fera

Annual Review

2012/13

Fera's main campus just outside York is becoming a magnet for organisations with a related interest in detection and diagnostics, with new partners, including SMEs, choosing to locate here during the year. This has enabled us to launch the Sand Hutton Applied Innovation Campus with the support of local partners including the Local Economic Partnership and the nearby University of York. The campus is being put at the heart of a combined city/rural growth plan.

Foreword

by Adrian Belton, Chief Executive

Welcome to The Food and Environment Research Agency's (Fera) Annual Review for 2012/13.

Adrian Belton

I am delighted to report that Fera has had another year of strong trading in what continue to be exceptionally challenging times. We saw our income go up again and productivity improve, we have maintained strong levels of customer satisfaction and have achieved impressive efficiency savings during the year. This has enabled us to protect and further invest in our nationally important scientific capabilities.

The needs of our customers in the Agri-Food sector are the driving force behind our activities and have led to some exciting developments in 2012/13, which are highlighted below and in further detail later in this review.

Our extensive plant pest and disease diagnostic capability was called upon to help unravel the identity of a highly damaging maize disease in Kenya using next generation DNA sequencing methods.

We announced two major new EU-funded projects, PROteINSECT and TESTA, which will see us apply our capabilities to help tackle the challenge of global food security.

Our expertise in developing 'point-of-need' diagnostic tools has led to new work in developing rapid tests for such diverse fields as detecting hospital acquired infections and tackling campylobacter in turkey flocks.

We launched the Fera International Food Safety Training Laboratory (Fera IFSTL) in partnership with Waters Corporation, enabling us to share our analytical expertise in food quality and safety.

We continue to play a vital role in supporting the UK Government in responding to national emergencies, and our response capabilities have been put to the test on several occasions during the year. A notable example is our work on detecting the presence of *Chalara fraxinea* by developing a field-based rapid diagnostic that enabled the entire country to be surveyed for the presence of Ash Dieback in a matter of weeks. Another is our development of tests to enable the rapid detection of the veterinary drug phenylbutazone ('bute') when the presence of horsemeat was found in food products.

At the heart of Fera's work is an unparalleled research capability which supports the development of advanced methods to detect and identify 'unknown unknowns'. The interaction between and integral nature of our regulatory, response and research capabilities is described in more detail by our Chief Scientist, Professor Rob Edwards, in the following section.

Much of 2012/13 was spent considering Fera's longer term future in the face of increasingly tough Government spending projections, and we have produced a five-year plan to aid the development of the Agency and Defra's decision-making on its future. As part of developing the five-year plan, we have defined a new vision for the organisation to be:

"A leading supplier of scientific solutions, evidence and advice across the Agri-Food supply chain."

This new vision reflects our renewed focus and strategy for growing an Agri-Food research and technology based business.

This Annual Review is an opportunity for us to showcase some of our successes and illustrate what we have done to help other customers. I hope the selection of articles will give you a sense of how our knowledge can be utilised and developed to meet the challenges and opportunities that you face. I look forward to hearing how we might work together in the coming months and years.

