

# “Wine Industry Impact AWARDS Submission” Viticulture

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**Ripen**  
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## Overview

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- Growers are obligated to produce fruit to a contracted weight in the wine and orchard industries for the wineries and the marketplace.
- Traditional methods are not accurate (-30% of harvested weight) leading to common downstream issues such as over-ordering of consumables or rejection of product.
- Founded in 2023 Ripen Tech has developed an IoT device that weights fruit in real-time while still on the plant.
- This technology provides growers the ability to monitor fruit weights to accurately track and predict yield, understand the impacts of irrigation and heatwaves, improve water use efficiency in real-time, increase yield, avoid fruit loss and select an optimum harvest date to improve fruit quality. 110





# Background/Problem/Opportunity?

To date, winegrape weight monitoring has been undertaken manually by destructively removing and weighing approximately 5-10% of bunches from the vineyards which is not accurate, equating to ( $\pm 30\%$ ) off the harvested weight. This costs wine companies money in lost productivity annually and is observed by the following:

Before this technology growers did not have any real-time data of fruit performance to impact daily decision-making. Due to not having the data, growers will under or over-irrigating winegrapes.

Evidence - Within the viticulture sector, bunch weights are out by 30% a day. Therefore, pinpoint methods (hand picking) will not take into account the daily change. **We have developed and introduced an IoT device that can capture weight data hourly without the need to visit the vineyard.**

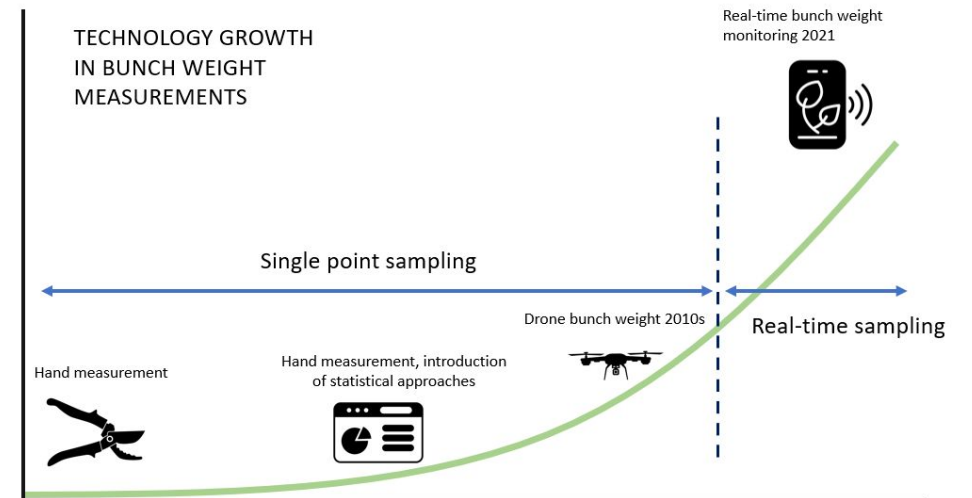


Fig 1. demonstrates the introduction of different bunch weight monitoring methods.

# Solution



## OUR INNOVATION

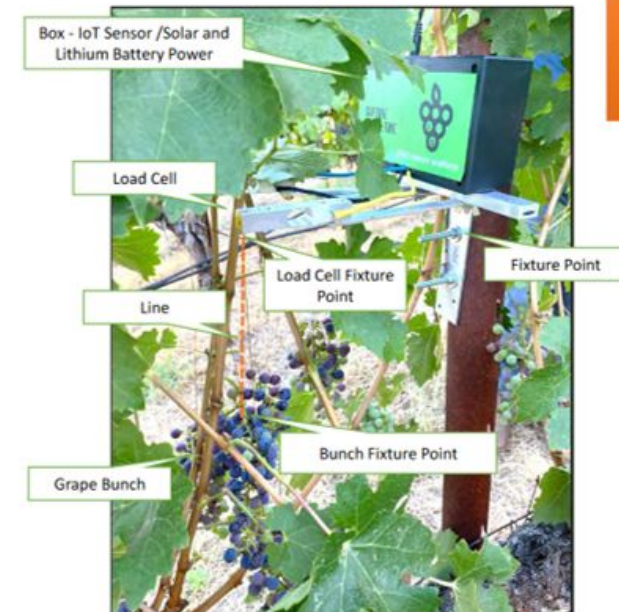
A patented IoT process that monitors fruit weight in real-time while it is still on the plant. Fruit weight data is sent hourly to the growers providing them real-time information to make management decisions. Its key feature is Real-time analytics for fruit weight, greater understanding of fruit performance during climatic and environmental conditions, understanding of irrigation impacts in real-time and to refine water use efficiency.

## KEY BENEFITS

- Optimized Harvesting: Timely and accurate data helps in determining the optimal harvest time, ensuring peak fruit quality
- Yield Improvement: Monitoring systems contribute to better yield management by providing insights into berry growth patterns, climatic and environmental conditions
- Cost Efficiency: By reducing waste and improving resource allocation, these systems help in lowering operational costs including water and labour.
- Quality Assurance: Ensures consistent fruit quality, which is crucial for maintaining domestic and international markets and consumer satisfaction
- Data-Driven Decision Making: Provides actionable insights that help in making informed decisions regarding vineyard irrigation management and supply chain logistics.

