

Director's Introduction

We live in a world in which balancing priorities is an increasingly important component of everyday life. Within the Institute, we have to balance the quality of our science with its relevance to our key end-users and within our end-user community, we have to strike a balance between different end-users. To help us to take a more strategic approach to getting the balance right, we have recently created a new post of Communications and Outreach Officer and Chris York has recently joined us in that role. Hence it seemed like a good idea to give Chris the task early on of producing a Newsletter!

The main theme of this Newsletter is how the Macaulay's research can benefit the agricultural community. We are indeed part of that community, in that we manage three farms in Scotland as "Research Stations" and contribute to management of a fourth farm in Wales. In the past, we used these farms largely to provide livestock and fields which we could manage under controlled conditions and about which we knew the history. However, the nature of our research has changed over the years and we now see new opportunities for using these farms to communicate the findings of our research. You can read more about this on page 10.

One piece of research conducted on the Welsh farm in collaboration with the Institute for Grassland and Environmental Research was designed to explore whether anecdotal evidence of particular breeds being better suited to certain management systems could be scientifically proven. The answer to that is on page 9 but our research also looks beyond the farm gate. The increasing realisation that activities in one location can have an impact elsewhere is particularly true where water is involved. The article on page 8 illustrates how run-off from farms can impact on beaches while the article on pages 4 & 5 discusses both the importance of nitrogen for plant growth and the potential downside of excess nitrogen when it gets into groundwater and can

*the Macaulay Institute
is well-placed to
'develop a role as
a facilitator between
policy makers and
land users'*

then move large distances. Our role is not only to identify these linkages but also to ensure that advice on how to avoid these problems is communicated to farmers and land managers through advisory bodies such as the Scottish Agricultural College. The five-yearly external research assessment suggested that the Macaulay Institute was well-placed to 'develop a role as a facilitator between policy makers and

land users' and how we might do this is an area we will wish to explore with both policy makers and land users in the near future.

Finally, April saw a considerable change in the membership of the Macaulay's Board of Governors. Seven members came off the Board and five new members joined it. We have included comments by three of our 'retiring' members who are actively involved in agriculture in this Newsletter. We would like to thank them for their commitment to the Institute over many years and also to thank Mr Douglas Boyd and Professors Malcolm Cresser, Ian Hodge, and David Macdonald, who left the board in March, together with Professors Malcolm Newson and Wilhelm van Riemsdijk who left the Board during 2002 for taking the time to travel to Board meetings and to give us the benefit of their expertise and experience. Brief details of our five new members appear on page 2 and we welcome them most sincerely to the Macaulay.

News in brief • News in brief • News in brief

New Board of Governors

From April 2003, the Macaulay Institute is no longer classed as a Non-Departmental Public Body (NDPB) but we remain a SEERAD sponsored-body. The only change so far is that the Board of Governors is responsible for its own appointments, rather than Scottish Ministers. Seven of the existing Board Members have agreed to continue in their role, and there have been five new appointments:

Prof. Melvin Cannell, Director of the Centre for Ecology and Hydrology at Bush Station in Edinburgh, whose research interests include plant - soil - animal ecosystem functions, climate change and sustainable use of resources.

Mr Michael Gibson, who has over 30 years experience in livestock production in North-East Scotland, and was involved with setting up of the Food Standards Agency (FSA). He currently has responsibility for the FSA in Scotland.

Mr Simon Ingall, a chartered accountant, formerly with KPMG, now with landowning interests, and is a non-executive director of Thistle Mining Ltd.

Prof. Jim Prosser of the Department of Molecular and Cell Microbiology at Aberdeen University, whose research interests focus on soil microbiology. Prof. Prosser has held a personal chair in Microbiology since 1995.

Prof. David Read, Professor of Plant Sciences at Sheffield University, whose research interests include soil microbiology and soil/plant interactions.

The existing members who will continue to serve on the Board are Mr Andrew Raven (Chair), Dr Eileen Buttle, Prof. Mick Crawley, Dr Victoria Edwards, Dr Maurice Hankey, Cllr Bill Howatson and Mr Garry Watson.

How are we doing?

The Macaulay Institute's research programme is given a review every five years by the Scottish Executive, the equivalent of a full service and "MoT". There were three criteria used to assess the Institute's performance: Quality of Science, Knowledge Transfer and End-User Relevance. The review took place over the winter of 2002, culminating in a week long visit to the Institute in January 2003. The final report from the Visiting Group will be used to set a course for the future.

