PIRSA AgTech Growth Fund

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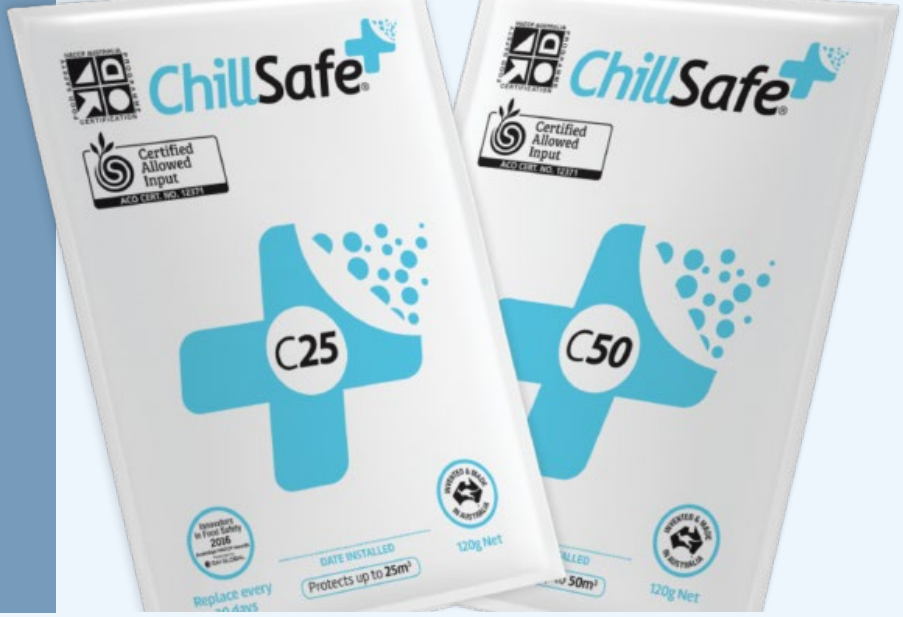
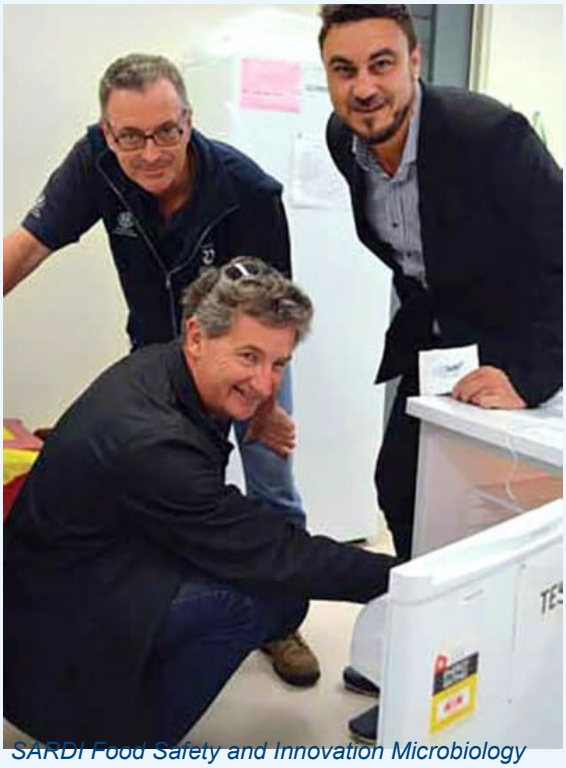


Coolsan Australia

Maintaining the quality and safety of raw agricultural produce across long supply chains



SARDI Food Safety and Innovation Microbiology Laboratory Manager Geoff Holds (left) with Coolsan Principal Scientist Dr Gary Erickson (front) and Coolsan Chief Executive Thomas deMasi (right) during ChillSafe testing in 2014.

A chance encounter between a marketer and a scientist in 2009 set the course for a journey to reduce food wastage. The scientist – Dr Gary Erickson – had a background in developing medical disinfection technologies but, following a tree change, was running a restaurant in rural New South Wales. While doing that, he noticed the fresh produce he bought in had a very short shelf life, with a significant amount of that product going to waste. Dr Erickson developed a molecular decontamination technology with the potential to extend shelf life of fresh produce and reduce food waste. The technology, dubbed Ultra Low Dose Hydrogen Peroxide Vapour (ULD-HPV), currently deployed in sachet format as ChillSafe, was proving beneficial in his own restaurant fridges and he was looking at to taking it to the next level when he met marketer Thomas deMasi.