## PRODUCT

- IoT platform using cellular/satellite communication, load cell sensor, and solar power.
- Core Features: real-time analytics





# How does this create IMPACT ?

**This will create significant output in the wine-growing industry operating in Australia with export capability.** The introduction of a new tool to refine water use and irrigation planning along with improved prediction of crop yield and size along with the optimal selection of harvest date to maximise the quality of produce will assist wine companies and growers immensely. This technology will take the guesswork out of pertinent decision-making in a challenging and changing climate. **Below is a cost comparison against other existing bunch weight methods, as shown our method provides 24 samples a day compared to 1, and significantly reduces the cost since it is delivered on an IoT device.**

Table 1, Cost to undertake the collection of bunch weight per a day. Steinhorst, L., & Kudla, J. (2019). Signaling in cells and organisms—Calcium holds the line. *Frontiers in Plant Science*, 10, 559. <https://doi.org/10.3389/fpls.2019.00559>

	Area (ha)	Survey time (h)	Survey cost (\$AUD)	Elaboration time (h)	Elaboration cost (\$AUD)	Time (h)	Cost excluding (\$AUD)	Notes
Ground - manual picking	5	2.1	\$ 51.41	0.2	\$ 4.13	2.3	\$ 55.54	Single sample data collection
	10	4.2	\$ 102.82	0.3	\$ 8.11	4.6	\$ 110.77	
	50	20.8	\$ 509.18	1.7	\$ 40.85	22.4	\$ 550.19	
UAV	5	0.2	\$ 7.34	0.8	\$ 24.48	1	\$ 31.82	Single sample data collection
	10	0.4	\$ 14.69	1.7	\$ 52.02	2.1	\$ 66.71	
	50	1.7	\$ 62.42	8.3	\$ 253.98	10	\$ 316.40	
CAT-IoT	5	0	\$ 14.83	0	\$ -	0	\$ 20.00	Contiuous data collection
	10	0	\$ 14.83	0	\$ -	0	\$ 20.00	
	50	0	\$ 14.83	0	\$ -	0	\$ 20.00	

# Trial Results - Bunch Weight Response to Heat Waves

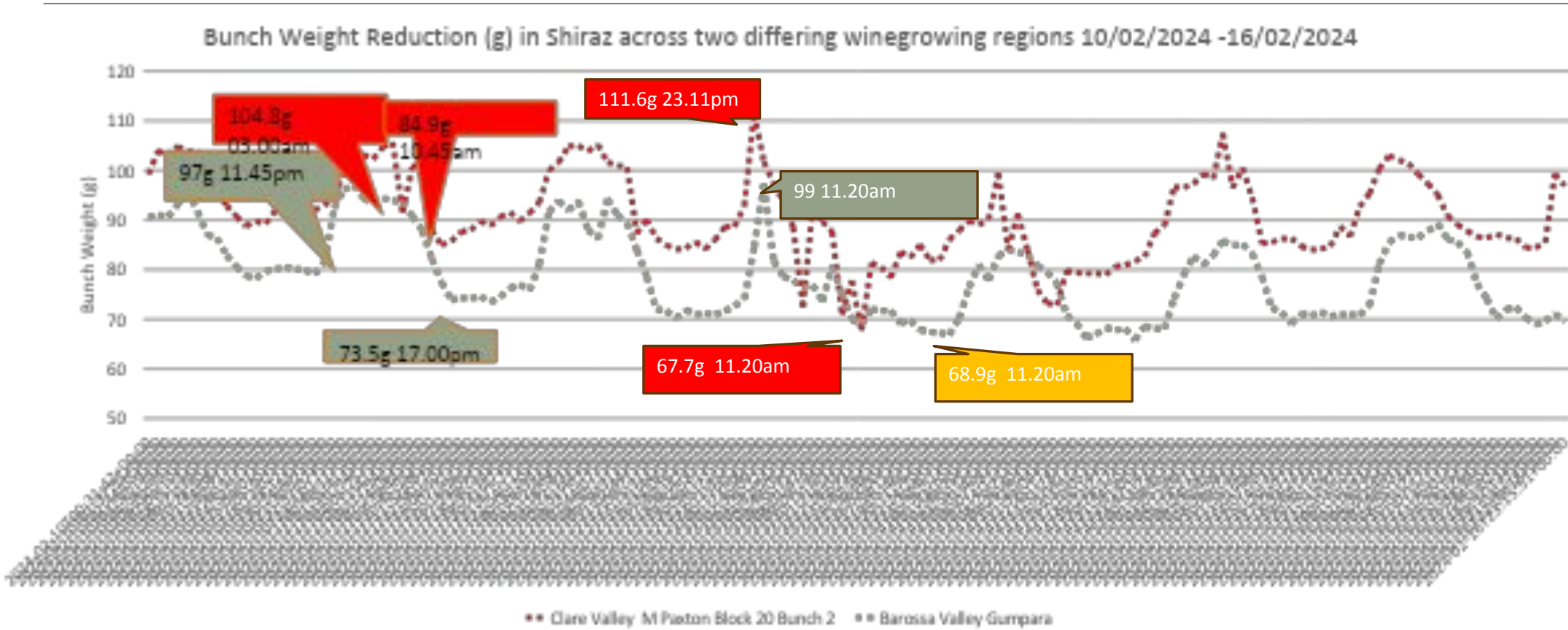


Fig 2. Real Monitoring of bunch weight decline in the Barossa Valley and Clare Valley during two heat wave events. Bunch weight can fluctuate in a single day from 19% to up to 40%.