Enterprise Culture

The Institute has set up a new commercial arm aiming to provide services based on the Macaulay's expertise. Macaulay Enterprises Limited (MEL) is a new subsidiary of the Macaulay Development Trust which has the aim of taking relevant Institute research to the commercial sector. All profits generated through this venture will be re-invested into the Institute through the Trust, to support future research projects.

Neil Lindsay, MEL's Chief Operating Officer, said "We are aiming to provide commercial services in three sectors in which the Macaulay Institute has significant knowledge and expertise. We will continue to expand the Analytical Services provided to the oil industry, while also diversifying into other sectors: our Renewable Energy Services will offer everything from site planning and environmental impact assessments to policy advice, and we intend to develop new services for Waste and Contaminated Land Management."

The strategy is to tap into the existing knowledge base within the Institute bringing in consultants to help deliver contracts. Prof. Maggie Gill said "The growth areas of renewable energy and waste management in particular provide exciting opportunities to make the results of the high quality research done at the Institute available to the commercial sector. We are keen to promote the enterprise culture within the Institute, while recognising that the primary function of our scientists is to produce high quality research outputs."

For further information about Macaulay Enterprises Ltd. contact Neil Lindsay on 01224 498265 or n.lindsay@macaulayenterprises.co.uk

Economic impacts of Foot and Mouth Disease outbreak in Scotland

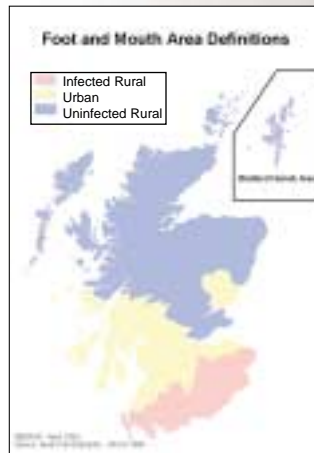
by Ayele Gelan*

In 2001 the UK experienced the worst outbreak of Foot and Mouth Disease in recorded history and Scotland did not escape the consequences. The outbreak was principally contained in the Dumfries and Galloway and Borders regions. Some 187 farms were confirmed as being infected with Foot and Mouth disease and in all, 735,000 animals were slaughtered in Scotland. However, the disease had indirect consequences that were felt over a much wider area and the Macaulay Institute has been involved in research, commissioned by the Scottish Executive, to quantify the likely economic impact from 2001 to 2006.

Perhaps the most important finding of the research is the relatively small change in the total Scottish Gross Domestic Product (GDP). The net reduction in the Scottish economy as a whole in 2001, caused by the effects of the outbreak, is estimated at £33.5 million. This figure was produced using a system wide economic model and represents 0.05% of Scottish GDP. The largest proportion of this change is explained by the export ban on animals and meat products, where the reduced activity of the meat-processing sector caused a chain reaction of reduced demand for services, felt by the rest of the economy.

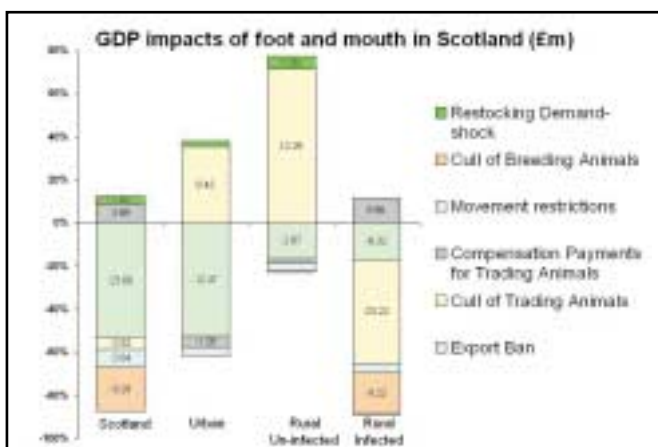
The overall predicted impact on the Scottish GDP does, however, hide important differential impacts across regions, particularly between urban and rural areas. The estimated negative GDP impacts are strongly skewed towards the "rural infected" regions: apart from benefiting from government intervention via compensation payments for trading animals, all the other impacts of the disease on agriculture generated a negative GDP change in these areas. The restocking of farms generated a positive stimulus to the "uninfected rural" and "urban" regions. Also the direct impact of the cull on restricting the animals coming to the market had a positive impact in uninfected areas. This was not enough to offset the negative impacts for the "urban" region, primarily from the export ban, but a small increase in activity was registered in the uninfected rural area.

