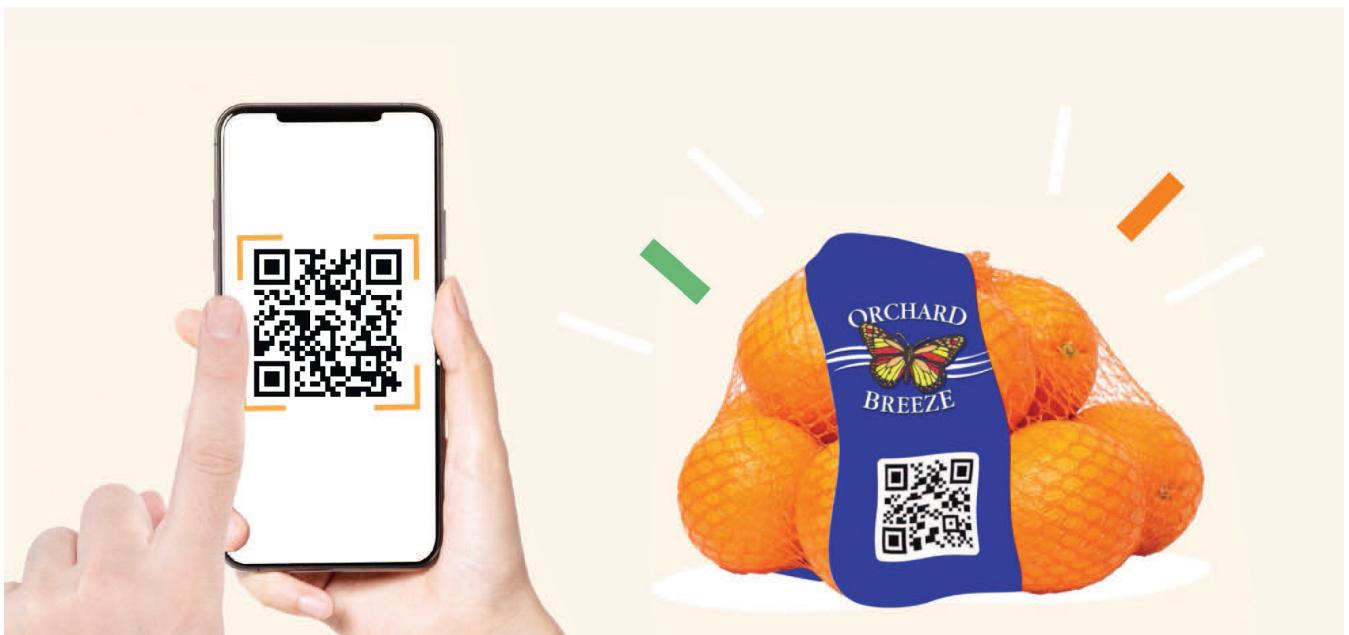**Traceability & 2D barcodes case study**

Citrus fruit traceability in a snap...

Thanks to the capabilities of next generation 2D barcodes, consumers and supply chain partners alike are benefiting from the simple, pragmatic traceability solution implemented by Mildura Fruit Company with the support of Citrus Australia and Agriculture Victoria.

Challenge

Citrus growers in Australia are looking for new ways to protect their brand, engage with consumers wherever they are in the world and collaborate more efficiently with supply chain partners.

Solution

A project aiming to implement end-to-end traceability using 2D barcodes and GS1 Digital Link from an Australian packing house, through the supply chain, to consumers in Asia Pacific markets.

Benefits

Overall, the project was a success, and it serves as a model for other businesses to adopt enhanced digital traceability within Australia and for export markets.

One of Australia's major fresh horticulture sectors is citrus fruit. There are over 1,300 citrus orchards in the country, and annual farm gate sales can reach AU$900 million (€545 million). More than half of the citrus harvested is exported, predominantly to the Asia Pacific region.

Traceability is important for fresh food

The Australian fresh food sector has long been interested in traceability to maintain and elevate safety and quality for consumers, but also to leverage the value of Australian brands.

That's meaningful, because horticulture producers and suppliers play an important role in making food systems more traceable and sustainable. Growers and manufacturers are at the start of the food supply chain, and increasingly, they are connected to and integrated into its downstream partners.