# Trial Results - Bunch Weight Response to Irrigation Application after a Heat wave, February 2024

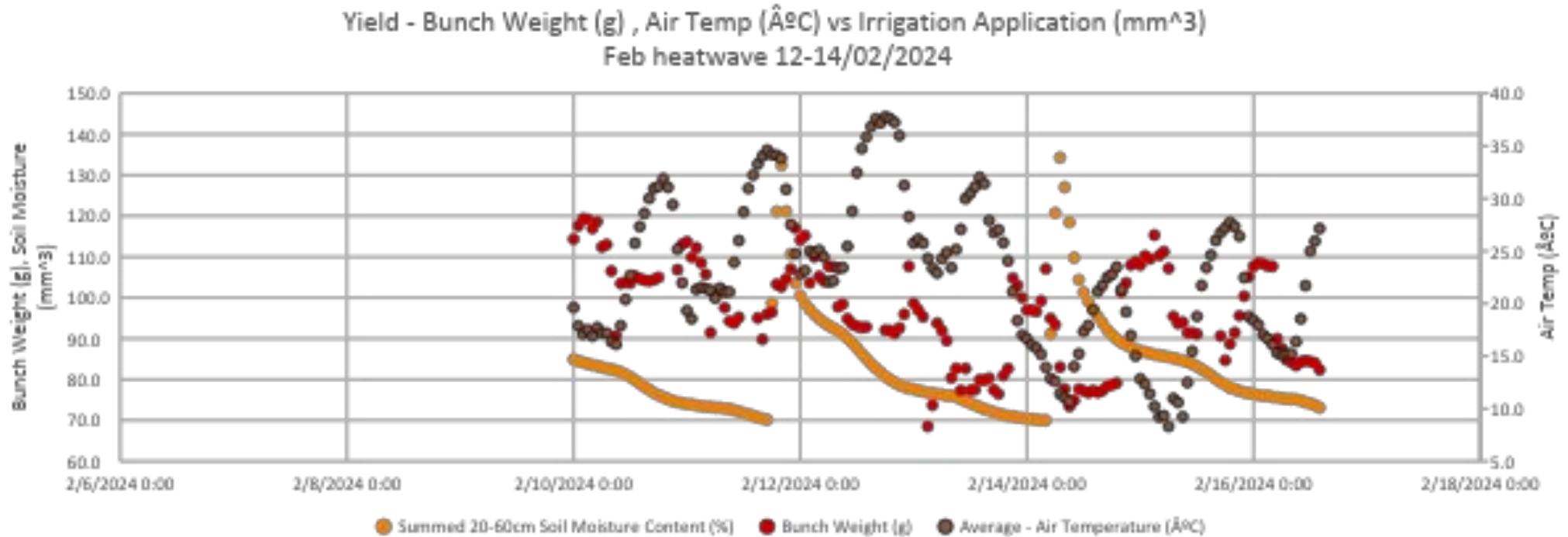


Fig 3. Monitoring the effect of irrigation application in real time on bunch weight recovery after a heat wave.

# Trial Results - Bunch Weight vs Trunk Diameter Response to Irrigation, February 2024

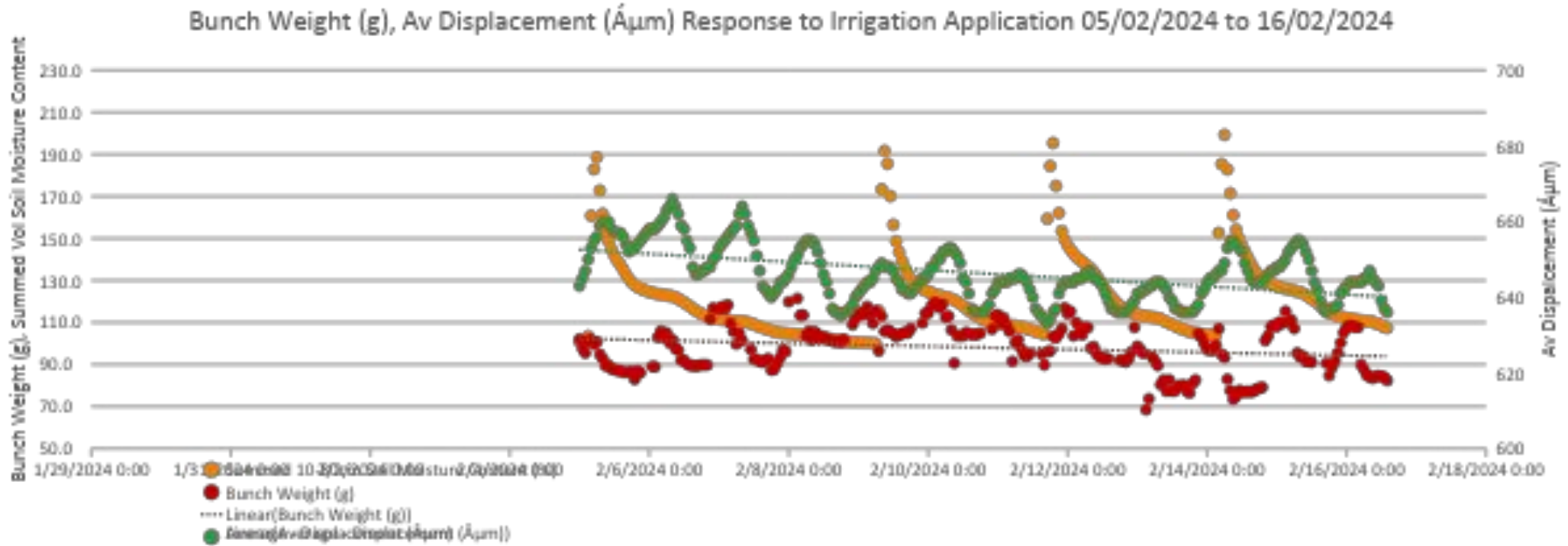


Fig 4. There is a similar pattern to bunch weight and trunk diameter response to irrigation application.



