

# Annual Report 2013 & Financial Statements







# Introduction

The 2013 Annual Report is built around the goals outlined in the Teagasc Statement of Strategy. Examples of key achievements and developments for the Research, Knowledge Transfer and Operations directorates are described in the context of these goals.

## Contents

Introduction	1
Chairman's Statement	2
Report of the Director	4
Authority Members	6
Authority Committee Members	7
Senior Management	8
Organisational Chart	9
Office Locations	10
Review of the Year	11
Goal 1 - Improve the competitiveness of agriculture, food and the wider bioeconomy	13
Goal 2 - Support sustainable farming and the environment	31
Goal 3 - Encourage diversification of the rural economy and enhance the quality of life in rural areas	39
Goal 4 - Enhance organisational capability and deliver value for money	47
Financial Statements	57
Notes to the Financial Statements	68

*Edited by Mark Moore*

# Chairman's Statement

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*Teagasc had a busy and productive year in 2013. At farm level farmers had a mixed year, depending on their individual enterprises. Dairying continues to offer the best returns for producers and is on the verge of entering a new era with the removal of milk quotas in 2015. The other enterprises present more challenges at farm level for producers to earn adequate returns on their land, labour and capital employed.*

The preliminary estimates from the Teagasc National Farm Survey 2013 showed that the average income level on Irish farms increased slightly in 2013 (up 1%) to €25,639. The stability in the average level, however, masks dramatically contrasting fortunes across the different components of Irish farming. Average dairy farm incomes increased but incomes for all the other enterprises decreased.


Cattle rearing family farm incomes declined by 22% due to higher production costs. Incomes on other cattle farms and sheep farms declined by 13% and 39% respectively in 2013 due to lower levels of output combined with higher costs of production. On tillage farms, despite largely stable costs of production and higher yields, lower prices and lower hectares harvested led to lower output and lower family farm incomes. Farm incomes on specialist dairy farms, despite large increases in costs of production (+11%), increased strongly due to a combination of higher prices (+23%) and increased levels of milk output per hectare (+11%).

Teagasc continues to focus on developing technologies to assist all sectors become more competitive. One such example is the new cattle genotyping panel. Developed by Teagasc in collaboration with ICBF and Weatherbys, a new genotyping platform (SNP chip) called the international dairy and beef SNP chip is available for use in dairy and cattle breeding. This new panel is being used in 2014 as part of the new Beef Genomics Scheme.

The development of new cheese technologies was another major initiative. Teagasc has developed a new cheese technology platform that allows the manufacture of cheeses from reassembled milk formulate from dairy ingredients, and has already been used by one major dairy company.

Grass has long been recognised as one of the country's most valuable resources and gives Irish dairy and beef producers the comparative advantage they enjoy relative to other production systems.





Teagasc is leading the way in the establishment of a national grassland database (PastureBase Ireland) launched in January 2013. This allows the measurement and evaluation of grasses on commercial farms in real production environments.

Teagasc has developed the largest high-throughput DNA sequencing centre in Ireland for food innovation. This facility is available to other research organisations and to the industry in general and has made important contributions in a number of areas. One example is a collaboration with a food company where the technology was used to identify microorganisms which were contributing to food defects and causing significant wastage.

As new entrants and existing dairy farmers are preparing to develop and expand their businesses, Teagasc advisers, along with the organisation's financial and dairy specialists, have held several farm planning workshops to assess the requirements and the risks involved in successfully expanding a modern dairy farming enterprise. This is a valuable service for young and developing farmers which will help them avoid potential future shocks related to the market or from the weather.

Teagasc research continues to be recognised for its high quality and 381 A1 refereed scientific papers were published during the year. These are available through T-Stór, Teagasc's Open Access Repository. Eighty nine research projects were completed and 76 technology updates were published.

The increased level of demand for Teagasc-run education courses has been sustained and there were 3,700 students on courses in the 2013 academic year. The demand for agricultural education continues unabated. CAP proposals introducing top-up payments to CAP Basic Payments Scheme for young farmers is generating exceptional demand for Teagasc part-time and distance/online education courses for 2014.

Total Teagasc income for 2013 was €163.16 million, excluding net deferred funding for pensions. The net surplus for the year was €330,000 on the current account. Transfers for capital expenditure of €1.53 million left a deficit for the year of €1.20 million. The balances at year end were €9.03 million. Six offices at New Ross, Baltinglass, Moate, Bagenalstown, Tipperary, Rathdowney and a small area of land in Athenry, were sold.

I would like to thank the Minister for Agriculture, Food and the Marine, Simon Coveney TD and the Minister of State, Tom Hayes TD for their support for Teagasc research, advisory and education initiatives undertaken during the year. Teagasc has worked closely with the Department of Agriculture, Food and the Marine led by the Secretary General Tom Moran, along with stakeholders in the sector to lead the development of Irish agriculture and food. This is a positive time for Irish agriculture with opportunities to expand and develop.

During 2013 there were a number of changes to the Teagasc Authority. In September the Minister appointed Alan Jagoe and Prof. Ger Fitzgerald to the Teagasc Authority while Pádraig Gibbons was reappointed for another term. Frank O'Mahony stepped down having completed his term and I thank him for his valued contribution to Teagasc as a member of the Authority during his term. I would also like to thank Eddie Downey for his contribution and welcome the appointment of Tim O Leary in February of 2014.

I would like to thank the Director, Prof. Gerry Boyle, his management team, and staff for their hard work, contributions to the organisation, their commitment and dedication to working for the improvement of the Irish agri-food sector.

**Dr. Noel Cawley**

Chairman of the Teagasc Authority

# Report of the Director

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*The agriculture and food sector faced a number of challenges during 2013 and Teagasc were quick to respond and support the sector through the difficulties. Poor weather in the spring of the year left many farmers short of feed due to cold temperatures and resultant poor grass growth. The Teagasc response on the ground was decisive, helping farmers come through this period and subsequently in rebuilding their fodder stock.*

The Teagasc National Farm Survey showed that poor weather in the first quarter of 2013 and the continuing impact of the 2012 fodder crisis led to dramatic increases in feed and fertilizer expenses for all grassland based farming systems. Farmers' expenditure on purchased concentrate and bulky feed increased dramatically, while in the second half of 2013 expenditure on fertilizer increased as farmers worked to rebuild depleted stocks of conserved forage. On average, direct costs of production increased by 11% when compared with 2012.


In the forestry sector the emergence of Chalara, a disease of ash trees, caused difficulties for many forest owners and again the Teagasc response in working with farmers affected, and with the industry, has helped to manage this disease problem. The Teagasc response was part of the All Ireland Chalara Control Strategy published by the Department of Agriculture, Food and the Marine and the Department of Agriculture and Rural Development in Northern Ireland.

In animal production, a number of important initiatives were taken to improve the competitiveness of the agricultural sector in the longer term. These included the establishment of a Next Generation dairy herd at Teagasc Moorepark, a Beef Maternal Index herd in Grange and Teagasc participated in a large scale on-farm dairy sexed semen trial. All these initiatives are significant in advancing animal breeding in the national dairy and beef herds.

Knowledge transfer activities by Teagasc advisers centred on farmer discussion groups through the Beef Technology Adoption Programme (BTAP) and Sheep Technology Adoption Programme (STAP). There are now over 800 farmer discussion groups involving over 12,500 farmers. Research has shown that farmers who participated in dairy discussion groups achieved higher levels of performance in their businesses than those that didn't.

It has also been shown that farmers who use the Teagasc eProfit monitor are more profitable than those who don't measure their financial performance. The Teagasc advisory service has renewed multi-year joint programmes with all the major dairy processors, which ensure that the Teagasc dairy business and technology service is aligned with the needs of farmers and stakeholders.





An innovative beef and sheep knowledge transfer programme has been rolled out, which is the first such programme between farmers, advisers, a food processor and a food retailer, involving Super Valu, Kepak, Teagasc and a group of individual farmers.

The Food Research Programme continues to partner and work with food businesses. The Teagasc Food Technology Transfer Office has deepened the relationships with food companies through the introduction of Teagasc Customer Relations Managers (CRM) to liaise directly with individual companies. Through the Food Gateways events, technologies and expertise from Teagasc which are available to the industry, are displayed. A new cheese was developed with the Irish Dairy Board and launched on the Saudi Arabian market in October. It's one of a pipeline of new products being developed as part of this relationship.

Teagasc has supported the environmental sustainability agenda through the setting up of a sustainability farm in the Teagasc College in Kildalton in Kilkenny. This farm will be used to demonstrate to farmers how they can sustainably intensify their farms. Roll out of the Teagasc Carbon Navigator commenced through the advisory service.

The Teagasc heavy soils programme, involving commercial farms, is demonstrating how farmers on marginal soils can optimise grass production from their land. This programme coupled with the Teagasc Manual on Land Drainage produced last year is an important resource for farmers.

Teagasc entered into a new contract with Goldcrop, a commercial partner to distribute and promote grass seeds from Teagasc bred grass varieties. In 2013 three new perennial ryegrass and two new white clover varieties were awarded Recommended Listings in different countries. These were ryegrasses Carraig, Claddagh, and Giant, along with white clovers, Iona, and Buddy. A further two perennial ryegrasses, GlenRoyal, and Solas, were approved to be added to the Ireland Recommended List, subject to seed availability.

The Teagasc Potato Breeding programme released two new varieties in 2013. Bikini is a main crop variety with agronomic and eating qualities similar to Rooster. Casino is a high dry matter long oval yellow variety which has exceptional eating qualities and appearance.

Teagasc made a number of important submissions which contributed to government policy formulation. One of the most important was in relation to the Department of Agriculture, Food and the Marine's CAP Public Consultation Process Policy which influenced how the reformed CAP will be implemented for the years ahead. Teagasc also made submissions on: Carbon-Neutrality as a horizon point for Irish agriculture; and to the Consultation Paper on The Second Review of Ireland's Nitrates Action Programme Submission.

Teagasc published a policy and strategy document outlining the opportunities and challenges for Teagasc in relation to research and knowledge transfer initiatives in the area of international agricultural development.

Our international collaborations continue and a new Memorandum of Understanding (MOU) was signed between Teagasc and the Chinese Academy of Agricultural Science.

The Teagasc/RDS lecture series has highlighted the global challenges facing international agriculture and food production and has provided a forum where these issues could be discussed in Ireland. Through the Teagasc Walsh Fellowship Scheme, young scientists are trained and developed in research in agriculture, food and related disciplines, establishing 'new science' areas in Teagasc in response to changing priorities. In 2013, 48 Walsh Fellows completed their Phd's or Masters degrees, while an equivalent number of new fellows joined the scheme.

Demand for our education courses, both at higher level and further level, in agriculture and horticulture continued to be strong in 2013, and this was met through the Teagasc and private colleges and through the education centres in the advisory regions.

The Teagasc Roadmaps 2020 for each of the main farming enterprises and for the food and the agri-environment were updated and published in 2013.

I would like to thank all my colleagues in Teagasc for their efforts and hard work during 2013.

**Professor Gerry Boyle**  
Teagasc Director



# Teagasc Authority



1. Mr. Tom Tynan, 2. Ms. Marie Christie, 3. Mr. Padraig Gibbons,  
4. Mr. Brendan Gleeson, 5. Dr. Noel Cawley – Chairman - Teagasc,  
6. Mr. Tommy Cooke, 7. Professor Gerald Fitzgerald,  
8. Dr. Karina Pierce, 9. Mr. Tom Collins, 10. Mr. Eddie Downey,  
11. Mr. Alan Jagoe.



## Attendance at Authority Meetings \*

Name	09 Jan	06 Feb	06 Mar	03 Apr	01 May	05 Jun	03 Jul	04 Sep	02 Oct	06 Nov	04 Dec
Cawley, Dr. Noel (Chairman)	.	.	.	.	.	.	.	.	.	.	.
Christie, Ms. Marie	.	.	.	.	.	.	.	.	.	.	.
Collins, Mr. Tom	.	.	.	.	.	.	.	.	.	.	.
Cooke, Mr. Tommy	.	.	.	.	.	.	.	.	.	.	.
Downey, Mr. Eddie	.	.	.	.	.	.	.	–	–	–	.
Gibbons, Mr. Padraig	.	.	.	.	.	.	.	.	–	.	.
Gleeson, Mr. Brendan		.	.	.	.	–	.	.	.	–	.
O'Mahony, Mr. Frank	.	.	.	.	.	.	.	.			
Pierce, Dr. Karina		.	.	.	.	–	.	.	.	.	–
Tynan, Mr. Tom		.	.	–	.	.	.	.	.	.	.
Fitzgerald, Prof. Gerald									.	.	.
Jagoe, Mr. Alan									.	.	.

Note: This schedule of attendances at meetings is provided in accordance with paragraph 3.8 of the Code of Practice for the Governance of State Bodies dated June 2009.





Mr. Tom Tynan, Mr. Brendan Gleeson, Mr. Padraig Gibbons, Mr. Tom Collins.

## Audit Committee

	19 Feb	05 Jun	02 Oct	02 Dec
Tynan, Mr. Tom (Chair)*	.	.	.	.
Gibbons, Mr. Padraig	.	.	–	.
Gleeson, Mr. Brendan	.	–	–	.
Mr. Alan Jagoe **			.	
Collins, Mr. Tom	.	.	.	.

\* Appointed Chairman of the Committee at May 2013 Authority meeting

\*\*Mr. Jagoe replaced Mr. Brendan Gleeson for the October meeting



Mr. Brendan Gleeson, Ms. Marie Christie, Dr. Noel Cawley, Mr. Tommy Cooke.

## Operations Committee

	25 Feb	30 July	20 Dec
Gleeson, Mr. Brendan (Chair)	.	.	.
Cawley, Dr. Noel	.	.	.
Cooke, Mr. Tommy	.	.	.
Christie, Ms. Marie	.	.	.

## Advisory & Education Committee

	23 Jan	08 Apr	13 Dec
O'Mahony, Mr. Frank (Chair)	.	.	
Collins, Mr. Tom	.	.	.
Cooke, Mr. Tommy (Chair 13 Dec)	.	.	.
Downey, Mr. Eddie	.	.	–
Gibbons, Mr. Padraig	.	–	.
Christie, Ms. Marie	.	.	.
Jagoe, Mr. Alan			.

## Research Committee

	20 Jun	09 Oct
Pierce, Dr. Karina (Chair)	.	.
O'Mahony, Mr. Frank	–	
Downey, Mr. Eddie	–	–
Christie, Ms. Marie	.	.
Collins, Mr. Tom	.	.

### Teagasc Authority Appointments

Mr. Brendan Gleeson, Dr. Karina Pierce and Mr. Tom Tynan were appointed to the Teagasc Authority by the Minister for Agriculture, Food and the Marine, Simon Coveney TD. The new board members attended their first meeting of the Authority on Wednesday, 6 February, in Oak Park, Carlow. The appointments are for a five-year term.

Mr. Gleeson is assistant Secretary in the Department of Agriculture, Food and the Marine. Dr. Pierce is a Lecturer in Dairy Production in UCD's School of Agriculture and Food Science and a former president of the Agricultural Science Association (ASA). Mr. Tynan has held senior management positions in Origin Enterprises, Aryzta AG, (formerly IAWS Group Plc.) and Golden Vale Plc. He also worked as Special Adviser to Ivan Yates TD during his term as Minister for Agriculture, Food & Forestry and was Executive Secretary to the IFA National Dairy and Liquid Milk Committees.

Teagasc Chairman, Dr. Noel Cawley welcomed the new members and acknowledged the valuable contributions to Teagasc made by recently retired Authority members Mr. Jimmy Brett, Professor Pat Fottrell, Ms. Margaret Sweeney, and Mr. Martin Heraghty.

In October, Minister Coveney reappointed Dr. Noel Cawley as Chairman of the Teagasc Authority for a second five-year term. Dr. Cawley is a former Chief Executive of the Irish Dairy Board. Dr. Noel Cawley said that he was honoured to be reappointed by the Minister. He said he looked forward to working with his colleagues on the Authority and with Teagasc management to deliver the important work programmes in research, advisory and education in Teagasc over the next five years.

The Minister also reappointed Padraig Gibbons and appointed two new members, Alan Jagoe and Professor Gerald Fitzgerald to the Teagasc Authority for five year terms.

Alan Jagoe from Nohoval, Co. Cork is a dairy farmer and farms in partnership with his father and brother. He is a former President of Macra na Feirme and is the nominee of that organisation.

Professor Gerald Fitzgerald is Head of the School of Microbiology at University College Cork. His research activity has been a major contributor to the development of the multidisciplinary Food and Health programme in UCC.

Padraig Gibbons is a dairy farmer in County Mayo and chairman of Aurivo Co-operative Society. Mr. Gibbons was nominated by ICOS.

Teagasc Director Professor Gerry Boyle welcomed the appointments saying that he looked forward to continuing his excellent working relationship with Dr. Cawley.

## Senior Management Team

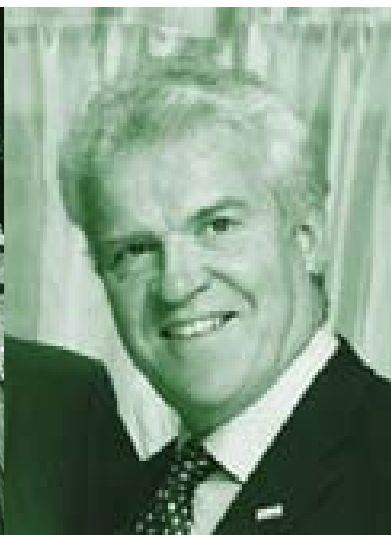
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Professor Gerry Boyle  
Director



Dr. Frank O'Mara  
Director of Research



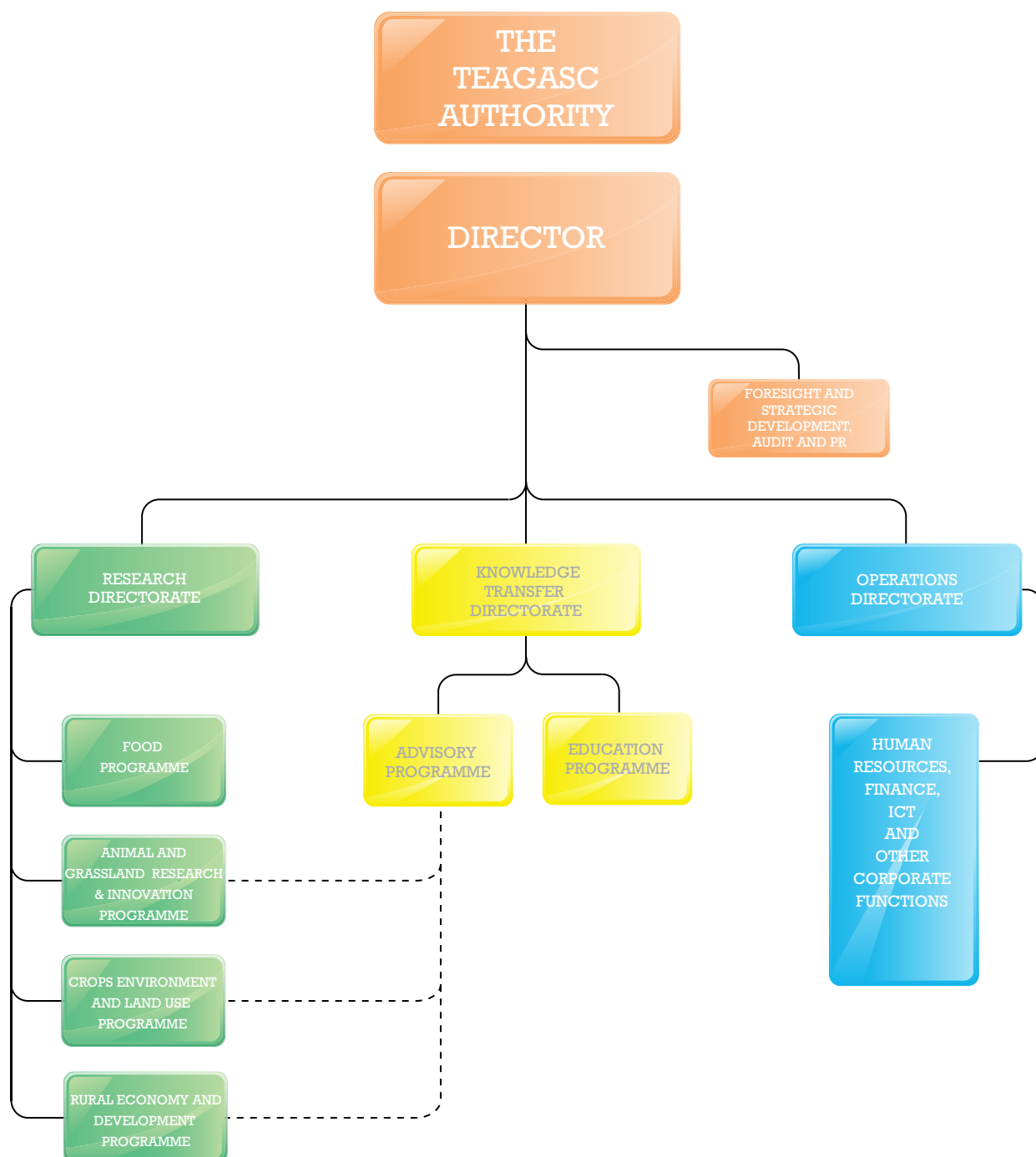
Mr. Tom Doherty  
Chief Operating Officer