As fresh food is frequently exported, it is important to have unique, persistent, standards-based identification that can cross borders. This enables data relating to products to be recorded and shared across markets and systems, from the farm, through the packing process and ultimately to consumers around the world.

Traceability systems also enable farmers and packhouses to respond quickly and efficiently to potential foodborne illness incidents and ensure they are well prepared to meet new regulatory requirements that will soon be implemented in different importing countries.

These reasons, and many others, were motivating factors in the launch of a project in the Australian state of Victoria.

"GS1 is internationally recognised and allows traceability. So GS1 is a really important standard for us to use."

Perry Hill,
General Manager, Mildura Fruit Company

A major innovative traceability project

In 2022, Citrus Australia, the trade association for the Australian citrus industry, and Agriculture Victoria, a governmental agency that works to grow and secure agriculture in Victoria, worked together on a major innovative project to strengthen citrus traceability for high-value export markets.

The pilot, funded by the Victorian Government, ran for the duration of the 2022 citrus harvest season. The aim was to implement end-to-end traceability from an Australian packhouse, through the supply chain, to consumers in two Asia Pacific markets.

The participating packhouse was Mildura Fruit Company, one of Australia's largest packers and exporters of fresh fruit, specialising in citrus. They are based in Mildura, Victoria and partner with over 120 Australian growers to send 80,000 tonnes of citrus to 30 countries around the world every year.

Mildura Fruit Company exports fruit in cartons to wholesalers and in bags to retail point-of-sale. The project covered five different varieties of Mildura Fruit Company citrus across a total of 11 different SKUs, all headed for either China or Vietnam.

To enable end-to-end traceability, each individual carton and bag in the project was labelled. Specialised printing enabled each of these labels to have a unique QR Code powered by GS1. After each label was attached to a product, it was activated with a scanner. This process helps reduce the risks of food fraud.

Next generation 2D barcodes to meet new expectations

Traditional barcodes—those familiar black-and-white vertical lines—are beginning to give way to the next generation of barcodes that can do more for more people: both GS1 DataMatrix barcodes and QR Codes powered by GS1 bring a whole range of opportunities to improve business operations and deliver new experiences for consumers.

And that's because they can hold a lot more information. For example, in addition to containing a GS1 Global Trade Item Number® (GTIN®) that goes beep at the register, the high-capacity 2D barcodes can also contain a product's batch or lot number, serial number and expiry date. With access to that data, business partners up and down the supply chain can boost transparency, improve inventory management, enable traceability and sustainability initiatives, reduce waste and simplify recall and return processes.

Food organisations like Mildura Fruit Company can further leverage the power and flexibility of 2D barcodes by encoding them with a GS1 Digital Link. In the same way that a URL points to a website, a GS1 Digital Link enables connections to all types of business-to-business and business-to-consumer information.

The choice of QR Codes powered by GS1

Mildura Fruit Company chose to use QR Codes powered by GS1 because they can be scanned by consumers with the camera of their everyday smartphones – no special app to download, no professional scanning device needed.

Individuals who scanned a Mildura QR Code were directed to a 'microsite' on the internet, tailored specifically for either wholesalers or consumers. The microsite was accessible in English, Chinese, and Vietnamese, catering to a diverse range of users.

On the microsite, individuals could easily access a statement of authentication, demonstrating that they had purchased genuine Mildura Fruit Company citrus – an excellent way to combat food fraud. Visitors were also directed to a comprehensive description of the scanned fruit along with customised storage instructions. A survey section enabled a two-way flow of information between the consumer and producer, something that had never been possible before.

Other sections shared stories of Mildura Fruit Company as well as images and maps showcasing the fruit's origin – all designed to connect consumers and supply chain partners with the source of their food and shine a light on "Brand Australia."

Powering the solution

GS1 standards provided the common language across international industry supply chains and were implemented alongside the packhouse's current data, to produce a comprehensive set of Key Data Elements (KDEs) in electronic format. This data supported harmonised global data sharing and future-proofing for evolving traceability requirements in Australia and overseas.