Science overview

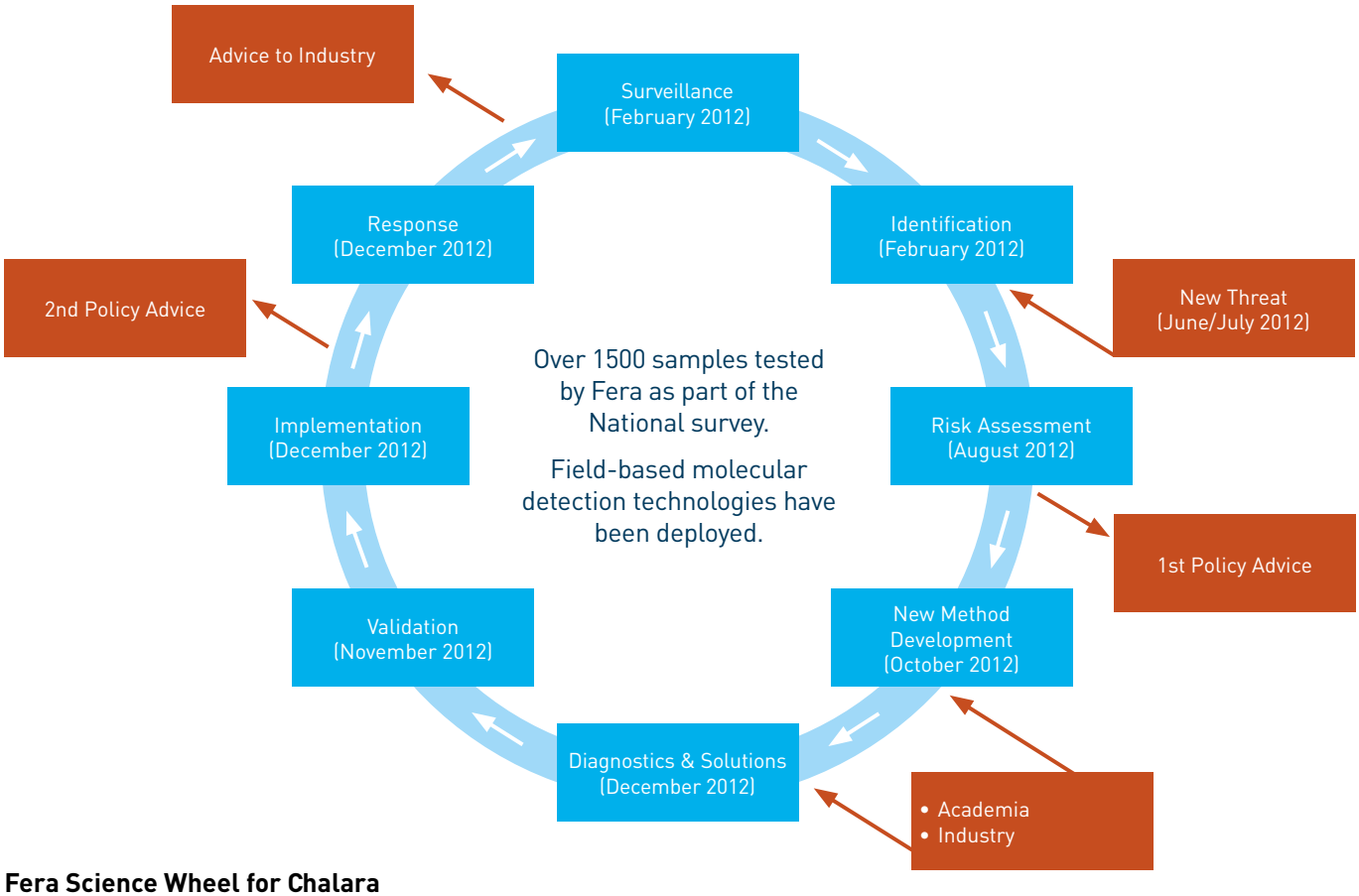
Fera's Chief Scientist, Professor Rob Edwards, provides an overview of the year's scientific developments and achievements.

Professor Rob Edwards

This has been a busy year with Fera scientists stepping up to provide analytical and diagnostic solutions in response to national emergencies affecting both industry and Government. Most notable of these were the *Chalara fraxinea* (Ash Dieback) outbreak in 2012 and the horsemeat crisis in early 2013. Accounts of Fera's involvement in both these issues are covered in the following section.

Fera science wheel in action

The Ash Dieback story embodies several principles which underpin the operation of the Fera science wheel. The science wheel illustrates how the competencies of Fera's 500 plus scientists in analytical chemistry, diagnostics and detection, crop protection, modelling and risk analysis can be fully integrated with our delivery arm in inspectorates. By taking the latest molecular pathology research tools in Ash Dieback detection, it was possible to work up a practical and validated in-field test for the disease based on isothermal DNA amplification technology for use by the teams in the field.



Fera Science Wheel for Chalara Ash Dieback Outbreak 2012

Building a forward-looking science base

The completion of the Science Strategy in 2012 has been invaluable in aligning Fera to fully deliver its potential in addressing the global challenge of food security. Fera is unique in the UK in operating across all sectors of the food chain and with our increased focus on Agri-Food research we are now in an excellent position to provide joined up solutions to our customers. In particular, Fera is well placed to help develop resilience in both agricultural production and food safety, as new trading practices and climate change are set to increase the arrival of new pests and pathogens which threaten our environment and farming industry.

In addition to extending our horizon scanning activities to identify these new threats at an earlier stage, we are increasingly bringing our skills to bear in providing multi-layered defence strategies to protect our crops and ecosystems. Similarly, Fera is ideally situated to identify new threats in the food chain, extending from new chemical and microbial hazards and adulteration as global supply chains derive materials from new sources. The Science Strategy has helped inform Fera's new five-year plan which is set to address these new challenges and provide new translational science solutions with an emphasis on cross-disciplinary working.

It is also clear that Fera needs to extend its partnering with the University sector and Research Institutes to identify new science opportunities which can be jointly developed. To this end, Fera is now a formal partner in the 'White Rose' University Doctoral Training Programme funded by the BBSRC, based on the theme of food security research.

