



HINKLER AGTECH INITIATIVE

Fresh Food Supply Chain Tracking Technology

INTRODUCTION

This trial was undertaken as part of CQUniversity's Hinkler AgTech Initiative. The Initiative aimed to increase the productivity and profitability of the Bundaberg region's agricultural sector through greater availability and utilisation of agricultural technology (AgTech). An extensive consultative process undertaken with agribusinesses identified on-farm needs that may be addressed using AgTech. Trials of selected AgTech products and services were then undertaken in partnership with agribusinesses and technology providers to determine the technologies' efficacy in on-farm conditions. This summary provides an overview of findings from one of the technology trials, including grower feedback and considerations for other growers when deciding whether to utilise the technology in their own enterprise.

Background

The supply chain for fresh produce in Australia is complex and involves many players, such as growers, distributors, wholesalers and retailers. This can make it difficult to track the movement of produce and ensure transparency and accountability. Maintaining product quality is also a challenge in the fresh produce supply chain, as produce is susceptible to damage or spoilage during transportation and storage. In an increasingly competitive market, Australian producers are turning to technology to provide real-time visibility, traceability and data analytics within fresh food supply chains. By leveraging this technology, it is possible to improve supply chain efficiency, reduce waste and ensure the safety and quality of fresh produce.

The Technology

The Escavox system uses RFID (Radio Frequency Identification) tracking tags to track produce in real-time from the point of origin to the point of sale. An Escavox 'blue box' tracker contains a microchip and antenna and is placed with the product during packing. The device continually monitors time, temperature and location and shares this information with a centralised database as the produce moves through the supply chain. The Escavox system is accessible via a user-friendly dashboard, providing the grower with complete visibility of their product during its journey.

The Trial

This trial involved the deployment of 211 trackers during 223 supply chain 'tracks' (some tags were used multiple times) from Bundaberg to domestic destinations in New South Wales (NSW), South Australia (SA), Victoria and overseas destinations in China and Malaysia. The tracks involved 12 different produce types grown by 14 separate growers.

Aggregated data from all tracks was scored on by a 'Voice of Product' (VOP) percentage. The VOP is based on the concept of 'if the product could talk, what could it tell you?' and provides a measure of freshness. VOP is calculated as the percentage of time spent in appropriate temperature, expressed in six ranges: 'bad' (<60%); 'poor' (60-69%); 'fair' (70-79%); 'good' (80-89%); 'excellent' (90-99%) and 'excellent (100%)

RESULTS

The overall average VOP score for all tracks in this trial was 55% which is classified as 'bad'.

The greatest issue identified for supply chains from Bundaberg is precool failure, with 57% of tracked produce in this trial not being pre-cooled successfully. Precooling significantly impacts the ability for the produce to remain cool and within optimal temperature range during transit.



There was a 38% difference in VOP between pre-cooled and non-pre-cooled tracks. The tracks with Perfect VOP scores (4% of all tracks) were all successfully pre-cooled to temperature before leaving their starting locations. Of the tracks with the top three VOP grades (perfect, excellent and good), 85% were successfully pre-cooled. These tracks still experienced temperature fluctuations, but because they were pre-cooled, these fluctuations did not significantly impact the produce. Fluctuations were generally seen at cross-dock locations such as transport hubs and markets, where produce was moved before further transport.

‘Too cold’ loads may also be subject to pre-cool failure. One example of a ‘too cold’ load issue was a track that travelled at high temperatures until it reached a cross-dock prior to delivery to a distribution centre. The produce was then cooled from 15°C down to 3.9°C and was delivered at an average temperature of 5°C.

Exported tracks were pre-cooled successfully but had quite different VOP scores. This illustrates the difference in export cold chains for different products. Temperatures for exported products were also notably higher than those ending at domestic locations.

Value to Business

The value to growers of deploying a supply chain monitoring system such as Escavox include increased reputation with wholesalers and retailers, greater control of your brand’s supply chain and improved quality / marketability of on-shelf product.

An additional industry-wide benefit is the potential reduction in food waste and loss due to damage and degradation.

Deployment of the Escavox system costs \$55 per track*. This price includes deployment of a ‘blue box’ tracker and access to the Escavox online platform which shows details for individual tracks, and trends over multiple journeys. Blue boxes remain the property of Escavox, and they manage their return and redeployment. The overall price of implementing the Escavox system can be negotiated according to the length of service and volume required by the grower.

Grower Feedback

Trial Summary Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I see value in this technology				✓	
I found the technology easy to use				✓	
The technology was easy to integrate within my business				✓	
I was satisfied with the service provided by the AgTech company					✓
I intend using this technology in my business				✓	
I recommend this technology to other growers				✓	

Other Considerations

Ensuring that produce is pre-cooled to within temperature parameters is the single biggest difference growers can make to their supply chains Bundaberg supply chains that implemented effective pre-cooling made up the majority of the top 3 scoring VOP grades. Pre-cooling produce dramatically reduced the incidence of ‘warm’ loads and ‘too cold’ loads occurring. Pre-cooling can be difficult and a few of the participants in this project did not have adequate pre-cooling facilities or the time to ensure that their produce was pre-cooled effectively.

‘Warm’ loads and ‘too cold’ loads can be addressed with effective communication and supporting data. Growers should query transport companies and wholesalers regarding their cold chain transport protocols, when trucks are in transit and at cross-docks. If the maintenance of narrow temperature bands is unattainable, then growers may consider altering them in consultation with other players in the supply chain.

Further Information



For further information on this trial and results, email CQUniversity’s agricultural research team: agriculture@cqu.edu.au

Further details on the Escavox system, including case studies and grower testimonials are available at: escavox.com

Summaries of other technology trials undertaken through the Hinkler AgTech Initiative are available at: bundabergagtechhub.com.au

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