



# IMPACCT CASE STUDY No. 2

Integrated Management Options for Agricultural Climate Change mitigation

## The Ryes, Southwick, Dumfries, Scotland

The Ryes is a 111 ha dairy unit that also rears beef young-stock and keeps overwintering hogs. It is located just outside Dalbeattie, in Dumfries & Galloway. Dalbeattie is near the centre of South West Scotland's Solway Coast. Its unspoilt beauty has made Dumfries and Galloway a refuge for wildlife, especially birds.

The farm site has a coastal granite uplands landscape. Its climate is wet. The land cover is quite varied and includes improved pasture in sheltered areas, to rough grassland often with gorse as a prominent feature. Fields often contain rocky outcrops and large boulders.



The farm business produces quality milk and beef, and grows its own feed in the form of silage spring barley and winter feed crops, such as kale and rape, the latter being strip grazed by stock.

The farm is located within the former Stewartry Environmentally Sensitive Area (ESA). In 2004-2009, the farm had a contract under the Rural Stewardship Scheme. This contract included the implementation of plans to manage and enhanced existing habitats on the farm for the benefit of biodiversity. The work that was undertaken included management of wetlands, species-rich grassland, scrub, native woodland, watermargins and drystone dyke restoration. Significant improvements in the farms biodiversity have been noted and UK/LBAP species present on the holding include: Snipe, Skylark, Curlew, Hen Harrier, Brown hare, Barn owl, Atlantic salmon, European otter, Linnet and Pipistrelle Bat.

The farm lies on the Drumcow and Boreland Burns, which flow into the Sandyhills Bathing Water Catchment. This area failed EU Bathing Waters Directive requirements. As a result, in 2002, the Scottish Office funded the 'Sandyhills Bathing Waters Project' that aimed to improve the cleanliness of bathing waters within the catchment. Ryes was one of ten farms that took part in the pilot project and, as a result, a Biogas Plant (comprised of an anaerobic digester and gas collection equipment) was installed on Ryes in 2004.



Biogas plant at Ryes

Photo: FH Land Management 2009

Ryes was chosen as the farm had inadequate winter slurry storage and it was anticipated that the facility would help reduce diffuse pollution and provide a source of useful by-products for the farm. The cost of the installation was significant but this was paid for by the project. There are also running costs to consider. Methane from the biogas plant is used to heat and provide hot water/cooking facilities in the farmhouse at a considerable cost saving. As this is a renewable fuel source and is displacing the use of fossil fuels, greenhouse gas emissions are reduced. The facility also shields the farmer from concerns regarding fluctuations in fuel costs.

The digestate from the plant is used as a soil conditioner. It is readily absorbed by plants and helps increase soil sequestration. This has reduced the need for synthetic fertilizers and so has reduced costs and greenhouse gas emissions.

The biogas plant is not the only climate change mitigation activity on the farm. Others include:

- The installation of energy efficient lighting in farm buildings. This has reduced the farm energy bill, reduced greenhouse gases and reduced waste. Bulbs need to be replaced less frequently. However, the energy efficient light bulbs are more expensive to purchase.
- A new plate cooler, compressor and storage tank for milk has been installed in the dairy. This system cools milk quickly but uses little energy. Whilst it involved an initial capital outlay running costs are very low and GUG emissions greatly reduced.
- The farm has purchased a soil aerator that attaches to a tractor with harrow or roller pulled behind. This has reduced the number of cultivations trips and causes less soil compaction and so has reduced GHG emissions (decreased fuel use, decreased risk of anaerobic soil conditions in tramlines and increased N<sub>2</sub>O emission). However, the aerator is an expensive capital cost.
- The farm has improved waste management and now recycles silage wraps that were previously burnt. This reduces emissions associated with the manufacturer of the wrap plastic and reduces the risk of stray plastic in the countryside. However, there is a cost to the farm for the collection and recycling of the wrap.



**Fenced watermargin on Ryes**  
Photo: FH Land Management 2009

- The farm now regularly selects more disease resistant varieties of seed to reduce herbicide use and reduce farm operations thus reducing emissions and costs.
- The clover in the grass sward has been increased to produce higher protein grass for the cattle. This has increased N fixation, increased sequestration and less N fertilization is required reducing emissions and costs.

- The areas of woodland/riparian woodland and scrub have been fenced off preventing stock grazing. Two areas of mixed native and conifer woodland were planted in 1995. The maintenance of these habitats will aid carbon sequestration, protect wildlife habitats and protect water courses from diffuse pollution. Improvements in wildlife populations have been seen.
- The farm has also improved management of the wetlands and species-rich grassland. Grazing has been restricted in the summer to allow plants to flower and set seed and wildlife to thrive. This has also increased carbon sequestration and reduced stock poaching.



**Mixed woodland on Ryes with gorse scrubland**  
Photo: FH Land Management 2009

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