': handheld boxes and shippers.
- QR code labels are scanned by supply chain partners such as consumers with smartphones in retail stores, logistics, importers, customs officials and retailers.
- QR code systems use optical identification of data.

HARDWARE (RFID, PRINTERS)

- Readers or scanners and mobile devices.
- Transport containers, pallets, bin, case, item.
- Labels printers.
- RFID gateways for receipts and dispatch.



12 Implementation Considerations (cont.)



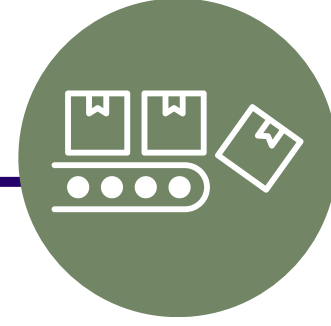
Type & number of packhouses



Receipting process



Stock location & picking management



Production, grading & packing lines in Use



Dispatch & logistics processes



Import & export markets

CONSUMABLES (LABELS)

- Type of labels in use.
- Type of RFID tags in use.
- Bins, pallets, cases and items.

SOFTWARE

- Integration protocols (APIs, REST, WsdL etc.).
- ERP solution.
- Warehouse Management Solution (WMS).
- RFID solution data capture and readers.
- Barcode scanner systems (including smartphones).
- Label print solutions.
- Transport logistics solution.
- Import and export documentation.
- Business intelligence reporting and analysis.



13

Summary of Success Factors

DIRECT BENEFITS TO FOOD PRODUCERS

Future-proof our export products

Meet increased government & business compliance globally

Improve food security

Increased consumer confidence

Maintain quality brand and quality of produce

Reduce counterfeiting of product

INDIRECT BENEFITS

Australian produce comes from a highly regulated source for fresh food, and traceability projects like this help maintain and enhance that reputation.

This in turn will deliver increased demand and value to consumers and producers.



14

Conclusion

Following a defined set of steps, most producers regardless of size, structure or technical capabilities can embark on the journey, in manageable stages, to improve traceability of their product to market and see return on that investment.

www.cherrygrowers.org.au

