

Drought and climate adaptation program

Using a drone on-farm—a grazier's experience

Background

Agriculture has been identified as one of the most promising spaces where drones offer great potential for addressing several major challenges. The general perception is that drones can enable significant improvements in grazing enterprise efficiencies in rural Queensland through time saving and eliminating some personal safety risks on large properties with poor roads and paddock access. However, the adoption of drone technology is challenging due to the cost coupled with limited knowledge of drone application and capabilities on farm.

David Bone manages a 125,000-acre beef cattle property near Mungallala in western Queensland. He has used a drone to assist with stock mustering and monitoring for over four years.

In November 2020 David attended the Drone Fundamentals: A Pilot's A-Z workshop in Morven, run by the award-winning professional photographer and drone educator Fiona Lake. This was a collaborative event led by ConnectAg in partnership with the Queensland Government's GrazingFutures project and significantly funded by the Queensland Health Tackling Regional Adversity through Integrated Care (TRAIC) project.

The workshop was designed for both those who already owned drones, and those who were considering purchasing and using a drone on farm. Participants were taught how a drone can be used effectively, safely, and legally in a grazing business, and those who already had a drone were provided a greater understanding of how to get more out of it.



Participants were able to operate a drone at the workshop.

Key messages

The biggest realisation for David, from participating in the workshop, was a greater understanding of the legal requirements of owning and operating a drone. When David began using his drone on farm it was more of a novelty than a fit for purpose tool, which is common for many people. As a result, users are often unaware of the stringent legal requirements for safely operating drones. Drone safety rules, also known as the standard operating conditions, are enforced by the Civil Aviation Safety Authority (CASA) and apply to all types of drone and remote-controlled aircraft flown in Australia. An example of one of the basic do's and don'ts of flying drones is that you must always fly your drone in visual line-of-sight for several reasons, but mainly because it operates in the airspace that other aircraft could potentially be flying through. If the operator doesn't see or hear a helicopter because it's too far away and makes contact, it could be catastrophic for the pilot.

Drought and climate adaptation program

Another key element from the workshop was hearing different opinions about different drones based on the experiences of others in the room, as well as the many ways drones were being used on farm. David began using his drone as a visual aid on farm and to simply reduce hazards when looking for and moving animals across blade ploughed paddocks. With practice, in some situations, David has been able to muster whole paddocks and walk large mobs by himself using his drone. In the past these tasks would have required the use of a helicopter or several other people. This has dramatically impacted his bottom line. David also learnt of other ways the drone can be used for on-farm efficiencies, including monitoring pipelines for leaks.

“Fiona had relevant information, particularly the video of a producer using different drones fit for purpose on farm, that was really interesting for me”.

Another key component of attending the workshop run by an experienced user of different drones for varying purposes was the myth busting session. Fiona was able to address common myths and misconceptions relating to the practical application of drones and linking these uses with legal requirements. One such myth is using drones for monitoring water points. This is a definite no-no as the drone must be kept within the operator’s visual line-of-sight. Battery life would also be a problem in this situation.

The value of the workshop

The workshop was particularly valuable to David as it backed up what he was already doing with his drone as beneficial as well as uncovering potential problems with both current and possible future uses of his drone on farm, principally legal use of a drone.

“The workshop certainly solidified that it wasn’t crazy to be using a drone for the purposes that I had been”.

Based on what David learnt at the workshop, he has since become a licenced operator. He felt this was a necessary requirement for him based on his current and planned use of his drone in relation to the regulations.

Fiona was very upfront with her points to consider when buying a drone—the first being that you get what you pay for. Unfortunately, many drone owners begin with a small, cheap drone and quickly decide to upgrade, wasting time and money.

David was also able to talk with Fiona during the workshop about the types of drones available to determine which ones were a better fit for his business needs. As a result, he has also upgraded his drone to better suit his needs. Access to this professional and objective advice would not have been possible and likely not sought voluntarily if the workshop wasn’t run. David upgraded to a drone that had better connectivity and less interference from trees compared to the drone he had been using. With advice from Fiona,



David Bone and fellow workshop participant operating one of Fiona Lake’s many drones.

