Farming FROM ABOVE

Lynda Gray

Every farmer who has come to see Brett Sanders' DJI Phantom 4 drone in action ends up buying one. The Central Otago farmer from Matangi station, near Alexandra, reels off the names of at least six who have bought into the remote-controlled flying technology after visiting for a demo and chat.

The main drone use at Matangi is for mustering sheep and cattle.

"We still use dogs but send the drone to the difficult spots which saves us time and is safer than having to climb down or take the four-wheeler."

Brett stations himself at a high viewing point and using line-of-sight and remote control sends the drone to hunt out sheep and cattle from the steep rock and Matagouri-filled gullies. He observes progress in real time on his Apple iPad, and alters the flight path accordingly.

Brett was an early adopter of the technology. He started investigating drones for mustering four years ago when the most suitable model had a $25,000 price tag. Instead of forking out thousands he bought a basic frame, shopped online for the extra parts and soldered one together for about $600. He built about a dozen and had lots of interesting times learning to fly them.

"I had a lot of crashes early on. It really was trial-and-error work."

But since buying a DJI Phantom 4 in August last year the homemade drones have largely sat redundant in the corner of the kitchen pantry alongside several shelves of parts and accessories.

"The out-of-the-box technology has leaped forward so much I couldn't build one to that standard now."

Most recently the Phantom has been used to accurately map irrigation at Matangi. Photos and data logged from each flight has been downloaded and sent to Drone Deploy, a cloud-based software, which produces incredibly detailed photos, overlaid on a Google Earth map. The maps give Brett important information on the slope and drainage of land which will be supplied as part of the water renewal consenting process. Drone Deploy provides free basic information beyond which other add-on apps can be used at a very reasonable cost. An example is the AgriSensPlant Insights Brett used to count the number of wilding pines on a block, which cost 9c/ha. He's also trialled another app to assess the plant health in a lucerne crop. The report, based on the supplied photos, isolated the areas of stressed plants.

"We would never have picked them otherwise so it gave us a head start on trying to work out what was needed."

The potential for more precision agricultural applications are endless although not something Brett feels the need to push on an extensively farmed system such as Matangi. Even though, the Phantom 4 is something he wouldn't be without.

"We find it's a major timesaver predominantly with stock movement but with precision agriculture there's a lot happening."

Brett makes drone control look easy and says after four years of flying them it's difficult to explain how to do it.

The Phantom 4 is now an essential stock mustering tool at Matangi station.

Key points

- Get familiar with Civil Aviation Authority's (CAA) Part 101 drone operating rules. Go to caa.govt.nz/rpas/index-2/ or airshare.co.nz/rules
- Check out airshare.co.nz, a NZ UAV and drone hub with useful information.
- Join Drones on Farms NZ, a Facebook page with useful discussion and pointers about onfarm use.
- There is a range of cloud-based drone software available such as Drone Deploy, Pix4D, or Sentera AgVault.

"It's a bit like trying to teach a learner driver to change gears in a car."

Lots of practice is required, outdoors preferably. Brett says a local farmer discovered the perils of indoor training and tried (unsuccessfully) to hide the evidence – propeller divet marks down the leg of the kitchen dining table – by repositioning the said item of furniture.

Brett has become a go-to person for drone advice and footage. There have been numerous international media enquiries and stories, most wanting to see how NZ farmers are using the technology. Recently he was asked how to use a drone to map an endangered plant species on Lord Howe Island. Brett's biggest drone problem is making enough computer storage space for the data and images collected. An eight-terabyte external drive sits on the home office desk but it's likely more storage will be needed before long.

What does a drone cost?

- A Phantom 3 (P3) Standard with extra battery and a softshell backpack retails for around $1200.
- A Phantom 4 (P4) Advanced with extra battery and a hardshell backpack retails for around $2850
- The P3 does not have crash-avoidance features. The flight time is less and the camera not as good as on the P4 models but is still very capable for the price.
- A package deal with the extra battery is a good value option because a single battery for a P4 is around $300.

Lifting fodder beet a saviour in drought

James Hoban

For Mark and Gill Forrester, lifting fodder beet proved a saviour in drought. The Forresters farm inland from Waipara, North Canterbury.