Trust Codes, an Australian provider of cloud-based brand protection and anti-counterfeit solutions, developed the product cloud that was used to integrate, capture and track all traceability data, supported by GS1 Digital Link and GS1 EPCIS protocols. Access to a dashboard with data and analytics was provided by Trust Codes to the packhouse.

| GLN					GLN				GLN			GLN				GLN
Grower	Item	Case	Pallet	Transport	Packer/ Shipper	Pallet	Transport	Wholesaler	Pallet	Transport	Distributor	Transport	Case	Item	Retail/ Foodservice	Consumer

GTIN   SSCC   GTIN

Data privacy

Data privacy is a common concern when sharing traceability information with supply chain partners and consumers. To maintain privacy throughout the project, a set of protocols was implemented to carefully manage the disclosure of data.

A product cloud captured the product traceability data and was made available to view through a dashboard at the packhouse by select members of the project team.

The packhouse had full control of their data and could select the information they chose to reveal through the mobile phone microsite. Other information was kept on record behind the scenes in the product cloud and accessed by the packhouse through the dashboard.
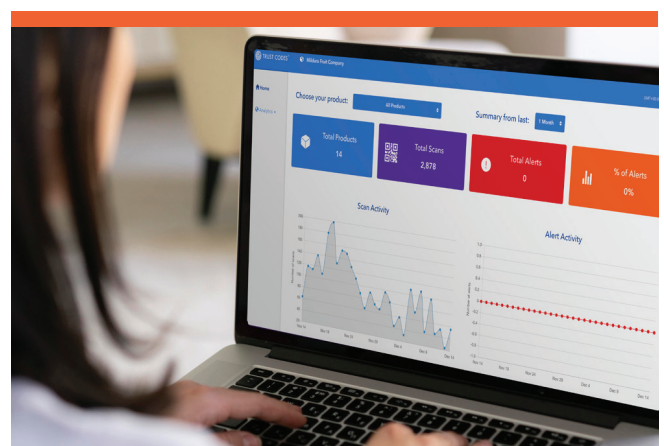
The project team's advice

At the end of the 2022 season, the project team came together to evaluate the results. They determined that the project was overall a success and an example of traceability implementation that other companies could follow.

The project team shared a few key takeaways:

- Get going on traceability systems now. The official recommendation of the Citrus Australia trade association to its industry members is to build traceability systems in their businesses sooner rather than later.

- Clearly define your project's scope. Mildura Fruit Company advises companies to be clear about the scope of a project like this, to prioritise the relevant needs of their business and to choose a "bite-sized chunk" of traceability to implement in the first season. There are always opportunities in future seasons to extend traceability standards and systems to other parts of the business. Coordinating with your supply chain more widely is also key.

- Leverage traceability systems with logistics partners. There is great opportunity for improved harmonisation with the logistics sector.

- Use GS1 standards. Mildura Fruit Company endorses the use of GS1 standards, recognising them as a solid foundation for future development, for consolidation with future system changes and for integration with other supply chain partners, including farms and logistics. Citrus Australia also supports GS1 standards as an example of a consistent and durable traceability standard that can be used across different systems and solution providers.

"GS1 standards and GS1 barcodes provide us with a common language internationally. And we think it's really important that we have an international standard and adhere to it."

Nathan Hancock,
CEO, Citrus Australia

Looking ahead

Future opportunities for project participants include developing further integration with farms and transporters and creating a virtual pallet packing user interface.

Embracing traceability is also a priority for the citrus and other horticulture industries due to increasing regulation by importing countries. The recently implemented US FDA Food Traceability Rule, for example, is perhaps the most comprehensive set of traceability regulations internationally and may be replicated by other importing countries. The US FDA rule requires compliance by key food supply chain businesses undertaking 'Critical Tracking Events' to record 'Key Data Elements'. Businesses need to provide traceability data back to the farm within 24 hours in an electronic format. These levels of reporting were used as the basis for data compilation and functionality within this project.

5
citrus varieties

6
months
Product labelling and scanning occurred from June to November 2022

11
SKUs

583,787
labels with a QR Code powered by GS1 were affixed to bags destined for retail points of sale

50,000
labels with a QR Code powered by GS1 were affixed to cartons destined for wholesalers

About Citrus Australia

Citrus Australia is the prescribed national peak industry body for citrus growers. It is a not-for-profit company limited by guarantee with a skill-based board. Based in Mildura, Victoria, the reach of the company's networks expands to all corners of the country and into the international citrus community including researchers, traders and growers in significant production areas around the globe.

Citrus Australia brought together project partners, provided project management and led communications for stakeholders in the citrus industry and beyond. Learn more about Traceability in Citrus.