# Trial Results - Bunch Weight Response to Different Undervine Treatments during an 8 hour Irrigation, February 2024

2024

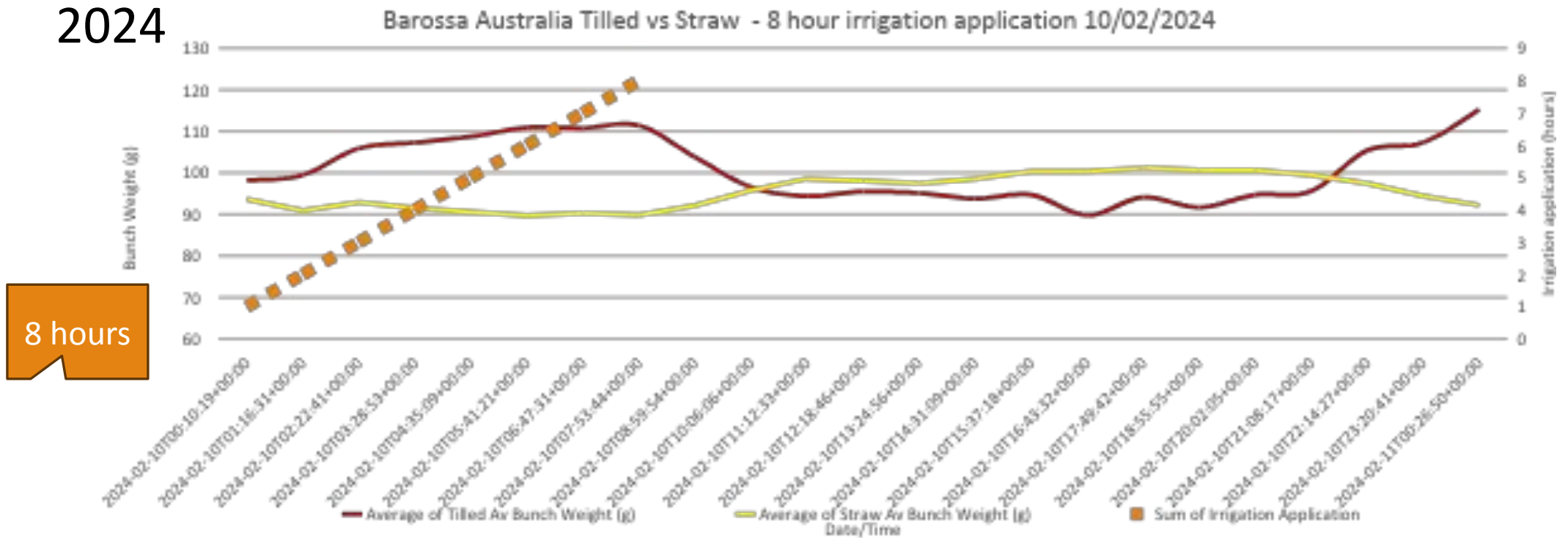


Fig 5. Differences in Bunch weight response to an 8 hour irrigation in two differing undervine treatments. Undervine Straw retains soil moisture for a longer time.