Science impact and outputs

Following on from the Science Strategy Fera has taken a leading role in developing new approaches and technologies aimed at delivering safety in the food chain and environment. In June 2013 Fera hosted an international conference on the application of 'omics' technologies in food science, as part of the Joint Institute for Food Safety and Applied Nutrition (JIFSAN) programme with the US Food and Drug Administration. Fera also organised and co-hosted with the Knowledge Transfer Networks and Foreign and Commonwealth Office a national workshop on biosensors and the potential for their future development using emerging technologies such as synthetic biology. Both meetings reviewed the latest cutting edge technologies, which Fera is actively involved in developing.

Fera's scientists continue to play a major part in the international science scene with representation on both international and national strategy panels. We have maintained the quality of our publications based on impact factor and with the commissioning of an external Impact Survey we now have a independent validation of the value of our work to industry and society.

2012/13 highlights

The following pages describe some key examples of our work from the past year, which demonstrate how we have translated our scientific expertise into practical solutions for our customers. There follows also profiles of some of our key experts responsible for delivering these solutions. If you would like any further information about the work described, or would like to discuss how Fera might help you, please contact us at info@fera.gsi.gov.uk

Bute in horsemeat – testing times for Fera

When undeclared horsemeat in the food chain highlighted the urgent need for industry and authorities to test meat products for the presence of phenylbutazone ('bute'), Fera's rapid response helped to restore confidence in the food chain.

Fera's expertise as UK National Reference Laboratory for veterinary medicines residues was put to test in early 2013 when the banned non-steroidal anti-inflammatory drug (NSAID) 'bute' was detected in horses being slaughtered in the UK for human consumption. Within a week of the issue arising, Fera developed its analytical procedures to ensure a rapid turnaround of results after sample receipt. This prompt action was vital to the Food Standards Agency's response to this issue.

Fera also provided valuable support to Defra during the horsemeat crisis, providing DNA-based analysis of many samples of processed foods and advising on the reliability of different methods for species identification. Whilst DNA methods work well for many food types, their effectiveness can be limited in some processed products. Fera's scientists have therefore been developing cutting-edge methods based on proteomics that can identify animal species in highly processed products, such as gelatine. These methods can also be applied to help food producers in other areas where identifying the species origin of foodstuffs is important.

Fera's rapid response capability was called upon to help the food industry respond to this crisis.

At the same time as these analytical developments Fera's proficiency testing service, FAPAS, was introducing a proficiency test for laboratories world-wide to check their horsemeat adulteration testing capabilities. FAPAS already had a proficiency test for NSAIDs, including bute, in its scheduled programme.

Tackling Ash Dieback the high-tech way

Fera scientists deployed the Genie II machine in the field to test for the presence of *Chalara fraxinea*.

Fera scientists are applying cutting edge diagnostic technology in response to the Ash Dieback outbreak.

Fera scientists have been responding to the problem of Ash Dieback in the UK by using portable DNA technology called the Genie II. In collaboration with a UK company, OptiSense, Fera has developed assays currently being used to detect the presence of *Chalara fraxinea* at disease outbreak sites, which give results in less than 30 minutes. The equipment uses the latest techniques in rapid DNA analysis, and represents the next generation of field diagnostics.

Use of the Genie II has allowed the UK government to take fast and decisive action as outbreaks have been identified. Scientists from Fera are the first in the world to have deployed the technology in the field for plant pathogens and have trained a number of stakeholders to use the technique including inspectors from Fera and Forestry Commission. Conventional methods rely on laboratory testing and can take a number of days. Using the Genie II, scientists and inspectors can take samples of potentially infected trees on location and test them for the presence of *Chalara fraxinea*, getting fast accurate results there and then. The detection is based on a novel nucleic acid amplification method called Loop-mediated isothermal AMPlification (LAMP) which is typically five times faster than the commonly used PCR methods.

HorizonScan food alerts for emerging issues

A comprehensive new online tool gives food and drink manufacturers and retailers easy access to the world's most up to date food safety information at the click of a mouse.

With commodity sourcing becoming ever more global, the food industry needs to keep abreast of potential food safety threats. To do this they need to be able to get a rapid overview of potential and emerging food safety issues without trawling many separate sources of information. HorizonScan, a new online tool developed by Fera in partnership with Leatherhead Food Research, offers just that.

HorizonScan provides recall, alert and food safety information from around the world, on a daily basis, allowing users to make informed decisions.

Dr Miles Thomas, Fera's Knowledge Solutions team leader explains:

"In managing food safety risks, the old adage of 'knowledge is power' is most certainly true. The food and drink market spans all continents but that shouldn't expose manufacturers and retailers to any greater risk than if they were sourcing locally. That's where HorizonScan comes in, providing the most up to date, authoritative insights possible from across the globe – all of which can be accessed 24/7."

