

AgTech provides on-farm labour savings

Labour savings and risk management have played a part in the choice of technology on the Young's farm.

James and Jodie Young have been testing digital technology (AgTech) on their property 'Eulong' near Cavendish in Western Victoria. Together with James' parents, the couple manage around 700 cattle and 12,500 sheep across 2,700 hectares and took part in the Smart Farm Sensor Demonstration with their local Grassland Society of Southern Australia (GSSA) group. Their aim was to investigate whether AgTech could assist with remote monitoring to mitigate risks across their geographically disperse properties. The Youngs hoped the sensor could potentially reduce labour requirements and offer benefits for work-life balance.

The Youngs installed several sensors which have given them confidence to remotely manage their out-block 30km away and immediately achieve labour savings. The estimated net benefits of the AgTech on their out-block is approximately \$4,760 in one year.



James Young is testing AgTech solutions on 'Eulong', Cavendish

Table 1: Summary of Devices

Device/sensor(s) installed	1 Electric Fence*, 1 Trough*, 1 Tank# and 1 Gate#
Device Connectivity solution	LoRaWAN
Device management software/Dashboard	Farmo
Dashboard platform	Web accessible from computer or mobile device

* Located on out-block, # located on home block

Choice of devices and provider

As part of the demonstration, the Youngs trialled sensors from a local AgTech provider who offered reliable support. A range of devices were connected into an existing long-range wide-area network (LoRaWAN) which had been established as part of a local shire connectivity initiative.

Most of the devices tested were plug and play and relatively simple to self-install. However, the AgTech provider connected the devices to the gateway and gave some ongoing support and maintenance. Having adequate support for installation of products was a key consideration for the Youngs. As James explained, "...good support is a must. The aim is to not to be overloaded with more jobs."

Using the equipment

The introduction of an electric fence sensor and trough sensor reduced the requirement for daily checking of a separate 485-hectare grazing property (out-block) located 30km from the main farm. Any faults or changes to normal readings are received via a mobile messaging system.

All device operations can be observed via a dashboard supplied by the AgTech provider (paid for via a subscription per device per year). Both devices on the out-block produced a combined net benefit of \$4,760 for the first year (calculated as the potential or real savings less purchase and operating cost of the devices).



Electric fence sensor

The electric fence sensor monitors the voltage of the electric fence on the out-block. The dashboard activates an SMS alert when the voltage drops below a set threshold, which triggers James to investigate the fault.

Prior to installing the electric fence sensor on the out-block, the Youngs paid an employee to drive the return trip at least twice per week to manually check the fence for faults.

The installation of the electric fence sensor now means the fences are only checked on average once a fortnight and the employee is only called out if there is a fault detected in the system.

Trough sensor

The trough sensor monitors the water level within the trough, enabling SMS alerts to be sent when water drops below a set threshold.

Prior to installing the trough sensors, water points were only checked when required based on weather conditions (i.e. higher frequency through warmer months). Outside of summer, troughs were typically checked twice per week. Since installing the trough sensor, this has been reduced to once per week. However, daily checks have continued in summer.

The installation of the trough sensor has also reduced the risk of stock being without water between daily checks in summer.





Tank depth sensor

The tank sensor has a pressure probe at the base of the tank which enables the water level to be displayed on the dashboard.

Prior to installing the sensor, tanks were manually checked once per week, now they are only routinely checked once per fortnight.

The depth sensors have provided surety to water availability, taking the guesswork out of tank water storage levels. The dashboard also tells the Youngs when the tank is filling, or water is being used. This is useful for diagnosing pump issues or pipe leaks and times of high-water demand.

Monetary savings from diagnosing large-scale tank water loss include potential stock loss and stress, pregnancy loss, time cost for stock relocation and water point damage.

Gate Sensor

The gate sensor uses a metal latch and magnet installed on the gate. The sensor recognises when the latch is in the closed position and will trigger an alert as it is opened.

It is vital for the Youngs to know when their out-block has been entered or if gates have been inadvertently left open.

Like the tank level sensors, the alert service provides peace of mind to know when there is traffic (intended or unintended) on their property. All entries to the property are time stamped, which provides evidence of any unauthorised entry.



Commercial cost for devices

The total commercial cost for the purchase and use of the four AgTech sensors for one year across the out-block and home block is \$1,972. This includes the device subscription on the dashboard at \$50 per device and \$0.10 per SMS alert. Email alerts are free.

The approximate costs and benefits to the Young farm are outlined below. Devices used in combination don't always have a cumulative benefit, but may, in conjunction with the use of a second device, provide a whole farm solution and yield a net benefit.

Device	Costs		Benefits	
	Up-front cost	Ongoing cost of device software / subscription	Financial benefits	Other benefits
Electric Fence sensor *	\$399	\$50	Labour savings of \$5,784 (1 trip/ week rather than 2)	Reduced number of false alarms for faults Prevention of escapees through a faulty fence (stock safety) Peace of mind
Trough Water Level sensor *	\$449	\$50	Potential savings of \$600 per fault (pump and water costs over a 24-hour period)	Reduced risk of welfare issues during warmer months Peace of mind
Tank Depth sensor #	\$599	\$50		Peace of mind Potential to mitigate water supply issues before they occur. Can highlight downstream issues etc. in troughs or broken lines
Farmo Gate sensor #	\$249	\$50		Peace of mind Deterrent as well as alert to unauthorised access

* Located on out-block, # located on home block.

No other monthly subscription costs are required for this farm. Please note that LoRaWAN and NB-IoT provision may be at further cost to the producer if not available or already subscribed. Installation costs may also need to be considered.

Conclusion

The Youngs saw a \$4,760 net benefit from the four sensors and were able to reallocate labour to other tasks on the farm. The AgTech solutions have provided risk mitigation options for the Youngs and is helping to achieve a better work-life balance.

After taking part in the sensor demonstration, the Youngs made the following observations and recommendations:

- Find a supplier that provides support for the devices as well as the software
- Invest time (two hours in the Young's case) to learn how to use the software and set alerts
- Hourly data updates were found to be adequate for the Young's four sensors.

Where do I find out more?

- Farmo sensors: <https://www.farmo.com.au/collections/sensors>
- On-farm demonstrations <https://agriculture.vic.gov.au/on-farm-demos>

About the project

Smart Farm Sensor Demonstrations: This project is supported by Glenelg Hopkins CMA, through funding from the Australian Government's National Landcare Program, Agriculture Victoria, Grasslands Society of Southern Australia, Southern Farming Systems and Southern Grampians Shire Council. The project runs from 2019-21 and tests and demonstrates a range of devices on farms in the south west region, including stock water and tank monitors, soil moisture probes, electric fence sensors and weather stations. The sensors provide real-time feedback to producers enabling them to make more informed decisions and better use of labour, time and capital.