Case study: Identifying opportunities, gaps and barriers to regional ag-tech adoption and utilisation

Project summary

The Mallee Regional Innovation Centre has developed a range of demonstration projects at the SuniTAFE Smart Farm, offering hands-on experiences of technologies that can assist with everyday farming challenges.

Set up as part of a Drought Resilience Adoption and Innovation Hub project, the demonstration sites allow visitors to:

- >> identify key farm decisions and processes that can be supported by technology
- >> discover the use and value of technology solutions to inform and assist farm management.

A memorandum of understanding signed by Centre partners the University of Melbourne and SuniTAFE will ensure the longevity of the demonstration sites and strengthen the Centre's ability to expand the knowledge of these agricultural technology solutions in the region.

Visiting the farm

The technology demonstrations are now a regular feature of farm tours.

Over six months, the Irymple farm accommodated 21 tours, which exposed more than 400 people to project activities. Visitors included about 300 growers, as well as agricultural industry representatives, agronomists, policymakers, researchers and students.

Technology selection criteria

The technology for the demonstration sites was chosen based on a number of factors, including:

- >> relevance of the technology solution to horticulture production systems in the region
- >> presence of the company within the region (service support, maintenance)
- >> considerations for wider uptake or prolonged uptake (subscription, access to data, understanding the data, sustainable or competitive advantage of technologies)
- >> barriers to entry
- >> uniqueness that cannot be easily replicated
- >> educational value
- >> evidence of technical or commercial feasibility of the technology
- >> access to the relevant know-how, or existing/potential intellectual property that will be necessary for the trial (what other technology is compatible at SuniTAFE farm)
- >> other information required (e.g., soil data)
- >> available offerings to support/ add value to the installation.

"Technology is here to stay. It's whether you are identifying the right technology."

- Mallee grower

Mallee Regional Innovation Centre activities were undertaken as the North-West Irrigated Horticulture Node of the Victoria Drought and Innovation Hub as part of the cross-state project, Modern Drought Management for the Health and Longevity of Perennial Horticulture Plants.

Led by the SA Drought Hub, the project also involved the Southern NSW, Victoria, and Tasmania (through the University of Tasmania) drought hubs.

Victorian project collaborators: SuniTAFE, The University of Melbourne and La Trobe University
Service providers: Swan Systems, Incyt by LX, RapidAIM, Metos and Phytech

This program received funding from the Australian Government's Future Drought Fund.

MRIC Collaborate. Research. Innovate

SuniTAFE

LA TROBE UNIVERSITY

THE UNIVERSITY OF MELBOURNE

On-farm technology demonstrations

Digital dashboard that combines data for analysis & decision-making

What it does: An irrigation scheduling system collects and analyses data from devices that are installed at the farm. Data collected is used to provide recommendations for crop irrigation and management. The system can be used for a variety of crops, growth stage, and yield or quality goals.

The dashboard supports irrigation decisions through analysis of irrigation, weather, and satellite data. The system can respond to daily forecasts and variable weather, schedule irrigation times and amounts for optimum crop growth, monitor soil moisture levels to maintain ideal conditions for canopy and fruit growth, and recommend future irrigation needs in defined zones.

Benefits: The technology integrates with existing farm sensors such as weather stations, moisture probes and flow meters and controllers. It considers the crop and soil characteristics of each site, water budgets and the irrigation system to provide accurate daily recommendations.

Dashboard access: The dashboard displays a map-based overview of irrigation sites with summaries of plant health and alerts. Live data from the dashboard for the farm can be accessed at: https://go.unimelb.edu.au/r8v8

A device that detects pests (flies and moths)

What it does: The system combines hardware and software with advanced biomimicry and artificial intelligence pattern recognition and machine learning to identify pests in real time.

Benefits: Via the device, growers can receive real-time alerts when pests are present.

A system of tracking sensors

What it does: The system can measure air pressure, temperature, humidity and location, with indoor and outdoor options.

Units can be tracked and data relayed back into a platform to provide conditional locality information and location tracking and reporting.

Benefits: Units have a long battery life and can be mounted to trucks, cold rooms, shipping containers, beehives and a range of other conditions.

Weather station

What it does: Weather stations monitor data with a wide variety of sensor sets. These sensors capture temperature, rainfall, wind speed and direction, solar radiation, and relative humidity.

Benefits: The weather station measures, logs and sends data to the cloud and comes with six standard sensors – rain gauge, air temperature, relative humidity, leaf wetness, ultrasonic wind speed/direction, solar radiation. Calculated outputs include: Delta-T (the measure of evaporation rate and lifetime of a droplet), dewpoint, vapour pressure deficit, sunshine duration, chill units, growing degree days.

Soil moisture probe

What it does: The soil moisture probe with 10cm increments reports soil moisture, soil temperature and soil electrical conductivity (EC) – as related to salinity.

Benefits: Data from soil monitoring can assist in making irrigation decisions.

Camera with pheromone lure

What is does: An infield camera designed to photograph and calculate targets insects that are attracted to a pheromone lure applied to a sticky plate in the device.

Benefits: Camera systems are used for remote crop growth monitoring and modelling of fruit size, plant development and growth. They are also used for yield forecasting to assist with harvest logistics.

Crop camera

What it does: The crop camera is designed to allow three photographs per day of a growing crop to show growth phases and is used to size fruit in an orchard.

Benefit: Photos are stored in the cloud and the user is able to run timelapse videos as the season progresses.

Soil moisture monitor

What it does: The stand-alone telemetry unit can be joined to a soil moisture probe to read soil moisture.

Benefits: The user can join no sensors other than a moisture probe or join as many as they see value in.

Weather forecast + work planning & animal production

What it does: The weather forecasting tool has many powerful tools in the model that help with daily growing decisions.

Benefits: Standard features include 14-day forecast, 7-day hourly forecast, 7-day wind animation, spray conditions, radar and evapotranspiration.

Direct plant sensing

What it does: Data is transmitted in real time for analysis. Predictive analytics and plant intelligence capabilities provide alerts and recommendations based on plant status indicator (e.g. plant health and water demand)

Benefits: Maximising efficient water and fertiliser application whilst optimising yields and quality.

>> For more information about the technology demonstrations, visit the Mallee Regional Innovation Centre website: https://go.unimelb.edu.au/j2v8

Or scan the QR code:

Scan