

Conducting feeding trials in north-west Queensland using auto-draft and weighing technology

Agri-Science Queensland Innovation Opportunity

2 August 2016

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Summary

This project has further developed a demonstration site of walk-over-weighing (WOW) and auto-draft equipment to trial the economic benefit, and pinpoint the timing of dry season supplementation and marketing decisions. This demonstration was established through the Meat & Livestock Australia Limited (MLA) co-funded WOW Producer Demonstration Site (PDS) developed on Wilburra Downs Station (Richmond) in 2011. Purchasing of new WOW equipment in 2015, along with support from the Richmond Beef Challenge Producer Group (RBCPG), has enabled the Department of Agriculture and Fisheries (DAF) to continue demonstrating these innovative technologies and run evidence based trials. Consultation with industry and DAF staff members has identified the need to improve liveweight data reliability by scaling up yard and paddock facilities and increasing cattle numbers at the site. Through the assistance and dedication of the RBCPG, the site has been extended and fenced to accommodate more trial cattle. Several producers have expressed an interest in adopting these demonstrated technologies and it is therefore important independent evaluation continues in a commercial environment.

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Background

The Richmond Beef Challenge Producer Group (RBCPG) and Department of Agriculture and Fisheries (DAF) established a Producer Demonstration Site (PDS) in June 2011. The PDS, co-funded by Meat & Livestock Australia (MLA), demonstrated the use of walk-over-weighing (WOW), auto-draft and remote monitoring technologies, and was run in conjunction with the RBCPG herd (Hegarty *et. al.* 2015). For the three-year PDS, a WOW unit was leased from Precision Pastoral (PP) to trial the equipment and provide feedback to develop a reliable data collection unit.

The PDS demonstrated the effective use of WOW equipment to pinpoint the timing of key management practices, such as feeding of dry season supplements and identifying cattle numbers suitable for marketing. Reliability issues with the WOW unit hampered accurate data collection with the auto-draft unit in latter stages of the project. However, these technical issues have now been overcome by PP partly due to the feedback provided from the PDS and RBCPG. Many producers have expressed a genuine interest in adopting these technologies; however further commercial evaluation is required to demonstrate the use and management of this technology to industry. Research is also required to define the industry cost-benefit as well as evaluate the suitability of the equipment for research purposes, for example, trialling livestock supplements.

DAF purchased a new WOW and auto-draft unit in June 2015 and this was delivered to the original PDS site in May 2016. The new unit is the first next generation model commercially produced by PP. The original WOW unit was a very early prototype and is no longer serviceable. The new unit was installed at the original WOW PDS site as minimal additional infrastructure was required, and an enthusiastic producer group was already established.

The new WOW trial site will link to the Digital Homestead (weather station, monitoring cameras and tank level monitor) and the Cooperative Research Centre for Remote Economic Participation (CRC-REP) Precision Pastoral Management Tools Project (<http://crc-rep.com/research/enterprise-development/precision-pastoral-management-tools>). There is also opportunity to link the project site to the proposed eTrend Supplementation project. Supplements are the source of one of the largest costs of production for north Queensland cattle producers. The project approach aligns closely with DAF's strategy of driving innovation and productivity through research, development and extension while improving uptake of innovative technologies and practices to improve competitiveness and productivity.

Project Objectives

This innovation project aimed to establish an on-property research site located at Richmond in north-west Queensland to trial walk-over-weighing and auto-draft technology. Development of the PDS site removes potential 'paddock effects', allowing two supplemented mobs plus a control group (no supplement) to graze in the one paddock. The auto-match equipment will be used to investigate the effectiveness of dry season supplementary feeds (e.g. dry lick and molasses) in terms of animal performance and profitability. The site will also be vital in demonstrating the use of the remote monitoring equipment to the northern Beef industry.

Methodology

Project Design

Project design was discussed with DAF officers (Maree Bowen, Angela Anderson, Bob Karfs, Joe Rolfe and Bernie English) and Tim Driver (PP). The collection of WOW data will compare the liveweight changes in cattle fed two supplements (Group 1 and Group 2) and a control group (Group 3 - no supplement). DAF and industry consultation identified the need to expand the existing paddock and WOW yard set-up to increase cattle numbers and improve the liveweight data integrity. Paddock size was increased to safely run sufficient cattle (minimum of 120 head, 40 per treatment group, 1 AE:10.1 hectares) to overcome breed differences in a livestock supplement trial. Angela Anderson will analyse crush side liveweight data in August 2016 to allocate the trained cattle to their treatment groups. Each treatment group will have the same average liveweight and range of liveweights.

Site Establishment

The need to develop a new trial site and gather producer support was eliminated by utilising the original WOW PDS in partnership with the RBCPG. Allister McClymont, from the RBCPG, agreed to provide a 962 hectare trial area on his property, Wilburra Downs, 15 kilometres east of Richmond. Surveying and fencing the new paddock area was completed by Emma Black (DAF) and Darren Gillatt (manager of Wilburra Downs). Tim Driver (PP) installed the new WOW and auto-draft unit in March 2016 in the already established water yards. Tim will assist DAF and the property manager with equipment maintenance to help ensure data collection reliability.