Dr. Tom Kelly  
Director of Knowledge Transfer



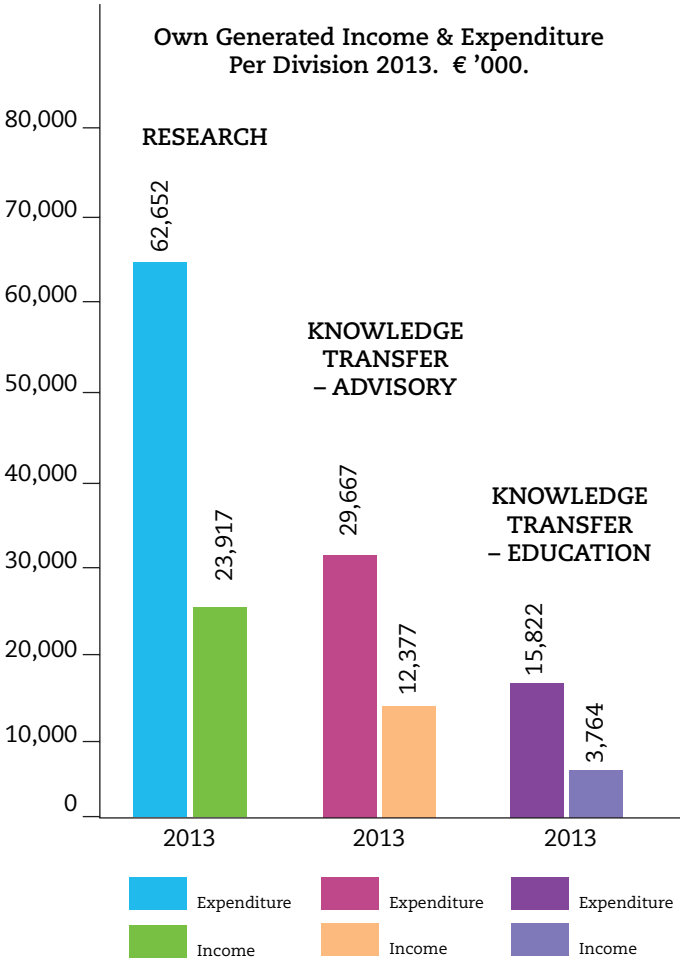
# Organisational Chart January 2013



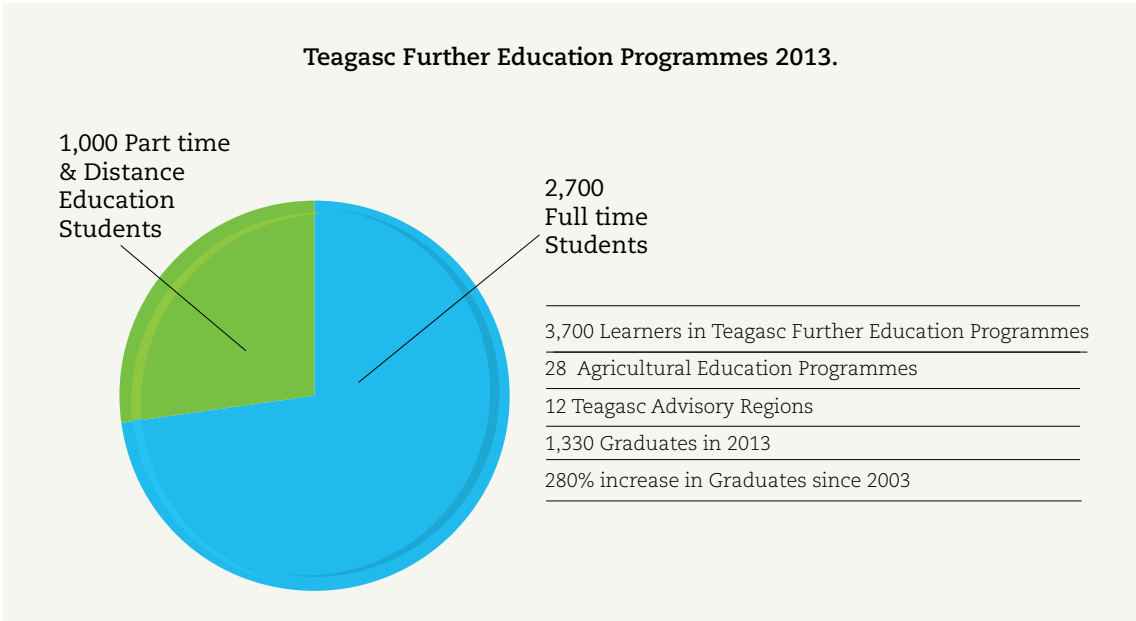


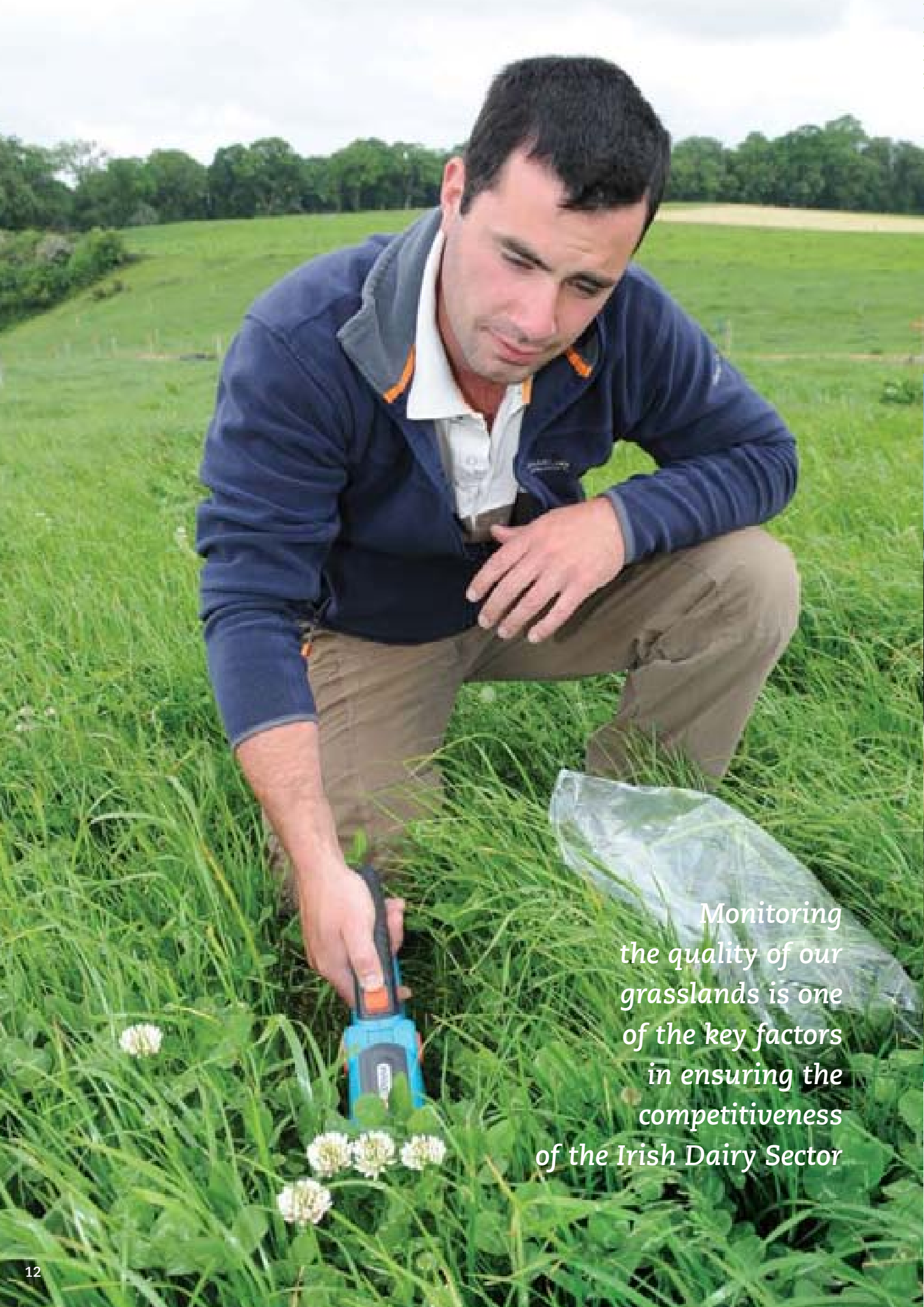


# Review of the Year



**Teagasc Own Generated Income as Percentage of Expenditure. (Excluding Pensions)**





*Monitoring  
the quality of our  
grasslands is one  
of the key factors  
in ensuring the  
competitiveness  
of the Irish Dairy Sector*

# Goal 1

Improve the competitiveness of agriculture,  
food and the wider bio-economy





## Key theme in 2013

# Fodder Crisis

**A difficult grass growing season in 2012 due to excessive rainfall resulted in a very late harvest of grass for silage. Livestock farmers entered the winter of 2012/2013 with tight silage stocks and silage of mediocre to poor quality.**

In mid-November, 30% of farmers were short of silage and the average deficit was 17% and many had forecast an early turnout in spring 2013. The tight stocks were manageable until late March 2013. Many farmers stretched out their silage by feeding additional meals, buying silage and other forages, and selling stock in some cases.

Difficult grass growing conditions into late spring resulted in the late turnout of cattle and higher than normal demand for conserved forage to fill the gap that grazed grass would normally fill. The Fodder Transport Scheme was announced by DAFM for the importation of feed and this scheme was in place from mid-April into early May. Emergency assistance was also made available under the DAFM Early Warning System. A late spring resulted in zero silage stocks in most farmyards and the late closing of silage ground. First cut silage yields were poor in many areas of the country.

### What did Teagasc do?

- Teagasc set up an internal working group consisting of regional managers, specialists, advisers and researchers, to provide direction in dealing with the problem.
- An Interagency Fodder Committee was established under the chairmanship of Dr. Tom Kelly, Teagasc, in early summer. This group included co-ops, media, Veterinary Ireland, ACA, IGFA, ICMSA, IFA, DAFM, Macra na Feirme and Teagasc.
- Joint initiatives were agreed with local Early Warning System groups.

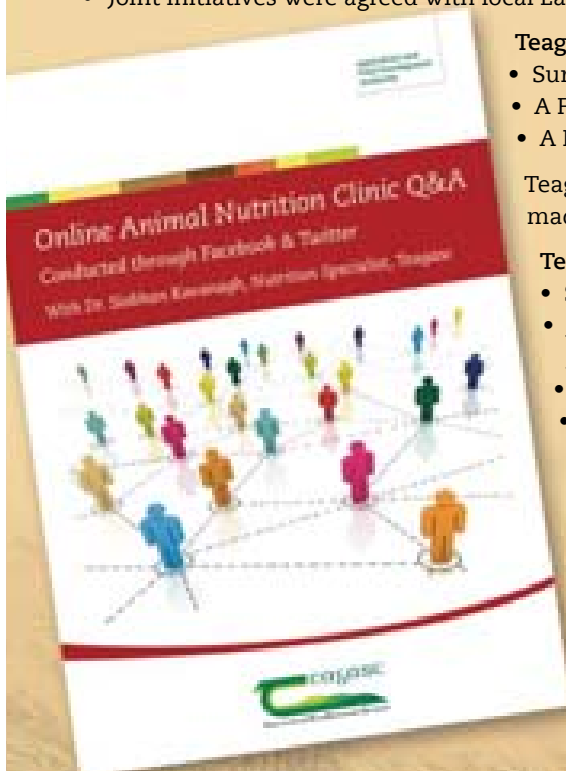
### Teagasc Surveys

- Survey of the knackereries Spring 2013
- A Fodder Census was carried out in July 2013.
- A Fodder Census was carried out in September 2013.

Teagasc Advisory Services on the theme of forage management were made available to all clients and non-clients.

### Teagasc publications

- Special technical notes in Teagasc newsletters September 2012
- Joint initiative – Teagasc, IFJ & IFA – Technical Insert into Irish Farmers Journal – November 2012
- Local & national print media articles
- Today's Farm special dealing with the crisis was published in spring 2013
- Published a flier to the knackereries to be made available to all customers coming in with fallen animals
- Technical notes/support provided to clients coming into Teagasc offices for Single Farm Payment advice
- Technical notes circulated to DVO, IFA, ICMSA & PVP's
- Press releases
- Text messaging of technical guidance to all clients.
- Text messaging to join buyers & sellers of silage stocks
- Technical note prepared for the Ploughing Match 2013.



*Teagasc conducted an online live Q&A on animal nutrition.*

## Goal 1- Improve the competitiveness of agriculture, food and wider bio-economy

### DAIRYING

#### Robot Milking for Grazing Dairy Cows

Teagasc Moorepark, in association with partners from Ireland (Irish Grassland Association), Sweden, Denmark, Netherlands, France and Belgium, is developing technology integrating robotic milking with grazing dairy cows. The name given to this innovative project is 'AUTOGRASSMILK'.

There are currently very few farms with robotic milking technology in Ireland. The Food Harvest 2020 report recommends an increase of 50% in milk production by 2020. Robotic milking could help by addressing:

- (i) fragmentation – where farms are divided into more than one block, robotic milking could offer the opportunity to split the herd,

- (ii) labour – robotic milking has the potential to reduce labour costs on farms, particularly as they expand, and

- (iii) entry level – the successful introduction of robotic milking in grass based systems could offer farmers an entry level into dairying allowing them to continue other employment until the farm is viable.

#### Sexed semen

Conventionally there is a 50/50 chance of male or female offspring but, in the dairy industry, female offspring are more desirable than male offspring. Dairy farmers using sexed semen will be able to increase the numbers of heifer calves born and reduce the number of unwanted male dairy calves.

Teagasc researchers led a €1m project with ICBF and US-based Sexing Technologies to establish the viability of using sexed semen in Ireland.

A large semen study was completed on approximately 350 dairy farms during spring 2013, with over 15,000 cows and heifers enrolled. 4,000 pregnancy diagnosis exams were carried out on a sample of the herds in June/July.

Based on this data, frozen sexed semen achieved conception rates that were 87% and 85% of conventional semen in heifers and cows, respectively. This equated to a reduction in conception rate of seven % units in both heifers and cows compared to conventional semen. The performance of sexed fresh semen was poorer than sexed frozen semen. Final results will be available in 2014 after calving events have been recorded for all cows enrolled in the trial.



## Goal 1- Improve the competitiveness of agriculture, food and wider bio-economy

### Dairy Expansion- Requires Careful Financial Planning

The Open Day at the Teagasc Animal & Grassland, Research and Innovation Centre, Moorepark attracted over 10,000 dairy farmers in July 2013. Irish dairy farming is entering a period of immense opportunity and challenges with the abolition of EU milk quotas in April 2015. These changes will create opportunities for dairy farmers to grow and restructure their farming businesses.

This major event focused on a roadmap for high profit dairy farming under Irish conditions. Dairy farmers were told that the immediate challenge is to increase the competitiveness of their farming business through the adoption of grass-based technologies.

### Teagasc National Dairy Conference

Jim Woulfe, Chief Executive of Dairygold co-op expects milk supply to increase by 57%, or an extra 540 million litres of milk, by 2020 from the 2011 base. Speaking at the Teagasc National Dairy Conference in Limerick he said that Dairygold are investing to ensure they have the capacity to process this additional milk and have committed to accepting all extra milk produced by their suppliers in their catchment area.

Addressing the 500 dairy farmers attending the conference Tom O'Dwyer, Teagasc Head of Dairy Knowledge Transfer, said that he expects that a typical family dairy farmer in 2020 will have 100 cows, farming 50 hectares and be a one-man unit. The conference was repeated on the following day in Cavan.

### Milk Quality Tool

As the milk quality criteria requested by milk processors and by customers generally are becoming more strict and rigorous a new tool to improve milk quality standards has been developed at Teagasc, Moorepark.

It comprises a series of video clips showing critical stages of the milking process and provides guidelines and recommendations for the production of high quality milk.

This user friendly tool provides valuable information on all aspects of quality milk production (e.g., TBC, SCC and residues). Specific topics addressed include: milking management on smaller (12 unit parlour) and larger (24 unit parlour) farms; and milking management on farms with adequate labour (two-people milking) and those with some automation (automatic cluster removers and cluster flushing).





## Heifer Rearing

Over 250 farmers attended the open day on the farm of Jim and Teresa White, Cloneen, County Tipperary, to learn more about dairy replacement heifer rearing. The Whites were the national winners of the 2013 Heifer Rearing Competition.

Teagasc Dairy Specialist George Ramsbottom said: "Three key features of the success of the White family at heifer rearing are: how they manage the newborn calves, their focus on grassland management during the grazing season and their use of weight recording at critical times in the heifer rearing process."

## Increased Profit from Reseeded Pastures

Reseeding old pasture swards increases grass production and increases profit. Over 1,400 farmers attended a Grass Reseeding Event organised by Teagasc in Tullamore in August. New reseeded pastures were on display which had been established using different cultivation and sowing methods just six weeks previously.

Farmers from discussion groups could assess the benefits of the different methods used to establish the swards and the benefits of grass reseeded. Teagasc advisers Paul Fox and Mark Coyne outlined how reseeded perennial ryegrass pastures are 25 per cent more responsive to nitrogen fertilizer compared to old permanent pastures and provide more grass in early spring and late autumn thus reducing winter feed costs.



Teagasc Advisers Paul Fox and Mark Coyne present their findings at the Grass Reseeding Event at Tullamore.

## PastureBase Ireland

PastureBase Ireland is a grassland management decision support tool and a mechanism to capture background data on farms. PastureBase Ireland stores all grassland measurements in a common structure. This allows the quantification of grass growth and DM production (total and seasonal) across different enterprises, grassland management systems, regions, and soil types using a common measurement protocol and methodology.

PastureBase Ireland is now on 130 farms nationally which includes 12 Teagasc farms. A PastureBase web server has been developed.

## Special recognition.

Dr. Donagh Berry, principal investigator in statistical genetics at Teagasc, was awarded the Sir John Hammond Award by the British Society of Animal Science at their annual conference at the University of Nottingham.

The award is presented to scientists in the early-mid part of their career who have made a significant contribution to developing animal science and production.

Dr. Berry received the award for the cutting-edge work he has done in helping improve Ireland's cattle production capabilities. Chris Warkup, BSAS president, said Dr. Berry had made considerable contributions to genomic science which had helped put Ireland at the forefront of dairy genetics.



## BEEF

With an increase in dairy cow numbers expected and the likely roll out of sexed semen across the country the number of beef animals sourced from the dairy herd is expected to rise significantly over the coming years. The challenge to Irish beef farmers is how best to finish these cattle in profitable and sustainable beef systems.

Dr. Paul Crosson of Teagasc Grange has examined the potential returns from the different dairy calf to beef systems: “Gross margins of almost €1,500/ha and net margins of almost €900/ha are achievable from dairy calf to beef systems. The key issues are to have excellent herd health to minimise losses and to attain a very high percentage of total lifetime gain from grazed grass.

“Systems based on early maturing crossbreds are normally more profitable; however, pure Holstein-Friesian systems are also capable of delivering good economic returns.”

## Breeding for Quality

A new research project, Breed Quality, involving Teagasc, UCC, UCD and ICBF will use state-of-the-art tools to develop phenotypic, genetic and genomic approaches for a national strategy to improve the quality and consistency of milk and meat products from Irish cattle and sheep.

Dr. Donagh Berry, Teagasc Animal & Grassland Research and Innovation Centre, Moorepark, explains: “To achieve consistency in quality, the underlying meaning of quality to consumers must be described, understood and translated into technical specifications at each stage within the supply chain.

“The first task of the Breed Quality project will be to document the relative importance of quality attributes in delivering consumer and customer satisfaction and this will help guide the focus of the ‘breeding for quality’ research.”

## SHEEP

### Opportunities to Grow the Sheep Sector

Sheep output in Ireland was worth €209 million in 2012 but there is still significant scope to improve output on sheep farms here. At the Teagasc National Sheep Conference farmers heard how opportunities exist to improve animal health on sheep farms. The best strategies to meet the nutrient requirements of the breeding ewe and lambs were also outlined.

Teagasc Sheep Enterprise Leader Prof. Michael Diskin said that there is a growing threat of anthelmintic resistance increasing in sheep flocks. There is a need for new dosing strategies to maintain the effectiveness and the efficacy of the products available.