The direct and adverse impact of the outbreak also affected tourist expenditure. Tourist activity was reduced through the



restricted access to the countryside imposed during the outbreak and the image of the country was adversely affected for foreign tourists. However, the reduced Scottish tourism and daytrip activity in Scotland is thought to have increased household consumption on other goods and services. In aggregate the model predicts employment losses (by about 1,700 jobs) in the two rural regions, but a significant employment gain to the urban region (by 1,400 jobs). The net impact on Scottish jobs via reduction in tourist expenditure is therefore estimated as a decline by 300 jobs.

Focussing on quantifiable economic impacts of the Foot and Mouth Disease outbreak, the model suggests that the overall impact on the Scottish economy is likely to be relatively small. However, the damage to key sectors of the economy and a number of rural locations should not be lost in the headline figures.



Calculating the impacts

A specially adapted version of the Fraser of Allander Institute's Computable General Equilibrium model, AMOS (A Macro-Micro Model Of Scotland) was used to investigate the impacts of the Foot and Mouth Disease outbreak, using information from existing studies and official reports. This modelling procedure (capturing multipliers, labour market displacement and competitiveness effects) produces national and regionally disaggregated results on a wide range of economic variables.

The direct and indirect impacts on agriculture are broken down into six separate components: the export ban; the production implications of the cull of trading livestock; the compensation payments for trading livestock; the implications of the movement restrictions; the production implications of the cull of breeding animals; and the demand implications of the replacement of breeding livestock.

Further information on this report can be found at: www.scotland.gov.uk/

*Authors of the main report also include: Kim Swales (Strathclyde University) and Deborah Roberts (Aberdeen University)

Nitrates in the environment

by Allan Lilly

THE ROLE OF NITROGEN

Nitrogen is a vital element for all organisms, it is necessary for building proteins in plants and animals and is found within DNA.

Nitrogen comprises about 80 percent of the atmosphere but plants can only utilise nitrogen in the form of ammonia or nitrate. In natural ecosystems, this conversion is done by micro-organisms but in modern agriculture, the organic and inorganic forms of nitrogen in fertilizers are needed to produce the food we eat.

As Nitrate is highly soluble, any remaining in the soil after the crop has ceased to grow or has been harvested is liable to leaching. As the use of nitrogen fertilizers has increased, then the amount of nitrate available for leaching has also increased.

THE NITRATE DEBATE

It has been estimated that between 50 and 70 percent of nitrate in water comes from agricultural sources with the remainder from sewage discharge, recreational ground and gardens. There is a continuing debate about the effects of increased nitrate levels in the ground and surface waters. An increase in nitrate levels (eutrophication) has been associated with increased algal growth. It is thought that increased levels of nitrate may have more effects on the ecology of shallow coastal waters.

Work by the World Health Organisation implied that the consumption of potable groundwater with excess nitrate over a prolonged period may be detrimental to the health of certain vulnerable groups. However, despite many studies, the link between nitrate levels in drinking water and ill health has not been proven.

LOOKING FOR A SOLUTION

In 1991, the European Community issued the Nitrates Directive (91/676/EEC) in order to protect aquatic ecosystems and sources of potable water such as rivers, lochs and groundwaters from the effects of nitrate lost from agricultural land. The Directive stated that waters that exceeded, or were likely to exceed, a nitrate concentration of 50 milligrams per litre should be identified and their catchments designated as Nitrate Vulnerable Zones (NVZs). Measures should then be taken to reduce the amount of nitrate leaching from agricultural practices within these catchments. Of the private water supply abstractions in Scotland where nitrates were measured, about twelve percent exceeded 50 milligrams per litre and a further 6 percent had levels greater than 40 milligrams per litre.

“...the designated Nitrate Vulnerable Zones reflect the areas that were identified by the model as having the greatest leaching losses...”

