

Remote Management Field Day

Tilmouth Well, Napperby Station
19 October 2007



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Management Field Day

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Welcome to the Desert Knowledge Cooperative Research Centre's Remote Management field day at Tilmouth Well. This field day will focus on the 21st Century Pastoralism™ Core Project. It will demonstrate commercially available technology as well as cutting edge prototypes, all with the aim of assisting desert pastoral enterprises to be more economically resilient.

Desert Knowledge Cooperative Research Centre

The Desert Knowledge Cooperative Research Centre (DKCRC) is made-up of a network of 28 partner organisations representing research agencies, governments, private industry, and non-government organisations. This extensive network seeks to develop desert solutions for desert people by bringing people together to solve big problems. The core effort of DK-CRC is to link local desert knowledge with the advances of science in order to generate new economic options for desert (remote/regional) Australia.

The DKCRC is committed to creating economic opportunities for desert people, and to making a demonstrable difference for remote Aboriginal communities, through the application of excellent research and training. It does this through the following broad outcome areas:

- (i) Sustainable livelihoods for desert people that are based on natural resource and service enterprise opportunities that are environmentally and socially appropriate;
- (ii) Viable remote desert settlements that support the presence of desert people, particularly remote Aboriginal communities, as a result of improved and efficient governance and access to services;
- (iii) Thriving desert regional economies that are based on desert competitive advantages, bringing together Aboriginal and non-Aboriginal communities, government and industry.

21st Century Pastoralism™

The 21st Century Pastoralism™ Project aims to increase the economic viability of desert pastoral enterprises. The project has created a research collaboration that spans desert regions across

Australia. It includes many scientific disciplines and works with pastoral producers to solve key industry challenges.

The 21st Century Pastoralism™ Project incorporates three main subprojects:

- Cattle and Country
- Utilising Technology and Telemetry and
- WaterSmart Pastoral Production™ (funded by the Department of Agriculture, Fisheries and Forestry)

The Cattle and Country Project is evaluating current approaches to Aboriginal pastoral development with the aim of improving the impacts for both Aboriginal and non-Aboriginal pastoralists.

The Utilising Technology and Telemetry Project aims to test, develop and integrate new and existing technologies into pastoral production with the aim of lowering costs of production and increasing productivity through more precise information on which to base decisions of animal and herd management.

This handbook is your guide to the day's presentations and activities. It includes a program and brief introductions to the various presentations, as well as contact information.

Putting together a field day like this involves a lot of people, and we would like to thank Roy and Janet Chisholm, the staff of Napperby station and the Tilmouth Well roadhouse, the staff of the Desert Knowledge CRC and our project partners the Sheep CRC, Observant, University of Wollongong and NT Department of Primary Industry, Fisheries and Mines, the sponsors Rangelands Australia, Rabobank, Allflex, Observant, Prime Super, the Northern Territory Cattlemen's Association, Elders, Landmark, Tru-Test and LNT, as well as all of the presenters and exhibitors.

We hope you enjoy the Remote Management field day.

- The Field Day Organisers.

PROGRAM

Friday 19th August

9am	Field Day start and Morning Tea
9.20am	Welcome (DKCRC Managing Director Jan Ferguson & DPFIM Executive Director Primary Industry Rod Gobbey)
9.30am	Introduction to 21st Century Pastoralism and outline of Program Mark Ashley
9.45am	Travel to Tilmouth yard
10am	Utilizing Technology Roy Chisholm
10.15am	WoW Introduction Adrian James
10.30am	Autodraft Introduction Tim Driver
10.40am	WOW and Autodraft Equipment Description Adrian James and Tim Driver
11am	Questions
11.10am	Drink & Demonstration of WoW Autodraft
11.20am	SANDS equipment Mehran Abolhasan
11.30am	Introduction to Observant Equipment Matthew Pryor
11.50am	Carrying Capacity Calculator Alison Kain

Travel back to Roadhouse12.10pm lunch and free time to look at exhibitors

1.10pm Break out sessions (50 minutes)

SESSION 1 Remote Management Demonstration

SANDS Mehran Abolhasan

Observant Matthew Pryor

Producer Perspective Bec Cadzow

SESSION 2 Precision Management

Informed livestock management and marketing,
Tony Thompson

Opportunities for Beef production
Roy Chisholm

NT heifer project Tim Schatz

3pm Travel to New Well

3.40pm WaterSmart Colleen James

4.00pm Water Medication
Tony Woods

4.20pm Summary and Concluding comments
Mark Ashley

5pm Travel back to Roadhouse
Time to visit exhibitors

6pm Start social program and dinner

REMOTE CATTLE MANAGEMENT

Adrian James

The Desert Knowledge CRC's 21st Century Pastoralism™ team installed a Walk Over Weighing (WOW) prototype at Napperby station in April 2007. It's set up at the yard exit where cattle come every day for a drink. The prototype includes a weighing platform on two load bars, linked with a Tru-Test processor and display, an Allflex NLIS tag-reader antenna, and a solar power system.