## Goal 1- Improve the competitiveness of agriculture, food and wider bio-economy

Michael Gottstein, Head of the Teagasc Sheep Knowledge Transfer Programme said: "Discussion groups have been independently shown to increase productivity and profit levels in other farming enterprises. The same opportunity and incentive is now open to sheep farmers to avail of STAP. It has the potential to deliver much more than just the €1,000 payment per member, through the adoption of new technologies on participating farms."

### Sheep Open Day

Over 1,200 sheep farmers attended the Teagasc sheep open day in Athenry to hear the latest research updates and the best advice on producing lamb profitably.

The Teagasc Athenry sheep demonstration farm has shown that high levels of lamb output are achievable from a mainly grass based diet.

Teagasc researcher Philip Creighton told farmers that stocking rates and prolificacy are the two key drivers to maximise lamb output. Ciaran Lynch, Teagasc, outlined how real gains in productivity and profitability have been made on the commercial farms in the Teagasc BETTER Farm Sheep programme.

The lowland flocks in the programme achieved an average gross margin per hectare of €670 in 2012, up from €290 per hectare in 2009. There are 32,580 sheep flocks in Ireland and the Teagasc National Farm Survey represents 12,580 of these sheep farmers who had an average farm income of €16,898 in 2012.

*Teagasc Business & Technology Adviser Terry Carroll addressing the Sheep Demonstration and Open Day at Teagasc, Athenry which was attended by over 1,200 sheep farmers.*



Visitors to the Teagasc Open Day at Athenry were able to study sheep parasites under the microscope.

The average sheep farm was 49 hectares. Teagasc now has over 2,000 sheep farmers in 144 Sheep Technology Adoption Groups facilitated by 70 B & T Drystock advisers. The majority of these advisers also facilitate beef discussion groups.





## Goal 1- Improve the competitiveness of agriculture, food and wider bio-economy

### Teagasc National Tillage Crops Forum

The Teagasc National Tillage Crops Forum addressed two main themes: Profitable crop production and the new Sustainable Use Directive on Pesticides. The new Directive has implications for growers, sprayer operators, advisers and the associated trades. This legislation is now being rolled out.

At the Forum, Sheila Macken from the Department of Agriculture, Food and the Marine, outlined its relevance. Frank Wijnands, Wageningen University and Research Centre, the Netherlands, described Dutch experience and how involving all the relevant stakeholders is essential for success.

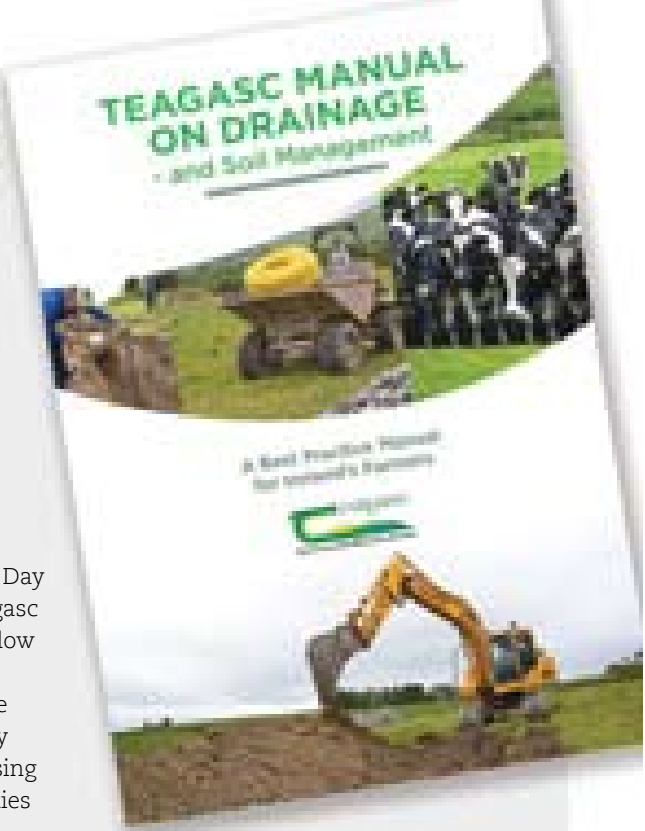
### Yield Potential in Tillage Crops

Addressing 1,000 tillage farmers attending a Teagasc Crops Open Day in June, John Spink, Head of Teagasc Crops Research in Oak Park, Carlow said that growers need to continuously strive to exploit the high yield potential in Ireland, by getting their technology right, using the most appropriate crop varieties and through the precise application of inputs.

### Teagasc Manual on Drainage and Soil Protection.

A new Teagasc land drainage manual was produced in 2013 and launched at the Teagasc dairy conference in November. Soil poses particular challenges in Ireland. The great variety of soils and soil problems means that every drainage challenge is unique.

Careful investigation of the site; professional diagnosis; prudent assessment of the costs/ benefits; expert implementation of a planned project and due consideration of environmental factors are all essential.



BELOW: At the announcement of IFA funding for Tillage research in Oak Park. Dr. Frank O'Mara, Teagasc Director of Research, Pat Smith, General Secretary IFA, Professor Gerry Boyle, Teagasc Director, John Bryan, IFA President, John Spink, Head of Crops Research, Teagasc, Noel Delaney, Chairman, IFA Grain Committee.







## FARM MANAGEMENT

### Discussion Group Members Generate Higher Profits

Farmers who are members of discussion groups are more likely than non-members to adopt new technologies, achieve higher physical performance in their farming enterprise and generate higher profit levels. These were the main findings of an independent evaluation report carried out by Broadmore Research on the 'Impact of Participation in Teagasc Dairy Discussion Groups.' Dr. Pat Bogue of Broadmore Research said: "Farmer members of dairy discussion groups earned statistically significant higher gross margins per hectare than non-members, in the order of €240 per hectare extra. A higher percentage of group members achieved the physical targets set out in the Teagasc Roadmaps compared to non-members. The Dairy Efficiency Programme (DEP) had a positive impact on grassland, breeding and financial management."

Teagasc Director, Professor Gerry Boyle welcomed the independent evaluation of Teagasc dairy discussion groups. He said: "Discussion groups are a key methodology used by Teagasc to transfer new technology to farmers. Farmers who are members of groups are up to 20 percent more likely to adopt new technologies and improve management practices on farms, resulting in a financial benefit for the farmer. For a 40 hectare dairy farmer, this is worth, on average, up to €10,000."

Teagasc operates a total of 812 discussion groups, covering dairy, beef, sheep and tillage, with 12,500 farmer members.

Since 2009, government policy, through the Department of Agriculture Food and the Marine, has been supporting an increase in discussion groups through the DEP, BTAP and STAP programmes.

*Carlow tillage farmer Fergus Cole with Teagasc Business & Technology, tillage adviser Phelim McDonald.*

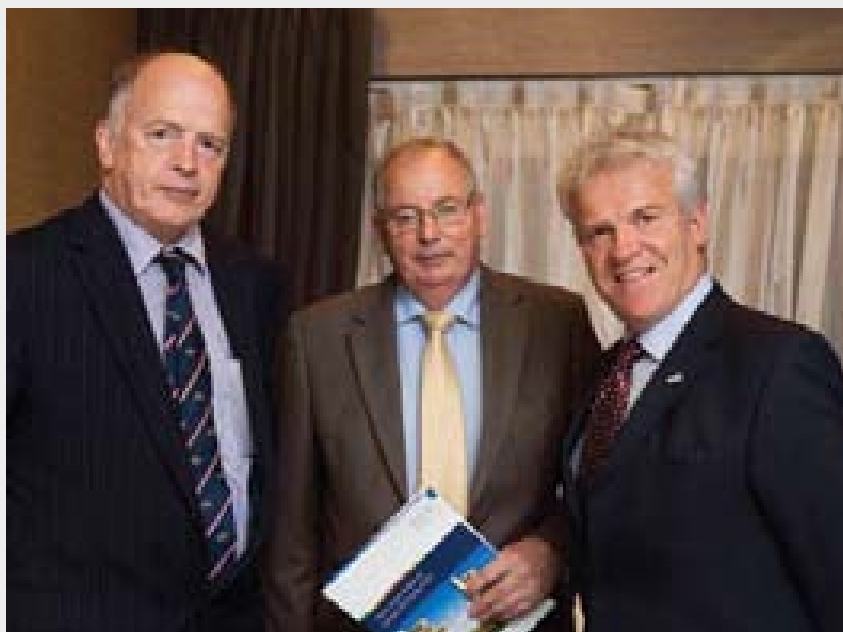


### Teagasc Management Data for Farm Planning

This publication provides detailed farm financial data to assist all involved in planning and analysing farm businesses. It includes budgets for livestock, crops, horticulture, and other farm enterprises. Information on taxation, social welfare, grants and schemes is also included.

Teagasc financial management specialist, and editor of the publication, James McDonnell said: "The budgets for the main enterprises are based on actual performance achieved on farms and measured through the Teagasc eProfit Monitor farm management tool. The book also contains Teagasc National Farm Survey results which give a historical view of the overall income generated for the different farm enterprises."

*Dr. Tom Kelly, Mr. Tom Collins, Teagasc Authority member, and Mr. Tom Doherty at the launch of the Teagasc 2020 Road Maps to Better Farming.*



Head of Farm Management and Rural Development, Fintan Phelan, said: "With many farmers considering expanding their farming enterprise, and others considering setting up new businesses, or switching enterprises, this farm management data book provides guideline data to plan a successful business transition during a period of change."

The Teagasc Management Data for Farm Planning book was launched by Tom Hayes TD, Minister of State at the Department of Agriculture, Food and the Marine on the Teagasc stand at the 2013 National Ploughing Championships.

### Teagasc 2020 Road Maps

The Teagasc 2020 Road Maps to Better Farming outline the direction for the different sectors, the anticipated size and shape of each sector in the future, the challenges to be overcome and the opportunities to be grasped.



The main policy and market issues to be addressed by all involved are also highlighted.

The nine road maps cover dairying, suckler beef, pigs, sheep, tillage, forestry, horticulture, environment and food. Technical efficiency targets for farm enterprise are set so farmers can benchmark their performance against the top performers.

Dr. Tom Kelly, Director of Knowledge Transfer in Teagasc said: "these road maps reflect the targets set out in the government's Food Harvest 2020 report which outlined ambitious growth targets for Irish agriculture. The Teagasc road maps outline the direction each sector is expected to take, and the technical performance levels that can be achieved at farm level. The actions required in research, advisory and education are also outlined to assist the sectors to develop over the next seven years."



## Collaborative Farming Arrangements Launched

Teagasc has prepared a detailed action plan to encourage farmers to enter into formal collaborative farming arrangements with other farmers. These arrangements include formal farm partnerships, share farming arrangements, contract livestock rearing, long term land leasing arrangements, producer groups and small cooperatives.

Ben Roche, Teagasc Farm Structures Specialist said; "The main benefits of collaborative farming arrangements for farmers are economic, skills and social. They provide the possibility for farmers to increase financial returns through achieving greater scale at lower capital costs while reducing costs which are duplicated on each individual farm. They provide a pooling of skills and labour and can present an opportunity to move away from the 'one man farm' model."

A copy of the Teagasc action plan was presented to the Minister for Agriculture, Food and the Marine, Simon Coveney TD in January.

Teagasc 2020 Road Maps for each of the main agriculture and food enterprises were launched by the Minister for Agriculture, Food and the Marine, Simon Coveney TD at the National Ploughing Championships in Laois in September.

## Preparing Farm Businesses for Change

'Professionals working together' was the theme of the Teagasc Farm Business Conference which took place in November. The conference was attended by solicitors, accountants, auctioneers and other professionals who work with farmers. The policy changes that are taking place in agriculture, as well as the challenges and potential solutions that may be available for clients of the professionals attending were outlined during the conference.

Decisions around the handover of the farm business and associated assets to the next generation are an important topic for discussion between farmers and their professional advisers.

This decision involves deciding the best business structure to suit the individual circumstances and future requirements of both the current farmer and the farm business successor.

*Denis and Brian Meade Co. Meath.*



## Goal 1- Improve the competitiveness of agriculture, food and wider bio-economy

### PLANT BREEDING

#### New Teagasc Grass & Clover Varieties

In 2013 three new perennial ryegrass and two new white clover varieties were awarded Recommended Listing. Carraig, an early tetraploid perennial ryegrass variety, was added to the Recommended Lists in Northern Ireland, Scotland and England/Wales. Claddagh, an intermediate diploid perennial ryegrass, was listed in Germany and Giant, an intermediate tetraploid perennial ryegrass, was listed in Belgium. Iona, a medium leaf white clover variety, was added to the Recommended List in Northern Ireland. Buddy, a medium leaf white clover variety, was added to the Recommended Lists in Scotland and England/Wales.

A further two perennial ryegrass (GlenRoyal, late diploid; Solas, late tetraploid) and two white clover (Buddy and Iona, both medium leaf size) varieties were approved to the Ireland Recommended List, subject to seed availability.

The varieties have been shown to offer improved yield, quality and persistence characteristics for grass-based production systems in Ireland. The four new varieties will be available in Ireland in 2014 to 2016.

#### Goldcrop

At the Teagasc National Dairy Open Day at Moorepark in July Teagasc and Goldcrop announced a long term agreement which will see Goldcrop market and propagate all forage material coming from the Teagasc Grass and Clover breeding programme for the next 10 years.



Pig researcher Dr. Keelin O'Driscoll and pig specialists Shane Brady and Amy Quinn.

#### Potato Breeding

The Teagasc Potato Breeding programme released two new varieties in 2013. Bikini is a main crop variety with agronomy and eating quality similar to Rooster. The variety has a very unusual skin colour (both red and yellow in defined patches) which should add to novelty sales. Casino is a high dry matter long oval yellow variety which has exceptional eating quality and appearance. The variety is also suitable for French fries. The previously-released Teagasc varieties Electra and Nectar are now firmly established in Great Britain and European markets. Infinity has passed rigorous industry crisping trials and is now accepted by several crisp manufacturers. Three further varieties will be released in 2014.

### PIGS

#### Teagasc and IFA Launch Pig Joint Programme

The Teagasc/IFA Pig Joint Research and Advisory Programme was launched in October.

Through the Joint Programme Teagasc will support Irish pig producers by providing advice, research and education across a range of issues of importance to the sector. The funding for the programme is provided through a pig producer levy and will enable Teagasc to improve its services to the pig sector. Ciarán Carroll, Head of Teagasc Pig Development Department welcomed the initiative saying: "The programme will enable Teagasc to provide a broader range of services to the sector. The levy will be used to fund two new advisers, two new researchers and a technician." As part of the advisory service producers will receive an annual visit to prepare and review an annual business plan for the farm. Other services will also be provided which will include the annual pig conference, workshops, groups meetings, research dissemination days, discussion groups, newsletters and registration of participants on the very successful FETAC pig course.



# Customer Profile

## THE MUSHROOM INDUSTRY

The mushroom industry in Ireland is now one of the best in the world, producing high quality mushrooms in technologically-advanced growing rooms and with consistently high levels of efficiency. The industry's success in this competitive sector is largely attributed to the entrepreneurial spirit of the key stakeholders. They have embraced new technologies and innovations in composting, growing and harvesting, leading to increased productivity and efficiency across the board.

Mushrooms are Ireland's number one horticultural export with a farm gate value of €112 million, of which close to 80% is exported. Teagasc supports this dynamic modern industry with the provision of two technical advisors, Gerry Walsh and Tom Kellegher, and a senior researcher Dr. Helen Grogan. Together they address industry concerns and needs across a range of activities from continuous professional development of mushroom farm staff to technical advice on optimising alternative energy sources to research on pest and disease issues.

2013 was a busy year for the Teagasc team. A major EU funded research project 'MushTV' co-ordinated by Teagasc, saw the group work closely with researchers and industry partners across Europe, identifying technical solutions to underpin integrated pest management (IPM) solutions within the framework of the Sustainable Use Directive (SUD). The group facilitated the production of the Mushroom Sector Development Plan to 2020, identifying the needs of the sector for it to remain viable and vibrant in the years ahead.

The biennial All Ireland Mushroom Conference was held in 2013 and linked up with the British industry for the first time. Technical advisor Tom Kellegher worked closely with the mushroom Producer Organisation CMP (Commercial Mushroom Producers), playing a crucial role in drawing down EU development aid for the industry.



*Dr. Helen Grogan*

The sector faces significant challenges into the future, due largely to the expansion of the industry in mainland Europe. The sector needs to remain sustainable and efficient while seeking to identify innovative ways of making Irish mushrooms the product of choice in the marketplace.

Teagasc staff are committed to working closely with industry entrepreneurs to facilitate the advancement of the mushroom sector. To this end, Teagasc are investing in a new state of the art mushroom facility at the Ashtown campus which is due for completion in early 2015.

## Goal 1- Improve the competitiveness of agriculture, food and wider bio-economy

### FOOD

#### Antibiotics affect babies' long-term health

Research in Cork and Canada shows that the bacterial composition in the gut of infants treated with broad-spectrum antibiotics is still altered eight weeks after treatment.

The research, carried out by scientists in the Alimentary Pharmabiotic Centre based in Teagasc, University College Cork, Cork University Maternity Hospital and The Hospital for Sick Children, Toronto, Canada, was published in the journal *Antimicrobial Agents and Chemotherapy*.

"This research suggests that the merits of administering broad-spectrum antibiotics - those that kill many bacterial species - in infants should be reassessed, to examine the potential to use more targeted, narrow-spectrum antibiotics, for the shortest period possible," said senior author Catherine Stanton of the Alimentary Pharmabiotic Centre based at Teagasc Food Research Centre, Fermoy, Co Cork.

#### Microbiota programmed by food

The human body contains over 10 times the amount of bacterial cells as human cells. These bacteria - now collectively called the gut microbiota - number in their trillions and are made up of more than a 1,000 different species most of which are beneficial in some way.

"Research is starting to show that the food we eat has a huge bearing on the composition of this collective and also that the profile of the collection of bacteria can be associated with a person's health status," explains Professor Paul Ross, Head of the Teagasc Food Research Programme and Principal Investigator at the Alimentary Pharmabiotic Centre, Teagasc, Food Research Centre, Moorepark.

Although the composition of the microbiota is highly stable during adulthood, there are times when it can be highly dynamic - such as at the extremes of life, e.g., following birth, during inflammatory bowel conditions, gastrointestinal infection and in the elderly. Despite this stability, the microbiota also displays a high degree of interindividual variation reflecting differences in lifestyle, diet, host genetics, etc. In a project called ELDERMET, a team of UCC/Teagasc scientists headed by Professor Paul O'Toole has recently profiled the faecal microbiota from elderly people in different residences including community, day-hospital, rehabilitation or long-term residential care locations.

This study found that the microbiota correlated with the residence location. "The results demonstrated that the individual microbiota of people in long-stay care was significantly less diverse than those that resided in the community," explains Professor Ross. "In addition, these subjects were also clustered by diet by the same residence location and microbiota groupings.

Interestingly, the separation of microbiota composition correlated significantly with health parameters in these individuals including measures of frailty, co-morbidity, nutritional status, markers of inflammation and with metabolites in faecal water."

Taken together these data suggest that diet can programme the gut microbiota - the composition of which correlates with health status. Such a suggestion opens up great potential for the food industry in the design of food ingredients and supplements which may in the future shape the microbiota in a particular direction to correlate with an improved consumer health status. Interestingly, a related study called INFANTMET, funded by the Department of Agriculture, Food and the Marine and led by Professor Catherine Stanton at Teagasc Moorepark, is looking at the development of the gut microbiota in early life as a consequence of breast feeding.

"This study will be of great interest to our Infant Formula Industry which produces approximately 12% of global exports in this sector. From a national perspective, Ireland is perfectly positioned to capture and capitalise on what is one of the most exciting areas in biological research as the country expands its Agri Food Industry to produce a greater variety of value-added food products to benefit the health of the modern consumer," explains Professor Stanton.



*Professor Paul Ross, Mr. Kevin Lane, Mr. Mubarik Bajuwaiber, Chairman AL-WISSAM ALARABI, Minister Simon Coveney.*

### **New opportunities in cheese**

For 2013 Teagasc targeted a total of three major opportunities in cheese emanating from Irish Dairy Board/ Teagasc collaboration. One cheese was launched in Riyadh in November by Minister Coveney. The IDB is to invest €20m in the plant. The second was launched in early 2014. The third is undergoing commercial trials in an Irish Dairy Co-op.

This will contribute to the returns farmers receive for the milk they produce.”

### **Collaboration with Irish Dairy Board**

Professor Paul Ross, Head of the Teagasc Food Research Programme said: “Teagasc is delighted to be collaborating with the Irish Dairy Board in applying the technologies developed in the food research centre in Moorepark, to develop fresh cheese types suitable for markets in the Middle East. The ambition of the collaboration is to continue to develop a pipeline of new innovative products to meet specific consumers and customer needs in key global markets for the Irish Dairy Board.





