

# Farming for a Better Climate



## Improving carbon efficiencies at Nether Aden - key focus farm findings



Nether Aden is a mixed, family farm, situated close to the village of Mintlaw in north east Scotland. The farm is run by husband and wife team David and Nicola Barron, with the help of their three sons Jack, Tom and Jamie.

Nether Aden extends to 203 hectares used to grow a range of winter and

spring sown arable crops, plus grass for grazing and silage. Livestock on the farm comprises a herd of suckler cows producing finished cattle, predominantly black Angus/Limousin crosses.

David and his family worked with SAC Consultants as one of nine, Climate Change Focus Farms between 2014 and 2018 to explore practical and low cost measures to improve farm efficiency and reduce the farm carbon footprint.

## Optimising fuel and energy use

With fuel and fertiliser being the two big business expenses, David was keen to explore ways to cut costs. With limited scope for saving on already efficient fuel use practices, David looked to new technology to see if this could help his business.

David identified HydroGen, a hydrogen electrolyser, working alongside conventional fossil fuels to reduce emissions and improve efficiency. The machine itself consists of an electrolyser, a control unit and a water reservoir.

The electrolyser is retrofitted to existing engines, with the potential to be moved to different vehicles if required (equipment visible as blue box fitted behind cab in photo).

Data collected over a 15 month period at Nether Aden showed a fuel saving of 20% on the telehandler, equating to 1,083 litres of fuel per year, equivalent to 43,440Kg CO<sub>2</sub> per year, and £596. At current rates, David could save 17,200 Kg CO<sub>2</sub> and £2,980 over a five year period.

You can read more about David's experience with the HydroGen system in the case study on our [webpages](#).



## 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](http://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](http://www.farmingforabetterclimate.org)  
[www.soilassociation.org](http://www.soilassociation.org)  
[www.gov.scot](http://www.gov.scot)  
[www.ipcc.ch](http://www.ipcc.ch)  
[www.agrecalc.com](http://www.agrecalc.com)  
[www.planet4farmers.co.uk](http://www.planet4farmers.co.uk)



# Key focus farm findings - Nether Aden

## Nutrient use efficiency - savings from better use of manures

Through soil testing and nutrient management planning, David has taken full account of the nutrients supplied from FYM (farm yard manure) on the farm. Nether Aden was producing approximately 2,219 tonnes of cattle manure each year. This was estimated to supply 13,214 kg of total nitrogen, 1,331 kg of available nitrogen, 7,100 kg of Phosphate and 17,752 kg of potash. With the fertiliser costs in place at that time, this equated to £12,719 of nutrients being available from FYM on the farm.

Using a nutrient management plan, it was estimated that David could save around £150 per hectare over a four year period, equivalent to £38 per arable hectare per year or over £5,000 per year based on the arable area on the farm at the time, through more targeted nutrient use. This is equivalent to an annual reduction in carbon emissions of 19,344 kg CO<sub>2</sub>e (carbon dioxide equivalents). Nutrient management and GPS analyses were also extended to grassland on the farm. Other measures investigated included use of composts, green manures to increase nutrient and organic matter content, along with identifying and remediating any soil structural issues.



## Optimising livestock performance

David was building his suckler herd over the duration of the project. Some of the measures implemented to improve livestock productivity at Nether Aden included:

- Grouping according to condition score - more attention to individuals making sure a greater number of cows are at target condition scores at key times during the year. This could reduce calving problems, increase calving percentage, reduce mortality and increase calf growth rates.
- Finishing cattle sooner - Cattle are more efficient at gaining liveweight when they are younger. Heifers are being finished 104 days quicker now than they were before. Steers are being finished 133 days quicker now, and bulls are being finished 23 days quicker. This reduces costs - and time spent contributing to farm emissions - over the life of the animal, e.g. feed, vet and medication costs, bedding and fixed costs such as labour, electricity etc.
- Bull management - bulls on the farm are tested for fertility prior to the mating period. Bulls are now regularly assessed to make sure they are in top condition and a feeding plan is in place to optimise their performance both prior to and during the mating period.
- Taking a detailed look at actual weight of beef sold per animal and the overall income per animal sold. This has prompted David to consider a move away from the larger continental animals in favour of smaller breeds.
- Focus on rations, cattle health and tweaks to ventilation in the shed.

## Key carbon findings

- Overall, total emissions at Nether Aden fell by 2% during the project through savings in fuel and fertiliser.
- The measure of on-farm greenhouse gas emissions in relation to saleable product, also referred to as 'emission intensity' increased during this time by 37% from 1.65 kg CO<sub>2</sub>e to 2.27kg CO<sub>2</sub>e per kg output. This increase was due to changes in cropping and the production cycle when building the herd; crop and livestock sales (outputs) had not yet translated down from the additional cows resident on the farm when compared to baseline, yet bedding and feed (inputs) were being bought in.
- Its anticipated that as more livestock reach sale age, the farm carbon footprint will begin to fall.
- David saved around £16,000 with no loss of production as a result of straightforward, low or no cost practical efficiency measures.
- For practical ways to reduce your farm carbon footprint, visit [www.farmingforabetterclimate.org](http://www.farmingforabetterclimate.org)