# Trial Results - Bunch Weight Response to Cool Spells

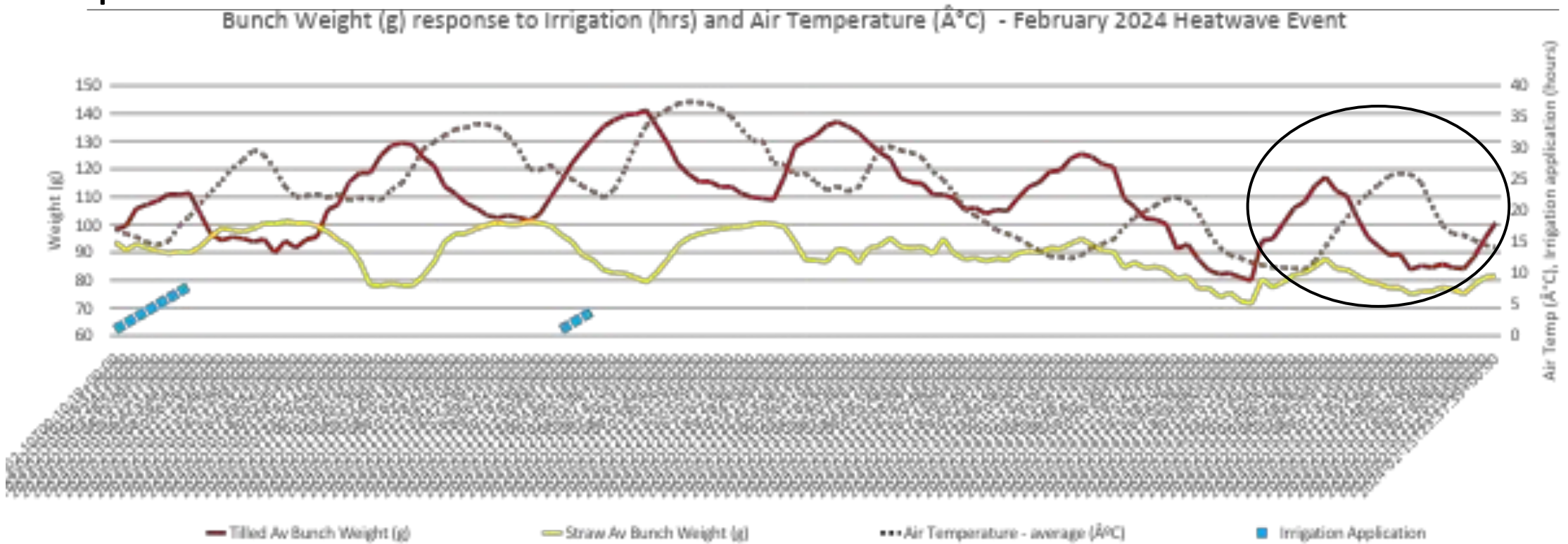


Fig 6. Bunch weight response to a cool spell in two differing undervine treatments. Tilled versus undervine straw mulch. Tilled versus undervine straw mulch.

# Trial Results - Yield versus Maturity 2024

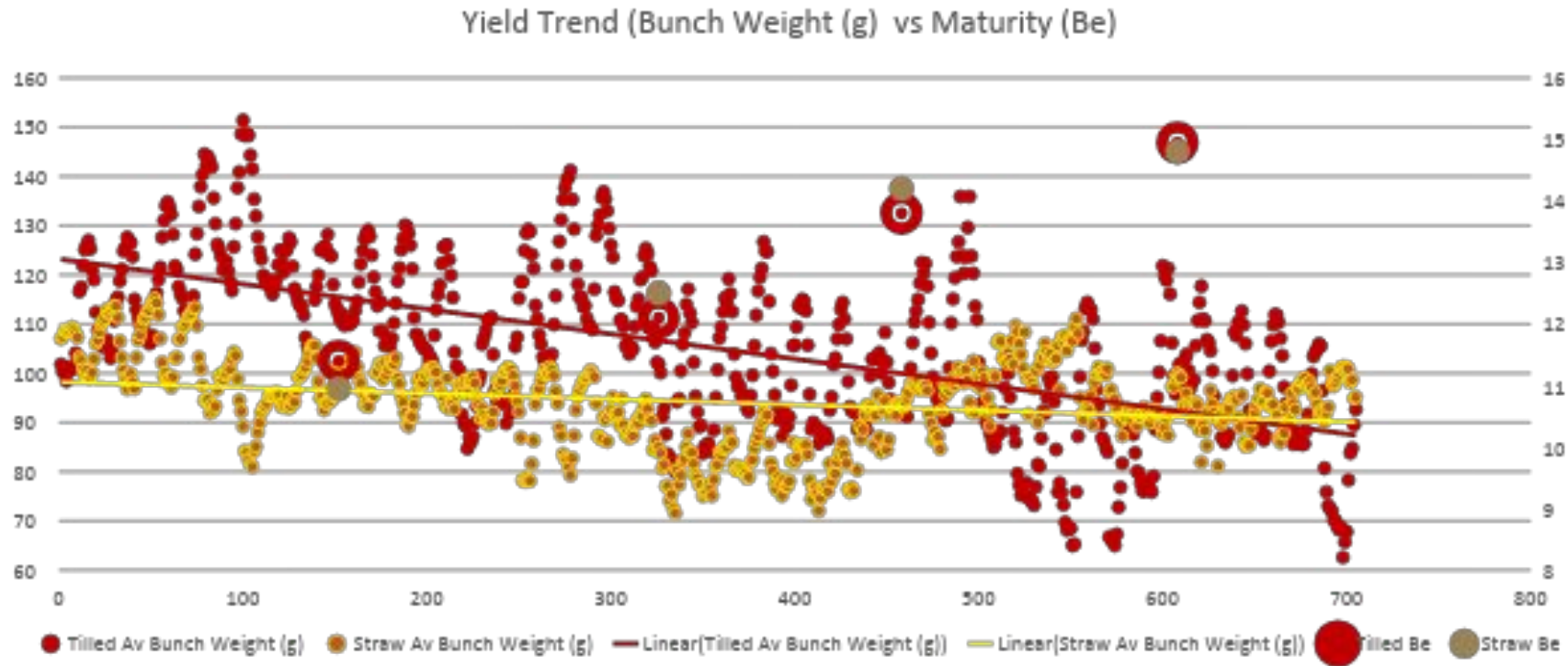


Fig 7. Bunch sugar maturity analysis plotted against bunch weight measurement to select an optimal harvest date in two differing under vine treatments. Tilled versus undervine straw mulch.

