

CREATING A BETTER FUTURE FORWARD THINKING FOR THE WHOLE FOOD SYSTEM

TAP THE BUTTONS TO NAVIGATE

# FORWARD THINKING FOR THE WHOLE FOOD SYSTEM

DELIVERING ON OUR  
SCIENCE STRATEGY

ANNUAL IMPACT REPORT 2023



Original thinking... applied



# BRIDGING THE GAP BETWEEN RESEARCH & IMPACT ACROSS THE WHOLE FOOD SYSTEM

Fera applies Original Thinking to support sustainable global food production. As described in our Science Strategy, Fera believes there is no singular approach to delivering food systems fit for the future. As food ecosystems evolve, there is a wealth of emerging technologies to help organisations build new capabilities to address tomorrow's needs.

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# FOREWORD FROM THE CHAIRMAN

Fera is an incredible story of scientific achievement, outstanding success, and impact. We deliver world leading science and innovation, applied research, testing and assurance services across the whole food system to protect the public, its food, our biosecurity, biodiversity, and natural environment.

In a world of globalised supply chains, rising demands under the many challenges posed by climate change, including new threats of pest and disease, food safety and national biosecurity have become more important making Fera's research, testing and wider services more critical than ever before.

Fera has been active for over 100 years in its various guises across the whole food system – from crop production and plant and animal health to farming and food production, packaging, and distribution. It is a great privilege to be Chair of such an inspired and essential organisation that has such a positive impact in all that it does, for both public and private sector clients and, of course, the wider community.

We are not complacent about our role and the value of Fera's work. We want to do more, playing our part as a world leading institution at the forefront of science and, in doing so, nurturing the food and environmental scientists of the future.

We are, therefore, all looking forward to the next chapter in Fera's continued development as Capita completes the sale of its shareholding in the Fera Joint Venture to Bridgepoint Group plc ('Bridgepoint').

This, our 2023 Annual Impact Report, presents a selection of how Fera's world leading science is helping to solve new global challenges, protect the public and support private sector innovation and development. I hope you enjoy it and are as excited by the impact of what Fera is doing as we are!

RICHARD MCCARTHY CBE



CHAIRMAN

# FOREWORD FROM THE CHIEF EXECUTIVE

2023 has been another critical and impactful year for prosecution of our Science Strategy culminating in two highly successful conference events hosted at Fera followed by a refreshing of the strategy in response to the changing technology landscape and market drivers that we serve.

As a science-led, expert services business, the quality of Fera's science underpins our strategic growth which drives our commercial success. As Fera enters a new phase of strategic development following the acquisition of the majority of its shareholding by Bridgepoint, it is vital that we refresh the strategy so that it informs our future growth plan best. We look forward to publishing and delivering on that Science Strategy in 2024 and beyond.

It is key to our purpose, duty and the success of our business model that Defra's shareholding and direction is also reinforced in Fera's next phase.

Public good is the most compelling driver for all Fera staff delivering responsive and innovative scientific support to our partners.

These are very busy, but also very exciting, times at Fera as we prepare for the next phase of expansion in capability, capacity, and international reach to serve and respond to opportunities in both the public sector and our commercial markets still better. As was clearly illustrated over two days at this year's Annual Symposium "*Food for Thought: Fera's Science in a Changing World*", from food security and food safety to natural capital restoration, to tackling new threats to biosecurity and responding to new risks and contaminants to the environment, the list and complexity of national and global challenges and the imperative for Fera to respond is only growing year on year.

From its own resources and with support from the BEIS national infrastructure resilience programme, 2023 saw Fera invest

in state-of-the-art instrumentation for measuring environmental contaminants and food (packaging) safety hazards as well as for a new capability to accelerate the introduction of bio-inputs for farming and innovative and more energy/ water efficient controlled environment experimental chambers. Over the year these capabilities have been commissioned and 'put to work' for impact.

I hope that you enjoy reading about these achievements in this year's Annual Impact Report and the selection of case studies describing our science and innovation coupled with our financial achievement and that of our key performance indicators.

As always, we owe huge thanks to everyone at Fera from Apprentice Technician to Principal Scientist for their engagement and energy in execution and who really deliver the impact.

DR ANDREW SWIFT



CHIEF EXECUTIVE

CREATING A BETTER FUTURE FORWARD THINKING FOR THE WHOLE FOOD SYSTEM

# OUR SCIENTISTS SET THE AGENDA

As a translational science organisation, Fera is focused on science for impact. Therefore, we invest in partnerships with leading academic institutes to support early-stage innovation and to nourish our own talent resource and ingenuity. We also participate in selected national and international applied research and development for translation to market impact.



# OUR SCIENTISTS SET THE AGENDA



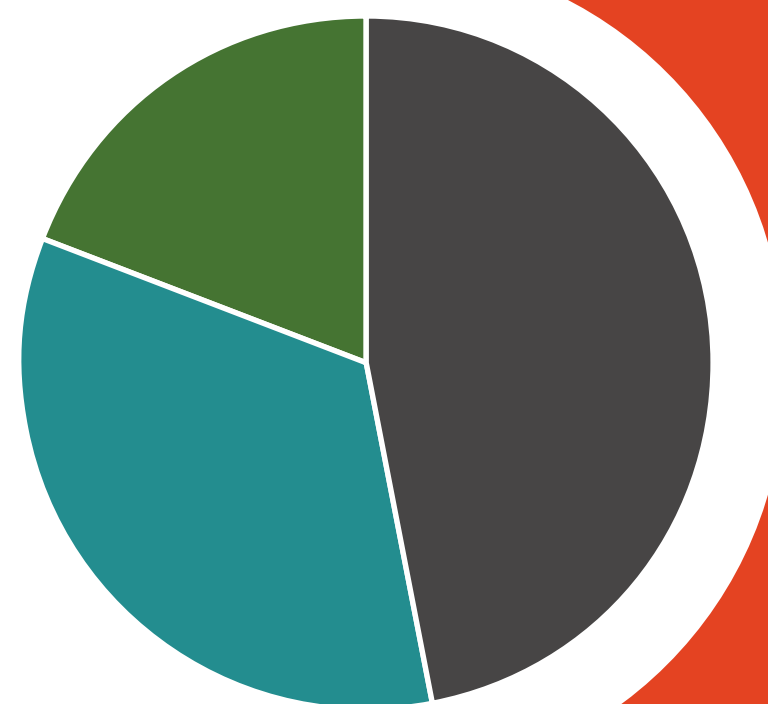
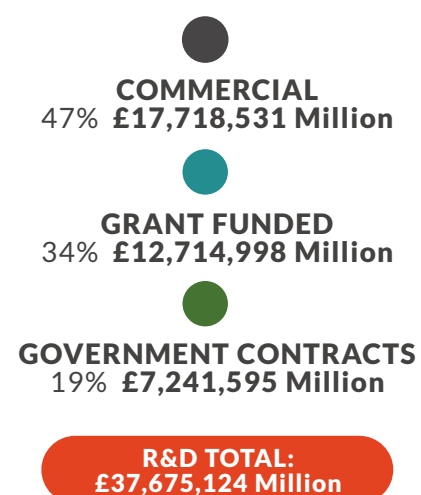
## NATIONAL & INTERNATIONAL RESEARCH

Fera submitted 591 bids and quotations in 2023, at a cumulative value of £37.6M.

We enjoyed success rate of 60% on all submissions; 40% for Grant funding, 59% for commercial tenders and 78% for R&D projects. Currently, we have submissions in to 9 Funding Calls awaiting outcomes and we have several significant commercial bids in progress.

Notable successes in the commercial sector include projects with a chemical manufacturer valued at £600k, a multinational food and beverage company valued at £357k, and a medical research facility valued at £425k.

### BID SUBMISSIONS 2023



### THE ENGLAND ECOSYSTEM SURVEY

Fera is leading a consortium of contractors to deliver the first year of the pioneering England Ecosystem Survey (EES). The EES is designed and led by Natural England and is funded by the UK government through Defra's Natural Capital and Ecosystem Assessment programme (NCEA).