Drought and climate adaptation program

he was able to trade in his old drone to bring the price for the new one down to around \$2500.

Benefits of using drones with livestock

The main use for the drone on David's property was for mustering and moving stock located out on the rough, blade ploughed areas which were dangerous to ride across. The use of the drone in the first year saw a substantial cost saving, estimated to have reduced the cost of helicopter fees by around \$20,000. This saving is a result of being able to muster the large, rough holding paddocks with the drone instead of the helicopter. There will however always be a need to use a helicopter for the larger paddocks as it's more efficient and practical and because of the need to maintain the drone in your line of sight. The drone is just a tool, not a replacement.

The greatest benefit of using the drone is being able to put it close enough to the animals to bother them and eventually cause them to move using a pressure and release system. David has found the cattle adjust well to using the machine for mustering. He also uses the drone to bring the cattle to him so he can get a good look at them without having to chase them around with a motorbike or vehicle. This eliminates the need for another person, motorbike or dog making it a very versatile and handy tool.

David finds using a drone is less intrusive and stressful on the animal than conventional mustering using a helicopter. *"The cattle settle and calm down much quicker once the drone is moved away in comparison to when they are moved by helicopter. It's noticeable, particularly when we need to hold them on water after a muster, they show lower stress levels"*.

Issues

In David's experience using drones to move and handle stock it's like anything, a drone is only as good as the user, and if you are careful and calm with how you use it, the animals will respond in the same way.

The other downfall is the limitation on large properties because of the legal requirement to keep the drone in your line of sight.

Battery life is a big issue with the size of drone he has been using, and he believes it will always be an issue regardless of the type of drone. David gets around 15 to 20 minutes of drone operation before the battery runs out. To mitigate against the short battery life, he has invested in more batteries, sometimes going out in the paddock with 8 batteries and a 12-volt charger. This allows him to be charging two batteries whilst still using the drone and to replace the flat battery as required. He always has the drone and charging equipment in the vehicle with him.

Drones are weather reliant and do not operate well in windy conditions and are generally not water resistant to be able to operate in the rain.

Drought and climate adaptation program

Birds, particularly eagles and hawks often mistake drones for prey and cause significant damage to a drone if grabbed. If an operator sees a bird of prey flying nearby its best to wait until its gone.

Other benefits of using drones

In addition to using the drone for mustering, David has found it useful when the channels are flooding. The drone can be put up in the air to view the water height of channels further ahead to see if it's worth crossing the first boggy channel or not depending on what's up ahead. Reducing unnecessary risk to vehicles and people.

He has also used his drone for a small amount of aerial mapping and aerial photography on farm. Other social uses include aerial photography for friends and neighbours, and once for wedding.

Wrap up

David now considers his drone as another tool that he can use when needed. *"I always have it in the ute. When opportunities arise a new purpose or use is uncovered"*.

The use of drones in grazing businesses is difficult as there is a lack of genuine understanding of how they can be applied on farm and finding objective advice is difficult. Coupled with uneducated retailers who are often unaware of the legalities with drones and give either little or no advice or sometimes incorrect advice to the purchaser with regards to safe and legal usage. Knowledge of a drone capabilities in a grazing enterprise is also often lacking at the point of sale which means the people who are slightly more technologically advanced are the only ones using them and learning from trial and error.

Information on basic drone safety rules to keep you and others safe as well as how the rules are enforced and what happens if you break them can be found on the Civil Aviation Safety Authority (CASA) website at <https://www.casa.gov.au/drones/drone-rules>.

Acknowledgements

GrazingFutures would like to acknowledge the financial contribution and assistance provided by Queensland Health's Tackling Regional Adversity Through Integrated Care program for the hosting of the Drone Fundamentals workshop in 2020.

Case study prepared by Gina Mace, ConnectAg, on behalf of GrazingFutures.

June 2022