Since that day in 2009, the duo have been further developing and refining the ChillSafe ULD-HPV technology with various success. In 2015, Thomas met Hugo LeMessurier – an experienced strategic advisor with a clear understanding of the value of reducing microbes in storage and transit spaces to extend shelf life. The three combined their skills and began working closely together to refine and scale their ULD-HPV technology.

With the help of the Department of Primary Industries and Regions' (PIRSA) AgTech Growth Fund and their industry partner EE Muir & Sons, Coolsan has been investigating a solution which could reduce food wastage even further – from the moment produce is harvested, right through to when the consumer takes it off the shelf and into the home refrigerator.

Government of South Australia
Department of Primary Industries and Regions

Industry challenge

According to the National Food Waste Strategy Feasibility Study, approximately 7.6 million tonnes of food is wasted each year across the supply chain, costing the economy about $36.6 billion a year. There is also a significant environmental impact associated with food waste. It accounts for about three per cent of Australia's annual greenhouse gas emissions and, to grow that wasted food, 2,600 gigalitres of water is used.

ChillSafe is currently available in two sachets each about the size of an A5 piece of paper, which have the ability to treat 25 Cubic Metres or 50 Cubic Metres, namely the C25 and C50 respectively. It is typically placed in packing sheds, cool rooms and shipping containers directly underneath or near the cooling system and is activated using moisture in the air to provide continuous preventative maintenance of refrigerated space and to keep food fresher for longer.

However, while beneficial, the current technology and packaging size requires buy-in from all areas of the supply chain to ensure it is used from paddock to plate, as the longer the fresh produce is exposed to Coolsan's ULD-HPV, the better the shelf-life outcomes.

Approach

Through the AgTech Growth Fund grant, with the support of EE Muir & Sons, Coolsan has been developing a smaller packaging size – about the size of a silica gel packet you might find in a new box of shoes – which can be inserted into the box or crate the product goes in at the packing shed.

This means the produce can be kept fresh all the way to the supermarket, regardless of whether each actor in the supply chain has the conventional C25 or C50 ChillSafe installed.

Until now, the limitation to miniaturising ChillSafe has been a lack of moisture within a box or crate to activate the product.

Outcomes

Results from trialling Coolsan miniature sachets in boxes of grapes have been promising.

Using 12 grams of ULD-HPV active, approximately 10 per cent of the amount found in a traditional 125g sachet (C25) of ChillSafe, Coolsan was able to achieve 30 days of protection. Although they were aiming for 42 days, Gary, Hugo and Thomas remain undeterred.

"We retained the crunchiness and texture of the grapes, but we ran out of steam because there wasn't enough active in the appropriate format," Gary says.

"We are still working on it, but we are getting close.

"The funding from PIRSA has leapfrogged us ahead compared to where we would otherwise be in product development."

Future opportunities

The trio agree on their aim for the miniaturised ULD-HPV ChillSafe is to replace, remove, or – at the very least – significantly reduce the use of sulphur dioxide as a post-harvest disease management tool on fresh produce.

“We all know that we have the capacity to be a significant disruptor,” Thomas says.

“The miniature format of our ULD-HPV has the potential to protect the quality of produce right through the supply chain so it won’t be significantly degraded by the time it reaches the consumer.

“There is also a significant opportunity for South Australian growers with the development of this product as it will keep the produce fresher for longer and help it get to more markets around the world.”

Industry view

Venus Citrus, a Loxton-based fruit packing company, started trialling ChillSafe in 2021 following a recommendation from EE Muir & Sons.

Venus exports fruit to more than 20 countries. They have a strong commitment to quality assurance and continuous improvement initiatives to maintain high standards in food quality and safety – from the grower right through the food chain. Venus grower liaison officer Fabio Spiniello says the company decided to trial ChillSafe in one of its cool rooms and quickly saw the benefits.

“We have an extensive storage program. We prolong certain varieties to obtain larger dollar returns for growers. So we decided to use ChillSafe,” he says.

“We’re able to hold fruit for longer and have been able to pack a larger percent so the losses have been minimised.”

Meanwhile, senior post-harvest consultant with EE Muir & Sons Craig Wooldridge says the miniaturised version ChillSafe ULD-HPV could be a real game-changer.

“For high volumes of export produce packed into boxes, like table grapes and berries, an in-box ChillSafe ULD-HPV pad could be a strong addition to the standard suite of post-harvest solutions, or an alternative to solutions like traditional sulphur pads’,” he says.

Contact

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