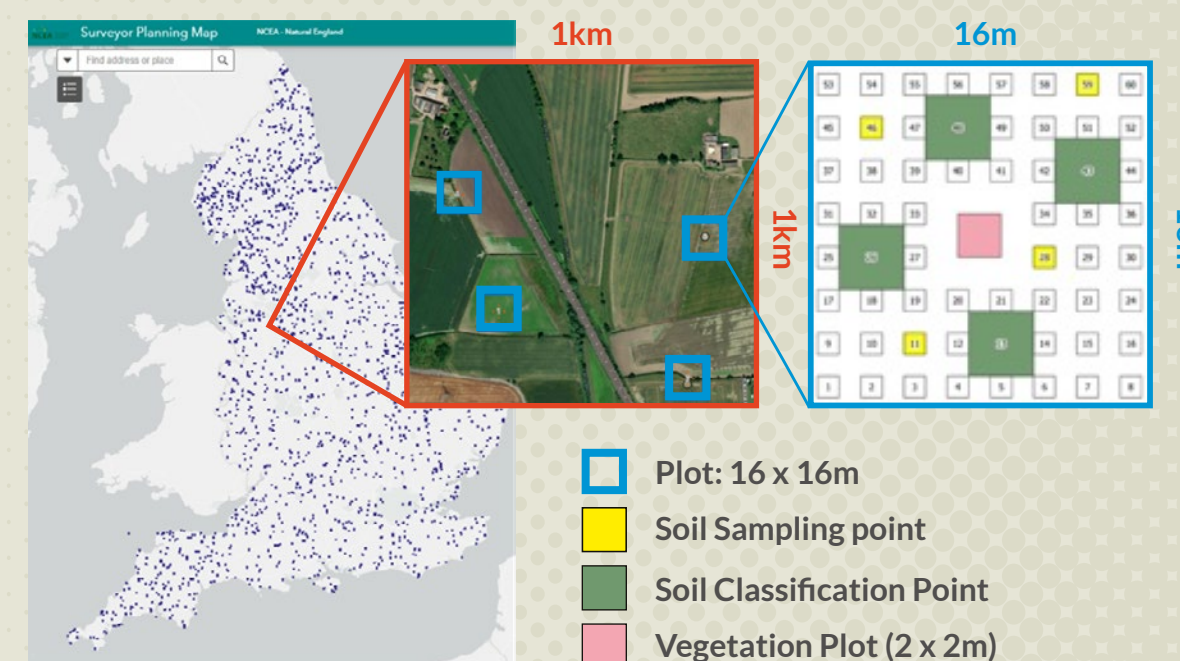
The NCEA is delivering a nationwide survey of England's land, coast, and sea - mapping the location, extent and condition of our ecosystems. The results will enable England to better understand and manage its 'natural capital' - which brings so many diverse benefits to people.

The EES will provide a comprehensive and long-term dataset of England's terrestrial ecosystems through which change can be monitored over time. It comprises hundreds of survey sites distributed across England in a variety of different habitat and land-use types, which will be re-surveyed on a 5-year cycle.

In a 'first of its kind' survey, data for both above and below ground ecosystems, is being collected from up to six plots within each site comprising measurements of soil characteristics (physical, chemical, and biological) plus vegetation and landscape biodiversity.

Fera's role is to lead a network of in-field teams of ecologists and soil scientists and to provide laboratory analysis of biological soil health. Soil samples collected across the country are being sent to Fera for cutting edge DNA analyses of the biodiversity that constitutes the soil-food web, from microbes to mesofauna.

The integrated dataset will be used in research across the UK to further develop understanding of soil health and facilitate the development of tools and policies that will be key in our transition towards more environmentally sustainable land management and agricultural practices.



### SUPPORTING FARMING IN THE UAE

Throughout 2023, Fera has enjoyed partnering with one of the UAE's leading Agri-Tech food companies to establish a national Technology Centre to optimise farming in marginal climates. Amongst other tasks, in collaboration with one of the UK's largest independent manufacturers and suppliers of scientific testing and laboratory equipment, we developed and commissioned a Mobile Crop Health Laboratory.

This has enabled our partner to conduct a range of rapid, in-field soil and water tests across their contract farms, using this data to guide farmer decision making for improved crop yield. In addition, our partner is building a UAE-based R&D centre; a 300,000 m<sup>2</sup> facility in Al Ain (Innovation Oasis) which provides a hub for academic institutions, research

organisations and businesses to develop and trial technically robust solutions for boosting agricultural productivity and domestic food security by sustainably enhancing food production in the UAE.

Fera's role has been to lead the core design and layout of this facility, the detailed specification of its laboratory requirements, as well as the role profiles for the scientists working there in the future. Following the commissioning of the facility in 2024 we look forward to an enduring partnership in which we hope to extend Fera's services across the UAE, providing expert technical support from the facilities at the Innovation Oasis and from Fera in the UK and from our shared interest in research and commercial projects for joint delivery and mutual benefit.



# OUR SCIENTISTS SET THE AGENDA



## ACADEMIC COLLABORATIONS & IAFRI

### ACADEMIC COLLABORATIONS

Fera has a long and successful history of supporting PhD studentships. Working in collaboration with several research-intensive universities around the UK, we are currently sponsoring over 35 students.

We recognise and seek to play our part in addressing the urgent need for the UK to 'up-skill' in Engineering Biology, Food and Environmental Science amongst other inter-related disciplines. As an industrial partner in the NERC supported Doctoral Training Partnership (DTP): 'Adapting to the Challenges of a Changing Environment' (ACCE), we support student collaboration with the Universities of York and Liverpool.

In addition, we are an industrial partner in the NERC supported Centre for Doctoral Training (CDT): 'Ecotoxicological Risk Assessment Towards Sustainable Chemical Use' (ECORISC), working in collaboration with the University of York and an industrial partner on a Defra funded 4-year PhD studentship with the University of Edinburgh.

Other such engagements in which we are strategically invested include:

- + Exploring the Incentivisation and Biodiversity Returns of Treescapes Using Agent-based Models *Georgia Carr - Liverpool / York, NERC ACCE DTP*
- + Pharmaceutical Pollution in Agriculture: Impacts & Risks for Soil Health and Crop Production *Isla Stubbs - York, NERC ECORISC CDT*
- + *Torymus sinensis*: Monitoring the Spread and Ecological Impacts of a non-Native Biological Control Agent in the UK *Abigail Carruthers - Edinburgh, Defra*



### INSTITUTE FOR AGRI-FOOD RESEARCH AND INNOVATION

The Institute for Agri-Food Research and Innovation (IAFRI) is a joint institute between Fera and Newcastle University (NU).

It delivers research and innovation in the disciplines of agriculture, food and environment and translates outcomes into real world application for the benefit of society. Its mission supports Fera's Science Strategy seeking to:

1. Generate and apply new knowledge to practical problems in Agri-Food-Environment.
2. Generate, manage, and exploit intellectual property to drive Fera's commercial growth.
3. Develop a talent pipeline of expert scientists for recruitment by Fera or NU.

Fera and NU typically sponsor 6 PhD studentships per year through IAFRI. Our 2023 cohort of students have begun research in to:



- + Green Waste to Food Grade Protein: Case Study for the Use of Rubisco in Food Production. *Jack Pattinson*
- + Agri Diagnostics: Sensing Approaches for Early Detection and Quantification for Crop and Soil Health. *Sophia Long*
- + Scaling-up Tree Health Monitoring Systems to Landscapes. *Quddus Busari*
- + Investigating the Impact of Biodiversity Funding on Tree Survival in non-Woodland Contexts Through Environmental Testing. *Molly Tuckey*
- + The Effects of Biopesticides on Bees and Implications for Regulatory Testing. *Izzy Hall*



CREATING A BETTER FUTURE FORWARD THINKING FOR THE WHOLE FOOD SYSTEM

# MARKET LED SCIENCE DRIVEN

## BRIDGING THE GAP BETWEEN RESEARCH & IMPACT ACROSS THE WHOLE FOOD SYSTEM

Fera's science is responsive and market-led. Our cohort of scientists across multiple disciplines set the agenda, are agile and adaptive to the changing world.