## KEY THEME IN 2013

# Closer co-operation between UK and Ireland in the Agri-food Sector



*Prof. Gerry Boyle, Director of Teagasc, Minister for Agriculture, Food and the Marine, Simon Coveney TD, the UK Secretary of State for Environment, Food and Rural Affairs, the Rt Hon. Owen Paterson, Mr. Simon McKeever, Director of Trade and Investment UK Embassy, Dublin.*

**The first ever UK-Ireland Food Business Innovation Summit and Exhibition took place in the Aviva Stadium, Dublin, on Wednesday 29th May. The event themed ‘Exploiting synergies for growth through innovation, research, skills and knowledge’ brought together over 300 leading UK and Irish food company executives and retailers, along with policy makers and research managers. The one day summit discussed the key opportunities that exist for innovation in the food sector and the considerable potential for closer co-operation in the agri-food sector.**

Two keynote addresses were given by the Irish Minister for Agriculture, Food and the Marine, Simon Coveney TD and the UK Secretary of State for Environment, Food and Rural Affairs, the Rt Hon. Owen Paterson, MP.

Speaking at the event, Minister Simon Coveney said: “This summit provides a wonderful opportunity for food company executives, retailers, and research managers from both sides of the Irish Sea to come together in order to debate the key challenges in research, skills and knowledge and the opportunities for innovation in the food sector. A key theme of this event is innovation and it is something I am deeply interested in.”

Secretary of State, Owen Paterson said; “This Summit and this sector have a key role to play in helping us unlock the huge potential that exists for the UK and Irish economies - economies that already benefit from a flow of people, goods and ideas. I want to work towards a plant and animal health biosecurity regime for both these islands, as part of our shared determination to strengthen our food and drink industries. By working together we can maximise the benefits to the food and drink industry in the UK and Ireland.”

The summit was jointly organised by Teagasc and the Institute of Food Research (IFR), UK and supported by Food Innovation Gateways, British Irish Chamber of Commerce, UK Trade & Investment (UKTI), Bord Bia and Enterprise Ireland. Delegates were welcomed by Professor Gerry Boyle, Director of Teagasc, the Agriculture and Food Development Authority, Ireland and Professor David Boxer, Director of the Institute of Food Research, Norwich UK.

The summit set the groundwork for a new era of collaboration across the two islands and will help increase growth and competitiveness by reinforcing our innovation capacity and helping towards the development of a wider European focus on innovation. This will include food research collaborations, working together on education programmes, and business innovation supports. Workshops at the summit addressed three themes;

- People entrepreneurship and skills for a growing food industry
- Global food innovation for economic impact
- Research, innovation and business opportunities to shorten the food chain and reduce waste

A series of presentations by leading UK and Irish food company chief executives and senior managers focused on issues such as food security, reducing waste, the growing world population, emerging markets and shortening the food chain. Both countries share a common objective of making the sector more productive and competitive. Food and drink exports underpin the relationship between the UK and Ireland.

In 2012, 42% of Irish food and drink exports, worth €3.8 billion were consumed in the UK. The market accounted for over 52% of total Irish beef exports and 36% of dairy products and ingredient exports in 2012. The flow of trade is two way. The value of food exports from the UK to Ireland is in the region of £3 billion per annum.

### Teagasc/FBD Student of the Year

Kevin Moran from, Shessagh, Taugheen, Claremorris, Co Mayo, is the 2013 Teagasc Student of the Year. The awards were presented by the Minister for Agriculture, Food and the Marine, Simon Coveney, TD.

Kevin Moran completed the Level 6 Advanced Certificate in Agriculture (Drystock Management) with Merit at the Mountbellew Agricultural College, County Galway. Kevin established himself as a new milk supplier with 70 cows on 38 hectares. He has expanded to 103 cows and is contract rearing his replacement heifers. He is passionate about dairy farming and about grass management and scrutinises the top 10 per cent of Teagasc eProfit Monitors to see what they are doing right so he can do it better.

Kevin is committed to producing high quality milk with SCCs down to 70,000 and TBC's of 3,000. He is a member of the Teagasc Tuam Discussion Group run by Teagasc adviser Mike Donoghue and is also now a Teagasc Monitor Farm.



*Prof. Gerry Boyle, Mr. Michael Garvey, Director of Marketing & Sales, FBD, Minister Coveney, Mr. Kevin Moran.*


### Horizon 2020

Horizon 2020 is the new, EU integrated funding system that will cover all research and innovation funding previously provided through the Framework Programme for Research and Technical Development, the Competitiveness and Innovation Framework Programme (CIP) and the European Institute of Innovation and Technology (EIT).

Over the last five years, Teagasc has greatly increased the level of research and innovation funding that it secures from the European Framework Programme.

Over a two-year period from 2009 - 2011, Teagasc more than tripled the funding secured from Framework Programme 7, the predecessor to Horizon 2020.





## KEY THEME IN 2013

# Greenhouse gases.

Food Harvest 2020 envisages ambitious expansion, with a 50% increase in dairy production. However, this expansion is occurring within an EU policy context whereby Irish greenhouse gas emissions (GHG) must be reduced by 20% on current levels. Currently agriculture comprises over 32% of Irish GHG emissions. Agricultural greenhouse gas emissions principally comprise of methane (from enteric fermentation and manure management) and nitrous oxide (from fertilizer and animal excreta deposition on soils). Conversely, grasslands and forests soak up CO<sub>2</sub> from the atmosphere, offsetting some of these emissions.

Despite the large proportion of national emissions, Irish livestock-based agriculture is extremely GHG-efficient with one of the lowest carbon footprints for milk and beef production. The aim of Teagasc GHG emissions and Climate research is to a) assess options to mitigate and offset agricultural GHG and ammonia emissions, b) design sustainable production systems to reduce C footprint, c) co-ordinate national research and d) assess risk and design systems to adapt to future climate change and weather volatility.

Teagasc are currently leading the Agricultural Greenhouse Gas Research Initiative for Ireland (AGRI-I). This is an organizational framework involving the main universities and the Northern Irish Agri-Food and Biosciences Institute and is designed to co-ordinate scientific expertise in GHG research. Specific research into reducing methane includes improving the genetic merit of the national herd, reduction in finishing times of beef cattle, extension of the grazing season (including drainage of wet land to achieve this goal), investigating the role of microbes associated with methane generation in the rumen and investigating altering the diet, particularly in young bovines. This latter project is part of a pan-European Joint Programming Initiative, funded in conjunction with AGRI-I.

Altered fertilizer type and timing combined with the use of urease and nitrification inhibitors to reduce both ammonia and nitrous oxide emissions respectively provide one of the main current focal points of GHG research. Other research includes investigating the use of clover to reduce nitrous oxide, the timing and application technique for landspreading slurry and the use of chemical amendments to reduce ammonia and nitrous oxide from urine deposition and slurry. Much of this research is in conjunction with the NZ Global Research Alliance, which globally helps co-ordinate agricultural GHG research across thirty countries. The Alliance is also involved in Teagasc research into carbon sequestration. This research has shown that European grasslands effectively remove carbon dioxide (CO<sub>2</sub>) from the atmosphere during photosynthesis and there is a net 'sink' of approximately 1-3 tonnes of CO<sub>2</sub> per hectare per year from grasslands. Teagasc is quantifying the role of pasture management on C sequestration as part of a major European Framework project (AnimalCHANGE).

Teagasc have been central to policy development in this area, contributing to National Economic and Social Council (NESC) Report on Carbon Neutrality and the forthcoming Climate Action and Low Carbon Development Bill. Finally Teagasc have been central to Bord Bia's Carbon Footprint certification of Irish beef production as part of the Origin Green initiative and has developed the Carbon Navigator to allow farmers make on-farm decisions that will improve both farm efficiencies and the Carbon footprint.



## Goal 2-

### Support sustainable farming and the environment





## Goal 2 - Support sustainable farming and the environment



### SOILS

#### Soil Fertility

Teagasc has observed substantial reductions in soil nutrient levels over the last five years. If this trend continues there is concern that grass and cereal yields will fall. Research has shown that the grass yields on fields low in Phosphorus (P) can be 1.5 tonnes of dry matter per hectare lower than where there are optimum P levels. Sixty per cent of soils analysed by Teagasc in 2012 were below the recommended Index 3 for Phosphorus.

As part of National Soil Fertility Week Teagasc hosted a series of public seminars across the country. The seminars provided farmers with the essential steps to measure and manage soil fertility accurately.

The seminars focussed on:

- Best practice in taking and interpreting a soil sample.
- Applying lime to achieve the best growing conditions.
- Managing slurry to optimise nutrient value and improve environmental outcomes.
- Designing a fertilizer plan to meet crop requirement.
- Developing strategies to maintain and improve soil fertility.

#### Phosphorus in Soils

In agricultural systems, the amount of phosphorus that is available to the plant rapidly decreases after the farmer applies it to the field. This occurs because phosphorus interacts with soil material at the soil surface. Phosphorus can then be washed away into streams and water-bodies, which can have harmful effects on the environment.

Experiments at Teagasc Johnstown Castle have shown that earthworms promote a more even distribution of phosphorus by removing nutrients from the soil surface (0 – 1 cm depth range). “Earthworms are classified into three groups: those that live in the litter layer at the surface; those that live below ground; and those that produce semi-permanent vertical burrows. By feeding on material on the soil surface, earthworms can mix phosphorus present at the surface with soil below the surface,” explains Dr. Rachel Creamer at Teagasc Johnstown Castle.

*Galway farmer John English beside a two-tiered weir constructed to assist migrating salmon on the Bunowen river.*

## **WATER**

### **Farming and Water Quality**

A report on Phase 1 of the Teagasc Agricultural Catchments Programme was launched in 2013 by Tom Hayes, TD, Minister of State at the Department of Agriculture, Food and the Marine. The aims of the Agricultural Catchments Programme are to protect and improve water quality and support the production of high-quality food. The Programme is operated by Teagasc with funding from the Department of Agriculture, Food and the Marine.

Ger Shortle, Teagasc Manager of the Programme, said: “This report contains encouraging results for Irish farming and the environment. The streams monitored in all six catchments in the Programme met the drinking water standard with nitrate levels well below the limits for human health.

Average groundwater nitrate levels were also within drinking water limits.”

Prof. Phil Jordan, Principal Scientist on the Programme added: “Very rigorous scientific techniques were employed which monitored both nitrogen and phosphorus in catchment soils and different water bodies. Part of the work indicates that water quality has shown recent signs of improvement, likely due to the adoption of better management practices by farmers, but there is a continuing need for monitoring.”

### **Managing Riparian Zones**

A Teagasc and Inland Fisheries Ireland joint initiative established best practice in the management of watercourses. Teagasc organised a series of events including classroom and onsite training, to equip farmers with the knowledge to support fish friendly management of the riparian zone.

The keys topics covered in the training included:

- Restricting Livestock Access.
- Fencing of the Riparian Zone.
- Fish friendly management of trees and plants.
- Development of Buffer Strips between tilled fields and water courses.
- Invasive species management.
- Preventing barriers to fish movement.
- River crossings by box culvert.

Inland Fisheries Ireland CEO Dr. Ciaran Byrne commented that “This joint initiative is the way forward to ensure that there is a consistent and best practice approach to preserving watercourses for the benefit of farming and fisheries alike.” These courses qualified as a second optional course for farmers in REPS4.



## Goal 2 - Support sustainable farming and the environment

### Environmentally Sustainable Dairy Farming

A group of Dutch dairy farmers and advisers visited Irish farmers as part of a transnational cooperation project called DAIRYMAN (Dairy Resource Management) whose aim is to study the sustainability of dairy farms in the Northwest of Europe in terms of economics, greenhouse gas emissions, nutrient use efficiency and energy use. The project is funded by INTERREG IVB North West Europe (NWE).

Farmers from seven European countries, including Ireland, share details of energy monitoring and carbon foot printing work done on the farms as part of the Dairyman Project. The sustainability of Irish milk production systems is one of the positive elements to emerge from the study.

Dairyman emphasises the need for researchers, advisers and farmers to learn from each other. During the three day trip, the Dutch dairy farmers visited the Teagasc Animal and Grassland, Research and Innovation centre, Moorepark, Carbery Milk Products in Cork, and local farmers including Dairyman pilot and Carbery pilot farmers.

Addressing the DAIRYMAN farmers, Prof. Gerry Boyle, Teagasc Director said: "All of the factors that drive efficiency in dairy farms also deliver positive outcomes in terms of the environment. An example is that on Irish dairy farms we have reduced usage of artificial nitrogen by 30% from peak in the last few years. That has had a real benefit for farmers in terms of profitability but it has also had obvious benefits for the environment."

Johan Dekker (Dairyman pilot farmer in the Netherlands) said: "From Irish farmers we have learned a lot about pasturing and that is a type of knowledge we had lost in recent years in Holland, where the system is based in indoor farming."

### Sustainability Demonstration Farm at Teagasc Kildalton College

Teagasc is showcasing its expertise on sustainability through a new sustainability demonstration farm 'Kildalton 2030: Leading Sustainable Growth'. This initiative will train the next generation of farmers in the concept and practical aspects of agricultural sustainability and provide a unique environment to evaluate emerging technologies in the context of an operational farm.

*Artist Ian McNinch producing a graphical representation of the Teagasc Kildalton sustainability demonstration farm.*





Irish farming claims to be among the most sustainable producers of food in the world – a crucial asset in the marketing of Irish produce. But we need to prove our green credentials. It has already been reported that Irish milk has the lowest carbon footprint in the EU, but sustainability involves more than carbon footprints alone. Teagasc is now developing indicators to capture all these aspects of sustainability, at farm level, at national level, and internationally in partnership with the FAO.

Dr. Pierre Geber of the FAO said: “With growing concerns about how food is produced, the livestock sector is under particular pressure to assess, improve and communicate on its environmental performance, while coping with the increasing demand for animal products.”

Principal of Teagasc Kildalton Agricultural College, Frank Murphy said: “Over the next seven years, we will transform the dairy farm at Kildalton College into a showcase of sustainable dairy production. This initiative will assist in training students in all aspects of agricultural sustainability.”

The new initiative: “Kildalton 2030: leading sustainable growth” will change the college farms – starting with the dairy farm – into a farm that is resilient to the challenges that lie ahead. The initiative will be rolled out on a phased basis.

### **Grass and Satellite Imaging**

Teagasc’s Spatial Analysis Unit is using NASA and the ESA satellite technology to monitor grass growth using infra-red technology. Using satellites to observe plant growth is a well developed technological service used across the globe, especially in tillage and horticulture. Measuring grass levels in a highly managed landscape like Ireland is less advanced.

Teagasc researcher Stuart Green describes the work that Teagasc, in collaboration with colleague Dr. Fiona Cawkell in UCC, is doing: “We hope within a short time to be able to offer farmers estimates of current growing conditions, growth rate predictions and management advice such as when to turn out cattle from winter housing. Focussing on grass and the delivery of plain, easily used, advice over the mobile phone means that the benefits of this technology will be available to all farmers regardless of size or system.”

### **Future Weather – Future Farming**

The records of Irish weather show a robust warming trend in recent decades, which is consistent with the global picture. An increase in rainfall is also evident but this may be partly a feature of natural variability. Those were the views of Ray McGrath from Met Eireann who was speaking at the Teagasc Conference – Future Weather - Future Farming in December 2013.

He said that Irish climate has become wetter with mean annual rainfall increasing by about 5% in recent decades. There is also evidence of an increase in frequency of very wet days.

He said that rising temperatures and changes in precipitation patterns will impact on Irish agriculture but there is still uncertainty regarding specific details. He said that it is unlikely that the weather related to the recent fodder crisis in the spring could have been anticipated months in advance.

Teagasc Economist Dr. Thia Hennessy estimated that the total cost of the 2013 weather related fodder crisis during 2012 and the spring 2013 to be over €450 million. She stressed that fodder crises are not a new phenomenon with the most recent one being endured by farmers in 1998/1999.

## **FORESTRY**

### **‘Qualified’ Status for Orchards**

The National Downy Birch Seed Orchard and the National Alder Seed Orchard have achieved ‘Qualified’ status. This follows a major research effort by Teagasc to genetically improve tree quality. In coming years, seed and planting material will be available from the seed orchards at the much improved ‘Qualified’ level. The Qualified seed orchards were launched at the Irish Forestry, Woodland and Bioenergy Show in Stradbally, Laois.

The Teagasc and COFORD-funded birch and alder improvement programme began in 1998 when work was initiated on breeding downy and silver-birch suitable for the Irish forestry sector.

Stakeholders had highlighted the need for more work on broadleaves, especially native species. Birch was considered to have potential for timber as it is the most important commercial broadleaf species in Northern Europe; highly valued in Scandinavian and Baltic countries.

## Goal 2 - Support sustainable farming and the environment

### Teagasc National Farm Survey.

The Teagasc National Farm Survey for 2013 showed that the average income level on Irish farms increased slightly in 2013 (up 1%) to €25,639. The stability in the average level, however, masked dramatically contrasting fortunes across the different components of Irish farming.

Average dairy farm incomes increased but average incomes for all the other enterprises decreased. Poor weather in the first quarter of 2013 and the continuing impact of the 2012 fodder crisis led to dramatic increases in feed and fertilizer expenses for all grassland based farming systems.

Farmers' expenditure on purchased concentrate and bulky feed increased dramatically, while in the second half of 2013 expenditure on fertilizer increased as farmers worked to rebuild depleted stocks of conserved forage. On average direct costs of production increased by 11% when compared with 2012.

Cattle Rearing family farm incomes declined by 22% due to higher costs of production. Cattle Other and Sheep farm incomes declined by 13% and 29% respectively in 2013 due to lower levels of output combined with higher costs of production. On Tillage farms, despite largely stable costs of production and higher yields, lower prices and lower areas harvested led to lower output and lower family farm incomes.

On dairy farms despite large increases in costs of production (+11%) average incomes increased strongly due to both higher prices (+23%) and increased levels of milk output per hectare (+11%).

In 2013 the average Irish farm received 8% less in direct payments as compared to 2012 due to reductions in single payment receipts, agri-environmental payments (REPS) and the ending of the suckler cow welfare scheme. Dr. Kevin Hanrahan, Teagasc Agricultural Economics and Farm Surveys department said:

*Dr. Noel Cawley, Prof. Gerry Boyle, Drs. Anne Kinsella, Brian Moran, Thia Hennessy, Cathal O'Donoghue, at the launch of the Teagasc National Farm Survey 2013.*

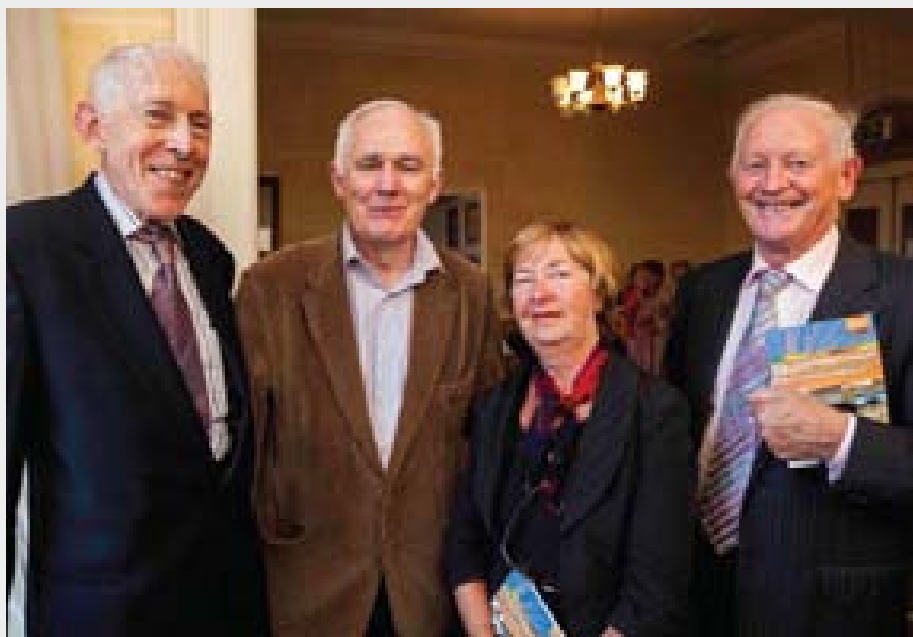


“On average the dependence of family farm income on subsidies declined in 2013 as compared to 2012. However, on Cattle Rearing, Cattle Other and Sheep farms direct payments still accounted for significantly more than family farm incomes. This overwhelming dependence of incomes on direct payments highlights the fact that on many Irish farms costs of production far exceeded returns from the market in 2013.”

Incomes on farms with a dairy enterprise increased in 2013 and almost fully reversed the large drop in incomes experienced in 2012. In 2013 the average specialist dairy farm income was €64,371. The increase in dairy farm incomes was driven by the large increase in the milk prices received by farmers along with additional production per hectare. Like other grassland systems, direct costs of production on dairy farms (mostly feed and fertilizer) increased in 2013. However, unlike cattle and sheep farmers, the increases in output prices received by dairy farmers were sufficient to deliver strong income growth.