Until recently, only two Nitrate Vulnerable Zones had been designated in Scotland and 68 in England and Wales but in 2000, the European Court ruled that the UK Government was in breach of the Directive. This was because the vast majority of these NVZs were designed to protect potable groundwater supplies rather than all waters as required by the Directive. As a result, there was potential for fines of around £50 million per annum.

As it was a devolved issue, the Scottish Executive was charged with the implementation of the Nitrates Directive in Scotland. The Macaulay Institute undertook a significant proportion of the work to identify potential NVZs, following a successful tender for the contract.

Although there was good information available on the level and distribution of

nitrate in surface waters in Scotland, the concentrations in groundwaters was less well known and incomplete. A model was developed and implemented within a Geographic Information System (GIS) to establish those groundwaters likely to be most at risk from nitrate pollution.

The model was developed using the national datasets held at the Macaulay Institute such as soil permeability, land cover and rainfall

together with estimates of typical nitrate losses from individual crops. This information was used to predict where and how much nitrate would leach below the rootzone. This was then overlain with maps showing the rock types that contain groundwater developed by the British Geological Survey, established areas most vulnerable to pollution. [See Modelling Groundwater Nitrate Levels for details of the data used in the model.]

One of the main elements of the Nitrates Directive is that NVZ designation has to be based on the hydrological catchment, so the upstream catchments of high risk areas were selected as potential areas for NVZ designation. The existing data from private and public water abstractions were used to test the prediction of those areas at

risk of nitrate pollution.

PUTTING LEGISLATION INTO PRACTICE

The reports on the modelling work from both the Macaulay and British Geological Survey were made available to the public on the Scottish Executive website, along with proposals for NVZ designation. There was a period of wide consultation within the farming and environmental communities including a number of meetings organised by the Scottish NFU at which the work of the Institute was presented.



- an agricultural challenge

At the end of this consultation period, four NVZs were designated. These cover an area of approximately 13 percent of Scotland (about 80 percent of the cultivated land) primarily in the east from the Moray Firth to the Borders, although Nithsdale will also be designated as nitrate vulnerable.

Within the four areas, Action Plans will be implemented that restrict the spreading of organic fertilisers over the winter months from September to February. It is during these times that the greatest losses of nitrate occur. Farmers will need to take account of the nitrogen content of any organic manures and inorganic fertilisers they apply so that they do not exceed the total amount allowable. The aim is to closely match the nitrogen input with crop requirements and to minimise the nitrate leaching. This will have economic consequences for many farms in NVZs, especially

those where large volumes of slurry are generated. The slurry needs to be stored during the restricted period and it is likely that larger storage tanks will be needed to accommodate this.

Even soils that receive no nitrogen fertilisation will leach nitrate through natural processes and the nitrate already in the groundwater may take years to reach the river network. Therefore, any environmental benefits of changes to agricultural practice are unlikely to be seen in the short term. With the improved monitoring of both surface and groundwaters, more good quality data will become available that will allow us to test more sophisticated models to explore and understand the effects of land use on water quality. This will enable policy makers to make more informed decisions and help land managers in their long term stewardship of the countryside.

MODELLING GROUNDWATER NITRATE LEVELS

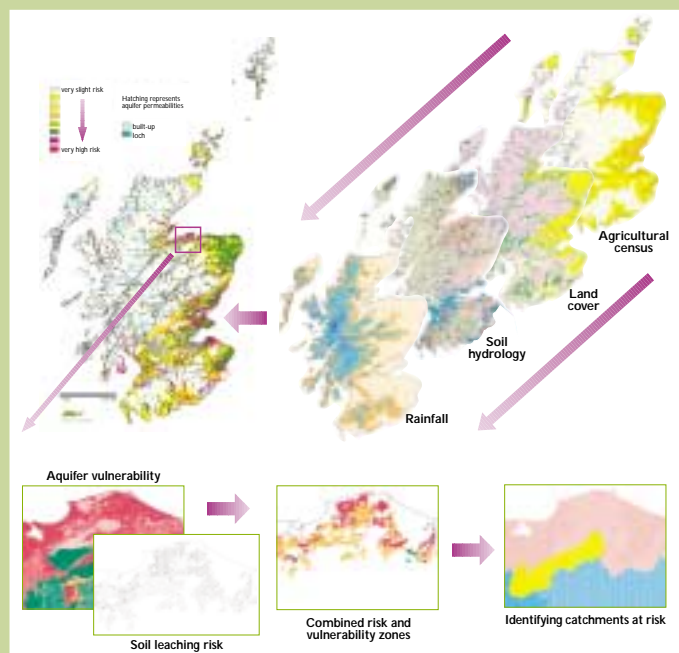
The model was developed by the Macaulay Institute and makes use of the annual Agricultural and Horticultural Census data collected by the Scottish Executive. The average proportions of crops grown in each Parish over the period 1989 to 1999 were calculated. Each crop type was allocated a value related to the amount of residual nitrate available for leaching at the end of the growing season or after harvest. These values were spatially distributed throughout the parish using four broad land use categories (arable, long ley grassland, woodland and semi-natural vegetation) in addition to urban determined from the Land Cover of Scotland (LCS88) dataset.

