

Setting the farm up for broadband connectivity – a Keytah perspective

■ By Louise Gall – Project Officer, Gwydir Valley Irrigators Association

KEYTAH, near Moree, is an example of a farming operation actively moving towards the implementation of digital agriculture. Currently the farm is using a range of technology such as water and soil monitors, weather stations, remote pump site monitoring, tractor monitoring and a number of administrative systems for farm management, accounting and paddock record keeping. Generally, these systems work with slower internet speeds, but efficiency could be improved with higher speeds.

In the near future Keytah want to expand the integration of technology into their farming systems. Some of the innovations anticipated to become a part of the operations include:

- Automation of irrigation;
- Autonomous tractors; and,
- Automation of pumping.

Automated irrigation

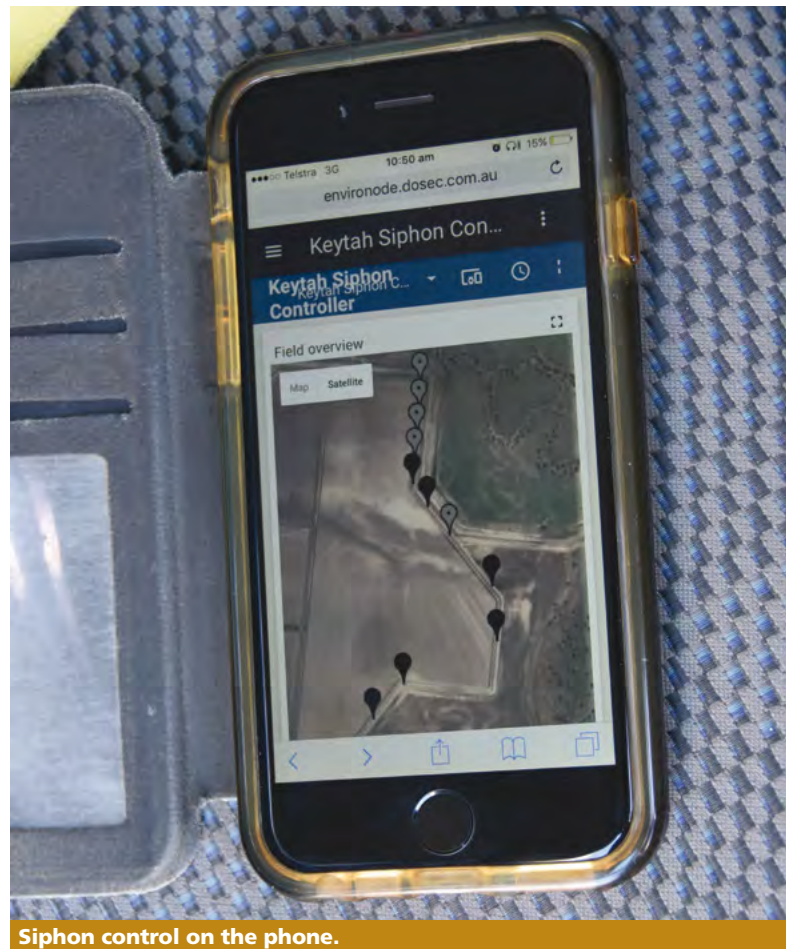
The first step Keytah has taken in this transition is the automation of irrigation. During the 2017–18 season, Keytah installed 94 hectares of siphon automation as part of the Smarter Irrigation for Profit project. The field has been fitted with 1100 Smart Syphons which can be remotely controlled in gangs of up to 150 siphons.

To automatically control the siphon gangs, the field has been set up with a telemetry hub and wireless modems to link the siphon remote terminal units to the hub. To aid in optimised irrigation there has also been investment in soil probes, water level sensors and water advance meters. The control of the siphons and level sensors is possible through a mobile phone.

To fully implement and integrate all the components needed for full automation going forward, the farm needs to have access to reliable high speed internet. The standard system at Keytah at the start of the season was not as reliable as needed and



Automated siphons.



Siphon control on the phone.