# Trial Results - Yield versus Maturity

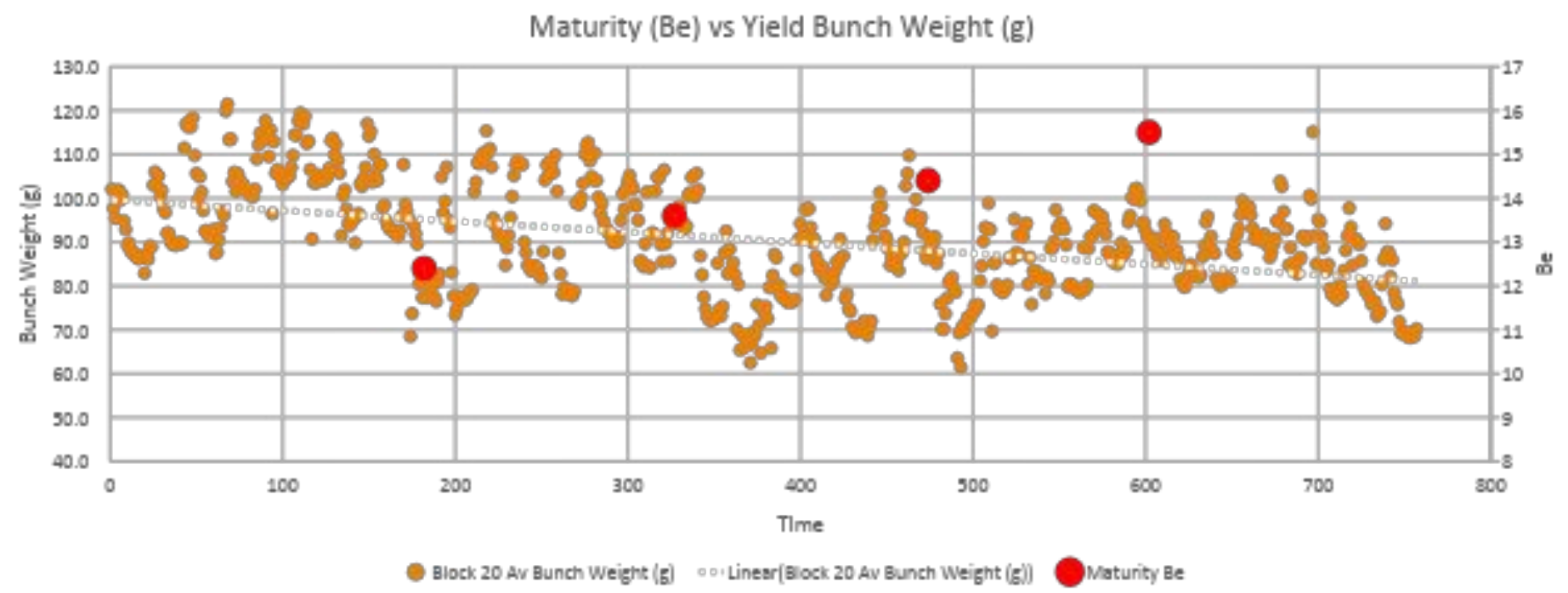
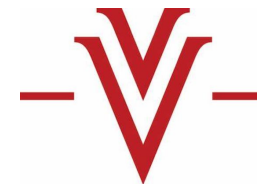
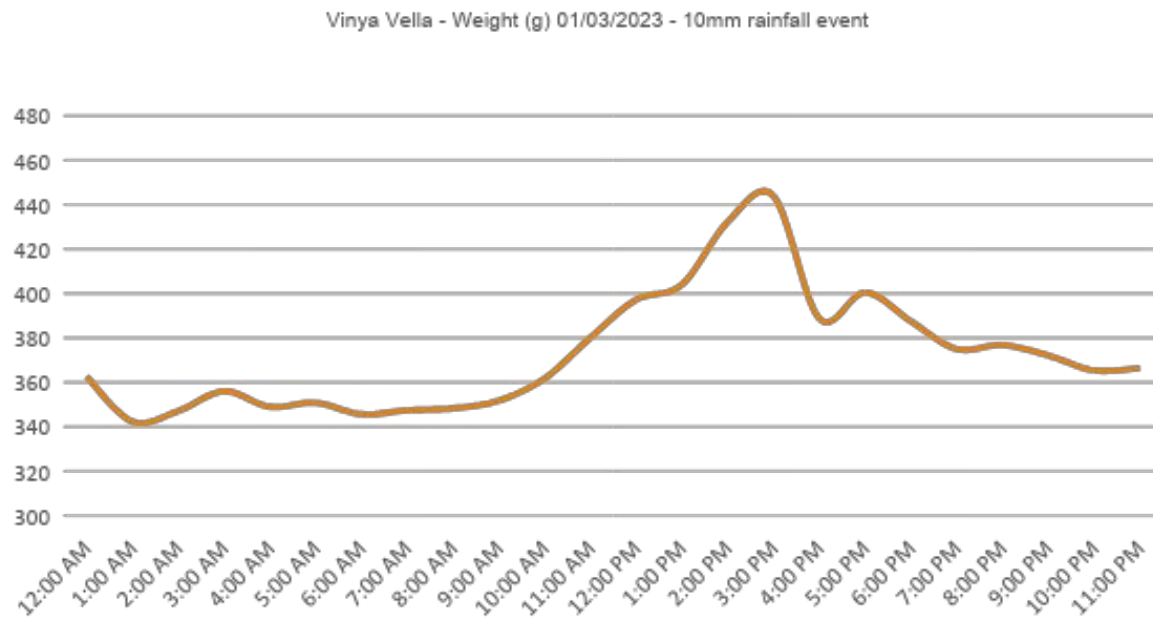


Fig 8. Bunch sugar maturity analysis plotted against bunch weight measurement to select an optimal harvest date.