HorizonScan
Food Safety at Your Fingertips

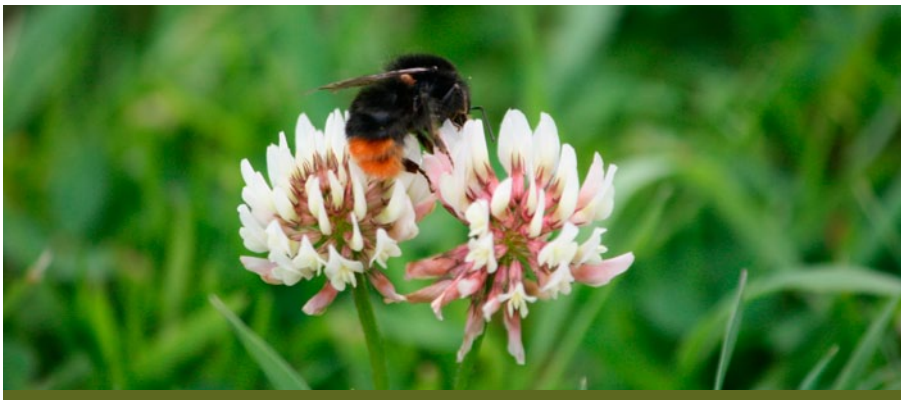
Wireless wanderers – tracking bee foraging

Use of a novel wireless tracking system will give Fera scientists valuable insight into bee movements.

Understanding the risks posed to bees by crop protection products is key to regulatory risk assessments. To address the need for further information for use in such assessments, a Defra funded project at Fera is helping to design more effective field studies – these will provide valuable information on foraging honey and bumble bees.

The project is looking at the use of a wireless tracking system. It uses radio-frequency electromagnetic fields to transfer data from special tags attached to the bees, giving feedback on their movements.

However, before this novel system can be put into practice Fera scientists are helping to establish the optimum number of bees which should be tracked per colony, for how long, and how many colonies to assess.



Detailed information on bee movements will enable researchers to design more effective studies.

Waste not, want not

A new €3 million, EU-funded project, led by Fera is investigating how insects can contribute to the growing demand for protein for animal feed.

With an estimated three billion extra mouths to feed by 2050, the need to improve land use efficiency and to reduce the environmental impact of waste has never been greater. The potential for the exploitation of insects as a source of valuable proteins has been recognised by scientists at Fera.

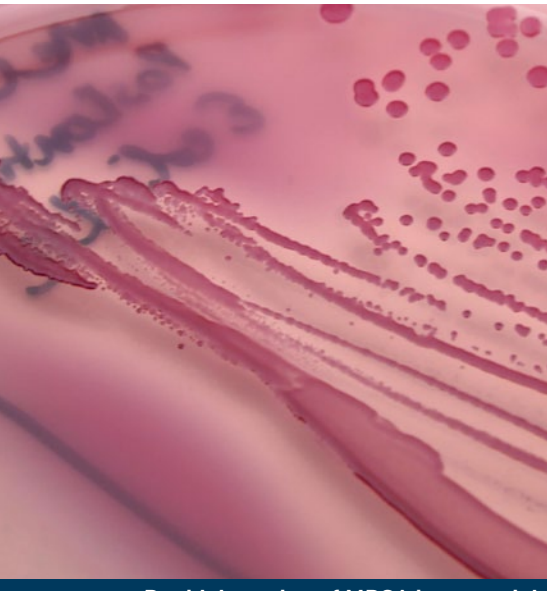
Sharing expertise in entomology and food safety, Fera is now leading an EU project called PROteINSECT that aims to facilitate the global exploitation of insects grown on organic waste as a source of protein for animal feed and human nutrition. With partners from China, Mali and Ghana, PROteINSECT will bring together expertise in these countries with European insect breeders and feed producers to set up pilot scale production facilities in the EU. The project places emphasis on evaluating the quality and safety of insect protein products and the regulatory aspects of utilising insects grown on waste materials for animal feed.

In another project entitled "Oils from Insects", funded by Defra, Fera is looking at ways to produce oils from the residual material from anaerobic digesters, which could potentially be used in all manner of products, from cosmetics and detergents to fuels and animal feed.

PROteINSECT will include feeding trials with fish, poultry and pigs.

New rapid method for detection of MRSA

Fera is applying its expertise in developing portable diagnostic tools to tackle rapid diagnostics in medical settings.



Rapid detection of MRSA is essential to help prevent outbreaks.