# MARKET LED SCIENCE DRIVEN



## LAND360

Research scientists at Fera have a long track record of supporting government and policy in monitoring and evaluating agri-environment schemes designed to support environmental sustainability in agriculture and food production.



Fera regularly attends industry events across the UK. Pictured here at Groundswell 2023

Following the launch of LAND360 in early 2022, clients from a wide range of sectors have expressed an interest in learning more about Fera's land use, biodiversity, and natural capital services. Several projects have been undertaken for large estates, however Fera has also explored projects from a wider range of sectors including renewable energy, housing development, retail and the energy and chemicals industry.

The common thread across all of this interest is the realisation that business models are changing as landowners and managers need to consider the options of deploying their land to 'produce' environmental goods and services that are, or will be, subject to public and private payments.

At the same time, the team has taken on a number of large projects for Defra that are examining how the range of policy devices being developed can contribute to achieving the biodiversity targets defined in the Environment Act.

Increasingly, the team are working on projects that need to consider blends of public and private finance to enhance natural capital. This requires an understanding of the current and future interactions between public and private funding streams and which of these are the most appropriate models for different groups to pursue.

### IMPACT OF NET ZERO POLICIES ON BIODIVERSITY

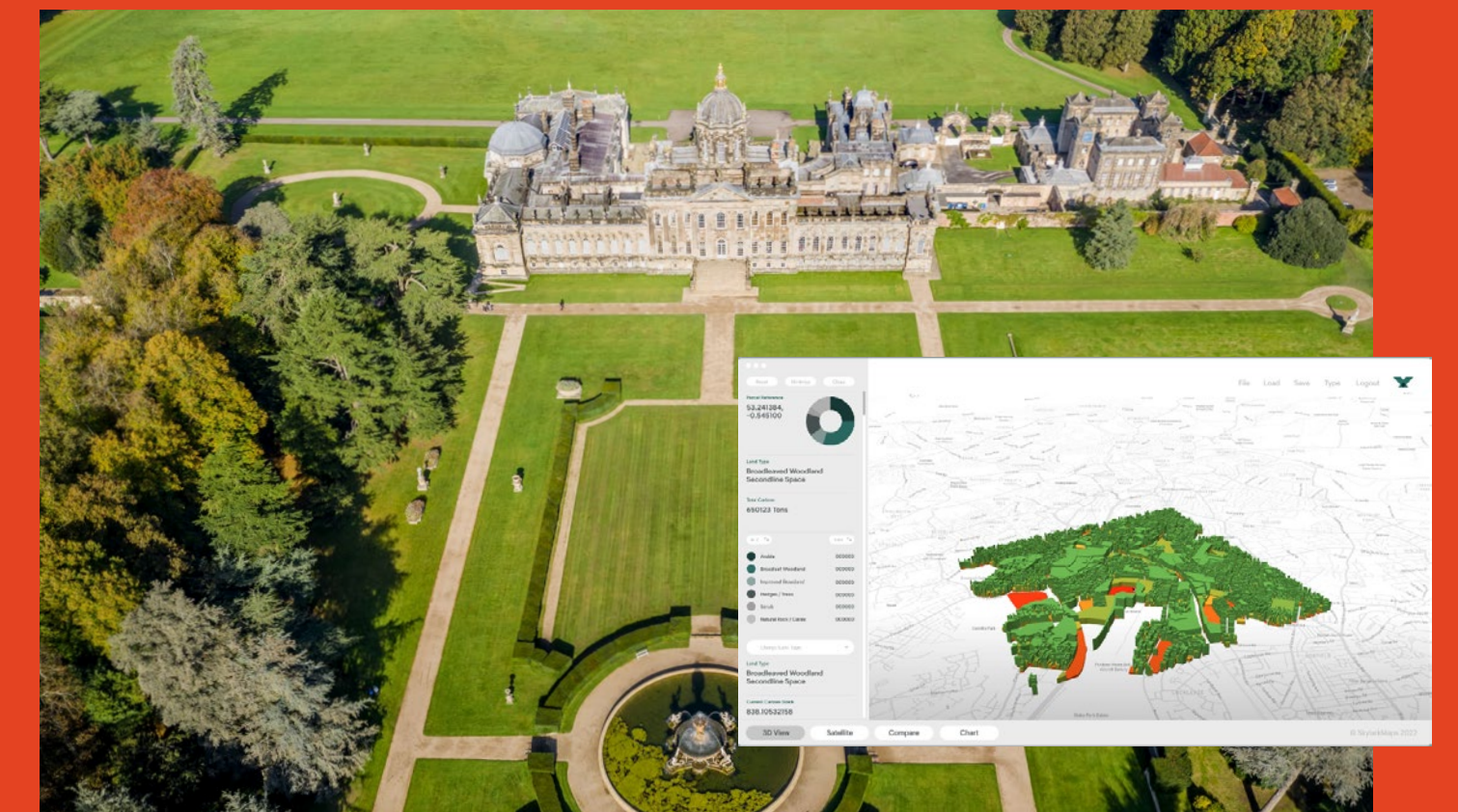
This Defra-funded review investigated the impact of Net Zero policy on biodiversity outcomes, and include three systematic reviews focusing on impact assessments, wider literature, and EU policy equivalents respectively.



The aim is to identify the intersection between Net Zero and biodiversity, whether trade-offs or solutions exist that benefit both and with the further aim of informing the development of Defra's biodiversity targets and strategies.

The project capitalises upon the strengths and expertise of Fera's social scientists, economists, ecologists, and soil scientists.

### INNOVATE UK - FERA SCIENCE / SKYLARK



Collaborating with Skylark Maps and Castle Howard, this R&D project (funded by Innovate UK), aims to bring a case study to the market which will assess real time impact on Biodiversity Net Gain (BNG), carbon and capital value.

This will be an excellent use case to demonstrate how Fera (LAND360) and Skylark can collaboratively produce a scalable service. For Castle Howard, the project is significant in shaping discussions with other stakeholders, refining commercial terms for outsourcing the BNG uplift across the area.

Launched in November 2023, the project is currently in the phase of data collection and processing, which will be completed mid-January 2024. Subsequently, the focus will shift to developing a broad overview baselining methodology, and 30-year biodiversity modelling based on the habitat changes planned.

# MARKET LED SCIENCE DRIVEN



LAND360  
CASE STUDIES

## AGROCHEMICALS



**A GLOBAL AGROCHEMICAL ORGANISATION APPROACHED FERA WITH AN INTEREST IN OUR LAND360 MAPPING+ PACKAGE FOR WHICH OUR TEAM CONDUCTED A COMPREHENSIVE DESK-BASED STUDY.**

They mapped habitats and computed baseline estimates for biodiversity units, carbon storage and carbon flux on three UK farms associated with the agrochemical organisation.

A thorough examination of the LAND360 workflow was carried out, focusing on potential efficiency savings, and exploring the feasibility of integrating the system with the company's online platform and this aspect of the project is set to extend into 2024.

An evaluation of EU policy and data availability for the broader LAND360 project, beyond the UK, revealed that the integration of biodiversity into climate mitigation policies is currently confined to various individual initiatives.

The "EU Biodiversity Strategy Actions Tracker" serves as a policy tracking tool to monitor the progress of multiple policies related to biodiversity.

Interviews with policymakers underscored the existence of barriers hindering the mainstreaming of biodiversity considerations in EU policy-making processes. These challenges, such as the absence of standardised methods for quantifying biodiversity, should be addressed in future public policy frameworks and initiatives.



## HOUSING DEVELOPERS

**WE ARE COLLABORATING WITH ONE OF THE UK'S LEADING HOUSING DEVELOPERS. FERA WAS APPROACHED TO PROVIDE SUPPORT IN DESIGNING AND IMPLEMENTING A PILOT BIODIVERSITY NET GAIN (BNG) PLAN ACROSS A SAMPLE OF THEIR NATIONWIDE DEVELOPMENT SITES.**

Fera, along with their collaborator, TEP, designed a holistic approach to the adoption of BNG policy, evaluating the impact of the legislation and adopting a geospatial methodology which was aligned to the organisation's aims and objectives.