Teagasc Director, Professor Gerry Boyle said: “The contrasting outcomes of dairy and non-dairy farmers are also reflected in the average farm outcomes across Ireland’s regions in 2013.

Those regions where dairy farming is more concentrated (the Southwest, South East and South) saw average incomes increase, while incomes in other regions, which have a greater dependence on drystock and tillage farming, saw declines.



*Brendan Riordan, Michael Keane, Anne Confrey, Brendan Kearney at the National Farm Survey 40th Anniversary.*

The largest increase in average family farm incomes occurred in the South Region (Cork and Kerry) where average farm incomes increased by 24%, while incomes in the Midlands region, where drystock farming and tillage dominates, declined by 16%.”

### **Teagasc National Farm Survey 40th anniversary**

The Teagasc National Farm Survey celebrated 40 years of publication in 2013. It measures farm incomes across the main enterprises and reflects the changes in sales, costs and incomes on an annual basis.

Teagasc marked the anniversary at an event in the Royal Dublin Society, Dublin. 2013 is also the fortieth anniversary of Ireland’s membership of the European Union and Teagasc produced a publication to mark both called - “40 years of Irish Farming since joining the European Union: A journey with the Teagasc National Farm Survey”.

Accession to the European Union brought with it an obligation to establish an annual survey of farm incomes to provide statistics on farming in Ireland to the European Commission.

The National Farm Survey, which is Teagasc’s longest running research project, was established in 1972 and every year since then it has been used to produce annual estimates of farm income.

When Ireland joined the EEC in 1973, there were approximately 250,000 farms in the country and the average family farm income, as measured by the NFS was €1,500 in nominal terms. In 2012 the average family farm income was €25,483.



## KEY THEME IN 2013

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# Ash Dieback Disease

*Chalara fraxinea*, known as ash dieback disease, is a relatively newly described fungal disease of ash. The harmful reproducing stage of the fungus, a new species *Hymenoscyphus pseudoalbidus*, was discovered in 2010. The disease has spread rapidly across much of Europe, and is now present in most European countries where ash is present.

Common ash is susceptible to ash dieback disease, as are a number of other species of ash and the disease can affect trees of any age and in any setting. Over 19,000 hectares of common ash (*Fraxinus excelsior*) woodlands have been planted in Ireland, primarily by farmers. In addition, ash has been planted along roadsides, on farms and in gardens.

Symptoms of the disease include foliage discolouration and wilt, dieback of shoots, twigs or main stem and necrotic lesions and cankers on the bark. This disease can be fatal, with younger trees (less than 10 years old) succumbing more rapidly.

The first confirmed finding of ash dieback in Ireland was in October 2012 on plants imported from continental Europe. The number of findings has increased to 120 by spring 2014, with all, except two cases (involving hedgerow trees), involving plants imported from Europe. The disease has been found to be present in forest plantations, horticultural nurseries, garden centres, private gardens, farm plantings (REPS and AEOS) and roadside plantings. The two hedgerow findings are close to infected sites.

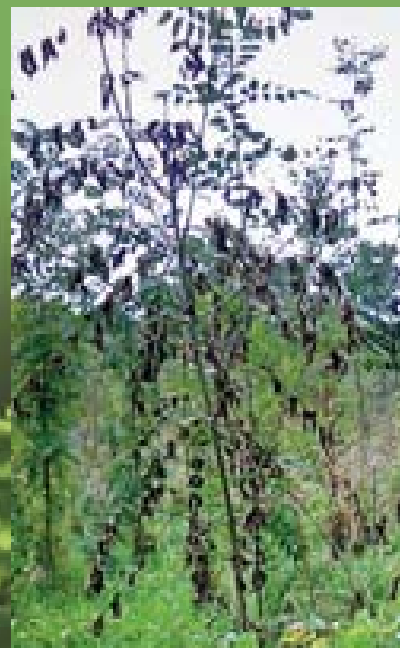
To date the policy is to remove and destroy infected plants. A Ministerial Order was introduced to restrict the movement of ash plants, seeds and ash wood into Ireland. The Department is continuing to survey for the disease and have temporarily suspended the grant aiding of new ash plantations under the Department's afforestation schemes.

### Advisory Activities:

Teagasc Forestry Advisers have been very proactive in supporting forest owners who had concerns or were affected by the disease. This included providing information, providing advice on disease symptoms and on the protocols to be adopted in relation to the disease. They have also provided an initial screening for symptoms that might be confused with the disease including frost damage and ash bud moth.

A series of 22 public information meetings on ash dieback disease were held nationwide between 20th and 30th of May at various Teagasc offices. These were organised by the Teagasc Forestry Development Department and were run collaboratively with Teagasc Agri-Environment Department, Forest Service and DAFM Agri-Environment Schemes and Plant Health Sections. Approximately 800 people attended and many more received information from the associated press releases, ads, editorials in local and national press, radio interviews and TV appearances.

A Teagasc newsletter on ash dieback disease was posted to all Teagasc clients and a short information leaflet was also prepared for distribution at events, information meetings and in Teagasc offices. Regular ash dieback updates are provided in Teagasc Forestry e-Newsletters.





## Goal 3 - Encourage diversification of the rural community and enhance the quality of rural life





## Goal 3 - Encourage diversification of the rural community and enhance the quality of rural life

### FARM SAFETY

#### National Farm Safety Conference

Professor Stephan Van den Broucke, a leading expert on prevention of accidents and ill health, was the keynote speaker at the annual National Conference on Farm Safety and Health. The conference in Nenagh, Co. Tipperary was hosted by Teagasc and the Health and Safety Authority as part of their Joint Prevention Initiative in association with the Farm Safety Partnership and is sponsored by FBD Trust.

Professor Van den Broucke is Head of the Department of Health Psychology and Prevention at the Catholic University of Louvain, Belgium and his presentation was entitled "Designing more effective Farm Safety programmes – Understanding what drives safe behaviours".

Professor Van den Broucke based his presentation on research among Belgian farmers, in gaining positive health and safety change. According to Professor Van den Broucke the principal driver of good health and safety management on farms is preventative action.

#### Staying Fit for Farming

A booklet entitled 'Staying Fit for Farming' promoting farmers health and healthy lifestyles was launched at the National Ploughing Championships.

'Staying Fit for Farming' was produced in collaboration with Dr. Noel Richardson, Director of the Centre for Men's Health at Carlow Institute of Technology, following alarming research by Health Service Executive medical consultant in public health, Dr. Breda Smyth.



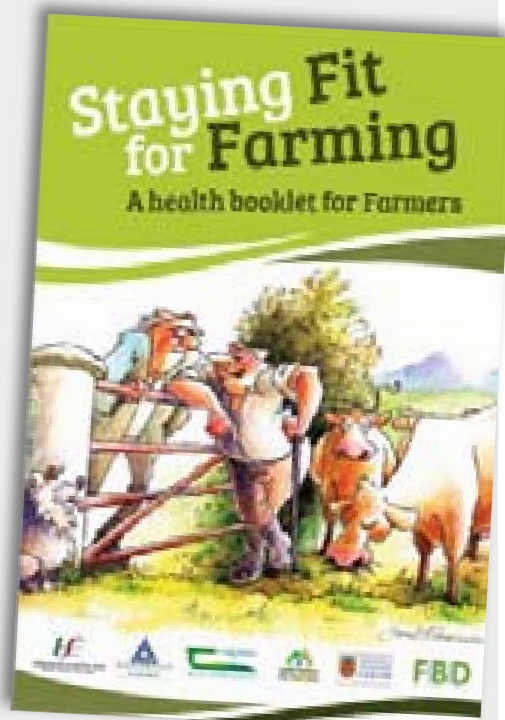
Mr. Martin O'Halloran CEO, HSA, and Prof. Gerry Boyle, Teagasc, signed a 'Memorandum of Understanding.'

Her study indicated that farmers have much higher death rates than most other groups in the occupational age range of 15 to 64 years old. The research, based on national mortality data, found that the death rate of farmers was over five times higher than salaried employees, who had the lowest death rate.

Farmers have particularly high mortality from circulatory diseases, cancers and injuries and poisonings. The high death rate was particularly associated with small farms with low income. The case studies included in the booklet show the consequences of ill health and give practical examples of how to maintain or improve health.

A number of areas, that are key to well-being, have been highlighted; coping with stress, keeping weight down, good back care, reducing alcohol intake and quitting smoking will all lead to major improvements for farmers.

'Staying Fit for Farming' was sponsored by the HSA, Teagasc, FBD Trust and the HSE. It was circulated nationally through the Irish Farmers Journal in early 2014 and is available from the [www.hsa.ie](http://www.hsa.ie), [www.teagasc.ie](http://www.teagasc.ie), and the HSA.



## HORTICULTURE

Teagasc provides advice to fruit and vegetable growers and conducts a limited research program. An example research project is irrigation of strawberries. In Ireland all of the substrate grown strawberry crops are irrigated manually or by timer, taking little account of changes in environmental conditions which drive plant demand for water or nutrients. A research project is targeting reduced labour costs, sustainability around fertilizer and water use and increased fruit quality.

### Courses for Organic Scheme Applicants

Teagasc provided training courses for land owners considering converting to organic farming in spring 2013. The course was mandatory for all new applicants to the Organic Farming Scheme re-launched by the Minister of Agriculture, Food and the Marine, Simon Coveney, TD.

Organic farming can be a profitable alternative to conventional farming. In Ireland the sector is growing steadily; at present there are 1,346 organic producers in the country with 58,566 hectares of land under organic production. It is envisaged that the area farmed organically will increase further due to strong demand for organic produce, the suitability of

many farms to organic conversion, and Department of Agriculture, Food and the Marine Scheme incentives.

The 25-hour Introductions to Organic Farming courses are FETAC accredited to Level 5 standard and were run over a four day period. The venues for the course were: Ballyhaise, Castlereagh, Fermoy and Macroom. Course topics included the principles of organic production, organic standards and regulations, and the economics and market opportunities for produce.

*North county Dublin tomato growers William and Martin Flynn. The Flynns are investing in new glasshouses to produce tomatoes on the vine for the Irish market. "This is not a decision to be taken lightly as a hectare of modern glass equipped to grow tomatoes will cost over €1 million," says their Teagasc adviser Dr. Michael Gaffney.*



## Goal 3 - Encourage diversification of the rural community and enhance the quality of rural life

### HORSE BREEDING

#### Young Horse Breeders 2013

The National Young Breeders Competition, organised by Horse Sport Ireland (HSI) and Teagasc and partnered by Connolly's Red Mills took place in April 2013 in Teagasc Kildalton College, Piltown, Co. Kilkenny.

The aim of the Young Breeders Competition is to:

- Encourage young people to become actively involved in breeding, presenting and assessing mares and young horses.
- Identify young people with the potential to become judges/inspectors.
- Improve knowledge of horse breeding and evaluating horses.
- Present an opportunity to meet other like-minded individuals nationally and internationally.

The skills gained are applicable to many areas aside from the above mentioned – e.g. presenting for sale or at inspection; assessing stock to purchase; and deciding which deserve further investment and which should be sold.

#### Tutorial Video

A tutorial video on how to edit and upload a video of a horse for sale on 'Youtube' has been produced by Teagasc Equine Specialist Declan McArdle. The tutorial offers tips, for an amateur to best capture footage, and how best to package that material using the editing package "Windows Movie Maker" (which is free to download). According to Declan "The day of describing your horse over the phone is gone. Buyers want to see the horse on video before travelling to see it."

He also comments "any old footage won't do; sellers must take time and effort to produce a video which markets the horse effectively."

The tutorial provides a step by step guide through the process of videoing the horse, how to use the domestic camcorder and what footage potential buyers are interested to see. The tutorial also explains how to upload the footage onto a computer and then using Windows Movie Maker to edit the footage and upload the finished video to 'Youtube'.

The video is free to watch on the Teagasc website and on the Irish Horse Gateway website. Accompanying the tutorial is a sample video of a horse for sale which complements the advice offered in the tutorial.



*Prof. Gerry Boyle during a visit to crop trials in Ethiopia.*

### Teagasc Sustainable Seed Potato Production Project in Ethiopia

Teagasc Director, Prof. Gerry Boyle visited a pilot project in Ethiopia entitled “Developing sustainable seed potato production systems for improved livelihoods”. This project is being implemented with the Irish NGO, Vita, in the Chenchu region, of Ethiopia.

This project was set up as part of Teagasc’s new policy on international food security. Teagasc is partnering on the project with Vita, the Irish NGO, Wageningen University, The Ethiopian Institute of Agricultural Research, The International Potato Centre (CIP), Arba Minch University and the Irish Potato Federation.

The project will empower and strengthen the local knowledge base by funding and training three Ethiopian Ph.D students. Dissemination of the research will help local subsistence farmers and the research will ultimately be widely transferable across sub-Saharan Africa through a proposed Potato Coalition.



### First retailer-farmer development programme

Minister of State at the Department of Agriculture, Food and Marine, Mr. Tom Hayes TD launched the SuperValu Sustainable Farming Programme at the Teagasc Animal and Grassland Research and Innovation Centre at Grange, Co. Meath. This innovative programme is the first retailer—farmer programme to be launched in Ireland.

Ten Irish farms (eight beef and two sheep) have been selected to take part in the first phase of this two year programme, which aims to assist farmers to deliver world class standards in all areas of livestock production, enhancing produce quality and improving profitability for all partners in the supply chain.

A network of Teagasc advisors have been assigned to participating farms, which are located nationwide, to assist them in enhancing the sustainability, farm efficiency, technical performance and profitability of their farming enterprises through various modules including:

- Grassland Management
- Market Specifications
- Carbon Footprint Analysis
- Herd Health
- Breeding

One of the main components of this programme is the production of livestock tailored to Irish consumer preferences.

Participants on the programme have been selected based on their management skills and a willingness to participate in a continuous improvement plan to enhance current performance and all are from BLQAS - Beef & Lamb Quality Assurance Scheme approved farms.



*Armando Inroga, Minister for Industry and Commerce, Mozambique with Prof. Gerry Boyle during a visit to Teagasc, Ashtown.*





### The future of rural Ireland

The evolving settlement pattern in Ireland holds long-term implications for the future social and economic development of the country, in general, and rural areas in particular. Research undertaken on behalf of the Commission for the Economic Development of Rural Areas (CEDRA) which is chaired by Pat Spillane, established that during the period 1991–2011, 75% of the growth in national population occurred in rural areas. Significantly, most of the growth in the rural population occurred in rural areas close or accessible to urban centers.

Dr. David Meredith from Teagasc's Rural Economy Development Programme explains:

"We are seeing trends that are fundamentally changing the distribution of key population cohorts.

The past 20 years have seen substantial growth of the population between 30 and 49 in 'accessible rural areas'; these are good places to live for a whole range of reasons, housing is cheaper, or better value for money, the quality of life is perceived to be better than other urban and rural locations and, importantly, these locations are accessible to many workplaces relative to urban cores and more remote or less accessible rural areas."

Dr. Meredith stresses the importance of understanding long run geo-demographic processes and their implications for future social and economic development.

"We are seeing the progressive concentration of key sub-groups in accessible rural areas, particularly the cohorts between 30 and 49 with high levels of educational attainment.

While these developments are, generally, to the benefit of accessible areas, it raises questions about the long-term viability of other rural areas. It is likely, given the trends observed over the past 20 years, that Ireland will be faced with the challenge of managing decline in parts of the country."

"These developments pose important questions regarding the future of different types of rural areas and how they are integrated with national, regional and local development strategies."

"There is a critical need to ensure that policy initiatives and economic development strategies are coordinated from the national level, through regional and local authorities down to the community level to ensure the appropriate types of supports are made available where they are most needed and can be of greatest benefit."



## Économusée

Ireland's first food Économusée was opened in April 2013 at The Connemara Smokehouse in Aillebrack, Ballyconneely, Co. Galway by the Mayor of Galway, Councillor Tom Welby. An Économusée is an artisan business that opens its doors to the public to provide a learning and interpretive experience for visitors.

Owned and operated by Graham and Saoirse Roberts, the Économusée at The Connemara Smokehouse develops the educational aspect of the fish smoking expertise that has been handed down through the Robert's family since 1979. The Économusée showcases this artisan process, which begins by catching fresh salmon, tuna, herring and mackerel from the Atlantic Ocean's pristine waters off the west coast of Ireland. The seafood is then hand-filleted, dry-salted, seasoned and smoked subtly with beechwood at the Connemara Smokehouse before it is ready for the retail market. An Économusée is an important cultural tourism attraction and contributes to the sustainability of rural areas through the creation of direct employment and by providing an attraction that disperses tourists to rural regions. Speaking at the opening, Teagasc Regional Advisory Manager Brendan Heneghan said:

"The Économusée concept originated 20 years ago in Quebec, Canada, where there are now over 50 Économusées contributing to employment and the maintenance of local skills and knowledge in traditional rural businesses ranging from artisan food to boat building." See more at: [www.smokehouse.ie/tag/artisan-food/#sthash.VC2dm1IA.dpuf](http://www.smokehouse.ie/tag/artisan-food/#sthash.VC2dm1IA.dpuf)

## AranLIFE Project

The Department of Arts, Heritage and the Gaeltacht announced the provision of €2.6 million funding for Aran Islands conservation under the EU's LIFE+ programme in 2013. The AranLIFE Project will run for four years from 2014, working with local farmers to support traditional island farming practices and maintain the islands' significant natural and cultural heritage.

The AranLIFE Project is an integrated project between the Department of Arts, Heritage and the Gaeltacht, the Heritage Council, the European Forum for Nature Conservation and Pastoralism, Institute of Technology Sligo, Teagasc, and the farming communities of the three Aran Islands.

Additional funding is provided by the Department of Agriculture, Food and the Marine, Galway County Council and Fáilte Ireland.

The Department of Arts, Heritage and the Gaeltacht, which has overall responsibility for offshore Islands is the Co-ordinating Beneficiary or lead applicant for the project.

The communities of the Aran Islands have lived in and farmed the islands for centuries. Their traditional farming practices have been central in creating the iconic Aran landscape, and maintaining its natural heritage, which draws visitors from all over Ireland and the world. The islands are of such high value for nature that over 75% of the land area has been legally designated as Natura 2000 sites under European legislation.

*Graham Roberts of The Connemara Smokehouse.*



## CLIENT PROFILE

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### Deirdre Howlin Horticultural Entrepreneur

Deirdre Howlin is a plant lover, entrepreneur and a graduate of Teagasc Kildalton College. She initially completed a Level 5 Certificate in Horticulture, and then a Degree in Horticulture from Kildalton/Waterford Institute of Technology in 2007. Since graduating Deirdre has established several successful horticultural businesses: Grange Greens Plant Centre as well as 'Bridal Bloom' a floristry business directed at the bridal market. She is now a Teagasc client working with Teagasc ornamentals specialist Andy Whelton.

"I love the variety of work," says Deirdre whose businesses are run from the family farm near Kilmore in county Wexford. "At Christmas we were producing thousands of ornamental displays for sale through supermarkets in the UK. This month it will be something completely different like tending to plants here in the garden centre. You need business management skills as well as being able to produce top quality plants. We learned both at Kildalton."

It's clear that Deirdre also has the 'people skills' which are vital when dealing with members of the public as well as her passion for producing top quality plants. She says she has her dream job but she is also realistic about the industry. "Amenity horticulture is supplying a luxury product and naturally the recession has had an impact and there is fierce competition from the supermarkets."

"You have to be versatile and have a number of sources of revenue," says Deirdre who grows *Pittosporum* and other plants for the cut foliage industry on the farm. "The work can be both physically and mentally extremely hard but I find it a very satisfying way to make a living."

Demand for high quality, well graded cut foliage or greenery to export markets in the UK and Holland for use in bouquets and other flower arrangements is increasing and prospects for continuing expansion of the small Irish Industry are very good. Currently 25 growers are exporting over €3.5 million of greenery providing much needed employment in harvesting and processing in rural counties of Kerry, Wexford and Waterford. Teagasc, Bord Bia and Enterprise Ireland are confident that DAFM Food Harvest 2020 targets of producing foliage valued at €20 million and generating 300 full-time jobs in rural Ireland can be met. 150 hectares of foliage has been planted in the past four years with the support of grant aid from the Department of Agriculture, Food and the Marine.

More sustainable control measures fostering eco-friendly production is a major cornerstone of the current research programme in Teagasc. Buyers are constantly looking for innovation with new products displaying different textures, colours & scents. Teagasc leads this work in Kildalton College by evaluating a wide range of ornamental plants with potential for foliage.