This information was combined with rainfall figures and a hydrological classification of soils to apportion flow to groundwater or surface water, within the GIS. The resultant map showed the relative nitrate concentrations leaching to groundwater for the whole of Scotland with a resolution of 100 x 100 m grid.

The model was designed to estimate only the likely leaching of nitrate from agricultural cropping or grassland. It did not take account of point sources (such as intensive livestock units) nor of nitrates derived from urban, suburban or recreational land (such as golf courses). These sources could of course lead to localised contamination of groundwater.

This model predicted the relative amounts of nitrate that would leach below the rootzone but certain geological and drift formations may help protect underlying aquifers and groundwaters. The predictions of nitrate leaching were therefore overlain with aquifer permeability maps developed by the British Geological Survey to determine those areas of groundwater most at risk of pollution.

The most vulnerable areas occurred where there was the potential for nitrate to leach from the soil and where the underlying aquifer was permeable and unprotected by overlying less permeable geologies.





Sampling Loch Harrow in the Galloway region.



Monitoring slope erosion on Skye.



Dialogue Days: Titus Barthrum discusses his research at Hartwood Research Station.

Photo Gallery



Ythan Project Fun Day at Fyvie, March 2003. Members of the public try their hand at Dr Miller's Countryside Change Toolkit.



RECIPE (Reconciling commercial exploitation of peat with biodiversity in peatland ecosystems): European partners at Lambhill Moss (New Pitsligo) discuss peatland restoration strategies.



TechFest 2002: Professor Miller explains the "toolkit" at Techfest 2002, Aberdeen.



Demonstrations of "lifetime reproductive performance of sheep" at the Bronydd Mawr Open Day, June 2003.

Bathing waters and farmyards, a research link?

by Tony Edwards



Although it may come as a surprise to many people Scotland does, in fact, have a bathing season, which runs from the 1st June to mid September. Ensuring good bathing water quality is obviously important from a human health aspect but there are also knock-on economic impacts through tourism where, for example, "blue flag" status for beaches is important.

Water quality for bathing waters is assessed on the concentrations of various pollutants: faecal contamination, for example, is measured using "faecal indicator organisms". These indicators can be present in the water as a result of human sewage or agricultural waste, and concentrations of these indicators are measured during the bathing season. The Scottish Executive is committed to ensuring that water quality meets the standards of the European Bathing Waters Directive (76/160/EEC) for all 60 of the bathing waters around Scotland's coast.

One region of particular current interest is the Ayrshire coast, where local beaches have failed to meet the bathing standards. It has been demonstrated that agricultural pollution is partially responsible. In this area, non-compliance commonly follows after a period of significant rainfall, which suggests that the pollution is derived from local catchments. One important feature of this area is the high proportion of grassland and livestock enterprises (especially dairy) and the relatively high rainfall exacerbates the pollution problem.

As a means of tackling the issue, the Macaulay Institute has been working with the Centre for Research into Environment and Health at the University of Wales, Aberystwyth to quantify the impact of water runoff from farmyards on river water quality. This complements work being undertaken by the Scottish Agricultural College which is looking at pollution by runoff from fields.

With the help of the local National Farmers' Union Scotland, four farms within the River Irvine catchment were identified and intensively sampled during a period of the 2002 bathing season. Three types of samples were collected and analysed: runoff from steading roofs, yard hardstanding runoff and adjacent open streams or channels. Three of the farms had cattle present throughout the period of investigation providing a continuous fresh supply of "pollution".

