Looking to the sky for solutions

Using technology to manage, monitor and understand livestock grazing behaviour

LANDSCAPE SOUTH AUSTRALIA
SA ARID LANDS

Looking to the sky for solutions at Wintinna Station

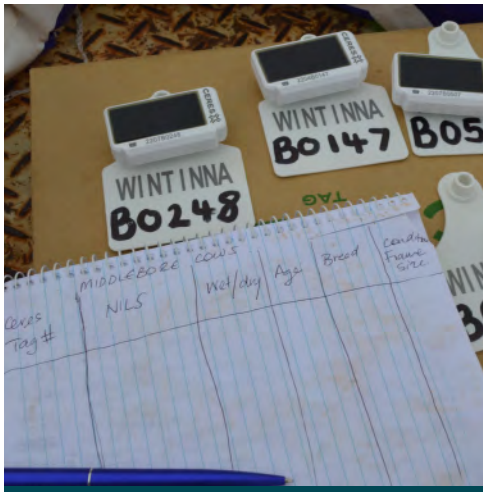
Property Size: 3812km^2 | Stock: Beef Cattle | Soil Type: Mixed Soil Types
Annual Rainfall: 180mm | Region: Marla Oodnadatta

Identifying the problem

Jake and Francesca Fennell run a beef cattle pastoral enterprise (approximately 4000 head) in the north of South Australia at Wintinna Station. **Extensive paddock systems make it difficult for them to control grazing pressure from stock.** To add to the challenges, Wintinna station has **highly sporadic rainfall patterns.** This, combined with varying soil types across the property, greatly impacts the composition and quality of the feed on offer. **Recent dry spells have prompted the couple to investigate satellite and telemetry solutions to manage their herd with the ultimate goal of regenerating pastures.**

Solution 1: Tracking livestock with GPS tags

Ceres Tags were implemented to track cattle movement over an 18 month period. By analysing the stocks movement, the Fennells learned a lot about cattle behaviour. Previously, the cattle would 'disappear' to remote parts of the station in search of water points. **Knowing the cattles location has revealed undiscovered water points** (a precious commodity) all from the comfort of their home office! Jake said "using information from the tags to know where cattle are before we start a muster has saved us so much time. Being a herd animal, **not every cow needs a tag to make the information very useful."**



Benefit 1
Minimise time by quickly locating cattle prior to muster.

Benefit 2
Utilising newfound surface water for property and grazing rotation planning.

Benefit 3
Learn grazing zones and where the cattle like to graze the longest.

Solution 2: Rotational grazing plans

The future of Wintinna is focused on rotational grazing. **The long-term plan is to split Wintinna into 24 paddocks, with the core herd to be kept together and rotated through each paddock.** This rotation would take up to two years, as the cattle are mustered from one paddock to the next. This provides the time necessary for each paddock to recover naturally before the stock rotates back through, even with lower rainfalls. Jake and Francesca have observed the benefits of rest-based grazing on their property and how rested country facilitates more pasture growth and recovery after smaller rainfall events. Jake said "**we have noticed huge benefits in the way pasture has regenerated from having periods with no stock on it** – it's as though it has had a 25-30mm rain when its only received 10mm" – a great example of water use efficiency and drought-proofing.

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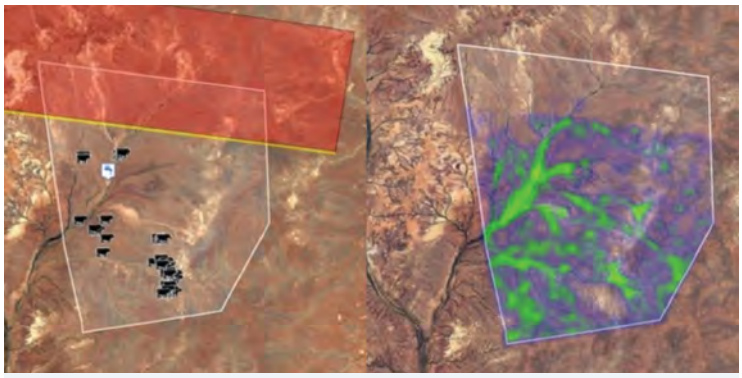
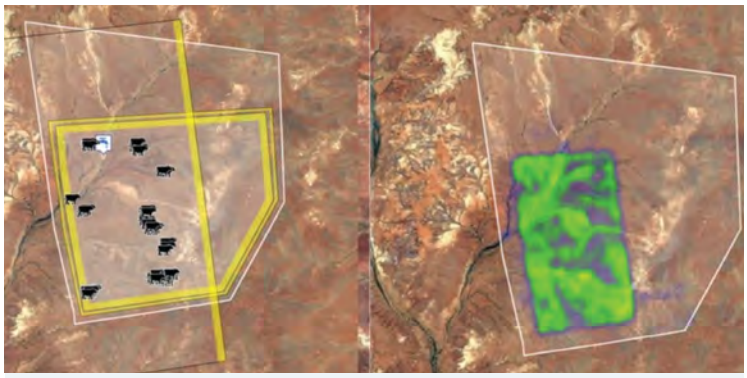
Turning to the skies for support