EOI

KIA ORA

QLD, St George: 450 Whyenbah Road

18,783*HA (46,414AC*)



HIGHLY DEVELOPED IRRIGATED & DRYLAND CROPPING ENTERPRISE

- + Combined land area of 18,783Ha*, inclusive of 8,898Ha* of highly developed flood irrigation, 1,335Ha* of water storage, 902Ha* of dryland cultivation, a further 3,525Ha* of arable land under development with the balance comprising grazing and support land.
- + Significant on-farm water storage capacity of 66,359ML*, with water entitlements having a Nominal Volume of 2,362ML* of supplemented water allocation and 19,476ML* of unsupplemented water allocation, supported by well-designed infrastructure and earthworks with an ongoing program of water efficiency and productivity enhancements.
- + High quality operational infrastructure and structural improvements with a continued investment of capital expenditure programs and technological developments that enhance on-farm efficiencies.
- + Productive moisture holding soil types underpin high cotton and grain yields, with scope for further development of dryland and grazing areas.
- + Excellent staff and management team. The standard of development and operational performance of Kia Ora is exceptional and well supported by an established "Best Working Practice" management program.
- + Opportunity to acquire a highly developed agricultural enterprise on a 'WIWO' basis, inclusive of all land, structures, water allocations, plant & equipment and planted crops.

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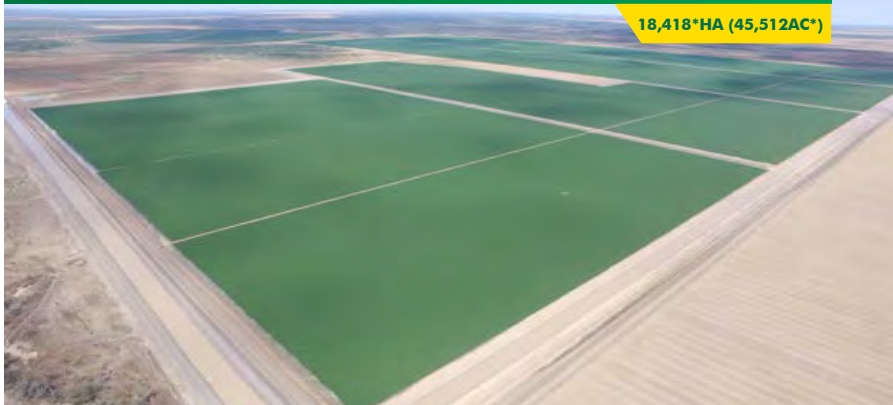
*approx

EOI

CLYDE

QLD, Dirranbandi: 10360 Castlereagh Highway

18,418*HA (45,512AC*)



LARGE SCALE IRRIGATED & DRYLAND CROPPING PROPERTY

- + Combined land area of approximately 18,418Ha*, inclusive of 3,904Ha* of highly developed flood irrigation of which 1,721Ha* has been developed to bankless channel, 690Ha* of water storage, 7,743Ha* of arable land under development with the balance comprising grazing and support land.
- + Significant on-farm water storage capacity of 39,090ML*, water entitlements having a Nominal Volume of 9,765ML* of unsupplemented water allocation, supported by well designed infrastructure and earthworks with ready access to further water allocations.
- + High quality operational infrastructure and structural improvements with a continued investment of capital expenditure programs and technological developments that enhance on-farm efficiencies.
- + Productive moisture holding soil types underpin high cotton and grain yields, with scope for the further development of grazing and support land to dryland cropping.
- + Excellent staff and management team. The standard of development and operational performance of Clyde is exceptional and well supported by an established "Best Working Practice" management program.
- + Opportunity to acquire a well designed agricultural enterprise with development upside on a 'WIWO' basis, inclusive of all land, structures, water allocations, plant & equipment and planted crops.

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was slow. It was unlikely to deliver what was needed for siphon automation, or for full integration of technology into the farm management system.

In partnership with the CRDC funded Irrigation Efficiency project, Keytah investigated options to improve the reliability and speed of their internet access. There were several options which were potentially suitable such as cable, microwave, Sky muster, LoRaWAN or Taggle, each with different speeds and accessibilities.

Keytah has opted for a microwave link into Moree's new fibre optic cable setup. This has been implemented through a 'second tier' telecommunication provider. The intention was to provide fast internet connection, unlimited data and Wi-Fi coverage over the majority of the farm. The process involved the design of network solutions, microwave licensing, and the purchase and installation of backhaul equipment. There was also the construction of an on-farm tower fitted with antennas, radio pairs and Wi-Fi access points.