This gave the housing developer confidence in achieving a positive outcome with the adoption of BNG. In August 2022, Fera and TEP were commissioned to develop a science-led, GIS desk-based assessment of baseline habitats for a BNG assessment on a selection of pilot sites. The high accuracy of the habitat maps produced via this desk-based approach removed the need for initial onsite surveys, which would (ordinarily) be carried out at the planning application phase, resulting in a quicker assessment process.

This method was extremely valuable at the strategic land phase of the project, as the BNG uplift potential for each site could be assessed from the start without it being a labour or time intensive task.

The site assessment results were disseminated via an online application, integrated into the developer's geographic information systems (GIS) systems, allowing updates to be continuously uploaded, as and when required. The project applied expert advice from ecological specialists, onsite verification surveys (completed by trained ecologists) and technical input from GIS specialists, to enable the developer to prioritise, measure, and monitor BNG now and in the future.

Following this pilot, the methodology will be rolled out across all sites within the developers' estate, providing a logical tiered approach to habitat modelling, defining varying requirements of sites. This pilot provides an element of future proofing for the developer. The expert insights will support longer term strategic decision-making, especially when prospective development sites are reviewed before being acquired into the business portfolio.



# MARKET LED SCIENCE DRIVEN



## REPLENISHING

Fera has been an international pioneer responding to the opportunity to prove and develop the potential of insect bioconversion to upcycle organic waste from an environmental hazard to valorised products for over ten years.

In 2022 Fera invested £1M to build an insect research laboratory to enable the upscaling of our insect bioconversion research to meet the needs of clients from across industry by demonstrating the economic and technical feasibility of insect bioconversion at pilot scale. In 2023 we have deployed the facility and our expertise in this area to support national and international projects, as well as our ongoing investment in PhD studies, linked to insect bioconversion.



## CLIENT FUNDED RESEARCH PROJECTS UNDERTAKEN THIS YEAR INCLUDE:

Across 2023 we have delivered on a range of exciting projects for our customers. These exemplify how Fera's expertise can support regulators and policymakers as well as industry in this rapidly developing subject, and include:

- i) examining the safety of insect products from larvae reared on non-permitted substrates for the Food Standards Agency.
- ii) leading on the Insect Farming Accelerator Programme (supported by the Foreign and Commonwealth Development Office) to support the UAE in developing the safe and reliable use of certain insect species to assist in the management of food and agriculture residues, by-products, and waste across the country.
- iii) exploring insect bioconversion for the creation of protein for sustainable animal feed in the Caribbean with the United Nations Food and Agricultural Organisation and the University of West Indies. This covers both community and private sector engagement whilst also working with ministries to ensure safety and compliance with regulations.
- iv) working with water companies (e.g., Yorkshire Water) to explore insect bioconversion for wastewater management.
- v) further research, optimisation and scalability testing of Black Soldier Fly (BSF) rearing for a range of clients including separate projects with MYGroup for research and development on rearing of insect larvae and quality and safety testing and with Future By Insects for a project sponsored by WWF and Tesco's Innovation Connections accelerator scheme award and supported by Hilton Food Group and Greencore, both major suppliers to Tesco.



In addition to these client funded research projects, Fera has hosted four webinars during 2023 looking at the potential of insect bioconversion for the food and drink sector, the petfood industry, the waste sector and for farming - each with expert panellists invited to support our content.

This has proven to be a strong route for raising the impact of Fera's research as well as extending discussions on the future of insect farming to reach out to future collaborators and commercial operators.

We have also presented at the Royal Entomological Society Insects as Food and Feed Special Interest Group conference and at the first international conference dedicated to the black soldier fly, BSFCon, held in Cambridge.



# MARKET LED SCIENCE DRIVEN



## PLANT HEALTH

Fera has a world leading Plant and Bee Health capability, and our diagnostic development and delivery is critical to the UK's biosecurity and protection of both the agricultural and natural environments.

### BORDER TARGET OPERATING MODEL

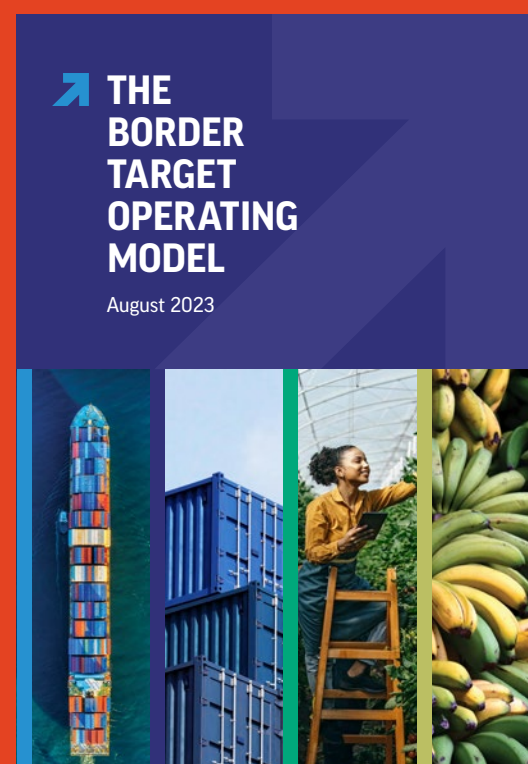
The UK government has been developing approaches to how it should manage its borders since leaving the EU. This has been encapsulated at a strategic level in the 2025 UK Border Strategy and at a detailed level for importing goods into the UK in the Border Target Operating Model (BTOM).

The BTOM introduces a more detailed risk-based approach to that previously and applies to both EU and non-EU countries.

These approaches will be phased in across 2024 and Plant Health inspectors will be operating out of designated Border Control Posts (BCPs) for EU goods rather than conducting inspections at Points of Destination (PoDs).

Importers can apply for Authorised Operator (AO) Status, providing delegated authority to perform physical and identity import checks. This element of the BTOM is being piloted across 2024 and, if deemed appropriate, will be rolled out to more importers.

Fera has been working with its partners in government to scale up its diagnostic capability with new facilities, equipment and staff trained and are ready to deal with the impact of the new approaches. We are also working closely with both the Animal and Plant Health Agency and a broader group of partners to develop effective and accurate processes and technologies that will enable speedier diagnostics and minimise delays.



### UK BORDERS

**Fera is a state-of-the-art testing and diagnostic laboratory, however as trading volumes increase along with the need for a safer and faster supply chain, there is a growing need for fast and accurate in-situ results, away from the laboratory setting.**

Rapid, reliable test results increase the speed at which decisions or interventions can be taken to enhance biosecurity and reducing disease spread as well as demurrage costs for the industry.

Whilst there are clear advantages to on-site testing, there remain significant challenges in delivery, ranging from end-user engagement to establish the test requirements needed, through to development of the test, to on-site training of end users. Fera engages and leads with the key actors across all these stages.

Ambitious, collaborative new projects which Fera is involved in to tackle such challenges include the £10M Defra and UKRI-funded Genomics for Animal and Plant Diseases Centre (GAP-DC), focussing on the

deployment of next generation molecular testing for plant health and the £19.2M Shared Outcomes Fund-funded PATH-SAFE programme, which is piloting new approaches to the surveillance of foodborne pathogens and AMR in the agri-food system.

Fera's partners in this work include the Food Standards Agency, Defra, the Animal and Plant Health Agency and other collaborative partners within the project consortia (Pirbright, Forest Research, Royal Veterinary College (RVC)).

Fera's connections with academic institutions such as Newcastle and Lincoln Universities through similar projects and studentships has enabled us to apply for joint projects with commercial companies that develop diagnostic devices. This is a very active area for funding, with calls from national research agencies and commercial organisations appearing at the time of writing.

The market for in situ molecular testing has grown significantly in recent years and is expected to continue to grow and extend beyond our existing partners into end users in sectors such as agriculture, horticulture and throughout all parts of the food chain.