Preliminary results clearly indicate the potential significance of farmyard runoff, particularly during storm events and the magnitude of this likely contribution is being assessed relative to other 'sources'.

This is an example of where new research is helping to provide information on the impact of agriculture on the environment and provide a focus for cost effective remediation actions feeding into practical solutions such as the Four Point Plan which contains simple guidance on reducing dirty water around the farm; improving nutrient use; carrying out a land risk assessment for slurry and manure and managing water margins.

Finding the source of the problem

Agriculture has been generally implicated in the widespread reduction in quality of surface and groundwater. Effluent from domestic and industrial sources is also often discharged directly into rivers and, despite ongoing efforts, this may still be a significant source of pollution during periods of low summer river flows.

Although an over-simplification, many 'point' sources tend to deliver a reasonably continuous loading to rivers. In contrast, contaminants derived from the wider catchment are often more dynamic and episodic, tending to respond to storm events. The contaminants reach rivers through a combination of surface runoff and subsurface drainage and are derived from multiple sources. As a result, it is difficult to measure contributions from individual sources which may in fact vary seasonally as they respond differently to climatic factors and farm management practices.



For further information try the following:

www.blueflag.org

www.creh.org.uk

www.sac.ac.uk/info/External/Publications/4PointPlan.pdf

www.sepa.org.uk/data/index.htm

www.scotland.gov.uk/library5/environment/sbws-00.asp

Matching livestock breeds to their environment

by Iain Wright

Until recently the breeds of livestock used in our agricultural systems have been chosen on the basis of their high levels of productivity and output. In the 1960s and 1970s there were waves of importations of beef cattle and sheep breeds, especially from continental Europe, beginning with the introduction of Charolais cattle from France. When prices for livestock products are buoyant the high levels of inputs, especially feed, required by highly productive animals can be supported. However, prices for most commodities have dropped considerably in recent times with the result that production costs, including fixed costs must be reduced. There is also increasing concern about the impact of some agricultural practices on the environment.

One way that farmers could adapt to the new economic and environmental circumstances is by matching the breed of animal more closely to the environment in which it is reared. Farmers have previously been encouraged to modify the environment for their livestock in order to support highly productive breeds. This has included providing large quantities of feed, often in the form of bought in concentrates and these breeds have also generally required intensive husbandry, especially during lambing or calving. These practices may need to be reviewed in order for farm businesses to remain viable and to minimise the environmental impact of agriculture.

There is a lot of anecdotal evidence that certain breeds are more suited to particular systems, but it is difficult to find hard evidence to support this idea. Research conducted by the Macaulay Institute, in collaboration with the Institute of Grassland and Environmental Research at the Bronydd Mawr Research Centre in Wales has started to provide this hard evidence.

Charolais-cross and Welsh Black yearling steers grazed

either an upland grass/white clover permanent pasture or an area of semi-natural vegetation dominated by Molinia (moor grass). There was little difference in the performance of the two breeds when they were on the permanent pasture. However, on the Molinia-dominated pasture the live-weight gain of the Charolais-crosses was considerably lower than that of the Welsh Blacks.

The exact reason for the variation between the breeds is not clear, but it has been suggested that there are differences in the way that different breeds forage on hill vegetation. This may be because of how the animals have learned to forage or may be due to genetic differences. If the latter is the case then there may be advantages to farmers in selecting a breed that can fully exploit the range of vegetation on a particular area of hill and so reduce production costs. Such differences in foraging behaviour, resulting in particular patterns of vegetation selection, may have long-term consequences for the vegetation, but this is an area that requires to be researched further.



Liveweight gain (kg per day) of cattle on different pasture types

Reaching out from the Research Stations

by John Milne

The Macaulay Institute's research stations have an important role to play in passing on knowledge from our research programme to others and in providing a platform for gathering the views of the users of our research.

We manage three research stations in Scotland, and co-manage a fourth in Wales in partnership with the Institute of Grassland and Environmental Research (IGER), Aberystwyth. The research stations are all upland or hill farms with different soil types and semi-natural vegetation communities that typify much of the agricultural resources of Scotland and Wales and are located where rural sustainability and environmental management are key issues. Whilst they are primarily used to provide research resources, they are managed to a high standard and therefore provide examples of good agricultural and environmental practice.

Enterprising ideas

The research stations provide good opportunities for the agricultural industry to learn about alternative enterprises to beef and sheep production from the uplands.