# Bunch Weight Response to 10mm rainfall Barossa Valley Grenache – Dr Dylan Grigg – Vinya Vella Vineyard 01-03-2023



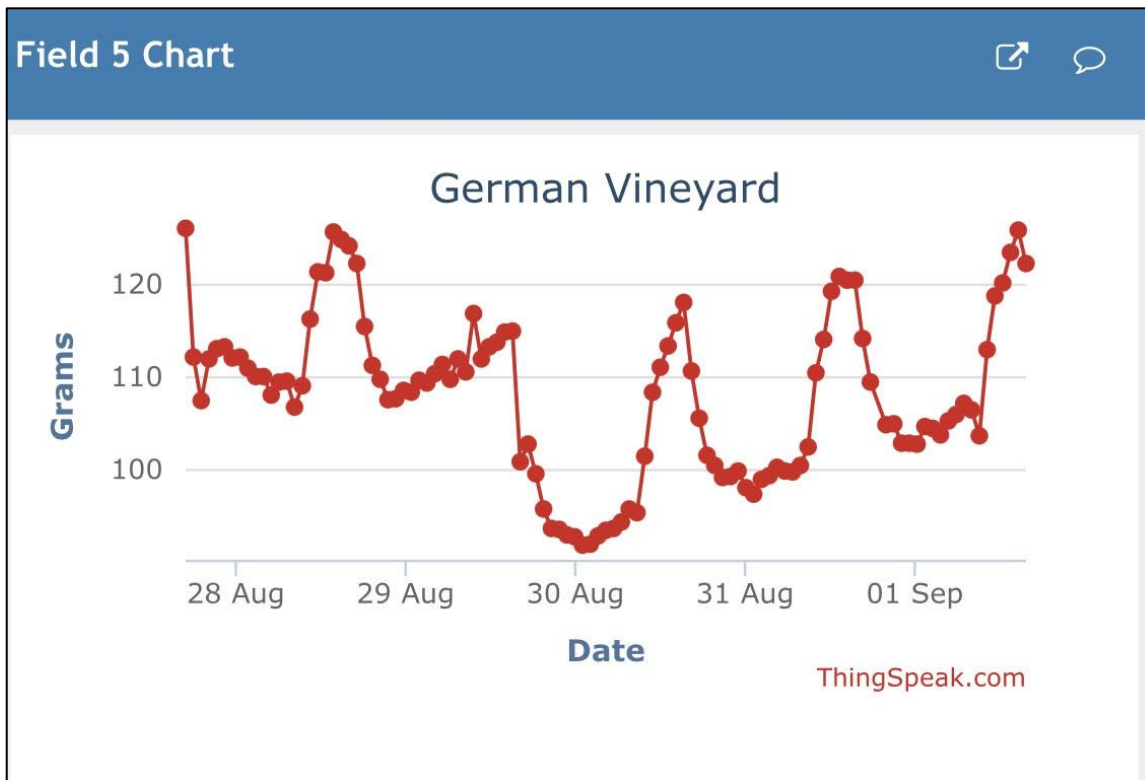
1/03/2023	7:00:27	347.4	Stable
1/03/2023	8:00:32	348.3	
1/03/2023	9:00:05	351.8	
1/03/2023	10:00:15	361.7	Rain
1/03/2023	11:00:30	380.1	
1/03/2023	12:00:14	397.2	
1/03/2023	13:00:22	404	Heavy
1/03/2023	14:00:10	432.2	
1/03/2023	15:00:01	444	
1/03/2023	16:00:30	388.6	
1/03/2023	17:00:25	400.5	
1/03/2023	18:00:21	387.5	
1/03/2023	19:00:03	375	
1/03/2023	20:00:23	376.8	
1/03/2023	21:00:33	372.1	
1/03/2023	22:00:06	365.4	
1/03/2023	23:00:11	366.4	
2/03/2023	0:00:14	361.5	Stable

Fig 9. Rapid bunch weight response to a 10mm rainfall event between 7am to 11 pm. This will assist growers to continuously track their yield and to assist in the decision-making process to reduce their irrigation application to improve water use efficiency.

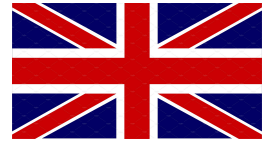
# Bunch Weight Response to a 6mm rainfall event at the National Institute of Agriculture and Botany NIAB University in Pinot Noir – Kent, UK 19-109-24 to 25-.9-2024



# Bunch Weight Response Post heat event - no irrigation applied in Riesling Weingut Dr Heger Vineyard 28-08-2024 to 01-09-2024 - Germany



# IoT Sensors Online in the UK and Germany – September 2024



- Harrow and Hope - UK
- JoJos Digital Vineyard - UK
- NIAB - UK
- Weingut Dr. Heger - GERMANY



**Weingut Dr. Heger**  
[www.heger-weine.de](http://www.heger-weine.de)  
Winery in Ihringen, Germany  
📍 Bachenstr. 19/21 · 79241 Ihringen







# SUPPLEMENTARY MATERIAL





# Collaborations 2024/2025

Australia - Viticulture	International - Viticulture
SA - Wine Australia – Andy Clarke	UK – NIAB – Dr Belinda Kemp
SA - Seppeltsfield –Michael Paxton	UK – JoJos Vineyard – Ian Beecher Jones
SA - Barossa Australia – Nicki Robins	UK – Harrow and Hope – Ian Beecher Jones
SA - Treasury Wine Estates – Dr Cath Kidman	Germany – Winegut Dr Heger – Nick Ringwald
SA - Pernod Ricard – Phil Deverall	NZ – Craggy Range – Laura Marston
SA – Vinya Vela – Dr Dylan Grigg	NZ – John Belsham – Wine Focus
SA – Hayes Family Wines – Brett Hayes	NZ – Indevin – Rhys Hall
SA – Vinhaven – Marty Gallasch	South Africa – Matthew Hooper -VAF Memstar
Swan Systems – John Pargeta	<b>Australia - Horticulture</b>
Crop X/GreenBrain – Adam Brown	SA – Costa Group – Citrus and Avocadoes – Ben Schaefer
WA - Mure Viticulture – Lee Haselgrove	
WA – Fogarty – Lee Haselgrove	