With the installation of this system, Keytah now has fast reliable internet access which has improved the usefulness and efficiency of existing technology systems.

Keytah monitors soil moisture, water pumped, storage levels and weather through Goanna Telemetry. This has helped improve irrigation scheduling through the use of soil probes and irriSAT. The management team is able to ensure water is pumped on time and at the rate required. They are also able to track storage water level, which gives them information on evaporation and seepage and enables the calculation of real time water balances.

Better connectivity has enhanced the efficiency of information exchange in the system. But there are still some challenges including the reliability of sensors, which are constantly being updated, and real time repairs of equipment can be difficult, especially in high demand periods. The other issue is ensuring that staff have the appropriate training to understand how to utilise the information to improve decision making.

Pump monitoring

Remote pump site monitoring involves measures of channel heights, storage levels and metering volumes being pumped. The system also monitors engine details such as bearing temperatures, fuel levels and if the engine is on or off.

This setup has helped to reduce the time allocated to checking



An automatic weather station on Keytah.



The EnviroNode Hub 2.

pumps when in use, and it also means that when there is an issue, it can be addressed much more quickly as staff are immediately aware of the problem. The challenge has been to get a good local technology provider to supply a reliable system at a reasonable cost. If the system is unreliable, it is difficult for staff to fully embrace the potential benefits of the system. The improved internet access has improved the reliability of the service and so has increased staff confidence in the system.

Using agCloud

Keytah utilises the PCT agCloud across their operation. There are a range of processing applications that can be used to provide a more detailed understanding of the interaction of production parameters on a field by field basis. This information is then utilised to improve water use efficiency. The system has helped in the understanding of soil variability, which has improved the placement of moisture probes. They have been able to pursue site specific drainage works using elevation data through Terra Cutta.

Variable rate Pix and fertiliser applications are possible, which will improve nutrient use efficiency and allow management to target Pix in specific areas with more rank growth. Yield maps are overlaid with other data to measure improvements or identify issues. The new internet service has significantly improved the ability to transfer data and images, and capture better, more timely data from tractors, pickers and pump sites – all of which can be incorporated more easily through the PCT system to improve decision making.

The installation of the on-farm microwave system has delivered excellent internet speed and reliability which have improved the confidence in technology as it has addressed the issues of reliability of data transfer. It has improved the efficiency of the



A water level sensor.

existing on-farm digital technology systems but has also opened the door to further investigate other opportunities. The system has also provided access to high speed internet for employees who live on farm, something which is becoming increasingly important in society.

The Smarter Irrigation: Grower-led Cotton Automation Integration trial is funded under the Australian Government Department of Agriculture and Water Smarter Irrigation for Profit Program, The Cotton Research and Development Corporation. The project is supported by Sundown Pastoral Company and the Gwydir Valley Irrigators Association.

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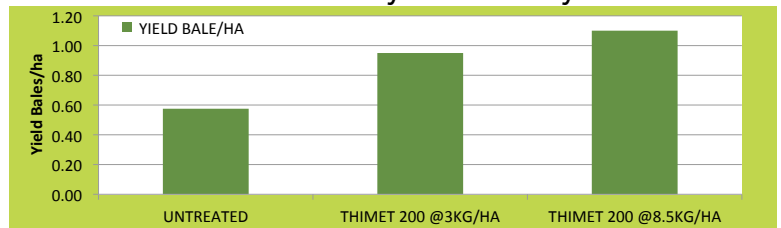
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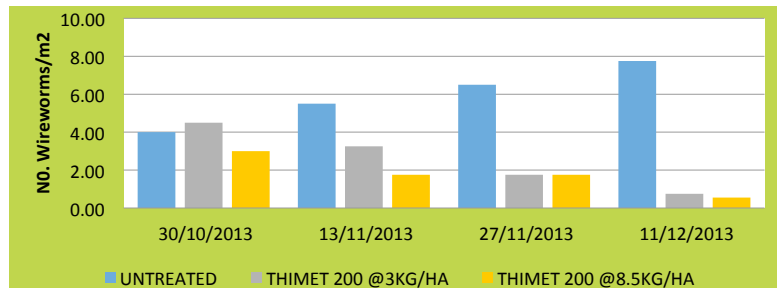
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Trials conducted independently in 2013 at Forbes NSW.