## Goal 4 - Enhance organisational capability and deliver value for money



## Goal 4 - Enhance organisational capability and deliver value for money

### Results of Change Programme 2

- Staff reduction from 1,574 in January 2008 to 1,109 in December 2013.
- Reduction in the pay bill of €26m between 2008 and 2013.
- Maintenance of advisory clients at about 40,000 over the full period.
- Increased enrolment in educational courses, from 1,049 in 2008 to 1,506 in 2013/14.
- Increased publication rates in top scientific journals, from 2.68 per permanent research staff member in 2008 to 4.03 in 2013.
- Reduction in office infrastructure, from 91 units in January 2008 to 51 in December 2013.
- Increased non-Grant-in-Aid income, reaching €40.7m in 2013, including income generated from success in research-tender applications, increased income from producer levies (dairy and pigs), etc.
- A streamlining of research structures, involving the establishment of four research programmes built around a small number of key research platforms that are common across ruminant livestock (e.g. animal breeding and grassland research) and the inclusion of enterprise specialists within research programme structures to ensure more effective delivery of results to stakeholders.

*Previous page: Prof. Gerry Boyle, Mr. Michael Berkery, Chairman FBD Trust, Conor Gouldson, Company Secretary, FBD Holdings PLC., and Dr. Noel Cawley, Chairman, Teagasc at the sod turning for the Paddy O'Keeffe Research and Innovation Centre, Moorepark.*



*Dr. Noel Cawley, Senator Hildegard Naughton and Prof. Gerry Boyle at a Teagasc briefing for Oireachtas members.*

- The increased use of discussion groups in the delivery of agricultural advisory services from 305 groups in 2008, comprising 4,500 farmers, to 812 in 2013 with 12,500 farmers.
- The integration of college based full-time education with the streamlined delivery of part-time courses through the establishment of 12 Regional Education Centres (RECs).
- The rationalisation of key operations' functions, including the centralisation of the finance function and the establishment of a central procurement unit.
- The development of a new technology transfer strategy for the food sector ("Gateways") to include the creation of a new Technology Transfer Office (TTO) and the pursuit of more collaborative engagement with the private sector.
- Recourse to outsourcing in the delivery of services in education and advisory (REPS).
- The establishment of strategic alliances with UCD and UCC.
- The implementation of a rigorous programme evaluation system comprising regular reviews of KPIs; the extension of external peer reviews to the advisory and education programmes; and the establishment of an International Scientific Advisory Board (ISAB).

## Farm Advisory Services to Enter New Era

An International Knowledge Transfer Conference opened in UCD in June (pictured below). Organised jointly by Teagasc, the European Commission and UCD, the three day conference heard

how we are entering a new era for advisory services in Europe. The EU has proposed the expansion of the Farm Advisory System (FAS) and the establishment of a European Innovation Partnership (EIP). The main aim of the EIP is "Agricultural Productivity and Sustainability". It seeks to ensure a steady supply of food, feed and biomaterials through efficient, productive, climate and environmentally friendly agriculture.



*Prof. Gerry Boyle, Director, Dr. Tom Kelly, Dr. Inge Van Oost, EU Commission and Prof. Hugh Brady, UCD.*

Addressing the 200 attendees representing 25 countries, Dr. Inge van Oost from the Agriculture and Rural Development DG in the European Commission said that advisers are key enablers of change and innovation, as they build bridges between research and farmers and between businesses and advisory services. The 'Budget for Europe 2020' under the CAP heading foresees €4.5 billion for research and innovation in the field of food security, bioeconomy and sustainable agriculture.

Delivering a joint paper prepared by Teagasc, ASA and ACA, Dr. Tom Kelly, Head of Knowledge Transfer in Teagasc said: "There is an opportunity to expand the use of best practice in knowledge transfer onto farms. We must work together to achieve much more and leverage the support of industry stakeholders. There is a huge opportunity to improve agricultural productivity and sustainability through the new European Innovation Partnership."





## Goal 4 - Enhance organisational capability and deliver value for money

### T-stór – Teagasc's new Open Access repository

Stór is the Gaelic word for repository or warehouse, and T-Stór is an online "store" of Teagasc research outputs and related documents. The repository is freely available to the general public at: <http://t-stor.teagasc.ie>.

'Open Access' refers to the free availability on the public Internet of scholarly articles published in an electronic format, permitting any user to read and re-use the content, provided only that the author is properly acknowledged and cited.

Teagasc is currently populating T-Stór with papers already available online. As new papers are published, they will be placed in the repository, so that eventually it will provide a picture of Teagasc research from 2012 forwards. Historical content will be added over time.

### ICT Investments

In 2013 Teagasc again almost doubled its investment in ICT systems. Investments included the replacement of almost half of Teagasc's desktop PCs and Laptops and their migration to Windows 7, completing the Pigs Module of the e-Profit Monitor system, upgrading the email system, completing the specification of requirements for a Nutrient Management Planning system, enhancing the Customer Information Management System and completing the centralisation of Purchase Invoicing.

### Annual Energy Usage Report

Teagasc operate out of 51 locations nationwide varying in scale from Campus type facilities with 100+ staff (e.g. Research Centres & Colleges) to small local Advisory offices with approximately 10 staff.

The Teagasc built-environment is the principal user of energy resources accounting for approximately 80% of total consumption.

In 2013, Teagasc consumed 23,725 MWh of energy consisting of:

- 10,217 MWh of electricity or 43% of total energy.
- 8,007 MWh of fossil fuel for space heating or 34% of total energy.
- 4,102 MWh of vehicle fuel (agricultural, commercial transport and car fleet) or 17% of total energy.
- 1,399 MWh of renewable fuels or 6% of total energy.

### Teagasc Office and land sales

In 2013 six former Teagasc advisory office premises at New Ross, Baltinglass, Moate, Bagenalstown, Tipperary, Rathdowney and a 0.63 ha field in Athenry were sold.



Dr. Frank O'Mara, Huk Mok Teagasc ICT and Maire Caffrey Teagasc Chief Librarian.

## The Teagasc Walsh Fellowships Programme

Through its Walsh Fellowships Programme, Teagasc offers up to 50 fellowships each year, mainly at PhD level, to young graduates to undertake postgraduate research in agriculture, food, environmental science, agri-food economics, rural development, horticulture and other related disciplines. The Programme promotes the professional development and training of young scientists in research in agriculture, food and related areas, enables them to gain experience in a working research environment and equips them with skills and knowledge which can be applied across a broad spectrum of the economy.

The Programme is also a key element of Teagasc's overall research strategy. Working alongside their Teagasc supervisors, Walsh Fellows contribute to advancing the Teagasc research agenda in agriculture and food and to the development of the organisation's mission. The Programme promotes closer liaison and collaboration between Teagasc and the nine universities on the island of Ireland, as well as with Irish Institutes of Technology and with universities in Europe, the US and New Zealand.

Teagasc invests over €5 million per annum in the Fellowships Programme, thereby supporting about 200 Fellows at any one time. Funding is provided from the Teagasc Grant-in-Aid and through a range of national and EU competitive research programmes.



*The 2013 winner of the Walsh Fellowships seminar and winner of the RDS medal was Patrick Gillespie who presented a paper on 'Grass utilisation as a driver of efficiency on European dairy farms'. He is a Walsh Fellow at the Teagasc Rural Economy Research Centre in Athenry, and the National University of Ireland Galway. Pictured are: Prof. Gerry Boyle, Mr. Declan Troy, Teagasc, Mr. Patrick Gillespie, Mr. Tom Cannon, RDS.*

With a view to strengthening the international dimension, an increasing number of fellowships are now offered in non-Irish universities and a limited number of short-term overseas awards are allocated on a competitive basis to students registered in Irish universities enabling them to undertake short training periods in overseas research institutions.

Through on-going adaptation to the changing scientific and industrial environment, Teagasc ensures that the Programme continues to address new challenges and opportunities as they arise. In particular, Teagasc has introduced new fellowship formats over the years, the most recent being a charity-based scheme, which was launched in 2013 and which provides philanthropists, business and industry with a valuable opportunity to fund agri-food research by establishing a Walsh Fellowship for a tax-efficient donation of €66,000 (for a three-year PhD programme) or €88,000 (for a four-year PhD programme).

## Teagasc Walsh Fellow of the Year Presented

The 18th annual Teagasc Walsh Fellowship Seminar 2013 took place in the RDS, Dublin, in November. Thirteen young researchers presented the results of their research, with a further 33 postgraduate students publishing posters.

Winner of the Walsh Fellowships seminar and winner of the RDS medal was Patrick Gillespie who presented a paper on 'Grass utilisation as a driver of efficiency on European dairy farms'. He is a Walsh Fellow at the Teagasc Rural Economy Research Centre in Athenry, and the National University of Ireland Galway.

The winner of the best poster was Shane Kennedy for his poster on 'Grain number /m<sup>2</sup> in barley – how much is too much?' He is a Walsh Fellow based at the Teagasc Crops Research Centre Oak Park and at SRUC Edinburgh in Scotland.



*Teagasc Gold Medal being presented to Prof. Tim Guinee by Teagasc Chairman Dr. Noel Cawley.*

## Evaluation of Teagasc Colleges

The Inspectorate of the Department of Education and Skills (DES) signed a Memorandum of Understanding (MOU) with Teagasc in 2013. This agreement provides for the Inspectorate to design and lead a programme of Whole-College Evaluations (WCEs) of Teagasc's Agricultural Colleges, in addition to privately-owned colleges that offer courses on behalf of Teagasc, over the next three years. On the invitation of Teagasc, pilot evaluations of two agricultural colleges - Ballyhaise College in Co Cavan and Gurteen College in Co Tipperary - were conducted early in 2013. Each inspection team was led by DES Inspectors and also included an expert from Teagasc's headquarters and an external expert with experience in agricultural education.

The pilot evaluations provided affirmation of many aspects of the work in the two colleges and also identified challenges and opportunities for improvement in the standard of provision in their courses. The Teagasc Authority reviewed the inspections and was satisfied that the WCE process fulfilled an important evaluative purpose. They believed that the WCEs provided valuable information, particularly about the quality of teaching and learning in the colleges, and they have requested the Inspectorate to carry out similar evaluations in the remaining agricultural colleges.

Following negotiations, the Department have agreed to conduct WCEs in the remaining three Teagasc and two privately-owned colleges over the period 2014 - 2016.

Chief Inspector of the DES, Dr. Harold Hislop, said: "The Inspectorate of the Department of Education and Skills is delighted to work with Teagasc in the evaluation of agricultural colleges. The agriculture sector is a vitally important part of our economy and we look forward to cooperating with the Authority as they work to improve the standards of learning for their students in the agricultural colleges."

The Director of Teagasc, Professor Gerry Boyle, commended the DES inspectorate on the joint pilot college evaluations carried out to date: "The professional, independent nature of the evaluations are particularly valued by Teagasc. In recent years Teagasc has seen almost a 150% increase in college enrolments leading to a very substantial increase in student to staff ratios. It is essential that Teagasc monitors closely the quality of its education delivery in that context. It may be necessary to restrict student intake if quality is being undermined," he said. In excess of 3,600 learners participate annually in Teagasc full time, part time and distance education courses. Teagasc though its provider agreement with Quality and Qualifications Ireland (QQI) implements a comprehensive quality assurance programme. Teagasc has introduced whole college evaluations as an additional measure to guide education managers in making continuous quality improvements.



## Teagasc Gold Medal 2013

The 2013 winner of the Teagasc Gold Medal was Prof. Tim Guinee, Principal Research Officer in the Department of Food Chemistry and Technology at the Teagasc Food Research Centre, Moorepark. The Teagasc Gold Medal is awarded to a serving staff member who has made an outstanding contribution to the organisation and to the agri-food sector.

The award was presented to Professor Guinee in recognition of his achievements during his career in Teagasc since joining the organisation in 1990.

Prof. Guinee is author/co-author of 84 peer-reviewed scientific papers, two patents, 21 book chapters, three text books, two monographs, and numerous other technical articles in various media. He is currently an editorial Board member for International Dairy Journal (since 2005) and Egyptian Journal of Dairy Science (since 1995), and was formerly a co-editor of the International Dairy Journal (2001-2005). He is a member of the International Dairy Federation action team on salt reduction in cheese.

Professor Guinee is an international expert in the study of the rheology and functional properties of composite high protein food matrices, and the exploitation of these properties in food manufacture and assembly/formulation, with particular emphasis on gels and cheese-based systems.

### Science Foundation Ireland & Teagasc agree M.O.U.

A Memorandum of Understanding, between Science Foundation Ireland (SFI) and Teagasc, will strengthen and accelerate research and innovation in Ireland's Agri-food sector which employs in the region of 150,000 people here. SFI and Teagasc have agreed to jointly fund research grants between scientists from the agriculture and food disciplines and scientists from other scientific and engineering disciplines.

The joint initiative aims to bring a broad range of disciplines and technologies to bear on strengthening innovation in the agri-food sector and to offer opportunities to scientists in disciplines including, genomics, robotics, material science, nanotechnology, immunology and ICT.

The convergence of this broad range of disciplines will help underpin the profitability, competitiveness and sustainability targets set out in the Department of Agriculture's "Food Harvest 2020" strategy.

### Formal agreement between Teagasc and the Chinese Academy of Agricultural Sciences

June 2013 saw the formal signing of a Memorandum of Understanding (MOU) between Teagasc and the Chinese Academy of Agricultural Sciences (CAAS) which allows for the facilitation of scientific collaboration and scientific exchange between the two agencies.

*The signing was witnessed by the Chinese Vice Minister of Agriculture, Mr. Zhang Taolin and by Minister of State, at the Dept. of Public Expenditure and Reform, Brian Hayes.*

The MOU, was signed by Mr. Tang Ke, the Director General of the Department of Science and Education, from the Chinese Ministry of Agriculture, on behalf of CAAS and by Professor Gerry Boyle, Director of Teagasc who signed on behalf of Teagasc in the offices of the Department of Agriculture, Food and the Marine in Dublin.

The signing was witnessed by the Chinese Vice Minister of Agriculture, Mr. Zhang Taolin and by Minister of State, at the Department of Public Expenditure and Reform, Mr. Brian Hayes.

The MOU follows from Minister Coveney's successful trade mission to China in 2012, when Teagasc participated in the Irish Sino Forum on sustainable agriculture production, which was hosted by CAAS.

Its aim is to encourage and develop scientific exchange opportunities between both agencies in the areas of animal breeding and genetics, dairy production, sustainable agricultural production, including relationship with climate change, food safety and residue analysis, and veterinary medicine and to facilitate increased opportunities to develop collaborative projects in areas of mutual interest.

The visit of Vice Minister Zhang "provided a further opportunity to raise the profile of Ireland as a centre of excellence in food production and research sciences at the highest political levels in China, and enhanced the already strong trading relationship between the two countries," said Minister Coveney.







## Science Week

During Science Week in November 2013 Teagasc research centres and colleges invited local schools to meet research and teaching staff and learn about the work Teagasc does to support science-based innovation in the agri-food sector and the broader bioeconomy that will underpin profitability, competitiveness and sustainability.

Over 1,000 students attended Teagasc Science Week events. In Athenry, students from local schools undertook a series of practical experiments to see how science is being used by Teagasc to address issues related to reproduction and parasitism in sheep.

Teagasc Grange research campus featured a demonstration of the beef and animal bioscience research at the campus.

At Teagasc Johnstown Castle, students learned about current Teagasc research in the areas of ecology, carbon cycling, water quality and soils, nutrient efficiency and sustainability.

At Teagasc Ashtown Food Research Centre, the aim of a fun-filled day was to promote an interest both in careers in scientific research, and the science behind food - through demonstrations, presentations and interaction with researchers in food and horticulture.

At Teagasc Oak Park, students toured the biotechnology laboratories and saw part of the plant science and potato breeding programmes. Researchers and technologists demonstrate the research programme and gave an insight into work at the forefront of crop science. Teagasc Oak Park's Dr. Stephen Kildea delivered a presentation at Carlow library on various well-known crops and their development and also discussed crop diseases.

Teagasc Kildalton College hosted a dissection of ruminant and monogastric digestive systems. The demonstration provided Leaving Certificate Agricultural Science students with an opportunity to see the organ structures of these systems up close, and some examples of common parasite damage.

*During Science Week students visiting Teagasc, Ashtown, learned how sausages are made.*

## Fulbright-Teagasc Award

Since 1957, Fulbright Awards have been given annually by the Irish and U.S. governments and provide Irish students, scholars, and professionals with the opportunity to study, lecture, and research at top universities and institutions throughout the United States.

A number of Irish companies and agencies sponsor Fulbright Awards including CRH Plc, Enterprise Ireland, the Marine Institute, and Teagasc. Mr. Shane Crowley is the 2013 Fulbright-Teagasc Student Awardee. Shane will research the isolation of dairy proteins in order to fortify foods and enhance their nutritional profile at the University of Wisconsin, Madison as part of his PhD at University College Cork.



## STAFF PROFILE

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### Dr. Eimear Gallagher Senior Research Officer Teagasc Ashtown.

Since joining Teagasc in 2000, Dr. Eimear Gallagher, a native of Bandon in county Cork, has been involved in 17 funded cereal and bakery-focussed research projects, co-ordinating 12 of these, totalling approximately €5.3 million. These funded projects have collaborative partners from Ireland, Europe and the US. She is also involved in a number of ongoing industry-funded research trials, both with large multinationals and SME-type food, ingredient and snack companies.

The outcomes of her research have resulted in a new suite of analytical procedures for the better evaluation and understanding of cereal quality attributes. She has also developed an internationally recognised competence in gluten-free research.

#### Coeliac disease

“In Ireland, approximately one in a hundred people suffer from coeliac disease,” says Eimear. “Coeliac disease is an autoimmune reaction to the prolamin fraction of the gluten protein, which causes damage to the villi in the small intestine. The only treatment for Coeliac disease is lifelong avoidance of foods containing wheat, barley, spelt, rye and some oats. Many gluten-free products available on the market are calorie dense, lacking in flavour, mouthfeel and nutrients, and are costly to buy.”

Dr. Gallagher and her colleagues have been investigating the use of alternatives to conventional flour in baking products. In particular they have been exploring the potential of orange pomace (OP). A by-product from the smoothie and juice industry, orange pomace has proven to have good nutritional attributes; it is low in fat (2% dry matter) and high in dietary fibre (40% dry matter) and has the potential to be used as a food ingredient.

“Using orange pomace we have been able to create bread with favourable baking characteristics and enhanced dietary fibre. OP is a viable, low cost food by-product for improving the physical and nutritional characteristics of gluten-free breads. The addition of this ingredient is not limited to gluten-free bread; it has potential to be used in both gluten-containing and gluten-free breads and confectionary.”

As a result of the dissemination of her research, Eimear now has considerable Teagasc consultancy activity with Irish and European bakery companies. She is also the co-ordinator of a recently-established national network of excellence in sensory food science.

The main outputs of her funded research activities include: 49 peer reviewed publications, two books, four book chapters, seven invited papers at international food conferences, 90 abstracts, 12 articles in the national newspapers, and 10 appearances on national television and radio. Eimear currently has a number of PhD students and postdoctoral researchers under her supervision.



## KEY THEME IN 2013



# CAP Reform

The Common Agricultural Policy (CAP) reform agreement of June 2013 marked the end of a long period of negotiations over the shape of EU agricultural policy. The reformed CAP will be in place from 2014 to 2020 and involves changes to **Pillar 1** (market organisation and direct income support policies) as well as **Pillar 2 (Rural Development)** policies. The key characteristics of the reformed CAP **Pillar 1** policies are:

- i) the redistribution of direct income support from farmers with above average levels of Pillar 1 support to those with below average levels of support;
- ii) the Greening of the CAP;
- iii) the increased flexibility accorded to Member States in how the direct payment regulation is implemented within the framework of fixed national direct payment ceilings (budgets) over period 2014-2020.

Throughout the negotiating process researchers from the Teagasc Agricultural Economics and Farm Surveys Department (AEFSD) provided research and analytical expertise to the Department of Agriculture, Food and the Marine (DAFM) in support of Ireland's involvement in the CAP reform negotiations process. Research undertaken by AEFSD staff focused on the changes to CAP Pillar 1 direct payment regimes, and sought to understand the impact on the distribution of direct income support of different CAP Pillar I reform implementation options, the impact of these policy options on farm incomes and the possible production impacts of CAP reform changes.

The set of possible reform options within the new CAP is very large and the narrower set of 5 policy options analysed by Teagasc was designed to provide decision makers with an objective assessment of the impact of policy options that Irish policy makers faced. The Teagasc analysis does not "recommend" one policy option over another; rather the Teagasc economic analysis provides objective evidence on the impact of different CAP reform implementation options on the distribution of direct income support amongst Irish farmers, on family farm income and on the agricultural output of Irish agriculture. The Scenarios analysed ranged from one in which the freedom to couple direct payments to production was exploited to the maximum extent possible to one in which only the minimum amount of redistribution allowed for under the reformed CAP was implemented in Ireland.

In so far as current receipts of decoupled direct income support payments from the Single Payment System (SPS) and the schemes provided for under the new CAP support agricultural production, the results of the Teagasc economic analysis point to a trade-off between legitimate but competing policy objectives that i) seek to maximize the income of the maximum number of farms and ii) seek to minimize the negative income impact of CAP reform on Irish agricultural output. Policy implementation choices that target coupled direct payments or area based payments on agricultural activities engaged in by large numbers of smaller scale farmers and less intensive farmers could adversely impact the profitability of production on a smaller number of larger more intensive farms.

