IMPACCT Newsletter

Integrated **M**anagement o**P**tions for
Agricultural **C**limate **C**hange mi**T**igation

February 2010, Issue 1

Welcome to the first IMPACCT newsletter. IMPACCT is the EU funded international research project examining the climate change mitigation potential of European farms. Over the coming months this project will be developing models and software tools for both policy makers and farmers that will aid the development and evaluation of policy and help farmers and growers identify and adopt agricultural practices that will reduce greenhouse gas emissions and increase soil carbon sequestration. There are three newsletters planned. This first one is aimed at introducing you to the project and bringing you up to date with early progress.

Climate change is probably one of the most serious threats to sustainable development, with adverse impacts expected on almost all aspects of our daily lives including environmental quality, human health, food security, economics and our physical infrastructure. Global climate varies naturally but scientists agree that high concentrations of greenhouse gases in the Earth's atmosphere are leading to changes in the climate. According to the Intergovernmental Panel on Climate Change, the effects of climate change have already been observed and, therefore we need to act fast. Without such action we will see severe impacts on climate-sensitive activities such as agriculture and this will, of course, impact upon food security.

With respect to agriculture, what does all this mean? Firstly, agriculture and food security are inextricably linked. Food security is a major concern for the coming years with increasing population requiring significant increases in food production. This will be difficult enough without the complications of climate change that could result in major declines in productivity. Secondly, agriculture itself is not helping the problem and is a significant producer of greenhouse gases. Most countries are therefore examining their agricultural policies and initiatives to ensure that farmers and growers understand the impacts that they are having on climate change and are given the help they need to mitigate and adapt.

Biogas Plant on Ryes
Photo: FH Land Management 2009

It is not easy to calculate or understand the carbon footprint of your own farm. In the UK we do have a few tools to help farmers and growers undertake this task but some European Countries are without such luxuries. Plus what's the good of just numbers? The information needs to be placed in context of the specific farm and it is only over time that it becomes evident as to whether or not the situation is improving. This will only be the case when mitigation options are identified and implemented. In addition, we must remember that whilst mitigating and adapting to climate change is an urgent need this must not be done at the expense of other environmental issues – it is not going to be helpful if in our attempt to reduce greenhouse gas emissions we actually causes other environmental problems. The key therefore, is not just to calculate the carbon footprint but to identify the best environmental solutions on a farm by farm basis.

The IMPACCT software

The key objective of the IMPACCT project is to develop a software package that will help policy makers, regulators, farmers, growers and other stakeholders identify the best environmental options for climate change mitigation that are also practicable and cost effective. The key specification criteria have been identified via a consultation exercise conducted in several EU member states. The software will have two operational modes – one for policy makers and regulators and another for farmers and growers. The specification criteria is different for the two end user groups:

Photo: FH Land Management 2009

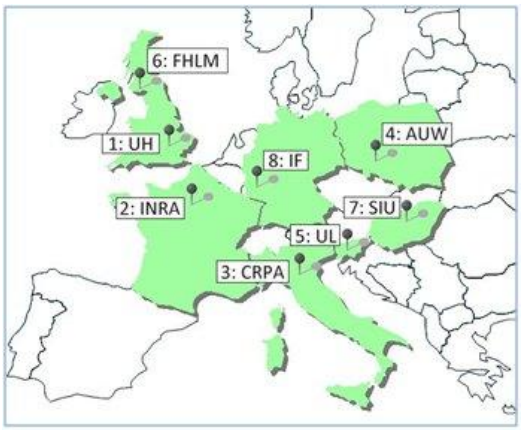
Policy Makers and Regulators

- The ability to use data from national surveys.
- The ability to search the underpinning emissions inventory database GHG emissions/carbon sequestration data by farm type, region or Member State.
- The ability to search the underpinning database for GHG emissions data/carbon sequestration for specific agricultural activities.
- Inclusion of economic data associated with mitigation options.
- The ability to identify any potential environmental impacts of mitigation options.
- Ability to combine outputs with geo-spatial data.
- The facility to view outputs temporally, e.g. plot trends over time.
- Facility to explore national what-if scenarios .
- Ability to override default emissions factors with alternative data/factors.
- Good software support – help text, video etc.