The aim is to test the system's reliability and effectiveness in improving the management options of desert beef production. The prototype and concept should be fully commercialised in the next few years.

The WOW prototype at Napperby records the time, weight and individual ear-tag I.D. of each animal exiting the yard. It collects a lot of information over time, which can be downloaded onto a portable computer or sent via telemetry to the homestead. With this information, a pastoral manager can:

- Closely monitor herd and individual weight performance
- Identify non-pregnant cows
- Identify individual mother-calf relationships
- Predict future animal performance

In September the team installed a remote cattle drafter linked to the WOW system at Napperby. This will enable the pastoral manager to separate individuals from the herd by remote control. Immediately after passing through the WOW system, animals will exit the yard or be directed to a holding pen depending on either their weight or ID tag. This will allow pastoral managers to:

- Draft off a particular section of the herd based on their weight
- Separate weaners from the herd
- Separate poor performers from the herd



- Muster and move stock when they're achieved maximum outcome on a particular pasture
- Muster and move stock with precision timing for market advantage

Walk-over-weighing collects extensive data in a short time when used with a large herd. The vast majority of weights collected are accurate to within a few kilograms. The information it collects can also tell you a lot about animal behaviour, since it gives you a record of the time and date for every time each animal goes through the yards.

Once the technology is commercialised, it will allow pastoral managers across desert Australia to easily monitor and control their herds with increased precision. This will provide new opportunities for production and improve the viability of the desert pastoral industry and communities.

ADVANCED REMOTE LIVESTOCK MANAGEMENT

Tim Driver, CAWD Engineering

The ability to manage livestock remotely is now becoming a reality thanks to rapidly advancing technology. Already remote cattle management systems can weigh, draft, and process individual animals automatically according to the parameters set by the operator. This can allow managers to make precise and timely decisions based upon individual animal performance whilst reducing the need for mustering operations, thereby potentially reducing running costs and at the same time reducing handling stress to the animal.

Napperby Station currently has a remote management system developed by CAWD Engineering in place. This system includes a Walk Over Weighing (WOW) prototype (developed with the assistance of the Sheep CRC) and an AutoDRAFT prototype engineered by CAWD Engineering. The system is solar powered and can be managed remotely via the internet and linkages to Observant telemetry software.

The WOW system is solar powered and operates continuously, collecting individual animal weights whenever an animal accesses water. The data collected is stored on site and can be transmitted back to the homestead.

The Automatic Drafting system is a pneumatic powered system capable of drafting individual animals based on an infinite number of characteristics which may include sex, weight, age etc. and operates in conjunction with NLIS tags.

The benefits of installing a remote cattle management system are wide-ranging and include:

- Improved monitoring of animal growth rates allowing producers to accurately predict when animals or herds will achieve predetermined sale weights, and the ability to identify differing weight gain performances across the herd.
- Grazing management and the ability to turnoff animals without the requirement for mustering operations. Parameters can be set to draft animals according to their target weight, age, sex etc. This is particularly important for arid



zone producers who may need to turnoff animals quickly in response to poor seasonal conditions.

- Control mating with heifers only exposed to the bull after reaching a target weight. Bulls could also be drafted out after a set joining period.
- The potential to record a breeder calving weight and the 'mothering up' of calves.
- The potential management of feral animals by drafting them away from access to water.

Working in conjunction with WOW and AutoDRAFT is the Sparse Ad hoc Networks for Deserts (SAND) telecommunications system. This technology allows large quantities of information to be transmitted over radios using 'mesh' network technology. The broadband capability allows for near real-time video streaming and improved visual monitoring of yards and water points. When SAND is used with the WOW and AutoDRAFT, a remote control and management system is created that enables an overall enhancement of management decisions in relation to running a large scale property.

SPARSE AD-HOC NETWORKS FOR THE DESERT

Mehran Abolhasan

The Sparse Ad hoc Networks for the Desert (SAND) project focuses on developing low cost and easy-to-maintain and operate broadband wireless networks for rural and remote applications. The core technology behind this project is Ad hoc Mesh networking along with open sources tools and software. Ad hoc Mesh networks have several key features such as: automatic fault detection, self-healing and the ability to create networks instantly. The SAND team have built a number of prototype Ad hoc Mesh devices which provide broadband speeds of up to 54 Mbits per second. To demonstrate their capabilities, the SAND team have deployed a number of these devices around Napperby, which provide real-time video monitoring of Tilmouth grazing yards and bores.