From April to October 2023 a virtual fencing trial was conducted at Wintinna with the help of satellite and telemetry solutions. The trial kicked off with 100 heifers being mustered into an area to begin their virtual fencing training (activating a physical fence line for the cattle to learn the virtual boundary system). The animals were then excluded from one area of the training paddock, showing that they had learned where the virtual fence was. Once released into the 'Dead Finish' paddock, bound now by just a virtual boundary, **the cattle responded very well and stayed within the exclusion zone.**



Before the Virtual Boundary

100 heifers were put into Dead Finish paddock. The heat map on the right shows the location of the cattle scattered throughout the paddock.



After the Virtual Boundary

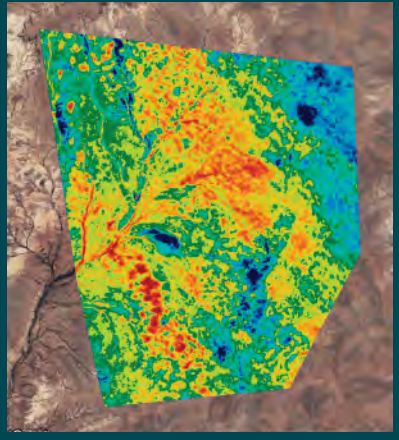
A virtual fence is implemented (the yellow line). The heat map on the right shows the location of the cattle, now restricted within the area.

Why virtual fencing?

To put up a physical fence on the property would cost over $5 million. As you can imagine, virtual fencing has been a solution on the Fennell's minds for a long time, however, current legislation prevents its use commercially. Jake says "If virtual fencing is successful and can keep the cattle where we want them, it'll make a massive difference to our plans over the next 10 years, especially with rotational grazing and resting our country."

What else can we learn from the sky?

Satellite technology in agriculture has become a widely adopted method of analysing large areas of cropping or grazing country. This gives new insights into variability both across, and between fields. As time goes on, satellite imagery has become higher in resolution and more affordable.



On the left is a Satamap 'RGBI map' capture from Jake and Francesca Fennell's property. An RGBI map (or Red, Green, Blue Index) shows soil type change from a spatial perspective by giving an enhanced colour scale to what is essentially a Google Earth image. It's up to the landowner to interpret these colours and ground truth what type of soil they represent.

Blue zones indicate a 'lighter or brighter' soil type (in this case 'breakaways' - a complex of mesas, escarpments and gibber plains). The yellow zones are described by Jake as 'Coongra' type country - sandstone and shale covered slopes, plains and plateaus with bladder saltbush.

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Extra takeaways

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Satellite Imagery Cont.

The red and orange zones along the creek line are 'Mt Willoughby', in this case, the zone is red pebbly clay flats and rises with occasional sand spreads. These are dominated by Mulga with Rock Emubush, patches of swamps with Nitre Goosefoot. Knowing where and how soils vary is powerful information. This can be useful for property planning, as each soil type supports different pasture species. Therefore, some zones are able to support greater numbers of cattle than others. Jake said "at best, some soil types could support 8-10 cattle per km², whereas the more marginal breakaway country would be 1-2 per km²."

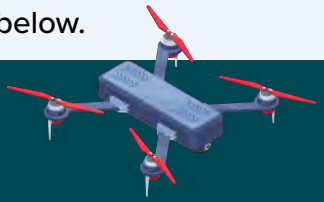
Assess your own ground cover

The Australian Feedbase Monitor is available FREE to all MLA (Meat and Livestock Australia) members. Powered by CiboLabs software, the Feedbase Monitor allows producers to access monthly pasture biomass estimates specific to a unique Property Identification Code, with data dating back to early 2017. This information is helpful to:

- Support objective and timely grazing decisions
- Increase the ability to monitor on ground cover - avoid environmental or welfare issues (scan QR code below)

Telemetry

Over the past ten years, advances in sensors and connectivity options for pastoralists to monitor water and other information (like weather and soil moisture) in remote locations greatly increased the uptake of this technology. A range of connection technologies have revolutionised the way data is transferred from a sensor to your phone or computer. Each has its limitations and advantages. Find out more on the 'Metering and Monitoring' factsheet below.



Want to learn more?

Learn more about telemetry & monitoring of water points:

See the future of virtual fencing in action:

Access to the MLA Australian Feedbase Monitor:

Acknowledgements:
www.breezyhillpas.com
https://www.mla.com.au/extension-training-and-tools/tools-calculators/australian-feedbase-monitor/

Australian Government
Department of Agriculture, Fisheries and Forestry

Future Drought Fund

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