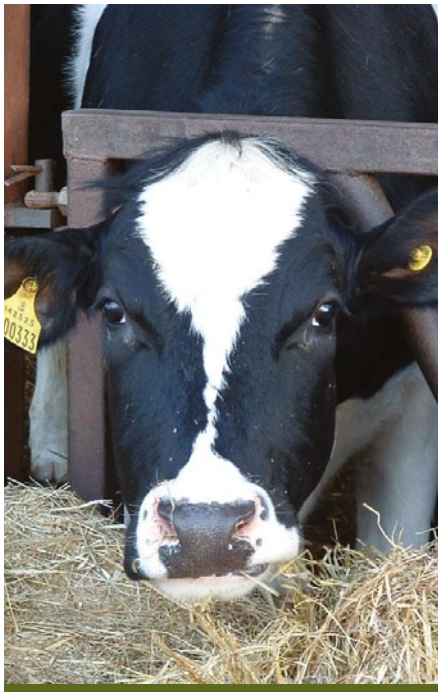
The bacterium MRSA (Methicillin-resistant *Staphylococcus aureus*) is responsible for difficult to treat infections in humans. It is a particular issue in 'point-of-care' (POC) settings such as hospital assessment rooms where a rapid means of detecting and identifying the bacterium in humans is badly needed. Fera is working on a solution.

Following the successful completion of a feasibility study in 2012 Fera, together with the University of Leeds and ELISHA Systems Ltd, has been awarded funding by the Technology Strategy Board (TSB) Biomedical Catalyst competition, to develop a working prototype that will enable identification of MRSA in human samples within 45 minutes or less.

The prototype, coupled to a dedicated sampling device being developed by the team, will be designed for use in non-laboratory environments as a POC device, allowing the rapid screening of patients for MRSA. This will help to prevent healthcare acquired infections and MRSA outbreaks in hospital settings.

In addition to the detection of MRSA, the principles of the technology could be developed for other settings where rapid detection of pathogens is needed, such as sepsis and infections where speed of diagnosis is vitally important for patient survival.

Raising the pulses of UK farmers



Fera is helping farmers meet the demands of the feed industry for vegetable protein.

Fera is applying its expertise to help UK farmers take advantage of the demand for vegetable protein in the feed industry.

Demand for vegetable protein to use in animal feed is creating a valuable market opportunity for sustainable farming in the UK. However, farmers need a high yielding, protein rich product to exploit this growing demand. Legume seeds (pulses) have the high protein content and they also contribute to environmental sustainability, but the challenge for the agricultural sector is developing legume crops with both high protein content and high yield.

Now a new project consortium is working with legumes to understand the genetic determinants of the higher protein content required by feed compounders without detriment to seed yield. This includes working to deliver novel plant genotypes for breeders which benefit feed industries, sustainable agriculture and the environment.

Fera's work within this project is co-funded by the TSB in partnership with Defra and BBSRC. Other partners include Wherry and Sons Ltd, Marks & Spencer, Aberystwyth University, Thompsons of York, John Innes Centre, iDNA Genetics, and Processors and Growers Research Organisation.

Kenyan maize killer unmasked

Fera has helped unravel the identity of a new and highly damaging maize disease in Kenya.

Maize Lethal Necrosis presents a significant threat to maize production in Kenya and neighbouring countries. Maize is both a major commercial and small-scale subsistence crop. The first step to solving this problem for farmers was to identify the disease, but this was not straightforward. Initial application of traditional diagnostic methods proved unsuccessful. Given the high level of concern in Kenya, Fera scientists took the decision to apply 454-Next Generation DNA Sequencing (pyrosequencing) to identify the causal pathogen.

Pyrosequencing provides genus and species level identification of the vast majority of organisms present in a plant sample. Within a week Fera had identified two highly likely virus suspects, namely Maize Chlorotic Mottle Virus and Sugarcane Mosaic Virus, as the cause of the condition. The research was coordinated via the Fera partnership with CABI in collaboration with the Kenyan Agricultural Research Institute (KARI) and Kenya Plant Health Inspectorate Service (KEPHIS) and partially funded by the UK DfID contribution to the CABI Plantwise initiative. Work will now focus on understanding the epidemiology of the two viruses and their modes of spread to develop a control strategy.

Pyrosequencing enabled Fera to identify the causal agent of this devastating plant disease.

Do you have the Campylobacter factor?

Poultry farmers will benefit from a new test kit to monitor Campylobacter infection in their flocks.

Campylobacter is the most common cause of bacterial food poisoning in the UK. Now poultry farmers could benefit from a new solution being developed by Fera offering a rapid, robust means to monitor Campylobacter infection on their farms.