Farmers and Growers

- User-friendly, simple layout and intuitive.
- Provision of default data to avoid model becoming data hungry.
- Calculation of the farms carbon balance by identifying the key sources (emissions) and sinks (carbon sequestration).
- Mitigation options appropriate for the specific farm.
- Environmental trade-offs identified for mitigation options.
- Guidance on the cost of mitigation options included.
- Ability to explore what-if-scenarios.
- Compare results with time and benchmark across farms.
- Flexibility in the type of outputs – e.g. by area, production unit, graphical and tabular.
- Good data management – saving, editing, re-use, printing.
- Good software support – help text, video etc.

Get Involved....



It is anticipated that the software will be available in beta form from mid-2010 and at that time we will be using our partners across Europe to test and pilot the software. However, there are several EU Member States not represented in the partnership and we are always grateful for more offers of help in the piloting process so if you would like to help and be one of the first to try the software please contact us at aeru@herts.ac.uk. Your feed back will help us refine and polish the software. The map on the left shows the partnership countries.

Case Study work: Arbigland Estate, Dumfries, Scotland

As well as the consultation exercise a number of farms across Europe have been involved in developing case studies. These farms have been visited by researchers who have collected information on what mitigation actions are being readily adopted, what the drivers are for this and other information relating to the financial costs and benefits. These farmers will also pilot the IMPACCT beta-software and help validate its outputs.

The Arbigland Estate is approx. 400ha in size and lies on the Solway coast in Scotland. It is comprised of both cereal and beef enterprises. The beef enterprise is a diversification introduced in 2006. The estate is a member of two quality assurance schemes. The climate is wet and the soil is predominately silty clay. The farm has a rich history and contains valuable archaeological areas as well as being listed in the Inventory of Designed Landscapes[≠]. On the estate there are a wide variety of habitats including woodlands, hedges, wetlands and watercourses. The farm has three Rural development contracts that help manage these areas. The farm has been active in adopting climate change mitigation activities, especially since the introduction of beef, including:

Photo: FH Land Management 2009

Fenced watermargin
Photo: FH Land Management 2009

- Some precision farming activities to optimise fertiliser use and reduce costs. This has reduced fertiliser storage needs and so less is wasted.
- A new, energy efficient tractor has been purchased to reduce fuel use and slightly reduce labour requirements. Initial expensive capital costs needed.
- Use of own farmyard manure on farm has helped reduce the use of synthetic fertilisers. This has also improved soil structure but has slightly increased labour needs.
- Farm has changed from traditional harvesting methods to whole crop silage. Much of the feed is used on farm but some is sold on. Stubble retained in fields before ploughing in. Silage wraps are recycled at some cost to the farm.
- An old derelict shed has been replaced with a new one incorporating a water tank for capturing rain. Reduced water costs and reduced ground disturbance from piping.
- Improved hedge management in Environmental Areas including coppicing, laying, replanting & fencing to exclude stock. This has increased wild bird populations due to increased nesting and feed opportunities.
- Woodland management has increased including planting, restocking, thinning & felling. Wildlife habitats have improved generally & some income has been received from wood sold. Wildlife has increased.
- Attention has been given to the estates permanent grass margins. These have increased in size which has improved wildlife populations.
- Improvements in the management of the wetland areas has also been adopted. This includes grazing restrictions & control of rushes to prevent them smothering other wetland plants. As a consequence increased numbers of wading birds have been recorded.
- Some conversion of arable fields to clover-rich grass leys.

Grass margins
Photo: FH Land Management 2009

[≠]The Inventory of Gardens and Designed Landscapes is maintained by Historic Scotland. Inclusion of a site in the Inventory is a material consideration in the planning process and any planning proposal that would affect a site included in the Inventory must be referred to Scottish Ministers (through Historic Scotland) and Scottish Natural Heritage.