# Market Opportunity/Business Model

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## Estimated Market Size

The market for dendrometers, which monitor fruit diameter, provides a useful benchmark. As of 2023-2024, the global market for dendrometers ranges between \$10-30 million annually, including both traditional mechanical models and advanced digital ones. The market is projected to grow at a CAGR of 5-10% over the next five years, driven by technological advancements, increased environmental monitoring activities, and the growing importance of sustainable practices. Ripen Tech anticipates attracting clients from this market segment, as well as those involved in current bunch weight monitoring operations in vineyards.

## Target Audience

- Growers with hanging fruit using fruit weight or diameter in their daily operations.

## Revenue Streams

- Subscription-based model.
- Full servicing options.

## Pricing Tiers

- Standard: \$150 AUD per week.
- Full servicing: Includes FTE staff allocation and a fleet of sensors.

## Customer Acquisition Strategy

- Direct sales.
- Online marketing campaigns.
- Strategic partnerships.

## Customer Segments

Ripen Tech's IoT fruit weighing device has a broad range of potential customer segments, including winegrowing and large-scale orchards. Additionally, agricultural cooperatives, research institutions, and agricultural technology companies can benefit from this innovative solution. The device is also valuable to wine and food processing and distribution companies for quality control, government and regulatory bodies for agricultural monitoring, and investors and stakeholders interested in agricultural technology advancements.



# Articles/Publications

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Publications – Australian and NZ Grapegrower and Winemaker

[Wine Titles September 2021 Grapegrowing-tracking-continuous-bunch-weight-measurement](#)

[Wine Titles June 2023 Transforming yield estimation using-real-time-bunch-weight-tool](#)

[https://www.linkedin.com/posts/winetitles-pty-ltd\\_managing-vineyards-in-heatwaves-part-2-activity-7216640670873108480-c-9r/](https://www.linkedin.com/posts/winetitles-pty-ltd_managing-vineyards-in-heatwaves-part-2-activity-7216640670873108480-c-9r/)

Article – SA Farmer Magazine

[Estimating wine grape yield made easy SA Farmer Spring 2022.pdf](#)

Article – Barossa Mag – Ripening Innovation

<https://www.barossamag.com/featured/ripening-innovation/>

Presentations

- Coonawarra Cabernet Sauvignon Symposium 2024 – Ag Tech Field Walk Presenter – Ripen Tech ‘Measurement of Bunch Weight in Real Time’
- SA Central Viticulture and Winemaking Symposium 2024 – Wine Australia/Seppeltsfield Trial – “The Ag Tech Adoption Challenge”. Tony Hoare and Amanda Mader
- Society of Precision Agriculture Australia Precision Ag Expo 2024 – “IoT Measurement of Fruit Weight in Real Time” – Mason Erkelens/Amanda Mader



## Team – Amanda Mader/Mason Erkelens 2021-2024

### **Amanda Mader – Chief Investigator, Gumpara Wines/Ripen Tech Pty Ltd**

Amanda Mader has been working within the viticultural sector for over 30 years, currently, she is the owner of Call the Vine Scout (Gumpara Wines) a Barossa based viticultural consultancy. Amanda has been the recipient of many awards, some key awards are:

- 2022 - Barons of Barossa- Viticulturist of the Year.
- 2021 – Women’s Innovation Award - ENGINEERING, SPONSORED BY THE UNIVERSITY OF SOUTH AUSTRALIA

### **Dr Mason Erkelens - Principal Investigator, Ripen Tech Pty Ltd**

Mason Erkelens has been working in the research and commercialisation sector for the past 10 years, his focus has been on water research and commercialisation of cost-effective innovations. Key projects are the installation and running of the SA Waters smart city network.

### **Amanda and Mason were successful recipients for:**

- PIRSA SA Ag Tech Grant – ‘Measurement of bunch weight in Real Time - \$10000 in July 2022
- Australian Innovation Commission (AIC) Competition Winner - \$30,000 in November 2023
- Farmers 2 Founders Hatch and Hone Program Recipients
- Wine Industry Suppliers Australia (WISA) Impact Awards Finalist – November 2022
- Wine Industry Suppliers Australia (WISA) Impact Awards Runner Up – November 2023





# Referees

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- Cath Kidman – Technical Viticulturist  
Treasury Wine Estates  
[catherine.kidman@tweglobal.com.au](mailto:catherine.kidman@tweglobal.com.au)
- Andy Clarke  
Wine Australia  
[andy.clarke@wineaustralia.com.au](mailto:andy.clarke@wineaustralia.com.au)
- Nicki Robins – Viticultural Development Officer  
Barossa Australia  
[Nicki@barossa.com](mailto:Nicki@barossa.com)
- John Pargeter – SA Business Manager  
SWAN Systems  
[john.pargeter@swansystems.com](mailto:john.pargeter@swansystems.com)
- Dr Belinda Kemp – PhD Viticulture and Oenology – Group Leader  
Wine Innovation Centre, East Malling Kent UK  
[Belinda.kemp@niab.com](mailto:Belinda.kemp@niab.com)