Fera is collaborating with Forsite Diagnostics, Optisense Ltd and the turkey industry to reduce the incidence of Campylobacter in the food chain by developing rapid test kits for detecting the bacteria without the time and expense of laboratory analysis. The new tests will enable farmers to identify infected flocks and help them decide on appropriate measures to control infection and minimise transmission of the bacteria through the food chain. The technology can also be adapted for the detection of other microorganisms, offering great potential for use in other areas where rapid diagnosis is essential. Fera's work with Forsite Diagnostics is an example of the successful collaborative environment being forged between world class scientists and businesses working alongside each other at the growing Sand Hutton Applied Innovation Campus.

Prompt detection of Campylobacter could help safeguard human health and save the UK economy money.

Authentik way to combat food fraud

Fera is applying it's expertise to help the food industry meet the challenge of food fraud.

A new project at Fera will enable the food industry to take advantage of advanced technology to tackle food fraud.

Food fraud affects brands, retailers and industry reputations, leading to a loss of revenue and potential food safety issues. To combat this, technologies have been developed allowing the authenticity and provenance of foods to be verified. Maps that contain chemical fingerprints from food, known as 'isoscapes', can be created against which suspect foods can be compared to determine their authenticity. However, until now the costs associated with setting up the databases required to enable this technology has prevented industry from adopting it.

A new TSB funded project called 'Authentik' sees Fera working in collaboration with Food Forensics Ltd and PerkinElmer to remove this barrier and allow isoscape technology to be brought to market. Fera scientists are determining the most appropriate technology for authentication and creation of chemical fingerprints, based on consideration of accuracy and cost-effectiveness. This will help to ensure the integrity of food and drink in existing and emerging markets.

TESTA – protecting global food security

A new Fera-led EU project will help to ensure global supplies of healthy seed for food crops.

The increasing global population continues to put pressure on food supplies. Combined with the impacts of climate change and global trade, which have increased the spread of plant pests and diseases, this raises concerns about global food security. Seed is the basic unit of crop production and therefore, food production. Seed-borne pathogens may cause disease or death of plants resulting in yield reduction. In addition, seed is produced and traded across the globe and can carry and spread pests and diseases to key production areas.

Fera scientists are leading a major EU-funded project (TESTA) which will look at how and what pests and diseases are transmitted by seed, together with the reliable detection and disinfection of contaminated seed, thereby helping to boost yields. One of the partners in the project is Professor Terry Aveling, the chair of the Seed Health Committee for the International Seed Testing Association (ISTA). The Association's involvement will ensure that results of the project are focussed on global needs and are available for use by seed testing laboratories around the world.

Screening for seed-borne pathogens is vital for healthy crop production.

Fera IFSTL – sharing expertise worldwide

In January 2013, Fera launched the EU arm of the International Food Safety Training Laboratory network (Fera IFSTL) to share our expertise in food safety testing with laboratories around the world.

A significant proportion of food safety incidents reported in the EU are due to imports, therefore ensuring legal compliance and safety of imported food is vital for protecting consumers. A major new international food safety training facility, to improve compliance with EU food import standards, was launched by Fera in January, in collaboration with analytical equipment manufacturer Waters®.

The Fera IFSTL will train analysts from around the world, using state-of-the art technology and equipment, in best practice methods for determining contaminants and residues in food.

Speaking as he formally opened the Fera IFSTL, Lord de Mauley, Parliamentary Under-Secretary of State (Lords), said:

"It's very encouraging to see the public and private sectors working together to facilitate trade from outside the EU. This will improve food safety testing for food imported into the EU, ensuring food is safe before it reaches our tables."

The Fera IFSTL was formally opened by Lord de Mauley (centre), with Waters' VP of Mass Spectrometry Business Operations, Brian Smith (left) and Fera CEO Adrian Belton (right).

Our people

Fera's reputation is built on the world class expertise of our scientists. Here are profiles of some of the people who have helped deliver the solutions highlighted in this review.

Matthew Sharman

Matthew Sharman has worked for 30 years at both national and international levels as an analytical chemist on issues relating to trace chemical contaminants and residues in food and animal feed. This year his expert knowledge was used to set-up Fera's testing regime for phenylbutazone ("bute") in horsemeat (see page 6).

Hez Hird

Hez Hird leads a group involved in a wide portfolio of DNA based projects. One strand of work focuses on the design, optimisation, validation and implementation of assays for the verification of food ingredients. Her recent work to develop an assay to detect horsemeat in food products has gained wide attention (see page 6).

Simon Kelly

Simon Kelly is actively involved in applying stable isotope and elemental analyses to determine the geographical and production origin of foods and other materials and exploring the links between environmental factors and food composition. His current work is looking at exploiting 'isoscape' technology to help the food industry tackle food fraud (see page 10). He is also a member of the editorial board of the journal 'Food Chemistry'.

