IMPACCT CASE STUDY No. 3

Integrated Management oPtions for Agricultural Climate Change miTigation

Barrasgate Farm, Cummertrees, Dumfries, Scotland

Barrasgate is a 107 ha mixed farm located on the Solway Coast at Cummertrees near Annan. It lies in the Coastal Plain landscape and is gently undulating land overlying gravel with limestone and sandstone bedrock. It is a farmed landscape, mostly pasture but with some arable cultivation. The main farm enterprises are beef (~100), sheep (~180), arable (oats, barley, arable silage, potatoes, total of 78 ha) and short rotation coppice (10 ha). The farm also undertakes non-agricultural activities including a physiotherapy service that provides additional income.

The cropping rotation comprises of grass (7-8 years)/2 yrs barley/2 years oats /2 years potatoes then returned to grass (1st year barley undersown with grass) if yields are dropping. If yields are acceptable then potatoes are followed by barley/oats/fodder beet.

The main soil types include a gravelly loam and areas of peat and heavy clay. Fields are medium sized and bounded by hedges or fences.

Whilst the climate is mild and wet, onshore winds help shape the exposed landscape. The farm has a wide range of environmental features including hedges, woodland, wetlands, various watercourses and scrub. It also has a cropmark archaeological feature. Cropmarks are patterns in vegetation caused by differences in the rate of growth and ripening of crops such as wheat and barley usually caused by the presence of a buried archaeological feature.

The farm is a member of two farm assurance schemes Quality Meat Scotland and Scottish Quality Crops.The farm has a strong, positive attitude towards climate change mitigation and environmental management.

Lockerbie Steven's Croft Biomass Power Station

Short rotation willow coppice was planted in 2006 under contract with Renewable Fuels Ltd., North Yorkshire. The first crop is due for harvest in 2010 and the wood will be used at the Steven's Croft Biomass Power Station, which is the UK's largest wood-fired biomass station, located in Lockerbie, Scotland.

This has increased soil sequestration on the farm through the willow growth as it is a perennial as opposed to annual crop and as the willow is a sustainable fuel source as is used as a substitute for fossil fuels, overall greenhouse gas emissions have been reduced. The farm has also received an energy crop grant. The willow crop has also increased wildlife populations on the farm as it provides an undisturbed habitat.

The farm has adapted its practices to mitigate climate change and to save money. Actions taken include:

- Steps have been taken to make farm buildings more energy efficient. For example, low energy light bulbs have been fitted in sheds and sodium lights fitted for external lighting. This has reduced energy use, reduced greenhouse gases and reduced waste as the new bulbs have a longer life expectancy.
- The farm has stopped using contractors for most operations and instead is doing most of the work itself using a smaller tractor than that used by the contractors. For example, the farm is spreading farmyard manure itself rather than using the contractor. This has saved money and fuel. The tractor also causes less soil compaction and so has reduced GHG emissions (decreased risk of anaerobic soil conditions in tramlines and increased N_2O emission). As the manure is taken straight from the shed to field and ploughed in losses of nitrogen to the atmosphere will be minimized and there is less risk of diffuse pollution from runoff and leaching.

- The farm has recycled its plastic waste for many years, re-using materials as much as possible before finally recycling off-farm.
- A one year old baler/wrapper for silage has been purchased. This did incur some capital cost outlay but it means the farm can save on contractors costs by doing the work itself and using its own equipment.

Watermargin on Barragate
Photo: FH Land Management 2009

The environmental areas on the farm are managed primarily for wildlife but this work also offers benefits for climate change mitigation through both reduced emissions and increased soil carbon sequestration. For example:

- Grass margins maintained around the edges of fields and a small part of each crop is left unharvested allowing more biomass standing. No fertiliser is used on margins. As well as reducing fertiliser use and costs this has increased rough vegetation and so increased carbon capture. The farm has noticed wildlife benefits from this including an increase in tree sparrow populations. The farm is also one of the last sites in Dumfries and Galloway for the corn bunting. However, the extra margin area has meant a loss of arable income.
- Soil sampling in the arable fields has been undertaken to help optimize fertilizer applications. There has also been an increase in the field walking to assess pest problems and decrease the use of pesticides. Pesticides are used to control rather than eradicate pests and those that are applied are used at low dosages taking due consideration of any potential resistance problems. This has increased weeds around the edge of the field that has been a benefit to wildlife.
- Oats and barley used to be dried using conventional oil burning dryers off the farm but now oats are dried in ambient air on-farm and barley is stored as moist grain (crimped). This has meant reduced energy costs from drying and from transporting the grain.

The farm is still planning to do more in 2010. A new shed will be built to over winter cattle and this will incorporate a tank on the roof to collect rain water. Over wintering the cattle will reduce the risk of any poaching although this is not a serious problem on the farm.

Watermargin on Barragate
Photo: FH Land Management 2009

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