About Agriculture Victoria

Agriculture Victoria is a state government organisation and works in partnership with farmers, industries, communities and other government agencies to grow and secure agriculture in Victoria. Victoria is Australia's largest producer of food and fibre products, and these make up over half of Victoria's total product exports.

Agriculture Victoria provided funding for the project from its Food to Market Program. The Food to Market Program supports businesses and organisations in the agri-food supply chain to help them undertake projects that invest in and improve supply chains. Agriculture Victoria provided project management, regulatory insights and communications support.

About Mildura Fruit Company

Mildura Fruit Company (MFC) began operation over 100 years ago as the Mildura Co-operative Fruit Company. Since then, they have grown to become Australia's largest packer and exporter of fresh citrus. Decades of growing, packing and marketing experience have equipped them to be leaders in packing and marketing to the world. Their world-class packing facility is able to pack approximately 3000 cartons per hour. MFC have invested heavily in grower services, providing timely world leading information to their grower base to enhance the quality of fruit.

MFC packs and markets a large range of citrus varieties from more than 120 growers in the horticultural regions of Sunraysia, Riverland and Riverina to destinations around the world.

MFC has built a reputation for high quality in export markets, especially in China. MFC is the sole licensee of the Sunkist brand from Australia into the Asia Pacific region. Maintaining B2B and B2C customer confidence is crucial. Brand fraud and food safety issues were the motivation for MFC's involvement in the fruit traceability project. MFC were the packhouse for the project.

About Trust Codes

Trust Codes provides brand protection, end-to-end traceability and consumer engagement based on a unique QR code, acting as a license plate for each and every item. Connecting brands to consumers, the use of a unique QR code enables transparency and traceability through a products lifecycle. Trust Codes leverage advanced algorithms and machine learning to protect authenticity and brand value through predictive analytics. Data-driven storytelling allows visibility of the journey for each item through the supply chain to the consumer's hands. Trust Codes works with their customers to create world leading UX design for the delight of their customers, creating a meaningful and trusted relationship between the brand and those that purchase their products.

About GS1

GS1 is a neutral, not-for-profit organisation that develops and maintains the most widely used global standards for efficient business communication. We are best known for the barcode, named by the BBC as one of "the 50 things that made the world economy". GS1 standards improve the efficiency, safety and visibility of supply chains across physical and digital channels in 25 sectors. Our scale and reach—local Member Organisations in 116 countries, 2 million user companies and 6 billion transactions every day—help ensure that GS1 standards create a common language that supports systems and processes across the globe.

www.gs1.org

Get started with traceability

Global GS1 standards provide a common language for traceability based on unique identification and data standards across international industry supply chains. The GS1 Fresh Fruit and Vegetable Traceability Guideline correlates with the traceability implementation within the project.
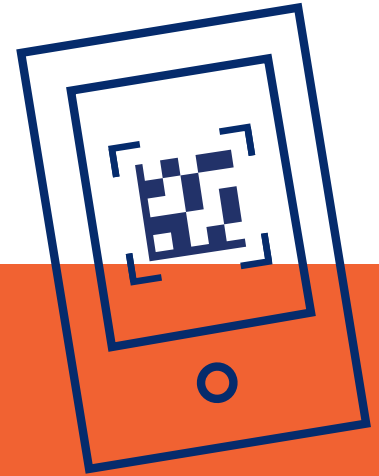
Get started with 2D barcodes powered by GS1

GS1 is working with industry to support 2D implementations and create guidance for assisting in the design of proof-of-concept demonstration pilots.

At a high-level, consider the following elements:

- **Retailers:** create a vision for use cases enabled by 2D barcodes, assess your current technical capabilities (scanners and back-office systems) to understand your roadmap to enable scanning of all barcodes, and collaborate with other stakeholders to ensure alignment on goals and outcomes.

- **Brands, Manufacturers and Suppliers:** bring together your supply chain and marketing executives to collaborate on a combined barcode strategy that achieves both consumer engagement and supply chain goals.

- **Solution Providers:** consider the upgrades needed to your systems to enable multiple barcode scanning/printing and support your end-users achieve their top use cases enabled by 2D barcodes.

Questions about the 2D barcodes future?

Contact your local GS1 Member Organisation to see how GS1 can help you begin your journey toward next generation barcodes!

www.gs1.org/contact