The potential of such applications for the cattle industry is enormous. Services such as real-time video have the potential to significantly cut down the number of bore runs per year, which in-turn will cut down operational costs significantly. Furthermore, such services can be monitored over the Internet, which means that pastoralists can monitor their stock and resources from any where in the world. In addition to real-time video monitoring, the SAND project technology has the proven capacity to other services such as Voice and Internet access. Such services open up a number of other services to pastoralists such as the ability to make voice calls from their yard to anywhere in the world or access the Internet.

A detailed report on the SAND system is available from the DKCRC office or web site (www.desertknowledgecrc.com.au/publications/research.html)

OBSERVANT TELEMETRY

Matthew Pryor

J. Matthew Pryor & Simon Holmes à Court will present the Observant Remote Management solution. The focus of the presentation will be on the use of the system at Napperby station, providing a detailed overview of all the different types equipment that can be monitored and managed by the Observant system.

The presentation will cover the current system and provide an overview of development projects and upcoming features.

Of particular interest will be upcoming products such as the Observant C2 and the ZeroWire cable-free installation system.

Below: soon to be released Observant C2



WATERSMART PASTORAL PRODUCTION

Colleen James

Economic and environmental gains through better pasture utilisation and reduced fuel, vehicle maintenance and labour costs are some of the benefits experienced by pastoral properties around Australia. Off-the-shelf technologies have been introduced to the WaterSmart Pastoral Production™ demonstration sites as part of holistic water management plans for these sites.

Project Officer Colleen James says that “the project helps landholders to boost their bottom line and protect their environment through better water management practices, for example new water storage and delivery technologies.”

All of the demonstration sites are monitoring not only time and costs savings involved in the changeover,” she says. “We are also recording any lifestyle and business changes and documenting how reliable and easy the new technology is to use and maintain.”

The Desert Knowledge CRC's WaterSmart Pastoral Production™ project is creating opportunities for graziers to learn about the technologies available to help manage water on their place through field days, demonstration sites and the website.

www.desertknowledgecrc.com.au/watersmart.

“Having the information about a jammed float sooner and going out to take action saved both time and money, as left another day it would have started running over and damaging the turkeys nest wall.” says Anthony Desreaux, manager of NAPCo's Monkira Station.

“The telemetry is working well and the add-on's to the Observant system eg: rain gauge, camera etc make this extremely versatile and useful technology.”

“As well as dollar savings, time has been a major saving for Mount Ive staff,” says Len Newton owner/manager Mount Ive Station in SA, “There is no time for siestas but we have a lot more time do other things now that we do not have to do water runs so often.”

Allan Fuller, manager of De Rose Hill Station says, “The Blackmore's telemetry system we have chosen is not the top of the range system with all the bells and whistles, but one that provides us with the data that we need and at the same time is good value for money, it is proving to be a great time saver.”



Sustainable Carrying Capacity

Alison Kain

The primary cause of land degradation is over grazing. The only way to ensure sustainability of pastoral enterprises in central Australia is to get your stocking rate right. So how do you work out what is a safe carrying capacity?

Swiftsynd is a program of collecting land type specific rainfall, soil moisture and pasture growth data within grazing exclosures to calibrate GRASP, a pasture growth model developed by QLD DPI. Using historical rainfall data with the calibrated model it is possible to determine how much pasture a particular land type is likely to grow in variable seasons. This is part of the equation for working out objective carrying capacity figures. The other components include; what do cattle eat, how much growth can you allow cattle to eat if you want pasture next year and how much do cattle need to eat to be productive?

The presentation is a little taste of what the Grazing Land Management workshop offers you!

PRECISION LIVESTOCK SYSTEMS

Tony Thompson

My business, Afterhours Ag, is based on the Darling River Floodplain at Bourke in Western NSW. I operate two properties "Prattenville Irrigation" and "Wirricanna". Total area is approximately 16,000 ha. Both properties consist of irrigation and pastoral grazing country. Water permitting, I annually grow 800+ ha of irrigated crops, predominantly cotton.

Due to the large degree of variability in all agricultural enterprises, it is my plan to run my agricultural operation using objective management. That being, decisions are made based on data. For my grazing operation, I am attempting to manage both animals and resources objectively and have developed a grazing system, called "Integrated Rangeland Management System".

For resource management I am implementing the pasture growth model paddockGRASP into my system. This computer model, when calibrated to my land types, will be used to predict pasture growth under different climatic forecasts. The purpose of the tool is to assist in managing livestock numbers and safe carrying capacity.