A portable diagnostic Next generation Sequencing machine, the Minlon



Fera staff on a visit to Heathrow Border Inspection Post

# MARKET LED SCIENCE DRIVEN



Fera has been working very closely with colleagues in Defra and the Animal and Plant Health Agency (APHA) in response to a significant outbreak of the Yellow-legged hornet (AKA the Asian Hornet, *Vespa vetulina*) in England.

## ASIAN HORNET RESPONSE

**This invasive species is an opportunistic predator that will likely impact the ecosystem in which it finds itself. As a significant predator of honeybees, it may cause heavy losses to Britain's beekeepers if it becomes established.**

Between 2016 and 2022, 13 nests were found and destroyed. In 2023, 72 nests have been found and destroyed.

The difference in 2023 became clear in mid-summer with reports of these hornets increasing rapidly and nests being found. This triggered Defra and APHA's contingency plans, leading to a refocus of National Bee Unit (NBU) Inspector activities to locate and destroy nests (i.e., pesticide treatment and physical removal).

In order to help NBU inspectors to find nests in the field, Fera developed a 'Track and Trace' app that allows nest locations to be triangulated from flight paths of captured hornets after public sightings.

All trapped hornets and nests (once destroyed) were sent in to Fera for confirmatory diagnosis and genetic analysis. Fera's bee experts dissected the nest to provide rapid feedback to the inspectors on the ground on the stage of the nest (i.e., has it started to produce the next generation of queens). A genetic analysis of the hornets in the nest allow comparison with individual hornets caught in traps nearby to provide insight into whether more nests remain unfound in the area.

More detailed analysis of the genetics in advance of 2024 will provide insight into the relationship between all the nests, helping in the understanding of the development of this outbreak and the implications for future years.

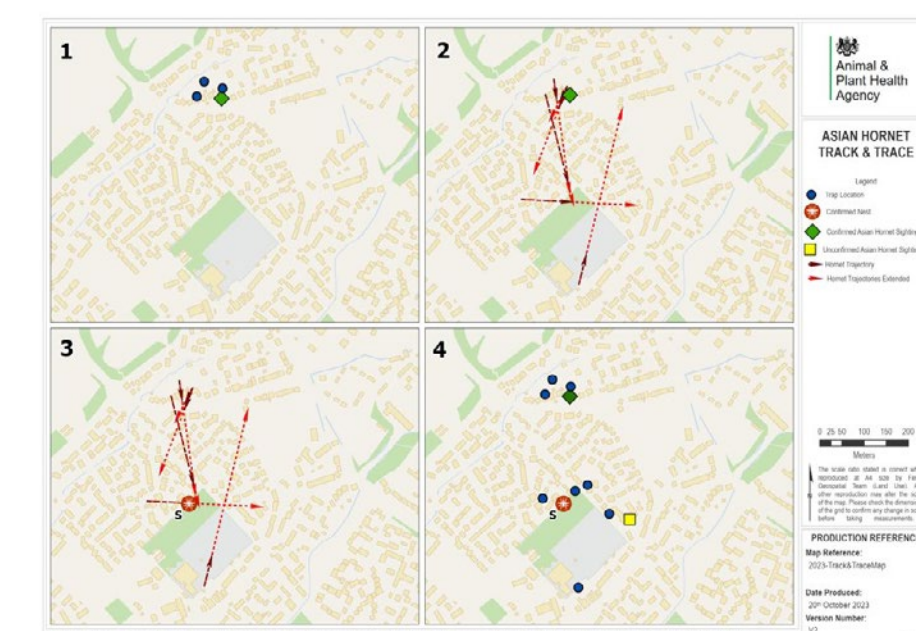
Should the Asian hornet become established in the UK, Fera is working closely with colleagues in APHA to model the resource required to control its spread and impact in future years.

Helping raise awareness of the outbreak, Fera, Defra, and APHA were featured on the BBC One Show, where Fera's Dr Eleanor Jones, Senior Molecular Geneticist, was featured showcasing the amazing work our team is doing in helping to tackle this invasive species.



Asian hornet nests found in 2023.  
Courtesy of APHA © Crown copyright.

The 'Track and Trace' field app used by NBU inspectors. 1) Public sighting reported, 2) Flight paths from captured hornets, 3) Nest location triangulated, 4) Post destruction trap monitoring. Courtesy of APHA © Crown copyright.



Helping raise awareness of the outbreak, Fera, Defra, and APHA were featured on the BBC One Show.



Pesticide treatment of nests and removal. Secondary nests are located high in the tree canopy. Courtesy of APHA © Crown copyright.



A pesticide treated nest removed from a tree prior to sending to Fera for analysis. Courtesy of APHA © Crown copyright.

# MARKET LED SCIENCE DRIVEN



**NOVEL FOOD**

*Including Authenticity & Allergenicity*

Fera aims to be a leader in supporting government and other stakeholders to ensure the authenticity and safety of alternative proteins, ranging from insect protein, cellular agriculture and lab-cultivated meat, precision fermentation products, micro-algae, CBD, and novel applications of plant proteins.

**Fera has been engaging with a wide range of stakeholders from the Novel Foods and alternative protein sector to increase its understanding of the latest innovations and provide the support that sector innovators require to ensure their compliance with the related regulatory requirements.**

This awareness is key to shaping our offer where we continue to build strategic partnerships. We are also supporting government to guide the method development necessary to ensure the authenticity and accurate labelling of novel foods. We are guiding government on the allergenicity of novel foods and determination of suitable methods to detect allergens in alternative proteins.

Much of the novel food market is still in its infancy, with most companies focused on developing the technologies, such as precision fermentation and cellular agriculture and options to scale up before moving on to thorough quality and safety investigations.

The complexity of the Novel Foods approval process in the EU and UK, so far, has been seen by some in the industry as a barrier and there is a call for more clarity and guidance regarding analytical data required for Novel Food dossier submissions. We have built on our strategic partnerships to engage with SMEs for grant-funded projects such as Innovate UK proposals, or with universities, e.g., a project in collaboration with the University of Lincoln funded by the UK Food Safety

Network, where we are working with alternative protein SMEs to investigate microbial risks associated with their products. Through our Insect Research Laboratory, we have upscaled our services in the alternative protein sector, supporting businesses and government to provide robust scientific evidence on the use of insects for alternative protein production. Ensuring that novel products meet the required quality and safety standards is a key aspect of these innovations and Fera's related services have increased accordingly. One aspect of safety refers to the known allergenicity of consuming insects and the ability to test foods for the presence of insect-related allergens to verify food labelling claims. Technologies to detect allergens specific to insect products are currently lacking,

We have secured government funding to determine the suitability of testing methods for the detection of allergens in insect protein and in other Alternative Proteins.

Fera has also continued to support businesses and government regarding quality and safety of CBD products. A survey of cannabidiol (CBD) products on sale in England and Wales was carried out to inform FSA risk assessment of CBD products.

One key focus is to engage more industry customers which has been challenging to date for various reasons, including the early stage of most of these developments, economic factors, and the uncertainties in the sector around other aspects such as scalability and regulatory approval.

Some examples of how Fera is trying to support this field include:



- + Rosario Romero (pictured) - Co-supervisor of an IAFRI PhD project on production of Rubisco protein for food from green waste - Started September 2023.
- + Rosario is also Co-supervisor of an IAFRI PhD project on cultivated meat (currently at recruitment stage).
- + Our Defra project FA0197 - Implications of emerging novel protein sources for food authenticity and labelling, starting in 2022 is also led by Rosario.
- + FSA project C173354 - Review of methods for the detection of allergens in Novel Food Alternative Proteins, 2023. PM: Helen Grundy.
- + FSA project - Analysis of CBD Products, 2022. PM: Susan MacDonald.
- + FSA project - Substrates for insects as feed, 2023. PM: Maureen Wakefield.

# MARKET LED SCIENCE DRIVEN



FOOD & FEED

Fera is contracted by the Food Standards Agency (FSA) to act as the UK National Reference Laboratory (NRL) for several areas of chemical contaminants in food.



