

Farming for a Better Climate



Improving Farm Efficiency; Findings from Torr Farm

Farmers Ross and Lee Paton at Torr Farm, a 389ha organic dairy farm near Castle Douglas in Dumfries and Galloway, participated in the Farming for a Better Climate initiative as a volunteer *Climate Change Focus Farm* from 2010 – 2013. With help from SRUC specialists, Ross and Lee looked at practical ways to improve farm efficiencies and if these measures could also reduce the farm carbon footprint.

This case study provides a summary of the measures Ross and Lee put into place, based on the five key action areas (see box). Taking a second look at routine practices helped the farm business become more efficient and make better use of inputs. **These practical actions helped Torr save around £37,000 and reduce the farm carbon footprint by 11%.**

Measures to optimise fuel and energy use.

There are a range of measures all farms can consider to reduce energy and fuel use. Small changes may seem insignificant, but if these actions are carried out on a daily basis they can add up to significant savings. During the initiative, Ross and Lee looked at the following measures:

- Electricity metering: installed a SMART meter to measure and monitor electricity use.
- Timers and insulation: checked settings on water heating timers and increased insulation on hot water pipes and storage tanks.
- Hot water use: reduced to one hot and one cold wash daily in the parlour.
- Assessed dairy operation: retrofitted a variable speed milk pump.
- Fuel: monitored and recorded use.
- Machinery: matched the correct sized tractor to the job where possible and made sure equipment was well maintained (e.g. correct tyre pressure).
- Reduced fuel use associated with spreading; minimised production and handling of lightly contaminated water.



These actions contributed to a reduction in electricity use of 22,455 kWh (21%) saving around £1,900 and 13.33 tonnes of CO₂. Fuel use decreased by 9,650 litres (33%) saving around a further £6,600 and 30.64 tonnes of CO₂.

How can you benefit from the work carried out at Torr?

Even well performing farms can benefit from taking a second look at steps to maximise efficiency. Savings are achievable; there are **five key action areas** that most farms will be able to benefit from.

For more information on efficiency measures and the farms taking part in the project, visit the website at www.farmingforabetterclimate.org

Case Study

Find out what other farmers are doing to improve profitability and adapt to a changing climate in our series of case studies.

There are five sets of Practical Guides covering :

Use energy and fuels efficiently

Develop 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

Find further information, including links to other Practical Guides and Case Studies, at

www.farmingforabetterclimate.org



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Websites

www.farmingforabetterclimate.org

www.soilassociation.org

www.scotland.gov.uk

www.ipcc.ch

www.agrecalc.com

www.planet4farmers.co.uk

www.fertbench.com



Findings from Torr

Measures to optimise fertiliser, slurry and manure use

- Optimise soil nutrient status: through a programme of regular soil sampling and targeted application, Ross was able to bring fields up to optimum nutrient and pH status.
- Nutrient management: PLANET Scotland was used to carry out whole farm nutrient management planning, highlighting optimum nutrient application on target fields
- Analysis of farm slurry: one 10m³ tanker could have an equivalent fertiliser value of around £30.
- Optimised slurry storage: installation of a new slurry store maximised storage and allowed nutrients to be used at the optimum time for the crop (SRDP funded measure, 2011).
- Slurry application: research suggests slurry applied by a trailing shoe system can produce 30% more grass compared with splash plate application. Using a trailing shoe, the nutrients are placed directly on to the crop, reducing nitrogen lost as ammonia (Ross had already been using this system for a number of years).
- Grazing system: introduction of more rotational grazing around the farm.



Measures to protect soils and 'lock-up' atmospheric carbon in vegetation

- Farm soil structure: assessment and improvement of soil structure in problem areas.
- Alleviated compaction: a programme of sub-soiling to remediate compaction. Estimated potential yield increase of 38 tonnes (fresh weight) could be achievable over 50ha of grassland. This is equivalent to £950 and 4.40 tonnes CO₂e when compared to buying in additional grass silage.
- Improved drainage: in 2013, 20ha of drainage systems were renewed on cropped land and grassland. The impact of drainage on crop and grass yields will not be evident until 2014. This is an expensive activity and a long term strategy; however, maintaining a rolling programme of drain maintenance and renewal will benefit farm soils and crop yields. Estimated that good drainage can deliver 30-40% improvements in grass yield.
- Improved soil structure and drainage: livestock could remain outside longer. Maximising the outdoor grazing period could reduce the need for additional bought in feed. Wet weather and field conditions forced early housing in 2012; this meant an additional 193 tonnes of bought in feed was required which increased CO₂e emissions by 24.15 tonnes, illustrating the importance of protecting soils to improve farm resilience.
- Native woodland: estimated the recently planted 2.2ha of native woodland could lock-up or 'sequester' 23.95 tonnes of CO₂ as the trees grow.

More financial and carbon benefits as a result of addressing soil nutrient status and drainage are expected to be seen in future years.

Measures to optimise livestock management

- Analysis of forage: producing high quality silage and knowing its nutritional value aids accurate rations, saving 1kg of concentrate per cow per day. Over a typical 182 day winter that can equal a saving of 32 tonnes of organic concentrates, saving £10,355 and a reduction of 10.91 tonnes of CO₂e.
- On-going monitoring of fertility and performance of dairy herd.
- Reduced age of calving from 34 months to 24 months: trialled with a batch of 15 heifers. From entering the milking herd to the end of the reporting year, milk production is estimated to have increased by 50,450 litres, generating around £17,500.
- Livestock housing: changes to livestock housing to increase available feed space, benefitting milk yield.
- Condition scoring of cows: feeding is adjusted accordingly, maximising feed use efficiency on the farm.

What were the key findings from Torr?

- Monitoring is key to identifying current performance and will highlight opportunity for savings
- Technically efficient farms can still identify scope for savings: Ross saved around £37,000 over the initiative.
- The carbon footprint at Torr reduced by 11% over the three year period; this figure was lower than expected mainly due to the poor weather in 2012/2013. Further reductions in costs and emissions are expected as the measures take effect on the farm (e.g. targeted spend on nutrients once soils are in balance, improved drainage leading to better yields).
- Weather has a big impact on farm costs and emissions. Prolonged rainfall increased emissions as the farm adapted routine practices to cope with the adverse weather.
- Implementing measures now can put you in better shape for the future, helping you to hand on a more resilient farm in an uncertain climate.