Miles Thomas

Miles Thomas has been foremost in the development of knowledge systems in Fera for 15 years and has led a number of EU-funded work packages in this area. As well as LIAISON, the recognised industry standard in pesticide approvals databases, he has also been instrumental in the development of food safety tools like FC24 and HorizonScan (see page 7).

Kate Wilkinson

Kate Wilkinson has worked for Fera's proficiency testing service, FAPAS, since 1997 and has seen the business grow beyond recognition. Her recent work has included setting up proficiency testing schemes in such diverse areas as gold purity and horsemeat authenticity (see page 6).

Adrian Charlton

Adrian Charlton leads a group of researchers developing cutting edge metabolomics and proteomics technologies. He plays a major role in bringing the state-of-the-art in modern biochemistry research to support customers in the food sector. He regularly presents his work at major international conferences.

Helen Grundy

Helen Grundy has been involved in food authenticity research for over 10 years. She develops screening methods to interrogate labelling claims in processed meat products. The pioneering work of Helen's team on determining the species origin of gelatine was recently featured in the Press Awards.

Neil Boonham

Neil Boonham leads Fera's novel diagnostics research, exploiting post genomic technologies for pathogen and pest detection. Neil's team were the first to publish and deploy methods for characterising new viruses using next generation sequencing and the first to deploy rapid DNA detection methods in the field. The team's recent work includes the identification of the causal agent of Maize Lethal Necrosis (see page 9).

Elaine Fitches

Elaine Fitches has over 10 years experience in the field of applied entomology. With particular expertise in recombinant protein production Elaine has led research to develop novel fusion protein based biopesticides at Fera. Her current work includes the potential exploitation of insects as a source of protein and oils in the PROteINSECT and Oils from Insects projects (see page 8).

Rosario Romero

Rosario Romero has a long track record in cell biology and protein biochemistry in biomedical research. Since joining Fera in 2011, Rosario has been leading work on applications of protein tools and technologies to food research, with a particular interest in developing proteomics methods for food safety.

Chris Sinclair

Chris Sinclair has over 15 years experience of research and consultancy, investigating the fate, effects and risk assessment of xenobiotics in the environment to support customers in the agrochemical and veterinary pharmaceutical industries. His current research interests include the degradation mechanisms of organic contaminants in soils, animal manures and the anaerobic digestion process, and pharmaceutical mixture toxicity to aquatic systems.

Christine Henry

Christine Henry has 32 years of plant pathology expertise particularly in the area of plant virology. She is currently the coordinator of the EU funded project TESTA (see page 11), which concentrates on developing detection and control strategies to improve plant seed health.

Financial review

Paul Whitfield, Director of Finance and Corporate Services, provides a review of Fera's financial performance during 2012/13.

In line with its remit as a net running cost Agency Fera produced an excellent result for the year showing a small surplus which in the present economic environment and pressures on all our customers is particularly satisfying.

Adjusted for one off activities* income increased by £1.9m (2.8%) year-on-year, with our Government income proving particularly resilient showing slight like for like growth. This demonstrates in these difficult times the importance and relevance of our translational science to our Government customer base. Adjusted Government income accounted for 69.6% of Fera's income (2011/12 70.0%).

Non-Government income increased by almost 5% over the year, primarily driven by a further year of increasing our fees and charges to statutory customers in line with the plan agreed with Ministers to charge Full Economic Cost (FEC) for our plant health services. During the year we set up a number of Government/ industry taskforces across our statutory services and we are working with our customers to deliver greater efficiencies that will constrain fee increases required in future years.

Through our continuous improvement (CI) programme we seek to focus on the things that matter to our customers and to streamline and develop our processes to better meet customer needs. Through this activity we are able to redeploy staff to work in other areas or where appropriate leave the organisation. Whilst over all staff numbers have remained relatively similar year on year, we have lost 34 surplus posts during 2012/13, in the main through the CI programme, compared with 47 in 2011/12.

With an increased income and similar numbers of staff, income per full time equivalent (FTE) increased by 3.1% year-on-year.

Capital invested in the Sand Hutton site and Fera's equipment amounted to almost £7m. This is a similar figure to the previous year and is an indication that the historic risks of underinvestment in the site, although not yet complete, are slowly being reduced. This is the second year where capital spend has been in excess of depreciation, a further welcome sign of investment in the business and the value placed upon our work by Defra, especially given the pressures on their scarce resources.

A small cash inflow (£1.1m) was produced in the year with trade creditors being particularly high at the year end due to much of the capital spend being delivered in the fourth quarter.