**Within this role Fera is working with the FSA to enhance UK capability to expand the scope of food safety testing to better protect UK consumers.**

Per- and Polyfluoroalkyl substances (PFAS) represent a large group (>4700) of anthropogenic chemicals. The group contains several categories and classes of durable chemicals with properties that include oil, water, temperature, chemical and fire resistance as well as electrical insulation. Due to these properties, PFAS are widely used in various industrial processes. PFAS technology is also used in numerous consumer products such as paper, textiles, non-stick coated cookware, and cosmetics.

Due to their chemistry PFAS are difficult to break down and are found in the environment, food chain and in human blood for extremely long periods following initial exposure.

Human exposure to PFAS from the environment and diet is in the global media spotlight with various consumer and advocacy groups lobbying government bodies to introduce regulations to safeguard the population.

Having identified contamination of foodstuffs with per- and polyfluoroalkyl substances (PFAS) as an emerging food safety issue and recognising that there is only limited capability within GB laboratories to offer PFAS testing in food Fera was commissioned to carry out valuable research developing novel methodologies to understand the occurrence levels of PFAS in UK food and the potential risk to consumers now and for the protection of future generations.

With the support of the FSA, Fera was successfully awarded BEIS (now DSIT) funding to purchase the state-of-the-art instrumentation needed to determine

these compounds in foodstuffs (and food contact materials).

**PFAS is a challenging analysis for several reasons including:**

- + The number of compounds and chemical diversity in this class
- + The extremely low levels of detection required (sub part per trillion)
- + The environmental background of PFAS
- + The matrix effects associated with complex matrices which can significantly suppress the PFAS response during measurement.

Hence the need for state-of-the-art instrumentation to determine these substances in complex matrices like foodstuffs.

Methodology has been developed to determine 30 priority PFAS substances in food matrices and used to assess the occurrence levels of these contaminants in a specified number of species of wild caught fish, crustaceans and cephalopods landed in England and Wales. This surveillance work primarily functions as a knowledge gathering initiative which forms part of the FSA's evidence-base for risk management of both emerging and pre-established contaminants in wild caught fish, crustacean and cephalopod products.

The key objective of this theme was to successfully develop and validate methodology for the determination of PFAS in food. This has been achieved and the methodology is now being taken forward for an International Ring-trial for the determination of PFAS in food.



# MARKET LED SCIENCE DRIVEN



BIOINPUTS

Transitioning to Net Zero, halting biodiversity loss and improving climate resilience are key sustainability objectives for many companies in the agricultural supply chain.

**Our vision at Fera is to help partners to respond to these challenges through world-class science, proficient measurement, and advice.**

In 2023 our multiple disciplinary teams with expertise in sustainable agriculture, the circular economy, soil health and life cycle analysis, partnered with the world's largest food and beverage company, Nestlé, to investigate how two initiatives can help deliver resilience within their supply chain and reduce greenhouse gas emissions linked to the use of synthetic fertilisers. Both initiatives are aligned to Nestlé's pledge to source 50% of its key ingredients from regenerative agriculture by 2030<sup>1</sup>, and matched with three of the five Whole Food System scientific change drivers identified in the Fera Science Strategy: protecting, growing, and replenishing (circular economy).

The first project, initiated by Nestlé Purina, is exploring the role of seaweed-based bio-stimulants on soil health and plant performance. The three-year study will test the potential impact of seaweed-based bio-stimulants on cereal crops and assess their ability to help the plants adapt to abiotic stress conditions, such as heat, drought, and increased soil salinity.

In this project, the Wageningen Plant Science Institute in the Netherlands will evaluate the potential impact of seaweed-based bio-stimulants on plant performance under laboratory conditions, while Fera will coordinate on-farm field trials in the UK and France to investigate how seaweed extracts applied to crops might improve soil health (soil microbiome and carbon stocks) and plant responses to abiotic stresses, while also investigating the potential to reduce the amount of synthetic fertiliser while maintaining yields.

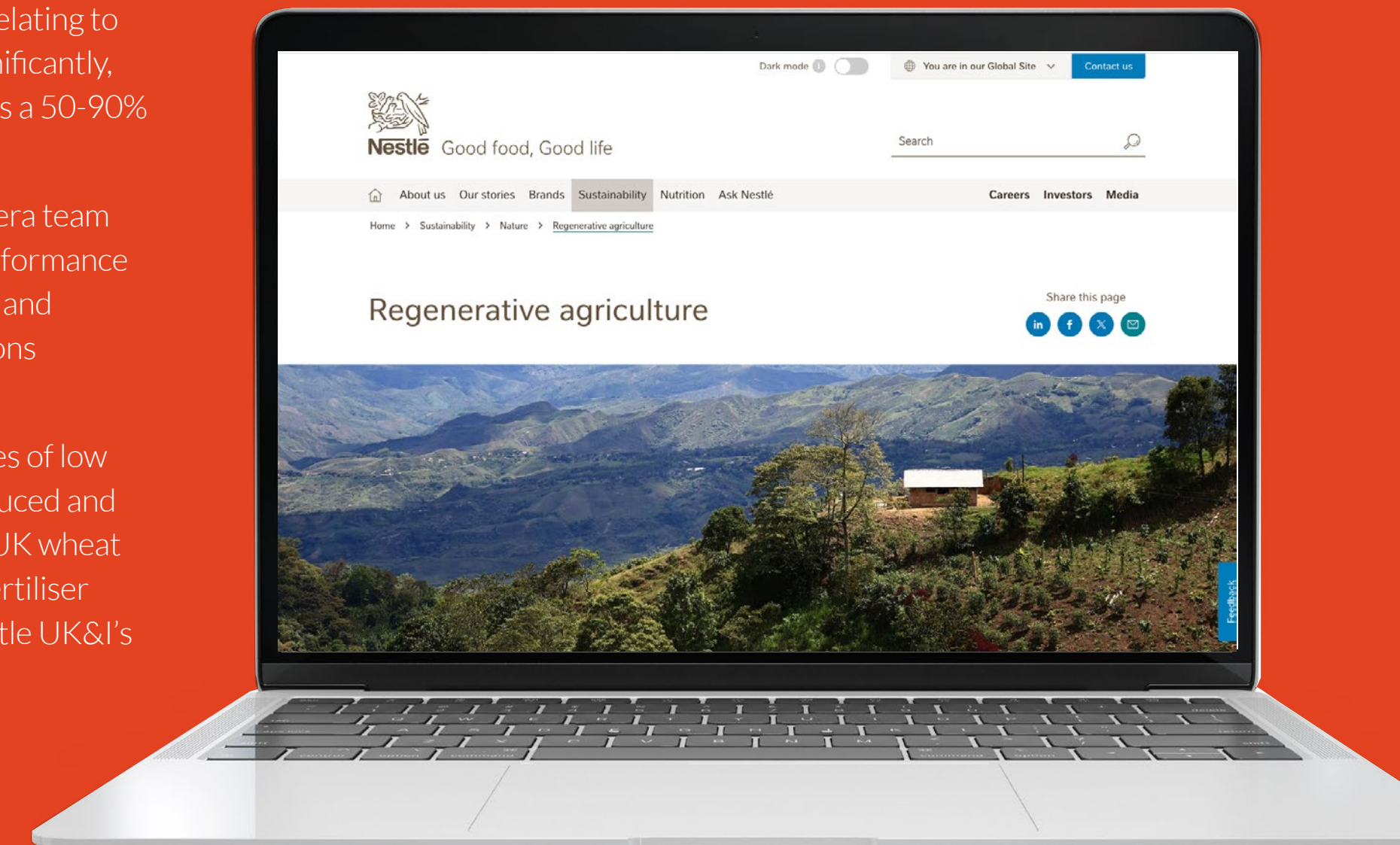
The second project is an initiative from Nestlé UK & Ireland and Cargill to investigate whether cocoa shells from a confectionery site in York could be used to create a low carbon fertiliser. The cocoa shells are supplied by Cargill, which processes the cocoa at the York facility to become key ingredients in iconic products like KitKat and Aero. A trial volume of cocoa shell has been processed and pelletised by Swindon-based CCm Technologies.

The CCm cocoa shell-based product reduces carbon intensity during the manufacture by minimising the use of fossil fuel during production by using renewable energy and by using nutrients recovered from waste.