Cattle

The RBCPG members supplied cattle for this demonstration. The cattle were individually weighed and selected from six RBCPG properties and transported to the trial paddock. These cattle are currently being trained to use the WOW and auto-draft unit (Hegarty *et. al.* 2015). Manual crush weights will be recorded in August 2016 allowing Angela Anderson to remove any outliers and allocate cattle to the three treatment groups. Additional cattle are also trained using the equipment (168 head total) to account for any outliers. Each treatment group will begin with the same average and distribution of liveweight. The RBCPG assists with cattle weighing and paddock work.

Results

A new WOW unit was purchased by DAF in June 2015 and installed over the short duration of this project. Tim Driver (PP) delivered and installed the new WOW unit to replace the leased prototype in March 2016. Figure 1 compares the leased prototype used in the WOW PDS with the next generation model commercially produced by PP. The original WOW unit was an early prototype and is no longer serviceable.

Through the support of Allister McClymont and Darren Gillatt, the trial paddock was re-fenced and extended to 962 hectares. Furthermore, Darren Gillatt fenced off a section of the adjoining area to place the WOW unit centrally in the paddock (Figure 2). The RBCPG paid for additional fencing (approximately \$5000). Seasonal conditions (400 mm rainfall received) and feed supplies will allow the trial paddock to safely carry 140 weaner steers (250 kg). This equates to the recommended safe stocking rate for Mitchell Grass Downs (1 AE:10.1 hectares). In an average year, the paddock should carry enough animals for scientific comparisons of livestock supplements.



Figure 1. The old leased prototype (left) that was used in the original WOW PDS (2011-2014) and the new Precision Pastoral (PP) WOW and auto-draft unit (right) installed in March 2016.



Figure 2. Satellite image of the WOW and auto-draft demonstration and trial paddock (962 hectares) located 15 kilometres east of Richmond. The fence running on the eastern side of the WOW unit and yards (marked in white) was removed to allow access to an additional 373 hectares.

A dam was fenced so that all cattle must go through the WOW unit to access water. This ensured at least three liveweights are collected per animal per week for accurate data to be provided over the WOW scales. A new water tank was installed, as well as 20 portable cattle panels, to accommodate additional cattle through the WOW and auto-draft system. Prior to this modification, the maximum number of cattle running through the unit was 89 head.

A new remote monitoring camera will be installed in the water yard in August 2016 to allow the property manager and DAF staff to check daily on any cattle that may be staying in the water yard and not crossing the WOW unit. This technology is vital, particularly for the first four months of training the cattle. The camera unit and website link have been kindly sponsored by uSee, a local Richmond business specialising in remote monitoring. The images are taken five times a day and will be viewed through an account on the uSee website (<https://www.usee.com/>).

Concern has been raised about the amount of dirt collecting on the floor of the WOW unit (Figure 3). Precision Pastoral (PP) maintains the scales required this layer of dirt to avoid cattle balking at the sight of a metal floor.



Figure 3. Large amounts of dirt collecting on the floor of the WOW unit raises concerns about the accuracy of the weight data collected and will continue to be closely monitored.

A new website to view liveweight data from the WOW unit has been established through PP (<http://cawd2.nsavant.com.au/>). A username and password is required to access the data and trial information will be available to the members of the RBCPG and DAF staff (Figure 4).