In July 2013 DAFM launched a public consultation process in relation to the implementation of the new Direct Payments Regulation of the CAP. The research and analytic advice provided to DAFM by Teagasc economists was published as part of the Teagasc submissions on CAP reform. The ultimate Government decision in relation to CAP reform implementation in Ireland was announced in January 2014. Teagasc economists through the research and analytic expertise provided to the Department of Agriculture, Food and the Marine assisted the Irish Government in the CAP reform negotiations process. The objective economic analysis of the consequences of different possible policy implementation choices provided Government as well as agri-food industry stakeholders with essential insights into the consequences of the policy choices faced.

# Financial Statements

For the Year ended 31 December 2013

# Financial Statements

Year ended 31 December 2013

Contents	Page
REPORT OF THE COMPTROLLER AND AUDITOR GENERAL	59
STATEMENT ON INTERNAL FINANCIAL CONTROL	61
STATEMENT OF RESPONSIBILITIES OF THE AUTHORITY	62
ACCOUNTING POLICIES	63 - 64
INCOME AND EXPENDITURE ACCOUNT	65
STATEMENT OF TOTAL RECOGNISED GAINS AND LOSSES	65
BALANCE SHEET	66
CASH FLOW STATEMENT	67
NOTES TO THE FINANCIAL STATEMENTS	68 - 81

# **Report of the Comptroller & Auditor General**

## **for presentation to the Houses of the Oireachtas**

I have audited the financial statements of Teagasc for the year ended 31 December 2013 under the Agriculture (Research, Training and Advice) Act 1988. The financial statements, which have been prepared under the accounting policies set out therein, comprise the accounting policies, the income and expenditure account, the statement of total recognised gains and losses, the balance sheet, the cash flow statement and the related notes. The financial statements have been prepared in the form prescribed under Section 12 of the Act, and in accordance with generally accepted accounting practice in Ireland.

### **Responsibilities of the Authority**

The Authority is responsible for the preparation of the financial statements, for ensuring that they give a true and fair view of the state of the Authority's affairs and of its income and expenditure, and for ensuring the regularity of transactions.

### **Responsibilities of the Comptroller and Auditor General**

My responsibility is to audit the financial statements and to report on them in accordance with applicable law.

My audit is conducted by reference to the special considerations which attach to State bodies in relation to their management and operation.

My audit is carried out in accordance with the International Standards on Auditing (UK and Ireland) and in compliance with the Auditing Practices Board's Ethical Standards for Auditors.

### **Scope of audit of the financial statements**

An Audit involves obtaining evidence about the amounts and disclosures in the Financial Statements, sufficient to give reasonable assurance that the financial statements are free from material misstatement, whether caused by fraud or error. This includes an assessment of

- whether the accounting policies are appropriate to the Authority's circumstances, and have been consistently applied and adequately disclosed
- the reasonableness of significant accounting estimates made in the preparation of the financial statements, and
- the overall presentation of the financial statements.

I also seek to obtain evidence about the regularity of financial transactions in the course of audit.

In addition, I read the Authority's annual report to identify if there are any material inconsistencies with the audited financial statements. If I become aware of any apparent material misstatements or inconsistencies, I consider the implications for my report.

### **Opinion on the Financial Statements**

In my opinion, the financial statements, which have been properly prepared in accordance with generally accepted accounting practice in Ireland, give a true and fair view of the state of the Authority's affairs at 31 December 2013 and of its income and expenditure for 2013.

In my opinion, proper books of account have been kept by the Authority. The financial statements are in agreement with the books of account.



# Report of the Comptroller & Auditor General

## Year Ended 31 December 2013

### Matters on which I report by exception

I report by exception if

- I have not received all the information and explanations I required for my audit, or
- my audit noted any material instance where money has not been applied for the purposes intended or where the transactions did not conform to the authorities governing them, or
- the information given in the Authority's annual report is not consistent with the related financial statements, or the statement on internal financial control does not reflect the Authority's compliance with the Code of Practice for the Governance of State Bodies, or
- I find there are other material matters relating to the manner in which public business has been conducted.

I have nothing to report in regard to those matters upon which reporting is by exception.

Seamus McCarthy  
Comptroller and Auditor General  
30 June 2014

# Statement on Internal Financial Control

On behalf of the Authority of Teagasc I acknowledge our responsibility for ensuring that an effective system of internal financial control is maintained and operated.

Any system of internal financial control can provide only reasonable and not absolute assurance against material error, misstatement or loss. In considering the effectiveness of internal financial controls, the Authority and its Audit Committee have regard, among other things, to the requirements of the Code of Practice for the Governance of State Bodies.

The Authority has taken steps to ensure that an appropriate control environment is in place by:

- clearly defining management responsibilities, authority and accountability;
- establishing formal procedures for monitoring the activities and safeguarding the assets of Teagasc;
- developing a culture of accountability across all levels of the organisation.

The Authority has established procedures to identify business risks within Teagasc by:

- identifying the nature, extent and financial implication of risks facing Teagasc including the extent and categories which it regards as acceptable;
- assessing the likelihood of identified risks occurring;
- assessing Teagasc's ability to manage and mitigate the risks that do occur;
- assessing the costs of operating particular controls relative to the benefit obtained.

The system of internal financial control is based on a framework of regular management reporting, administration procedures including segregation of duties and a system of delegation and accountability including:

- an annual budgeting and financial reporting system which is reviewed and approved by the Authority;
- regular reviews by the Authority of overall strategy, business and financial plans and variances against operating and capital budgets.

Teagasc has an internal audit function, which operates in accordance with the requirements of the Code of Practice for the Governance of State Bodies and with the effectiveness criteria set out in the Teagasc Statement of Strategy published in 2012. The work of internal audit is informed by analysis of the risks to which Teagasc is exposed and annual internal audit plans are based on this analysis. The internal audit plans are approved by the Audit Committee. In 2013 the Authority retained an external expert to advise the Audit Committee.

The Authority's monitoring and review of the effectiveness of the system of internal financial control is informed by the work of the internal auditor, the Audit Committee which oversees the work of the internal auditor, the executive managers within Teagasc responsible for the development and maintenance of the financial control framework and comments made by the Comptroller and Auditor General in his management letter.

I confirm that the Authority conducted a review of the effectiveness of the systems of internal financial control in 2013.

Dr. Noel Cawley  
Chairman  
27th June 2014

## Statement on Responsibilities of the Authority

Under Section 12(1) of the Agriculture (Research, Training and Advice) Act, 1988, the Authority is required to prepare financial statements in such form as may be approved by the Minister for Agriculture, Food and the Marine with the concurrence of the Minister for Finance. In preparing those financial statements, the Authority is required to:

- select suitable accounting policies and then apply them consistently;
- make judgements and estimates that are reasonable and prudent;
- prepare the financial statements on the going concern basis unless it is inappropriate to presume that Teagasc will continue in operation;
- disclose and explain any material departures from applicable accounting standards.

The Authority is responsible for keeping proper books of account which disclose with reasonable accuracy at any time the financial position of Teagasc and which enable it to ensure that the financial statements comply with statutory requirements. The books of account are kept at the Authority's headquarters at Oak Park, Carlow. The Authority is also responsible for safeguarding the assets of Teagasc and for taking reasonable steps for the prevention and detection of fraud and other irregularities

Dr. Noel Cawley  
Chairman  
27th June 2014

Ms. Marie Christie  
Member of the Authority  
27th June 2014

# Accounting Policies

## Year Ended 31 December 2013

The significant accounting policies adopted by Teagasc are as follows:

### Basis of accounting

The Financial Statements have been prepared in accordance with the historical cost convention, subject to certain assets being included at a valuation (see below), and in a form approved by the Minister for Agriculture, Food and the Marine with the consent of the Minister for Finance under the Agriculture (Research, Training and Advice) Act, 1988. The Financial Statements have been prepared using the accruals method of accounting except as stated below and in accordance with generally accepted accounting practices. Financial Reporting Standards recommended by the recognised accountancy bodies are adopted as they become applicable.

### Moorepark Technology Limited

Moorepark Technology Limited is a joint venture between Teagasc and various agriculture co-operatives. Teagasc has a 57% holding in the paid up share capital of the company. Separate audited financial statements have been prepared in respect of Moorepark Technology Limited. Teagasc has decided that it is not appropriate to consolidate the results of Moorepark Technology Limited. The reason for the departure from the applicable accounting standard is that the corporate structure of Moorepark Technology Limited and its size are very different from Teagasc. The chosen treatment in the Financial Statements gives the reader more information about Moorepark Technology Limited and its relationship with Teagasc than would be the case if the Financial Reporting Standards were adopted.

### State funding

State funding for food research and agriculture research, for the Stimulus collaborative research programme and for the Agricultural Catchments Programme is accounted for on an accruals basis. All other State funding is accounted for on a cash receipts basis.

### Research and other projects

Grants in respect of research and other projects are included as income in the year in which the related expenditure is incurred.

### Tangible fixed assets and depreciation

Assets were taken over from An Chomhairle Oiliúna Talmhaíochta and An Foras Talúntais on 8th September 1988 at the closing values in the Balance Sheets of those bodies. Additions are stated at cost.

Land is not depreciated. Assets under construction are not depreciated. The cost or valuation of other owned fixed assets is written off by equal instalments over their expected useful lives as follows:

Farm Buildings	20 years
Other Buildings	50 years
Plant and Vehicles	5 years
Computer Equipment	3 years
Laboratory and Office Equipment	10 years

Assets held under finance leases are depreciated over the lease term, where this is shorter than their expected useful lives.

A half year's depreciation is charged in the years of acquisition and disposal of assets.

### Leases

Fixed assets acquired under finance leases are treated in accordance with the policy noted above under fixed assets. The capital element of related rental obligations is included under liabilities, while the interest element is charged to expenditure over the term of the primary lease period.

Rentals on operating leases are charged to expenditure as incurred.

### Capital account

The balance on this account represents the unamortised value of funds used to purchase fixed assets.

## **Accounting Policies**

### **Year Ended 31 December 2013**

#### **Stocks**

Stocks have been valued by Teagasc officials. Livestock and own farm produce are valued at estimated net realisable value. Net realisable value is determined on the basis that animals are sold on the open market. Gains and losses, which arise from these valuations, are reflected in full in operational income. All other stocks are valued at the lower of cost and net realisable value.

#### **Debtors**

Known bad debts are written off as they arise and specific provision is made where recovery is considered doubtful.

#### **Pensions**

Teagasc operates defined benefit pension schemes which are funded annually on a pay as you go basis from monies available to it, including monies provided by the Department of Agriculture, Food and the Marine, and from contributions deducted from staff salaries.

Pension Scheme liabilities are measured on an actuarial basis using the projected unit method.

Pension costs reflect pension benefits earned by employees in the period and are shown net of staff pension contributions which are retained by Teagasc. An amount corresponding to the pension charge is recognised as income to the extent that it is recoverable, and offset by grants received in the year to discharge pension payments.

Actuarial gains or losses arising from changes in actuarial assumptions and from experience surpluses and deficits are recognised in the Statement of Total Recognised Gains and Losses for the year and a corresponding adjustment is recognised in the amount recoverable from the Department of Agriculture, Food and the Marine.

Pension liabilities represent the present value of future pension payments earned by staff to date. Deferred pension funding represents the corresponding asset to be recovered in future periods from the Department of Agriculture, Food and the Marine.

#### **Foreign currency**

Transactions denominated in foreign currencies are translated into Euro and recorded at the rates of exchange ruling at the dates of the transactions. Monetary assets and liabilities denominated in foreign currencies are translated into Euro at the rates of exchange ruling at the balance sheet date.



## Income and Expenditure Accounts

### Year Ended 31 December 2013

	Notes	31 December 2013 €'000	31 December 2012 €'000
<b>Income</b>			
State funding	2	127,982	134,046
EU funding	3	2,483	2,433
Operational income	4	28,981	29,295
Net deferred funding for pensions	9	28,542	14,822
Surplus on disposal of fixed assets	12	713	1,145
Other grants, donations and voluntary levies		3,000	2,500
		<u>191,701</u>	<u>184,241</u>
<b>Expenditure</b>	5	<u>191,371</u>	<u>184,573</u>
		330	(332)
Transfer (to)/from Capital Account	11	<u>(1,533)</u>	<u>158</u>
<b>(Deficit) for the financial year</b>		<u>(1,203)</u>	<u>(174)</u>
<b>Balance at beginning of year</b>		<u>10,233</u>	<u>10,407</u>
<b>Balance at end of year</b>		<u>9,030</u>	<u>10,233</u>

## Statement of Total Recognised Gains & Losses

	Notes	31 December 2013 €'000	31 December 2012 €'000
<b>(Deficit) for the financial year</b>		(1,203)	(174)
Experience gains on pension scheme liabilities	9	26,988	6,571
Changes in assumptions underlying the present value of pension liabilities	9	<u>0</u>	<u>(329,741)</u>
Actuarial gain / (loss) on pension liabilities		26,988	(323,170)
Adjustment to deferred pension funding		<u>(26,988)</u>	<u>323,170</u>
<b>Total Recognised (Loss) for the year</b>		<u>(1,203)</u>	<u>(174)</u>

The above amounts relate entirely to continuing operations. The Statement of Accounting Policies and notes 1 to 27 form part of these Financial Statements.

Dr. Noel Cawley  
Chairman  
27th June 2014

Professor Gerry Boyle  
Director  
27th June 2014

## Balance Sheet

### Year Ended 31 December 2013

	Notes	31 December 2013 €'000	31 December 2012 €'000
<b>Fixed assets</b>			
Tangible assets	12	96,584	95,051
Financial assets	14	<u>2</u>	<u>2</u>
		<b>96,586</b>	<b>95,053</b>
<b>Current assets</b>			
Stocks	16	4,441	4,576
Debtors	17	15,496	13,705
Bank balances		1,397	5,208
Short term deposits		<u>21,758</u>	<u>21,636</u>
		<b>43,092</b>	<b>45,125</b>
<b>Creditors</b> - Amounts falling due within one year			
Creditors and accruals	18	12,559	16,046
Deferred income	19	<u>21,505</u>	<u>18,848</u>
		<b>34,064</b>	<b>34,894</b>
<b>Net current assets</b>		<u><b>9,028</b></u>	<u><b>10,231</b></u>
<b>Total assets less current liabilities before pensions</b>		<b>105,614</b>	<b>105,284</b>
Deferred pension funding	9	1,276,842	1,275,288
Pension liabilities	9	<u>(1,276,842)</u>	<u>(1,275,288)</u>
		<b>0</b>	<b>0</b>
<b>Net assets</b>		<u><b>105,614</b></u>	<u><b>105,284</b></u>
<b>Represented by</b>			
Capital account	11	96,584	95,051
Income and Expenditure account		<u>9,030</u>	<u>10,233</u>
		<b>105,614</b>	<b>105,284</b>

The Statement of Accounting Policies and notes 1 to 27 form part of these Financial Statements.

Dr. Noel Cawley  
Chairman  
27 June 2014

Professor Gerry Boyle  
Director  
27 June 2014

# Cashflow Statement

## Year Ended 31 December 2013

		31 December 2013 €'000	31 December 2012 €'000
	Notes		
<b>Reconciliation of operating surplus to net cash inflow from operating activities</b>			
Operating (deficit)		(1,203)	(174)
Depreciation	12	6,694	6,967
Transfer to / (from) capital account	11	1,533	(158)
Interest received		(567)	(667)
Profit on sale of fixed assets		(713)	(1,145)
Decrease in stocks		135	179
(Increase) in debtors		(1,791)	(2,863)
(Decrease) / Increase in creditors and long term liabilities		(3,487)	1,628
Increase in deferred income		2,657	6,380
<b>Net cash inflow from operating activities</b>		<b>3,258</b>	<b>10,147</b>

## Cash Flow Statement

<b>Net cash inflow from operating activities</b>		<b>3,258</b>	<b>10,147</b>
<b>Return on investment and servicing of finance</b>			
Interest received		567	667
<b>Net cash inflow from returns on investment and servicing of finance</b>		<b>567</b>	<b>667</b>
<b>Investing activities</b>			
Payments to acquire tangible fixed assets	12	(8,341)	(7,143)
Receipts from disposals of tangible fixed assets		827	1,479
<b>Net cash outflow from investing activities</b>		<b>(7,514)</b>	<b>(5,664)</b>
<b>(Decrease) / Increase in cash</b>	23	<b>(3,689)</b>	<b>5,150</b>
<b>Reconciliation of net cashflow to movement in net funds</b>			
(Decrease) / Increase in cash	23	(3,689)	5,150
Net funds at 1 January		26,844	21,694
<b>Net funds at 31 December</b>		<b>23,155</b>	<b>26,844</b>

The Statement of Accounting Policies and notes 1 to 27 form part of these Financial Statements.

Dr. Noel Cawley  
Chairman  
27 June 2014

Professor Gerry Boyle  
Director  
27 June 2014

# Notes to the Financial Statements

## Year Ended 31 December 2013

### 1 Teagasc (the Agriculture and Food Development Authority)

Teagasc (the Agriculture and Food Development Authority) was established under the Agriculture (Research, Training and Advice) Act, 1988. Under Section 21 of the Act, the assets and liabilities of An Chomhairle Oiliúna Talmhaíochta and An Foras Talúntais were transferred to Teagasc upon its establishment.

Section 12 of the Act requires that Accounts shall be kept in such form as may be approved by the Minister for Agriculture, Food and the Marine with the concurrence of the Minister for Public Expenditure and Reform. This approval was given on 14 August 1998.

### 2 State funding

	2013 €'000	2012 €'000
The amount shown under this heading comprises:		
Vote 31: Agriculture, Food and the Marine		
Grant-in-aid for general expenses	69,675	78,560
Grant-in-aid for superannuation purposes	41,163	38,500
Grant for human resource purposes	11,000	11,400
Food research and agriculture research	3,842	3,839
Stimulus collaborative research programme	1,647	1,094
Grant for forestry publicity and awareness and training	610	610
Grant for forestry education	45	43
	<u>127,982</u>	<u>134,046</u>

### 3 EU funding

	2013 €'000	2012 €'000
Farm Survey Income	150	159
INTERREG	193	303
Framework Programme VI	94	300
Framework Programme VII	<u>2,046</u>	<u>1,671</u>
	<u>2,483</u>	<u>2,433</u>

Framework Programmes have been the main financial tools through which the European Union supports research and development activities covering almost all scientific disciplines. Framework Programme VI ran up to the end of 2006. Framework Programme VII started on 1 January 2007 and runs to the end of 2013.

Teagasc carries out EU funded research through the Framework Programmes. Grants in respect of such research are taken into account as income when the corresponding expenditure has been incurred.

## Notes to the Financial Statements - continued

### Year Ended 31 December 2013

#### 4 Operational income

	Operations €'000	Knowledge Transfer €'000	Research €'000	2013 €'000	2012 €'000
Advisory service fees	0	10,128	315	10,443	10,842
Other fees	9	3,258	8,585	11,852	11,882
Livestock trading surplus (Note 7)	0	803	1,898	2,701	2,887
Other farming operations	0	766	1,888	2,654	2,363
Canteen receipts	0	48	36	84	126
Publications and miscellaneous	628	325	294	1,247	1,195
	<u>637</u>	<u>15,328</u>	<u>13,016</u>	<u>28,981</u>	<u>29,295</u>

#### 5 Expenditure

	Operations €'000	Knowledge Transfer €'000	Research €'000	2013 €'000	2012 €'000
Pay (Note 8)	4,699	30,651	33,906	69,256	71,307
Pensions (Note 9)	69,351	0	0	69,351	59,138
Travelling and subsistence	306	1,774	2,052	4,132	3,909
Staff Training	501	4	29	534	528
General operating expenses (Note 6)	6,540	8,477	17,884	32,901	35,051
Financial charges	51	0	(16)	35	16
Depreciation (Note 12)	258	1,436	5,000	6,694	6,967
Grants to private colleges (Note 15)	0	2,958	0	2,958	3,019
Other grants	90	970	4,450	5,510	4,638
	<u>81,796</u>	<u>46,270</u>	<u>63,305</u>	<u>191,371</u>	<u>184,573</u>

Total pay of €69.256m includes	2013 €'000	2012 €'000
--------------------------------	---------------	---------------

Overtime	1,000	1,198
Allowances	2,322	2,443
Redundancy	1,044	124

In 2013 164 staff received overtime payments. The highest individual amount totalled €24,848.