At Glensaugh there is a long established red deer enterprise where best practice systems are demonstrated. The British Deer Farmers Association visited in June as part of their annual meeting with the particular aim of attracting new entrants to deer farming.

At Sourhope, the largest cashmere goat enterprise in the UK also provides a good example of a well tried system of effective management. The herd also provides the elite breeding stock for Cashmere Breeders Ltd and so the best examples of cashmere goats can be observed.

Both these enterprises produce products that have a high consumer demand and, in relation to the proposed changes in the Common Agricultural Policy, there are likely to be increased opportunities for diversification into venison and cashmere production.

The Institute has also been exploring farm woodland opportunities over the past two decades. At Glensaugh and Bronydd Mawr there are good examples of Agroforestry systems which have now been in place for almost 20 years. These demonstrate how sheep and tree production can coexist with one another and how incomes can be maintained from sheep whilst the tree crop is growing.

At Hartwood the coppicing of willow and alder for "biomass" production has been studied with the willow and alder plantations being maintained after the research had been completed. The plantations demonstrate the productivity of these tree species on the wet soils found in much of the central belt of Scotland.



Environmental ideas

Work at the Bronydd Mawr Research Centre highlights best practice for sheep and cattle production in relation to environmental management. This is another important direction that the Common Agricultural Policy is taking the farming community. Examples of long-term extensification of grazing of pastures and their impact on plant diversity are found at Hartwood and Sourhope. Glensaugh is also used to train staff from the environmental agencies in the identification of indicators of good habitat condition for semi-natural upland vegetation communities grazed by sheep and deer.

Developing research ideas

The research stations also have a role to play in the exchange of information and views with key end-users of the Institute's research. They provide a venue where such interactions can take place in a relaxed and informal manner and where end users can see the Institute's practical experience of land management issues. Dialogue days with end users were held at Glensaugh and Hartwood in 2002 and one is planned at Sourhope in September of this year. These have provided valuable insights from others that have helped the development of the Institute's research programme and they have also been important in cementing closer links with the local communities around the research stations.

For more information about visiting our research stations please contact:

**Jane Lund (Events Manager) tel. 01224 498200
j.lund@macaulay.ac.uk**

Insiders' views of the Institute

With the change in structure of the Board of Governors, we thought we would take this opportunity to find out how the retiring Governors from farming backgrounds view the Institute and its relevance to the agricultural community.

John Don

I joined the farming community in the 1960s and now, in partnership with my wife Elizabeth, we run two units totalling over 1,000 acres including arable crops, 200 suckler cows and 1,200 store lambs. My appointment to the Board of Governors of a Research Institute came as somewhat of a surprise to me, but in my seven years on the Board I tried to make a full contribution to the various committees on which I served. I have been particularly keen to encourage the educational work of the Institute with schools, and to raise the profile of the Institute with the wider public.



I think that traditionally it has been difficult for individual farmers to commission research, mainly through lack of resources. However, it has been reassuring to see the efforts made by the Macaulay to engage with people in the various communities of interest. I think that their role in the designation of Nitrate Vulnerable Zones is a good example of this, where the scientists were able to provide advice to policy makers in the Scottish Executive and also explain the issues to farmers.

Looking to the future, I think that there are many opportunities for the Macaulay to bring benefits to the farming community. Research will be needed on the impacts of UK legislation Common Agricultural Policy reform and EU Directives on the land and people, as well as working with other organisations to improve the quality of advice given to land managers. Whilst the Macaulay will always be judged on the quality of its science, I think that it has to continue engaging with a wide range of people to translate that research into tangible benefits for society and the environment.

Marina Dennis

I first joined the Board of Governors in 1994 and served for nine years, taking a particular interest in the practical application of research done by the Institute. As an active crofter and hill farmer in Strathspey, I hope that I have been able to bring a common sense and practical viewpoint to the Board.



I feel that the work of the Macaulay Institute has real relevance to crofters, especially where the research is transferred from other study areas. For example work

on deer management benefits those who croft on estates with multiple land uses, through better land management. The "land capability classification" data are of tremendous value in assessing common grazings, and I have often found it a useful resource in my continuing role as a Board Member of the Crofters' Commission.