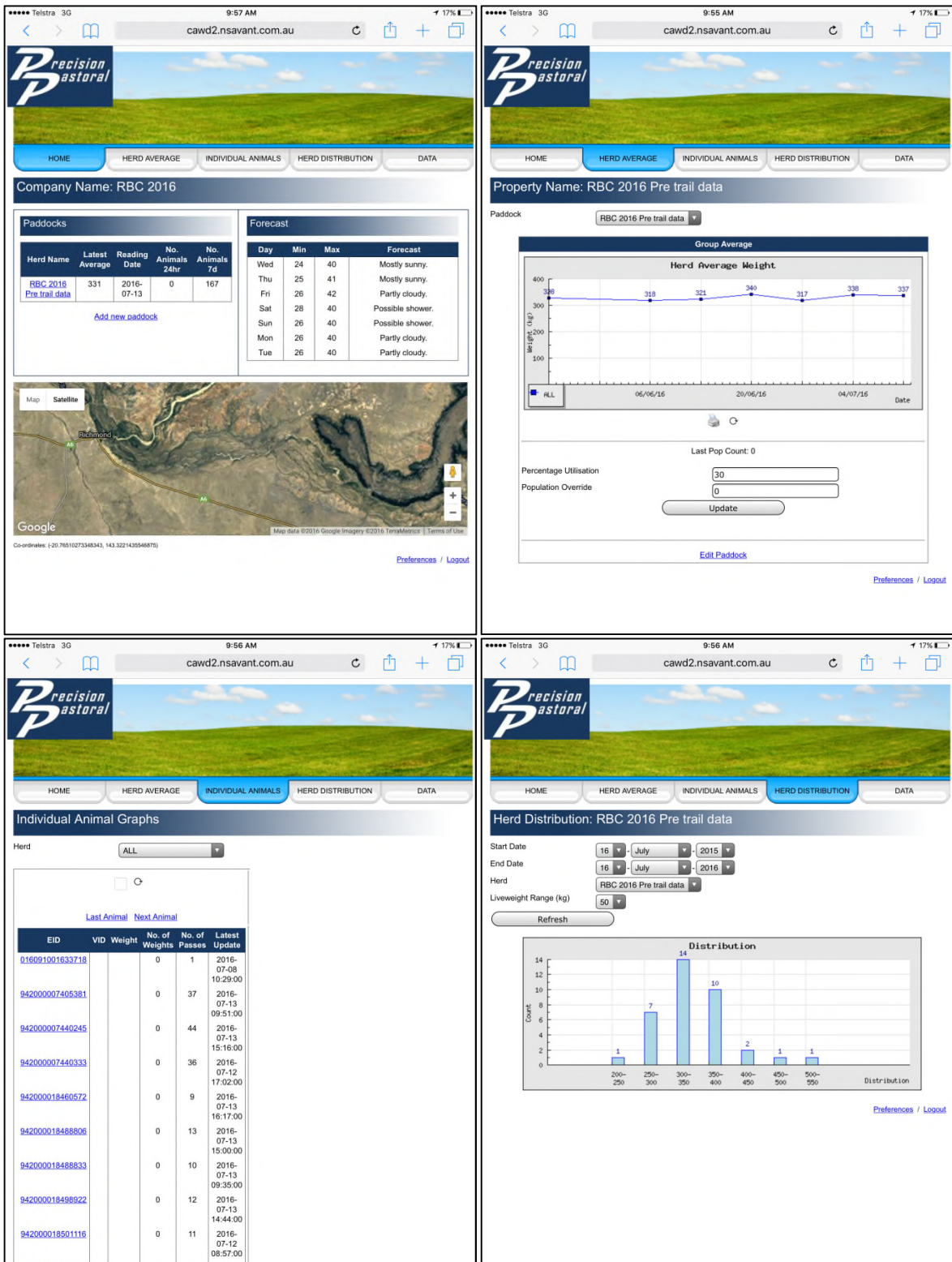


Figure 4. The four main screens displaying the WOW data on the new website supplied by Precision Pastoral (PP) from the Richmond WOW and auto-draft demonstration and trial paddock.

Conclusions/Significance/Recommendations

The demonstration of commercially available WOW and auto-draft technology is required for adoption across the northern beef industry. The site of the Richmond WOW PDS (2011-2014) has been further developed to increase cattle and data collection capacity from the WOW and auto-draft unit. The dedicated RBCPG has provided invaluable support to the project (cattle, cash and labour) and works in close partnership with DAF to ensure WOW and auto-draft equipment trials continue. Links will be established to the Digital Homestead and CRC-REP Precision Pastoral Management Tools Projects to provide an information and demonstration hub. Supplements are one of the largest costs of production for north Queensland cattle producers and few trials have been run on commercial cattle businesses to establish the cost and nutritional benefit across a range of seasons. The Richmond site is now well established to host livestock supplement trials. However, additional funding is required to refine the equipment and ensure ongoing demonstrations take place at this site.

Key Messages

Demonstrating the latest innovative technologies in WOW, auto-draft and remote monitoring technologies is required for increased adoption across the northern beef industry. A demonstration and trial site has been established on Wilburra Downs, 15 kilometres east of Richmond. Producer involvement in on-farm trials has been essential and a strong relationship with the RBCPG has guaranteed the site's ongoing use and development. Remote innovative technologies at the Richmond site is now at the stage where trials can be run to identify the economic benefit of supplements through removing the statistically robust 'paddock effect'.

Where to next

The RBCPG has agreed to provide funding for the purchase of supplements to trial with the three-way auto-draft system in 2016. Cattle are currently being trained to use the equipment and will be crush-side weighed and allocated to three treatment groups in August 2016. Through consultation with the RBCPG, it was decided to trial Beachport Minerals, a dry season lick (25% urea) and no supplement (control group). The producers involved have agreed for their cattle to remain in the trial paddock until at least April 2017. This will allow compensatory growth to be measured over the wet season to identify if the supplements provide a cost benefit given the seasonal conditions in 2016. The on-going costs of the telemetry have been paid by DAF up until April 2017. DAF staff will need to continue to source funding to ensure the ongoing demonstration of the technology, and allow this site to be developed for further scientific trials.

Budget Summary

The \$5000 provided by Animal Science for this project has been spent on two key items that were required to develop paddock and yard capacity at the trial site. A water tank was purchased for \$3500 and 20 portable cattle panels were purchased for \$1500. Both items were required to allow enough cattle to graze the paddock for scientific analysis of livestock supplements. Thanks to the ongoing support of the RBCPG, the cost of fencing and supplements for the remainder of 2016 will be covered (valued at \$7000-\$10 000). The support for this project by Richmond area producers is gratefully acknowledged.

References

Hegarty, E., Broad, K., English, B., Gunther, R. and Rolfe, J. (2015) *Use of Walk Over Weighing and remote camera monitoring to identify key management triggers and reduce costs*. Meat & Livestock Australia, Sydney.