Travelling and subsistence	Domestic €'000	Foreign €'000	2013 €'000	2012 €'000
Subsistence	1,189	280	1,469	1,373
Motor travel	2,352	0	2,352	2,247
Airline and ferries	0	311	311	289
	<u>3,541</u>	<u>591</u>	<u>4,132</u>	<u>3,909</u>



## Notes to the Financial Statements - continued

### Year Ended 31 December 2013

#### 6 Analysis of general operating expenses

	Operations	Knowledge Transfer	Research	2013	2012
	€'000	€'000	€'000	€'000	€'000
Farming supplies / services	2	915	3,020	3,937	5,079
Maintenance / repairs	171	2,299	3,420	5,890	6,516
Rents / rates / insurances	38	592	1,525	2,155	2,274
Postage / telephones	650	1,059	364	2,073	2,049
Power / fuel / petrol	163	827	1,707	2,697	2,656
Laboratory supplies	0	2	3,610	3,612	4,234
Printing / stationery / publicity	1,011	692	667	2,370	2,705
Seminar / classroom / library supplies	21	636	879	1,536	1,621
Services of external agencies	0	760	621	1,381	1,390
Student and staff canteen supplies	55	363	258	676	825
Audit Fee	47	0	0	47	47
ICT supplies / services	3,564	69	294	3,927	2,868
Legal / professional fees	812	137	974	1,923	2,126
Miscellaneous programme costs	0	113	523	636	606
Special events and miscellaneous	6	13	22	41	55
	<u>6,540</u>	<u>8,477</u>	<u>17,884</u>	<u>32,901</u>	<u>35,051</u>

#### 7 Livestock trading surplus

	2013	2012
	€'000	€'000
Sales	3,101	3,622
Grants and subsidies	<u>566</u>	<u>611</u>
Total livestock trading revenue	<u>3,667</u>	<u>4,233</u>
Opening stock	3,920	3,960
Purchases	<u>692</u>	<u>1,306</u>
	4,612	5,266
Less: Closing stock	<u>(3,646)</u>	<u>(3,920)</u>
Total cost of livestock sales	966	1,346
Surplus to Income and Expenditure account (Note 4)	<u>2,701</u>	<u>2,887</u>

## Notes to the Financial Statements - continued

### Year Ended 31 December 2013

#### 8 Staff

	2013	2012
The average number of staff employed during the year was as follows:		
Professional	623	631
Technical	145	151
Administrative/clerical	201	211
Farm/domestic	155	167
	<u>1,124</u>	<u>1,160</u>

The Director's remuneration was as follows:	2013	2012
	€'000	€'000
Basic pay	149	153
Benefit in kind (Car)	10	10
	<u>159</u>	<u>163</u>

The Director's pension entitlements do not extend beyond the model public sector defined benefit superannuation scheme.

Pension related deductions of €4,344,462 has been deducted from salaries and paid to the Department of Agriculture, Food and the Marine.

During 2013, nine staff were awarded contracts of indefinite duration on foot of hearings at the Labour Court and the Rights Commissioner.

#### 9 Superannuation

Section 9 of the Agriculture (Research, Training and Advice) Act, 1988 provides for the establishment of schemes for the granting of superannuation benefits in respect of staff appointed by Teagasc and staff transferred to Teagasc from An Chomhairle Oiliúna Talmhaíochta and from An Foras Talúntais.

Pending the approval of draft superannuation schemes by the Minister for Agriculture, Food and the Marine, the Minister for Finance and the Oireachtas, Teagasc operates superannuation schemes on an administrative basis.

Teagasc also administers two superannuation schemes (the Agricultural Colleges Staff Superannuation Scheme 1985 and the Agricultural Colleges Spouses' and Children's Contributory Pension Scheme 1985) in respect of certain staff employed by privately-owned Colleges of Agriculture and Horticulture, the cost of whose salaries is borne by the Exchequer through the agency of Teagasc.

The above schemes are defined benefit superannuation schemes. No separate fund is maintained, and no assets are held, to finance the payment of pensions and gratuities. The actuarial estimate of future liabilities accruing in regard to future benefits is shown on the Balance Sheet.

The average number of monthly pensions paid during the year was 1,682 (2012 – 1,665).

## Notes to the Financial Statements - continued

### Year Ended 31 December 2013

#### Superannuation Costs

##### (i) Analysis of total pension costs charged to income and expenditure account

	2013 €'000	2012 €'000
Current service cost	28,962	16,503
Interest on scheme liabilities	43,858	46,513
Staff contributions	(3,469)	(3,878)
	<u>69,351</u>	<u>59,138</u>

##### (ii) Movement in net pension liability during the financial year

	2013 €'000	2012 €'000
Net pension liability at 1 January	1,275,288	937,296
Current service cost	28,962	16,503
Benefits paid	(44,278)	(48,194)
Interest on scheme liabilities	43,858	46,513
Actuarial loss / (gain)	(26,988)	323,170
Net pension liability at 31 December	<u>1,276,842</u>	<u>1,275,288</u>

##### (iii) Deferred funding asset for pensions

Teagasc recognises as an asset an amount corresponding to the unfunded deferred liability for pensions on the basis of the set of assumptions described below and a number of past events. These events include the statutory basis for the establishment of the superannuation schemes, and the policy and practice currently in place in relation to funding public service pensions including contributions by employees and the annual estimates process. While there is no formal agreement regarding these specific amounts with the Department of Agriculture, Food and the Marine, Teagasc has no evidence that this funding policy will not continue to meet such sums in accordance with current practice.

Net deferred funding for pensions in the year

	2013 €'000	2012 €'000
Funding recoverable in respect of current years pensions	72,820	63,016
Resources applied to pay pensions	(44,278)	(48,194)
	<u>28,542</u>	<u>14,822</u>

The deferred funding asset for pensions as at 31 December 2013 was €1,277 million (2012 - €1,275 million).

## Notes to the Financial Statements - continued

### Year Ended 31 December 2013

#### (iv) History of defined benefit obligations

	2013 €'000	2012 €'000	2011 €'000
Experience gain / (loss)	26,988	6,571	1,838
Percentage of present value of scheme liabilities	2.1%	0.5%	0.2%
Changes in assumptions	0	(329,741)	(43,171)
Percentage of present value of scheme liabilities	2.1%	25.3%	4.4%
Actuarial (loss)/ gain recognised in the STRGL	26,988	(323,170)	(41,333)

The cumulative actuarial loss recognised in the Statement of Total Recognised Gains and Losses amounts to €184.388m.

#### (v) General description of the scheme

The pension scheme is a defined benefit final salary pension arrangement with benefits and contributions defined by reference to current "model" public sector scheme regulations. The scheme provides a pension (eightieths per year of service), a gratuity lump sum (three eightieths per year of service) and spouse's and children's pensions. Normal retirement age is a members 65th birthday, and pre 2004 members have an entitlement to retire without actuarial reduction from age 60. Pensions in payment (and deferment) normally increase in line with general public sector salary inflation.

The valuation used for FRS17 disclosures has been based on an actuarial valuation by a qualified independent actuary on 24 January 2014 in order to assess the scheme liabilities at 31 December 2013.

The principal actuarial assumptions used to calculate liabilities under FRS17 are as follows:

	2013 % per annum	2012 % per annum
Inflation rate increase	2.00	2.00
Salary rate increase	3.50	3.50
Pension rate increase	3.50	3.50
Scheme liabilities discount rate	3.50	3.50

The mortality basis adopted allows for improvements in life expectancy over time, so that life expectancy at retirement will depend on the year in which a member attains retirement age (age 65). The table below shows the life expectancy for members attaining age 65 in 2013 and 2038.

Year of attaining 65	2013	2038
Life expectancy - males	88.1	90.5
Life expectancy - females	89.3	91.5

On the basis of these and other assumptions and applying the projected unit method prescribed in FRS17, the present value of pension scheme liabilities is as follows:

	2013 €'000	2012 €'000
Total accrued pension liability	<u>1,276,842</u>	<u>1,275,288</u>

## Notes to the Financial Statements - continued

### Year Ended 31 December 2013

#### 10 Authority members' fees and emoluments

	2013 €'000	2012 €'000
Cawley, Dr. Noel, Chairman	21	21
Gleeson, Mr. Brendan	0	0
Christie, Ms. Marie	12	14
Pierce, Dr. Karina	12	0
Collins, Mr. Tom	12	12
Downey, Mr. Eddie	12	12
Tynan, Mr. Tom	12	0
Jago, Mr. Alan	3	0
Fitzgerald, Prof. Gerald	3	0
Fottrell, Dr. Patrick	0	9
Cooke, Mr. Tommy	12	12
Gibbons, Mr. Padraig	12	12
O'Mahony, Mr. Frank	9	12
James, Mr. Brett	0	4
Sweeney, Ms. Margaret	0	6
	<u>120</u>	<u>114</u>
<b>Total expenses paid to Authority members</b>	<u>33</u>	<u>38</u>

Department of Public Expenditure and Reform guidelines on One Person One Salary were implemented in the case of all but two of the Authority members in 2013. The One Person One Salary principal was not implemented for Dr. Karina Pierce and Professor Gerald Fitzgerald who were employed by public bodies. Immediate steps were taken to implement the guidelines in respect of the two members once this matter was brought to the attention of the Authority.

#### 11 Capital account

	2013 €'000	2012 €'000
Balance at 1 January	<u>95,051</u>	<u>95,209</u>
Transfers from income and expenditure account		
Amount capitalised in respect of purchased assets	8,341	7,143
Net amount released on disposals	(114)	(334)
	<u>8,227</u>	<u>6,809</u>
Less: Amortised in line with asset depreciation	(6,694)	(6,967)
	<u>1,533</u>	<u>(158)</u>
Balance at 31 December	<u>96,584</u>	<u>95,051</u>



## Notes to the Financial Statements - continued

### Year Ended 31 December 2013

<b>12 Tangible fixed assets</b>	Land	Buildings	Assets under Construction	Plant & Equipment	Total
	€'000	€'000	€'000	€'000	€'000
<b>Cost or valuation</b>					
At beginning of year	5,810	110,235	5,219	70,732	191,996
Additions	0	644	3,783	3,914	8,341
Buildings completed	0	4,150	(4,150)	0	0
Disposals	0	(133)	0	(1,070)	(1,203)
At end of year	<u>5,810</u>	<u>114,896</u>	<u>4,852</u>	<u>73,576</u>	<u>199,134</u>
<b>Accumulated depreciation</b>					
At beginning of year	0	42,599	0	54,346	96,945
Charge for year	0	2,569	0	4,125	6,694
Disposals	0	(88)	0	(1,001)	(1,089)
At end of year	<u>0</u>	<u>45,080</u>	<u>0</u>	<u>57,470</u>	<u>102,550</u>
<b>Net book amounts</b>					
At beginning of year	<u>5,810</u>	<u>67,636</u>	<u>5,219</u>	<u>16,386</u>	<u>95,051</u>
At end of year	<u>5,810</u>	<u>69,816</u>	<u>4,852</u>	<u>16,106</u>	<u>96,584</u>

Included in the opening balances is land totalling 522.8 ha (1,291.3 acres) transferred by the Department of Agriculture, Food and the Marine at nominal values, and certain other assets which were revalued at 31 December 1975 or 1 July 1980. Teagasc has the use of 34.15 ha (84 acres) of land owned by the Department of Agriculture, Food and the Marine, while the Department has the use of 27.1 ha (67 acres) owned by Teagasc. There is no charge to either party arising from these arrangements.

Certain fixed assets entrusted to Teagasc are protected by statute, and may not be sold.

Teagasc has a total of 55 offices/centres of which 50 are owned by Teagasc and the remaining 5 are under rental agreements. Three of the rental agreements are short term and expire within five years, one in eight years and the remaining agreement is a long term lease with the end date yet to be finalised.

At 31 December 2013 Teagasc held the following assets for sale:

	Carrying amount at 31 December 2013
Site at Athenry, Co. Galway	0
Former advisory office at Birr, Co. Offaly	0
Site at Raheen, Co. Limerick	465
Former advisory office at Tullow, Co. Carlow	0
Former advisory office at Athy, Co. Kildare	0

The combined Estimated Market Value of the five properties held for sale was €1.145m.

## Notes to the Financial Statements - continued

### Year Ended 31 December 2013

<b>Disposal of Fixed Assets</b>	<b>Proceeds/ Costs 2013 €'000</b>	<b>Proceeds/ Costs 2013 €'000</b>	<b>Proceeds/ Costs 2012 €'000</b>	<b>Proceeds/ Costs 2012 €'000</b>
Proceeds from sale of property				
Property sales during year	803		1,468	
Cost of sales	(65)	738	(31)	1,437
Proceeds from sale of other assets		89		42
		827		1,479
Net book value of fixed assets disposed				
Property assets	(45)		(287)	
Other assets	(69)	(114)	(47)	(334)
		713		1,145

There was no transfer to the Exchequer of asset sales proceeds in 2013.

### 13 Operating leases

At 31 December 2013 Teagasc had annual commitments under non-cancellable operating leases as follows:

	<b>Land and buildings €'000</b>	<b>Plant and machinery €'000</b>	<b>Total €'000</b>
Leases which expire:			
Within one year	52	25	77
Between two and five years	53	23	76
After five years	168	0	168
	273	48	321

## Notes to the Financial Statements - continued

### Year Ended 31 December 2013

#### 14 Financial assets

Teagasc has three small investments in agricultural co-operatives costing €1,243 in total (2012 - €1,243).

##### Moorepark Technology Limited

Teagasc has invested €650 in Moorepark Technology Limited and has a 57% holding in the paid up share capital of the Company (5,100 shares at €0.127). The Company, which was incorporated on 18 January 1991, is a joint venture between Teagasc and various agriculture co-operatives.

Separate audited financial statements have been prepared in respect of the Company and its results for the year ended 31 December 2013 were as follows:

	2013 €'000	2012 €'000
Turnover	1,527	1,508
Operating profit before depreciation, interest and tax	397	170
Depreciation (net of grants amortised)	(211)	(216)
Interest receipts	9	8
Tax	(1)	(2)
(Loss)/Profit after taxation	194	(40)
Accumulated profits to 31 December	359	165

The Company's Memorandum of Association provides that shareholders are entitled to avail of the Company's services at preferential rates.

Trading transactions between Teagasc and Moorepark Technology Limited (which consists of consultancy, analyses and use of technical and other facilities) were as follows:

	2013 €'000	2012 €'000
Moorepark Technology Limited sales to Teagasc (included in turnover)	383	405
Other recoupments from Teagasc (deducted from cost of sales)	132	142
Total	515	547
Amounts owed to Moorepark Technology Limited at 31 December	97	45
Teagasc sales to Moorepark Technology Limited	72	71
Amounts owed to Teagasc at 31 December	48	0

## Notes to the Financial Statements - continued

### Year Ended 31 December 2013

Under the terms of the Moorepark Technology Limited Promoters' Agreement, Teagasc has undertaken to provide from its own resources specified staff requirements in Moorepark Technology Limited, as well as underwriting the Company's utility, stores, accounts and effluent overheads. These costs were as follows:

	2013 €'000	2012 '000
Staff	179	197
Other	30	30

These totals are included in Teagasc expenditure under Research (Notes 5 and 6)

Moorepark Technology Limited utilises assets owned by Teagasc as follows:

	2013 €'000	2012 €'000
Original Costs	1,196	1,196
Net Book Value at 31 December	0	0

These amounts are included under Plant and Equipment (see Note 12 above).

In accordance with the Promoters' Agreement, Teagasc has also leased to Moorepark Technology Limited at a nominal rent of €127 per annum its existing processing hall at Moorepark Dairy Products Centre together with an adjoining site on which the Company has constructed additional facilities.

It was not considered appropriate to consolidate the results of the Company.

#### 15 Private Colleges

Teagasc provides support to three private agricultural colleges as follows:

	2013 €'000	2012 €'000
Grants to private colleges	2,958	3,019
Salary costs of staff seconded to private colleges (included in the total pay expenditure in Note 5 above)	605	558
External service provider costs for teaching services provided to private colleges (included in the general operating expenditure in Note 5 above)	98	0
	<u>3,661</u>	<u>3,577</u>

Grants to private colleges are shown net of the cost of workbooks provided by Teagasc to the private colleges being €91,050 (2012- €94,400).

#### 16 Stocks

	2013 €'000	2012 €'000
Livestock	3,641	3,916
Farm produce, fertilisers and feeding stocks	535	400
General supplies	265	260
	<u>4,441</u>	<u>4,576</u>

## Notes to the Financial Statements - continued

### Year Ended 31 December 2013

#### 17 Debtors and prepayments

	2013 €'000	2012 €'000
Trade debtors	6,237	6,241
Other debtors, prepayments and accrued income	9,259	7,464
	<u>15,496</u>	<u>13,705</u>

All amounts included above fall due within one year.

#### 18 Creditors - Amounts falling due within one year

	2013 €'000	2012 €'000
Creditors Accruals	7,553	9,247
Trade creditors	1,153	887
PAYE/PRSI	2,371	2,403
Value added tax	269	458
Withholding tax	95	114
Research advances	64	1,894
Other payroll deductions	864	957
Refundable deposits	190	86
	<u>12,559</u>	<u>16,046</u>
Creditors for taxation and social welfare included above	<u>2,735</u>	<u>2,975</u>

#### 19 Deferred income

Teagasc carries out public funded research in accordance with contracts with other State Institutions, principally the Department of Agriculture, Food and the Marine. Grants in respect of such research are taken into account as income when the corresponding expenditure has been incurred under each contract.

At 31 December the source and amount of deferred income in respect of research and other projects was as follows:

	2013 €'000	2012 €'000
Department of Agriculture, Food and the Marine – advance for FIRM projects	4,899	3,872
Department of Agriculture, Food and the Marine – advance for Stimulus projects	7,261	4,575
European Science Foundation – Food Safety Promotion	183	190
Other research related deferrals	8,048	9,097
Amounts received in advance for work associated with the completion of sale of land at Athenry	1,114	1,114
	<u>21,505</u>	<u>18,848</u>



## Notes to the Financial Statements - continued

### Year Ended 31 December 2013

#### 20 Finance leases

At 31 December 2013 Teagasc had no obligations under finance leases (2012 - Nil).  
There were no finance charges incurred during the year under finance leases (2012 - Nil).

#### 21 Capital commitments

Teagasc had capital commitments outstanding at 31 December 2013 amounting to €3.24m which relate to construction of buildings and facilities at the Research and Innovation Facility, Moorepark €2.84m and at Botanic Gardens, Dublin 9 €0.4m (2012 - €2.8m).

#### 22 Grant commitments

Teagasc had grant commitments outstanding at 31 December 2013 amounting to €9.073m which relate to Walsh Fellows €5.188m, Private College Grants €2.671m and Other Grants €1.214m (2012 - €8.123m).

#### 23 Analysis of changes in net funds during the year

	1 January 2013 €'000	Cashflows €'000	31 December 2013 €'000
Cash at bank and on hand	5,208	(3,810)	1,398
Bank overdraft	0	0	0
Short-term deposits	21,636	121	21,757
	<u>26,844</u>	<u>(3,689)</u>	<u>23,155</u>

#### 24 Authority members – disclosure of transactions

The Authority has adopted procedures in accordance with the guidelines issued by the Department of Finance in relation to the disclosure of interest by Authority members and the Authority has adhered to these procedures. There were no transactions in the year in relation to the Authority's activities in which board members had an interest.

## Notes to the Financial Statements - continued

### Year Ended 31 December 2013

#### 25 Capital Investment/Proceeds of asset sales

The Authority's accumulated surplus includes €7.6m in respect of the sale of assets in the years 2007 to 2013. The Authority has received sanction from the Minister for Agriculture Food and the Marine and the Minister for Public Expenditure and Reform to retain these funds for capital investment purposes. Below is a summary of the sales and capital expenditure figures:

	€'000
Accumulated sales proceeds retained between 2007 and 2013	37,609
Related accumulated capital expenditure between 2007 and 2013	(29,970)
Included in accumulated surplus on Income and Expenditure Account	<u>7,639</u>

Teagasc has secured sanction to invest in the following projects which are scheduled, underway or completed:

	Invested 31 Dec 2013 €'000	Budget to Complete €'000
Animal Bioscience Centre, Grange, Co. Meath	4,545	55
Sheep Research Facilities, Athenry	971	150
Student Facilities, Botanic Gardens	2,090	410
Demonstration / Technology farm, Athenry	36	134
Development of facilities at Ashtown	166	4,584
Research and Innovation Facility, Moorepark	601	3,099
Pig Biotest Facility, Moorepark	0	2,500
Kildalton College	4,090	0
Oak Park House	4,000	0
Neutraceutical Laboratories Ashtown	3,500	0
Functional Foods Laboratories Moorepark	4,974	0
Mellows Building Refurbishment	1,646	0
Oak Park Biofuel Laboratories	1,003	0
Environment Building Johnstown Castle	1,000	0
Other capital projects	1,348	0
	<u>29,970</u>	<u>10,932</u>

#### 26 Contingent liabilities

The Authority has been notified of a number of claims from (a) clients resulting from the provision of services and (b) in respect of certain industrial relations matters.

The Authority has made provision in the financial statements reflecting its best estimate of the liability arising. The Authority believes that disclosure of information on its provisions would prejudice the outcome of litigation arising from the claims.

#### 27 Approval of the financial statements

The Authority approved the financial statements on 27 June 2014.

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