Based on the results of independent field trials over the last eight years, it is expected that use of CCm materials will reduce carbon emissions relating to fertiliser use in agriculture significantly, with estimates up to as much as a 50-90% reduction.

Over the next two years, the Fera team will evaluate the fertiliser's performance on crop production, soil health and greenhouse gas (GHG) emissions reduction.

If successful, up to 7,000 tonnes of low carbon fertiliser could be produced and offered to farmers in Nestlé's UK wheat supply chain. This amount of fertiliser equates to around 25% of Nestlé UK&I's total fertiliser use for wheat.



<sup>1</sup><https://www.nestle.com/sustainability/nature-environment/regenerative-agriculture>



# MEASURING OUR SUCCESS

**Our Science Key Performance Indicators (KPIs) are a set of quantitative metrics taken from internal datasets and external databases to give an unbiased in-year assessment of Fera's scientific performance. These metrics feed into a KPI dashboard to provide an overall performance score across both Fera and Defra fiscal years and are sub-divided into three pillars: Quality, Impact, and Innovation. These are reported and signed off annually by Fera's Science Committee, for review and approval by Defra.**



Our Science KPIs were set out originally to reflect the structure of the Research Excellence Framework, applied nationally to UK universities to assess their research performance. This approach is now under review, with a new set of KPIs being piloted which have been devised to align more closely with Fera's combined JV business model as an expert testing, contract research and advisory services organisation to the commercial and public sectors.

Our Science Quality is measured by a demanding set of bespoke performance metrics. These include generation of a strongly cited, high impact peer-reviewed publication record, authorship of various grey literature and thought leadership pieces, as well as our success rate in competitive R&D bids. In addition, our commercial client satisfaction is assessed through customer feedback reports.

# MEASURING OUR SUCCESS



## R&D & IMPACT

Our Science Impact is measured by both commercial and research performance metrics. The commercial impact of our science is measured by the launch of new products or services using Fera's research and IP, whilst the Field-Weighted Citation Impact metric is used to benchmark the citation impact of our peer-reviewed publications within the Agricultural and Biological Sciences field.

### 2023 SAW THE LAUNCH OF:

- + Two new Enigma projects; Enigma II: Managing ToBRFV in the Tomato Sector, and Enigma III: Fresh Produce Food Safety in Vertical Farming.
- + Established LAND360 service into the housing development market
- + New capability for determination of PFAS contamination
- + Medicinal CBD as an extension of the already established CBD offering *and*
- + Our Proficiency Testing Group introduced 44 new products and a new service for cosmetics - chemistry and microbiology.

## BIOYORKSHIRE

BioYorkshire is a bold strategic initiative which aims to grow and develop the wider bioeconomy sector in York and North Yorkshire. It is a partnership between three core partners, all with deep roots in the region - the University of York, Fera Science Ltd, and Askham Bryan College.

Its ambition is to build on the existing strengths of the regional bioeconomy, to develop and scale the sector for the future. Fera has supported BioYorkshire over the past 12 months with the development of a strong proposition for the bioeconomy in York and North Yorkshire.

We have continued to work with both local government (through the emerging combined authority) and the UK Government, to articulate the strength and scale of activity taking place amongst the BioYorkshire cluster and the potential for future growth in the region.



From left to right; Jodie Roebuck; CFO, Fera Science, Damian Malins; Venturing Director, Fera Science, Marty Anstey; CEO, WeR1 Partners, Dr Simon Biltcliffe DBA; Founder and Executive Chairman, Webmart, Sue Jefferson; Chair of Business Board, York & North Yorkshire Local Enterprise Partnership, and Tim Smit; Founder, Eden Project.

In March Fera hosted the UKRI (UK Research and Innovation) Board, who saw the work taking place at Fera's Insect Research Laboratory which will deliver the food systems of the future.

And in July, we were joined by former Minister for Science Research and Innovation as well as senior colleagues from Aviva and Greensphere Capital, at the Big Tent festival in York, to discuss how the BioYorkshire proposition can help drive economic growth and provide the technological innovations needed to meet the UK's ambitious net zero targets.



From left to right; Charlie Jeffery; President, University of York, John Huddleston; Senior Manager Group Public Affairs, Aviva, James Farrar; COO, York & North Yorkshire Local Enterprise Partnership, Suresh Weerasinghe; Group Public Affairs, Aviva, Simon Marshall; Capital Lead, Aviva, Tim Whitaker; CEO, Askham Bryan College, Charlotte Jones; Group CFO, Aviva.

## FERA'S ANNUAL SCIENCE SYMPOSIUM

Held annually and hosted by Fera, the Science Symposium provides an excellent platform from which to cultivate the quality of our Science and demonstrate its impact. In 2023, the overarching theme was "Food for Thought: Fera's Science in a Changing Landscape". Scientists from Fera and Newcastle University discussed their current research in the context of the food system, focussing on cross cutting themes from our Science Strategy.

The two day event was launched with a stimulating keynote lecture from Sir Tim Smit (Executive Vice-Chair, and Co-founder of the Eden Project) and guest speakers included thought leaders, innovators and experts from across the sector including:

Lorand Bartels (Professor of International Law at Cambridge University and Chair of the Trade and Agriculture Commission), Nigel Jenney (CEO of Fresh Produce Consortium), Jyoti Banerjee (Co-founder of North Star Transition), Phil Pearson

(Owner of APS Salads), Joel Scott-Halkes (Campaigns Director at RePlanet), Lisa Smith (Head of Tree Health Policy & Plant Health Evidence & Analysis at Defra) and Professor Neil Boonham (Chair of Applied Crop Science at Newcastle University).



# MEASURING OUR SUCCESS



## INNOVATION

Our Science Innovation is measured largely by the annual investment made in our R&D projects, spend on infrastructure and facilities, and our in-year pipeline of intellectual property for commercial translation.

In addition, our Science Innovation is assessed through the number of PhD studentships started in-year, with the aim of gathering fundamental knowledge in line with our Science Strategy, data for existing products or services, or developing innovative products or services for new markets.

Our PhD studentships also function as a talent pipeline for development of future Fera employees.



Fera onboarded Adam Bedford as Enigma Projects Director in 2023

## ENIGMA

Fera applies Original Thinking to support sustainable global food production and has a long history of pioneering innovation.

In February 2022, Fera launched Enigma; a strategic R&D model established to support continued research, innovation, and knowledge transfer across the agri-food sector through a joined-up approach between Fera and industry partners. Under a highly innovative and value based B2B industry project model, the success of Enigma relies on industry collaboration in the agri-food sector.

Each Enigma project is co-sponsored by industry partners enabling Fera to deliver an impactful body of world-class science to find end-to-end solutions to sector challenges.

The first Enigma project, Sustainable Wireworm IPM, was established following an upward trend in wireworm damage in potato, salad, root vegetable, cereal, onion and other crops throughout the UK. Industry leaders have joined forces to co-fund a Fera-led R&D project to find an end-to-end solution. Representatives from Syngenta, Frontier, G's Fresh, Elveden Estate, Pearce Seeds, Inov3PT and Blackthorn Arable are collaborating on Enigma I for three years to understand

wireworm and its changing patterns of damage in greater detail. Scientific progress and engagement with project partners have been strong so far, the latter being facilitated by quarterly reports and project meetings. Achievements over the first 18 months include setting up a hub for project resources and outputs to be made available to partners; DNA barcoding to enable identification of the species which are major crop pests (this is impossible to do visually), proof of concept that we can identify food plants from DNA analysis of gut contents, and proof of concept that we can use DNA metabarcoding to identify larvae from soil samples.

We have also held an identification training course for partners. Work in progress includes investigations into potentially detrimental cover crops and life history studies at different temperatures. The outputs of the latter will feed into modelling development at different temperatures to inform field risk assessments and Integrated Pest Management.

## ENIGMA II & III:

The success of Enigma I has enabled Fera to move forward with two further Enigma projects focussed on ToBRFV in the tomato sector and on food safety in vertical farming.