During the year Fera undertook market research on its commercial opportunities and produced a five-year plan to aid the development of the Agency and Defra's decision-making on its long term future. To concentrate on our core Agri-Food vision some policy functions transferred back to Defra during the year and the wildlife function has transferred to a sister Agency in April 2013. It is likely that some further changes will be enacted during the coming year.

Figure 1 – Total income 2009/10 to 2012/13

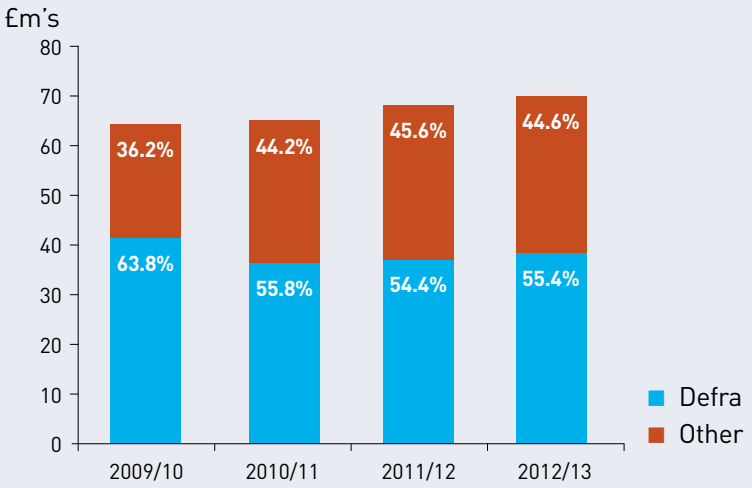


Table 1 – Financial Performance

Income and Expenditure	2012/13			2011/12		
	Reported £000s	***Adjustments £000s**	**Underlying Trading £000s**	Reported £000s	Adjustments £000s	Underlying Trading £000s
Income	**70,972**	**(1,300)**	**69,672**	70,763	(2,629)	68,134
Staff costs	**32,887**	**(1,300)**	**31,587**	33,588	(2,365)	31,223
Other running costs	**38,091**	**(184)**	**37,907**	37,460	0	37,460
Surplus/(Deficit)	**(6)**	**184**	**178**	(285)	(264)	(549)

This document has not been audited. Fera's full audited Annual Report and Accounts 2012/13 can be found on our website www.defra.gov.uk/fera/annualReport

Fera's quality standards

Quality standards applied by Fera are assessed by third parties including UKAS, the GLP Monitoring Authority, Lloyds QA, ISTA and the Chemicals Regulation Directorate so that Fera's customers can rest assured in the knowledge that the work carried out for them will meet or exceed their quality expectations.

ISO 9001:2008 Certification including TickIT for software development

Provision of scientific services to Government and non-Government customers worldwide. Software development is in accordance with TickIT principles.

ISO 17025:2005 Accreditation

Provision of food and plant health testing covering veterinary drug residues, pesticide residues, environmental contaminants, mycotoxins, food additives, authenticity, packaging, food microbiology, and plant pathogen detection.

ISO 17020 Accreditation

Physical examination of controlled materials for quarantine pests and diseases covering plants, potatoes, produce, seeds and grains, and soils and growing media. Compliance to EU Council Directive 2000/29/EC, the Plant Health (England) Order 2005 and the Plant Health (Wales) Order 2006. Sampling of regulated materials for plant health testing and diagnostics.

ISO/IEC 17043:2010 Accreditation

Provision of proficiency testing covering food chemistry (FAPAS), food microbiology (FEPAS), GM detection (GeMMA), and water and environmental (LEAP).

ISO 14001:2004 Certification Environmental Management System

Activities at our Sand Hutton site associated with analytical, diagnostic and consultancy services for land based and food industries.

Good Laboratory Practice (GLP) Compliance in accordance with Directive 2004/9/EC

Covering analytical chemistry, ecosystems, environmental fate, and environmental toxicity.

International Seed Testing Association (ISTA) Accreditation

Provision of seed quality testing, covering moisture content and purity.

Official Recognition of Efficacy Testing Organisations (ORETO) Compliance with Commission Directive 93/71/EEC

Efficacy trials and testing in agriculture/horticulture, stored crops, vertebrate control, and biologicals and semiochemicals. Assessed by the Chemicals Regulation Directorate (CRD).

Investors In People (IIP) Accreditation

Accredited since 1999 Fera undertook an IIP health check in 2011 which recognised further achievements in defining roles and accountabilities, improving leadership and management capabilities, developing future talent, and securing our commercial skills base.

National Reference Laboratory (NRL)

Fera is also the NRL for the UK and Malta for chemical safety in food, chemical contaminants in animal feed, pesticide residues and veterinary medicine residues.

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