

Farming for a Better Climate



Improving carbon efficiencies at Hillend - key focus farm findings

Hillend Farm is a 110 cow dairy just outside the village of Clackmannan and is owned and run by Ross Logan in partnership with his parents James and Anne.



The farm extends to 112 hectares, of which 45 hectares of cereals are grown each year with the rest of the land in grass for silage production and summer grazing. The dairy herd calves all year round with home bred replacements entering the herd. Male calves are finished on the farm.

Ross and his family volunteered as one of nine Climate Change Focus Farms between 2014 and 2018, working as part of the SAC Consulting Farming for a Better Climate initiative to explore practical and low cost measures to reduce the carbon footprint of the farm.



Fuel and energy use

During the project, Ross and his team were planning a switch from the current parlour to a robotic milking system. Ross put in place smart metering to monitor electricity use in the dairy. Variable speed milk pumps, improved insulation of hot water systems and a heat recovery system from the bulk tank chiller to preheat water going to the water heater were all identified as measures that could bring financial savings in the region of £1,500 per year. As Ross was in the process of moving over to a robotic milking system, most of these changes would be carried out during the switch.

Although fuel use at Hillend was low in comparison to similar dairy units, Ross still managed to improve diesel use. A 4.50 hectare field was direct drilled as opposed to being ploughed. By reducing field operations, fuel use fell by 140 litres, which at a price of £0.55 is a saving of £77 and 372 kg CO₂. With less soil disturbance, a successful grass crop and reduced labour, Ross intends to increase the use of direct drilling going forward.

Case Study

Find out how other farmers are improving profitability and adapting to a changing climate in our series of case studies, or take a look at our practical guides covering:

- Energy and fuel use
- Renewable energy
- Lock carbon into soils and vegetation
- Optimise the application of fertilisers and manures
- Optimise livestock management and the storage of manure and slurry

For more information, visit our webpages at Farmingforabetterclimate.org or find us on Facebook and follow us on Twitter @SACFarm4Climate



Farming for a Better Climate is funded by the Scottish Government

Websites

www.farmingforabetterclimate.org
www.soilassociation.org
www.gov.scot
www.ipcc.ch
www.agrecalc.com
www.planet4farmers.co.uk



Key focus farm findings - Hillend

Getting calves off to a good start

With a new calf shed constructed during the project, heifer calves were no longer housed in the same air space as older cattle or young bull calves. The heifer calves were kept in individual calf pens, then moved to igloos and group pens. Gale breaks gave calves more protection from adverse weather and calf jackets were put on calves up to four week old. These actions were reflected in calf growth rates, increasing by around an extra 0.5kg per day.



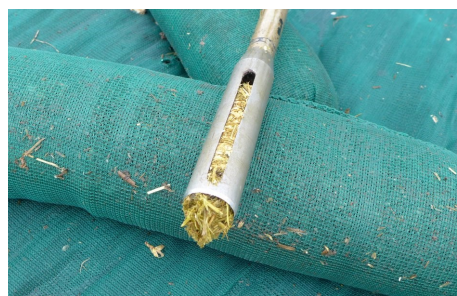
Age of calving

One of the benefits from improved heifer growth rates is that heifers are reaching optimal bulling weight at a younger age, which has helped the business reduce its age of calving from 27.5 months to 26 months. As a result, approximately 30 replacement heifers have not had to be kept for an extra 1.5 months with no output. Research suggests the full cost of rearing a heifer increases by £2.87 per day for every day increase in age at first calving over 24 months, which at Hillend would equals a saving of £3,870.

Better silage quality

Ross improved silage quality, knew its value and balanced rations with bought in feed accordingly. Based on a comparison of purchased feed used at the start of the project and at the end, there were 63 tonnes less bought-in feed fed, equating to a saving of £2,300 and 34,278 kg CO₂e.

Ross changed the dry cows diet by feeding more wholecrop instead of chopping and feeding straw. This meant the feeder wagon was running for approximately 182 hours less per year, saving 1,820 litres of fuel, around £1,000 and 4,841 kg CO₂. Knowing wholecrop nutritional value meant Ross could be more accurate when formulating rations.



Improving nutrient use and crop growth

With soil analysis results showing moderate to high P and K levels, Ross was better able to target slurry and fertiliser use across the farm. This resulted in a reduction of 8.8 tonnes of both P and K, saving 31.97 tonnes of CO₂e and £9,143 over three years. Soil testing also highlighted low pH across parts of the farm. With this information Ross was able to identify and prioritise areas for lime, applying around 57 tonnes of lime in 2015. Although it was not possible to quantify the actual benefits from increasing pH in terms of better nutrient utilisation or tonnes of grass grown, it was expected that a targeted nutrient use and liming plan would give a significant boost to grass growth over the coming years.

Key carbon findings

- Overall, total emissions at Hillend increased by 2% during the three year project. This was due to livestock numbers increasing during the project, and partly around timing of livestock sales.
- The measure of on-farm greenhouse gas emissions in relation to saleable product, also referred to as 'emission intensity' fell during this time by 6% from 1.53 CO₂e to 1.43 CO₂e per litre of milk. This demonstrates a reduction in carbon emissions per unit of product and an improvement in efficiency.
- Ross saved around £16,000 with no loss of production as a result of straightforward, low or no cost practical efficiency measures. By the end of the project, milk yields had increased beyond what they were at the start of the project but less purchased feed was required. Ross plans to move forward with the new robotic milking facility.
- For practical ways to reduce your farm carbon footprint, visit www.farmingforabetterclimate.org