Grazing is based on a rest and recovery mentality and I am attempting to use water to rotate animals around relatively large paddocks.

My animal management is planned to evolve around the Walk over Weighing and drafting system, which animals pass through as they enter a water point. This system potentially provides regular updates of animal performance and enables individual animal management remotely in a labour free and stress free environment.

The focus of my grazing system is better management of variability, which offers tremendous productivity gains.

NT HEIFER RESEARCH

Tim Schatz

Low re-conception rates in lactating first calf heifers has been identified as one of the biggest areas of inefficiency in breeding herds on NT cattle stations. There are currently 2 projects being run by DPIFM to address this problem.

One of the projects (which involves performance recording on commercial properties) has shown that the extent of the problem is actually much larger than many people realise. This can be seen from the fact that in the 2004 Pastoral Industry Survey the average of all the manager's estimates of re-conception rates in lactating 1st calf heifers was 63 %, while performance recording has been showing that it is usually less than 20% and it is not uncommon to find rates of less than 10%.

The main reason for the low re-conception rates in 1st calf heifers is that the heifers become too poor in body condition during the period when they are lactating to resume cycling shortly after calving. There are a number of factors that contribute to this including that on many NT properties pasture quality is poor during the months leading up to calving.

There are several large demonstration sites on commercial properties in the NT (including one at Tieyon in the Alice Springs district) where management practises aimed at increasing reproductive rates in young breeders are being researched and demonstrated. Results from these sites as well as other research being conducted in the NT are presented at this field day.

COSTS AND SAVINGS WITH TELEMETRY

Adrian James

Monitoring and controlling water levels and equipment by remote control (telemetry) is one of the most efficient investments a desert pastoral property can make. After the up-front cost of purchasing and installing telemetry equipment, a pastoral business can start making savings in time and money almost immediately. Just how much time you can save, and how quickly your investment will return a profit, depends on many things, such as:

- What sort of telemetry system you want
- How many bores you equip
- What distances you need to cover, and obstructions such as hills on your property
- How you rely on the technology

The Desert Knowledge CRC's 21st Century Pastoralism™ and WaterSmart Pastoral Production™ projects have been analysing telemetry systems on properties in NT, SA and QLD. Here are some results and indications:

Napperby Station Installed a comprehensive Observant system (with cameras, rain gauges, medicator interfaces and antenna extensions) on 15 water points at a cost of \$63,000 plus installation labour. The old cost of doing bore runs was roughly \$85,000 a year in vehicle costs alone. Mr Chisholm expects to halve the number of bore runs with his new telemetry system, which will save \$42,500 a year in vehicle costs. The telemetry system will pay for itself in 18 months. This prediction does not include labour costs, however it is expected that the telemetry system will free up 10 hours of labour each week.

Quinyambie Station had a northern bore run of 600 km, with one bore 191 km from the homestead. The vehicle cost of the northern bore run was over \$120,000 a year. In 2004 they installed a basic Stockman telemetry system including seven tank level monitors and 4 remote motor starters at a cost of \$32,000 (2004 price). Since then the station has saved at least 600 km a week in driving and 12 hours each week in time, and allowed them to reduce their pool of vehicles by one. Their telemetry investment paid for itself in just 6 months and continues to save the station over \$100,000 a year in labour, fuel and vehicles.

NUTRIDOSE WATER SUPPLEMENTATION

Dr Tony Wood

Water supplementation systems are now in widespread use throughout Northern Australia and the safety of these systems has been a primary driving force in their development. The Nutridose system, incorporating a Concentration Monitor, provides the latest breakthrough and gives unsurpassed additional safety when feeding urea to cattle via the drinking water.

The system also provides integrated telemetry management with all telemetry systems.

The conductivity of water from different locations and bores will vary significantly; however, it will give a constant pattern for each location. When nutrients such as ammonium sulphate and phosphates are added with urea to the water, the concentration and the conductivity of the water will rise. This is measured electronically with the Nutridose Concentration Monitor. The monitor detects any changes in concentration instantly and can be used to control the injection rate or close the injection system down. This means that if there is an increase in the concentration of urea in the water for any reason whatsoever, the Nutridose Concentration Monitor will detect this instantly and can be used to control the situation.

The monitor can be used as a process controller with the commonly used water medication equipment. It can be adapted for use with the Norprim, Nutridose, Dosatron or other proportional injectors. It gives a level of process control that has been previously unachievable.

Nutridose supplements are also specifically designed to suit each individual bore requirement and will give a balanced level of N, S and P while correcting alkalinity and protecting urea from alkaline degradation. The supplements are also designed to provide balances of N and P for both wet and dry seasons.

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