Two years ago, with autumn proving record-breaking dry, the Forresters came up with a novel way to get the most out of their six-hectare fodder beet crop. The crop was 22 tonnes/ha and by far the most feed they had available on any part of the farm.

The challenge was how to utilise it for their deer, with the paddock situated outside their deer unit. The drought had limited growth of other options inside the deer-fenced paddocks so the Forresters decided to lift the fodder beet and take it to the deer. They ended up feeding it to weaners, hinds and also yearling cattle.

The homemade beet lifting bucket

The fodder beet was lifted into a second-hand silage wagon they bought specially and was fed out on its own. Stock were given a daily break of grass as well but Mark points out that there was very little grass available at the time. The stock wintered well on the fodder beet and even feral pigs turned up in one paddock for a feed on a regular basis.

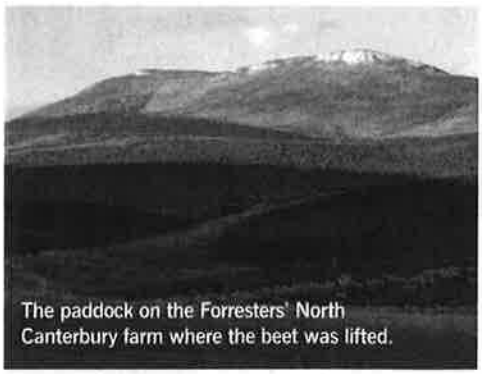
"We considered buying a lifting bucket but the cost was an issue and we thought 'this might be a one-off'."

A 2.6m lifting bucket is about $8000 new to buy.

Steve Carr, who worked for Mark and Gill at the time, was known for being handy in the workshop. He spoke to a number of people about how best to lift beet and eventually spent a morning in the workshop fitting a normal sheep gate to the bottom of a tractor bucket.

Mark says they tried a netting gate for a start and quickly ruined it. A barred gate came next and was perfect for the job.

Lifting the beet worked well because it was during such a dry period. Mark is quick to point out that he would never entertain doing it in a wet year but the conditions were perfect during drought. The bulbs popped out of the ground nicely without too much soil ending up in the silage wagon.



The paddock on the Forresters' North Canterbury farm where the beet was lifted.

"The Claremont soils are a bit like plasticine and when it's wet they're really sticky. We certainly wouldn't be able to lift it this season."

Mark is grateful that so far lifting fodder beet has been an isolated exercise but he says they would not hesitate to do it again in a dry season.

- *More on commercial fodder beet buckets in the August issue*

Droning-on in Southland

Lynda Gray

A Southland drone use discussion group has attracted a diverse bunch of farmers.

At the first meeting, organised by Dunedin agribusiness consultants Abacus Bio, were sheep, beef and dairy farmers of all ages, facilitator Luke Proctor says.

"It was a get-together to see how they were using drones and the applications they would like to see developed."

The majority were using them for stock mustering and monitoring, and the main application they wanted to see developed was for the accurate and consistent measuring of pasture cover.

"Many also said they wanted the drones to be fully autonomous so they could be set and left to do a regular task...the biggest challenge is keeping up with the technology because it's moving so fast."

Mark Gardyne launches the 3D Robotics hexacopter drone back in 2013 on a mission to check on the hoggets.

The meeting was at Neil and Pip Gardyne's Otama farm, near Gore where drone use has been a regular part of their farming since 2013 as featured in *Country-Wide*, December 2013.

"We're using it for normal farming stuff. We're still very interested but have pulled back a bit," Neil Gardyne says.

The "normal stuff" farm tasks include looking for cast sheep and checking stock for shifting.

"This morning I used it to check the cattle. It took five minutes."

The family took delivery of their first drone, a $4000 3D Robotics hexacopter, in June 2013.

The Gardynes' son Mark was the chief drone IT person but almost four years on the 16-year-old is kept busy with school and extra-curricular activities leaving little time for drone-related tasks. However, Neil has kept up onfarm drone use and three months ago bought a $2500 ready-to-go Mavick to replace an Aeronautics BOT.

"It's more convenient. It folds up into a camera-sized case and we can have it going in 20 seconds."