

## SUTHERLAND MONITOR FARM Drone Report

### THE CHALLENGE

In December 2017, we had a very interesting Monitor Farm Meeting on the advances and new technologies in farming. Stephen Burns from the Agri Epi Centre attended the meeting and one of the topics he touched upon was the use of drones in Agriculture. Following that meeting Victoria and Jason Ballantyne were keen to look at options in which a Drone/UAV (unmanned aerial vehicle) could potentially help them at Clynelish but on a lesser scale than those being used on larger commercial farms and industrial sites that Stephen had discussed.

As a business Jason and Victoria are always looking at ways to help reduce their time/labour costs on the farm and improve the ways in which they work so they can make their business more efficient.

Clynelish farm land expands across a varying terrain and distance from the actual farm itself so checking stock can take quite some time, especially in the areas that are effected by dense gorse. These areas are very difficult to access by truck, foot or by tractor. Having the use of a drone to fly over these areas and the other fields to check stock, would have a tremendous advantage and reduce the current time spent. In addition there was also the appeal of reducing the farm carbon foot print by reducing emissions generated from the use of vehicles to check stock.

### WHAT WE DID ON FARM

We had a meeting and discussed the benefits a drone could potentially bring directly to Clynelish:-

- Reduce labour costs
- Reduce the actual time spent checking stock
- Improve animal welfare over lambing/calving as less disruption to animals
- Improve the farm carbon footprint – reduced vehicle usage
- Reduced diesel costs
- More time being spent doing other jobs on the farm

We explored the various makes and models of drones that are available and spoke with several others that had drones for recreational use to try and gauge the most suitable drone. In the end we decided we would invite a drone specialist along to one of the monitor farm meetings to give us a comprehensive overview on the benefits of using a drone in agriculture. We invited Craig MacIntosh from Highland Drones Ltd along to our meeting where he delivered an excellent session on drones, along with sample drones to “try and fly” as well as giving end to end advice on the best drone. This

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resulted in a decision being made by the management team that a drone was going to be bought for use at Clynelish. A DJI Mavic Pro Platinum was then purchased.

On a much greater scale, drones can be used in agriculture in various ways and in much more substantial ways than we required a drone at Clynelish, these include:-

- Crop Observations
- Crop Spraying
- Crop Irrigation
- Pesticide Management
- Observation of fields and soils
- Photography/Thermal Imaging
- Planting and future Pollinating of plants
- Security

One of the great aspects of using a drone is that it is in real time, so the image you can see is what is happening on the ground at that exact time, this why it was ideal for the monitoring of stock at Clynelish.



## RESULTS

The Ballantynes have nothing but praise for the drone since they began to use it in November 2018.

The main advantages and key points on the drone that they have found are:-

- Great for looking over rough ground - saves having to take a quad or vehicle out to extensive rough bits and is a much safer option
- Can now be used to move sheep toward the gate
- Excellent in rough ground because sheep cannot hide behind bracken/whins
- Able to pick up where drainage channels are

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- Able to see wet or compacted areas of ground
- Able to see overlaid or ill sheep by a quick fly over
- Gathered good photos for both tenant's amnesty and future reference for fields
- Photos of fodder beet trial - aerial shots show real difference in varieties and sowing techniques
- Reduced tracking of wet ground over winter because not using vehicles
- Checked silage status in fields and plan top ups accordingly

On a daily/weekly basis, they have also felt that the welfare of their pregnant ewes and cows is less stressful as they have no reaction to a drone flying overhead, whereas with a person or vehicle entering a field, can cause the livestock to get quite stressed. The below picture indicates how close the drone can now fly to the livestock with little or no reaction.



At Clynelish they rotational graze the livestock and they are moved on a regular basis, because of this the cattle can get quite impatient when daily checks are being carried out, as they assume they are moving to fresh pasture, using the drone to check the cattle reduces this frustration.

Checking the hill areas where there is dense gorse, bracken and heavy rush has been made so much easier and quicker than by foot. The drone is especially effective in these particular areas of the farm.

The photo over the page gives an indication of the terrain in many areas of the farm and how beneficial the drone is for locating livestock.



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As mentioned in the bullet points, Clynelish is part of a Fodder Beet Trial – having the drone has played a vital part in monitoring the success in growth rates of the various varieties that have been planted without disruption.



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The drone itself is lightweight, easy to carry and fly it also produces great quality images. It has a long battery life and can fly up to 7km in distance and elevation range of 5000m, so has proven to be a great model for use on Clynelish. Like all drones though, the downside is that it cannot be used in extreme weather conditions.

With regards to the time/labour savings the drone has brought. Currently the Ballentynes would spend 1 hour 20 minutes per day, manually checking their stock by foot/vehicle.

Checking the equivalent by drone takes 25-30 minutes. Daily checks are carried out from April –July, then slightly less throughout the rest of the year. If the drone was used twice a week that's a saving of 104 hours per year.

The big saving on time comes when the drone is used to check sheep in the rough ground, on the quad this will take 40 minutes, however with the drone it takes 10 minutes. If the drone was used once a week this would save 30 minutes on time, which equates to 26 hours per year. This is an overall total saving of 130 hours per year.

If we take the average skilled farm labour costs (from the Farm Management Handbook 2018/19) at a cost of £14.19 per hour, this would equate to an annual saving of £1877.70

As we look to improve the carbon footprint at Clynelish, using the drone has seen a reduction on fuel usage for both the quad bike and truck. The quad will achieve on average 3.3 miles per litre and the truck 5.5 miles per litre. To check the stock would take 2 litres per week which is 104 litres per year being saved.



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Another cost saving factor in is the wear and tear of the farm vehicles. Using the drone takes the pressure off the vehicles and reduces the demand on them, in particular when being used on the rough terrain areas.

Other savings which are not fully quantifiable include the damage that the vehicles cause to the grass sward.

With Clynesh running a busy Bed & Breakfast throughout the summer months, the drone can be used to quickly check animals and work around the checking in and out of guests. This helps take the stress out of the very busy days.

## WHAT HAS CHANGED ON FARM

The technology of the drone has changed the way in which the Ballantynes farm.

Using the drone to regularly check their stock throughout the week, all from the comfort of the house or farm steading has proved to be a game changer for them.

The savings the drone has brought both financially and time saved, have been a tremendous help to Jason & Victoria and they cannot see themselves farming without the drone now or in the future.

### FACILITATOR CONTACT DETAILS

Willie Budge & Cat MacGregor  
SAC Consulting  
Industrial Estate, Janetstown, Thurso, Caithness, KW14 7XF  
01847 892602. Email: [fbsthurso@sac.co.uk](mailto:fbsthurso@sac.co.uk)

