Scientific research

TESTING TIME: Researcher Elizabeth Williams inspects samples at the Institute of Grassland and Environmental Research at North Wyke before undertaking a series of tests

Dr David Hatch, principal research scientist in the Soil, Environmental and Ecological Sciences Department, at the Institute of Grassland and Environmental Research at North Wyke, near Okehampton, outlines the institute's work

THE Institute of Grassland and Environmental Research is the major UK centre for independent research into grassland and the environment.

The present remit of North Wyke is:

- To advance the understanding of interactions between soils, animals and plants and the wider environment, with emphasis on grasslands and related communities
- To improve the scientific basis for reduced input forage production systems which are both biologically and economically sustainable
- To determine optimal strategies of land-use and associated activities which satisfy both agricultural and environmental criteria

Research programmes are directed not only at resolving current practical and scientific problems, but also at meeting the nation's needs over the medium to long-term.

Our major customers are central government departments, with research at present funded largely by the Department for Environment, Food and Rural Affairs (Defra). Several jointly-funded programmes are undertaken with European partners and are supported, in part, by the EU. Contract work is also undertaken for other government agencies and commercial organisations, where such work falls within the expertise or interests of the research station.

Collaboration is a feature of much of the work at North Wyke. Our research is conducted with many UK research institutes and universities as well as the other IGER sites and with organisations

CHECKS: Dr David Hatch, a principal research scientist at North Wyke, whose role includes kee

plays a vital role

PICTURES:STEVEN HAYWOOD

● **WIRED UP:** Laura Cardenas (left) and Jane Hawkins with equipment designed at North Wyke that measures levels of greenhouse gases

such as ADAS, English Nature, Environment Agency and the Forestry Commission. North Wyke is an Associated Institute of both the University of Plymouth and the University of Reading. The research station is a LEAF Innovation Centre.

A large number of visiting scientists from many overseas countries have worked at North Wyke and our research has attracted a high level of international interest and collaboration. In recent years many links have been forged with researchers in other EU countries, Eastern Europe, Commonwealth countries and North and South America.

North Wyke has built up a reputation for scientific excellence. Major advances have been made in our understanding of the efficient management and utilisation of permanent grassland by grazing cattle and sheep, the potential for low input legume-based swards, and of nitrogen and other nutrient transformations and transfers within and from grazed grassland.

Facilities at North Wyke allow researchers to tackle questions ranging from understanding processes at the molecular level, to practical implications. There is an expanding soils and ecology programme. Central to our research interests are the ecology of grassland and related habitats, the implications of changing patterns of land use and agricultural practice, strategies to limit pollution, the impact of climate change and techniques for improving species diversity.

"The Grassland Challenge offers access to a combination of local knowledge, training skills, and world-class expertise"

There is also work on birds and invertebrates in grassland.

Major interest areas include the efficiency of grass utilisation by grazing, understanding and manipulating nitrogen and phosphate transformations in grassland, increasing nutrient use efficiency, reducing losses to the environment and improving the utilisation of animal manures and other organic wastes.

A major new initiative was launched in 2003 to address the future needs of grassland farmers. The main aim is improving grassland and forage management through knowledge and technology transfer, and to improve farm profitability on a sustainable basis. The Grassland Challenge is a joint venture involving IGER, Duchy College, and the five Cornish Grassland Societies. It offers access to an unrivalled combination of local knowledge, training skills, and world-class expertise in grassland and livestock management.

The project team has secured £1.5 million funding to benefit the Cornish agricultural industry, by providing technical support services over three years and is linking up with more than 600 farmers.

This is an exciting opportunity for the project partners to have a lasting impact on the sustainability of Cornish agriculture at a crucial time in the development of the industry.

We are keen to get best practice recommendations, arising from research, across to the farming community. The direct connection from research to application is an important challenge, but provides an exciting opportunity for North Wyke Research Station and its partners, to be involved in contributing to sustainable changes for the region's farmers.

The Grassland Challenge is organised around a network of 12 farmers' focus groups and nine focus farms. Dairy, sheep and beef production are all represented. The focus groups serve as centres for information exchange, and are supported by extension officers employed by the project. There are two demonstration units, where innovations, such as new techniques or plant varieties, are being tested under local conditions.

The project team organises workshops, open days, seminars and other events, where farmers can discuss and analyse new information. Technical bulletins, a newsletter and a website help the flow of information, and individual farm visits are a popular forum for discussions and demonstrations.

The project employs four extension officers. This is an Objective One-funded project, currently operating in Cornwall, but there are plans to extend it across the entire South West region.

balance between land use and the environment

Challenges of soil management

Changing weather patterns will affect farming practices says Richard Smith, Principal Officer for Land Quality at the Environment Agency South West

FARMERS are always taking risks with the weather, asking themselves: "Is the land dry enough to travel on, is it too wet for harvest, is the seedbed going to be weather-proof?"

Westcountry weather records over the last 40 years show us that it has become wetter during the winter and drier in the summer. Intensity of rainfall has also increased. This may be a blip in the long-term trend, but climate scientists say that this is an indicator of global warming. They also predict that this pattern of extremes is likely to increase.

A big challenge will be soil management in difficult weather conditions to ensure profitable crops and protect the environment.

Every good farmer knows that timing is everything when it comes to working the soil. There is an optimum time to till the land when soil conditions are just right.

Judging this is a real art and changing weather is making it difficult for farmers. If conditions are not good then large areas of land can become relatively sealed, leading to excessive run-off, flooding and pollution problems due to wash-off of manures, pesticides and fertilisers.

Of course there are times when farmers have to go on the land during wet conditions to harvest winter crops and to feed out-wintered stock. Any soil damage is removed in due course by cultivation. But if it rains heavily before any remedial land work, run-off can be severe. In short, farmers are up against the weather.

Farmers are ever resourceful and can adapt with the weather. In future they will need to look at their land and think about the risks. They must ask themselves:

- Is the land too steep?
- Are there ways to use crop cover to protect the soil against the batter of the rain?
- Can soil be loosened to remove compaction?

There is always a technical answer – but finding the economic answer is not so easy. Hopefully farmers can work in partnership to recognise the problems and to find solutions.