Crofting has given rise to some of the best loved rural landscapes in Scotland through the social and agricultural systems that have been in operation since the 19th Century. It is sometimes seen as a part-time occupation but crofting is much more a way of life and a sense of belonging, both to the land and the community. With its remit for researching the impacts of rural land use, the Macaulay Institute is well placed to help crofting communities adapt to the changing needs of society, agriculture and the environment. Conversely, from a crofting perspective, future challenges for the Institute could include developing a better understanding of the socio-economics of crofting communities and their sustainable development, and research into the value of crofting "by-products", such as the landscape and environmental qualities of the "Crofting Counties".

Willie Porter

Like many farming families, agriculture is part of our history, and hopefully our future. Since taking on my father's tenancy at the age of 21, I have continued to expand my agricultural activities, which now include soft fruit, potatoes, grain, cattle and sheep production as well as ownership of an estate in Glen Lyon. It was perhaps this diversity of interests that helped my appointment to the Macaulay's Board of Governors in 1995. I have always been aware of the need for innovation, research and development in agriculture and I hope that I used this practical perspective to good effect in my time as a member of the Board.



Today, environmental concerns appear to have become as important to society as food production, and I think that the Macaulay Institute is well placed to play a prominent role in this area. As well as continuing to undertake high quality research, I think it is important for the Institute to engage with different sectors of society on land management issues.

Perhaps the greatest challenge for the Institute is to find ways of communicating the message to a wide audience, where necessary breaking out from traditional ways of passing on information, to provide practical advice and guidance to farmers and other land managers.

Working together for a better local environment

by Tamsin Morris



The partnership approach is commonly advocated as "the new way forward", with groups of organisations working together to achieve a common outcome. The Ythan Project is an example of this approach, where the partners include the Macaulay Institute, Aberdeenshire Council, Forest Enterprise, the Formartine Partnership, the River Restoration Centre, Scottish Environment Protection Agency, Scottish Natural Heritage and the Ythan District Fishery Board.

The Ythan Project is focused, unsurprisingly, around the river Ythan, located in north-east Scotland and aims to involve local people in protecting, restoring and enhancing the river. By international standards the river is very small, and yet almost every farmer in the UK will have heard of the Ythan as the catchment of the river Ythan was designated as Scotland's first large scale Nitrate Vulnerable Zone in May 2000,

following months of debate. As the Ythan shot to fame as the latest political hot potato, a local group, known as the Formartine Partnership, responded to the new interest in the river by producing a management plan for the area, based on the ideas and suggestions made by local people. The Ythan project has been working since August 2001 to deliver those ideas, with financial assistance from the project partners and the European Life Environment fund.

Approximately 95% of the land in the Ythan catchment area is in agricultural usage, and so restoring the river can only be done in conjunction with local farmers. The project is working with these farmers in three ways, firstly by providing information and guidance on agri-environment schemes and how they might be applicable to an individual's farm. The project is also bringing nutrient budgeting to farmers in the catchment area, and has just completed some bespoke computer software which will enable Ythan farmers to undertake budgets on their own



A fenced buffer strip on the River Ythan - one of the agri-environment options being promoted by the project.

farms, on a field by field basis. The project can provide training in how to use the software, as well as undertaking paper based budgeting exercises for farmers less keen on the computer age! Finally the project is also providing information to farmers on the various rules, regulations and recommendations associated with farming next to a burn or river.

As well as with working with farmers on an individual basis, the project is also involving the wider community in river related actions, including practical work on the river, tree planting, survey work, water sampling and a host of other activities.

The Ythan Project is funded until February 2005 and will then report back to the European Commission. It is hoped that the project can show the increased effectiveness that can be achieved by working with farmers and the local community on a one to one basis, rather than just trying to protect the environment by laying down the law and walking away. The added value of a partnership approach will also be demonstrated, encouraging governments, NGOs, academic establishments and local groups to work together for common goals.

For more information on the work of the project, please contact the project officer, Tamsin Morris, on 01358 726411, or visit www.ythan.org.uk

EVENTS

DATE	EVENT
2-5 September	Off-Shore Europe
8 - 14 September	Techfest 2003
10 October	Macaulay Lecture
13-17 October	Renewable Realities conference, Orkney
27 October	Olympia Energy conference
October - March	Institute seminar series

For more information about forthcoming events please contact Jane Lund (01224) 498200 email enq@macaulay.ac.uk