Our Enigma model of collaborative research has broad application, with building interest across the food and farming sectors and within their supply chains as we develop collaborations between primary producers, processors and retailers and the scientific community of Fera.

Enigma projects are an exciting example of the original scientific thinking of Fera supporting sustainable production and 2024 will see further Enigma projects brought forward across a range of issues as we develop the scientific solutions needed by industry, with industry, to solve pressing production and environmental challenges.



## NATIONAL POTATO INDUSTRY AWARDS 2023 – FINALIST



Fera's commitment to innovation is highlighted through our recognition as finalists in the Best Innovation category at the 2023 National Potato Awards. Our primary focus is on combating the economic impact of the root-knot nematode *Meloidogyne fallax* on potato crops, a parasitic nematode that significantly reduces yield and affects tuber quality, with a global economic impact exceeding £150 billion.

Originally designated a quarantine pest in the UK, *M. fallax*'s status has shifted to a non-quarantine pest for Great Britain, necessitating industry responsibility for management.

Fera's scientists have developed advanced technology for rapid *M. fallax* identification and utilise whole genome sequencing (WGS) for lineage mapping, origin tracing, and pinpointing population sources, crucial for early detection and management.

In technical development, Fera employed high-throughput sequencing platforms like Illumina NovaSeq and Oxford Nanopore PromethION to sequence *M. fallax* genomes.

Despite challenges, Whole Genome Amplification (WGA) applicability was explored but deemed unsuitable due to bacterial contamination and uneven coverage.

Genome assemblies were pivotal in identifying variable loci for reduced genome analysis, enabling the generation of multilocus genotype data. The resulting phylogenetic tree revealed asexual reproduction in *M. fallax*.

In summary, Fera's commitment to innovation is evident in advanced techniques for nematode identification and genome sequencing, addressing challenges associated with high-priority pests like *Meloidogyne fallax*.

**CREATING A BETTER FUTURE** FORWARD THINKING FOR THE WHOLE FOOD SYSTEM

# DEVELOPING THE NEXT GENERATION

**Fera's Science Strategy is devised and delivered by our scientists. We are also focussed on social inclusion and direct our efforts at ensuring our talent resourcing maximises ethnic diversity and inclusion. We maximise the opportunities for 'in-house' progression and deploy a strategy of recruitment and regional community engagement to construct a development pipeline providing attractive career progression to new joiners.**



# DEVELOPING THE NEXT GENERATION



## APPRENTICESHIPS

Since introducing the Laboratory Technician apprenticeship in 2011, we have harnessed new talent, on-boarding, and progressed apprentices to help develop the next generation of scientists.

The degree level Laboratory Scientist apprenticeship was a natural next step in 2018, followed by the Digital Marketing Degree apprenticeship in 2021, followed by the Data Scientist degree apprenticeship at level 6 and Research Scientist at level 7 (Masters) in 2022.

We are currently exploring introducing a Soil Scientist Apprenticeship at level 7, which has recently been approved for delivery and is awaiting an in-principal commitment from an end point assessment organisation (EPAO). Fera is currently liaising with the British Society of Soil Science on the delivery of this apprenticeship in 2024, once the EPAO is formally approved.

As part of the implementation of apprenticeships, Trailblazer groups, which includes employers who are responsible for developing and reviewing occupational standards which form a key component of an apprenticeship.

Throughout 2023, Fera has been a member of the trailblazer group for the review of the Laboratory Scientist. The outcome from this trailblazer has been the introduction of an integrated degree for this apprenticeship and new pathways being developed for Biological Scientist, Chemical Scientist and Physicist.

Our partnerships on apprenticeships are with both local provider York College, Leeds Trinity University and with Keele University.

Fera works with local schools and the City of York Council Skills Team to share our apprenticeships available at Fera and we attend careers events at local schools to inform students about our apprenticeships. Fera is also a member of the Yorkshire and Humber Apprenticeship Ambassador Network.

We are extremely proud of all our apprentices and their wide-reaching achievements. Following the graduation of our first-degree level apprentices, Fera has continued throughout 2023 to support several apprentices, as they also complete their degree level apprenticeships and will be graduating in 2024 and 2025.

A further cohort is planned for 2024.

During 2023, Fera has continued to enrol employees from our Chemical Safety and Plant Health Businesses onto the level 7 Research Scientist apprenticeships at Keele University, with further employees due to enroll in 2024.

Fera continues to support and encourage our staff to achieve their best potential through our apprenticeship programmes in Science and Corporate roles, and our membership of the trailblazer group further demonstrates our commitment to developing the occupational standards at national level.

### APPRENTICE SPOTLIGHT: JOE HOLLAND



**The first year of the Research Scientist Apprenticeship has provided me with a much wider understanding of team dynamics and project management and it has developed my ability to gather and apply scientific knowledge and data whilst showing me how to effectively communicate this, in both extended written reports and oral presentations.**

The module assessments throughout the first year have often required application of the learning to a problem or situation at work. This has included scenarios of how to motivate staff, manage difficult team members or how to coach and mentor those that want to develop.

Using business analysis models has allowed me to assess

weaknesses and strengths of my work area and how these can be addressed or used to an advantage, respectively.

I have produced a data analysis report examining issues with proficiency testing (PT) data statistical methods and a case study on a new PT sample packaging technique, potentially leading to significant cost savings.

The second year of the apprenticeship is a work-based project, to bring a new PT product from a growing area to market early 2025.

I am currently using the skills developed in the first year to conduct a literature review as a foundation to this piece of work.

# DEVELOPING THE NEXT GENERATION



## PHDS, CAREER PATHWAYS & REGIONAL CAREER ACTIVITY

Connected to our Science Strategy, in 2021 Fera's Board of Directors approved our commitment to onboard and recruit the next generation of scientists to enrich the scientific innovation and skillset of the future.

As a market-led, science-driven business Fera is investing in partnerships with leading academic institutes to support early-stage innovation.

Critical to fulfilment of this objective is for Fera to employ – and continuously develop – a cohort of doctorate level staff evolving as subject matter experts in those fields core to Fera's growth strategy. Not only is this important to the commercial growth of Fera – its capacity for innovation, new product development and quality of expert services provision – the quotient of PhD level employee staff is also a key criterion in the current set of annual science KPIs measured and reported for Fera.

Each year, we welcome our new PhD students at our Induction event, which includes introductory presentations from several key stakeholders in the PhD studies.

We value our people and support their ambition to progress within Fera, with clear visibility of how they can develop their careers and progress.

To enable this to be achieved Fera has a series of published career pathways, aligned to our Job Family Architecture and Competency Frameworks which clearly maps out the scientific and leadership roles available within Fera, from apprentice level upwards, and the skills and experience required to support our people to take their next step.

This is supported by training and development designed to complement and support the desired pathway and enable our staff to progress their career.

Over the last 5 years Fera has supported the PhD graduation of existing graduate staff.

This is a preferred route for Fera since it builds increased staff loyalty, demonstrates most visibly our enthusiasm to invest in our own people (motivating a wider population for professional development), often can combine

academic development with inhouse delivery, enable pursuit of Doctorate level study most closely aligned purely to Fera's scope of expertise and growth agenda.

**NORTH YORKSHIRE M  
APPRENTICESHIP  
AWARDS 2021**



Fera attends the North Yorkshire Apprenticeships Awards

## PHD SPOTLIGHT: HANNAH FENTON



There have been significant challenges during the course of my PhD but the support and infinite expertise of the Entomology and Land Use and Sustainability teams in particular have ensured that I was never without help... or cake!

Although I can see that it would not be the right choice for everyone, I've certainly benefitted from completing my PhD in the applied setting of a scientific business and being surrounded by teams delivering on commercial projects, as well as having access to the academic and pastoral resources provided by Newcastle University.

Following the end of my third year, I accepted a job as a Senior Entomologist here at Fera and I've loved the various projects I've been involved with so far. I'm currently working on developing my own projects and hope to support future PhD students.

# DEVELOPING THE NEXT GENERATION



## EMPLOYEE ENGAGEMENT

Fera staff can spend one day per annum volunteering to support local initiatives. Fera is an employer-partner with York Cares to support community projects.

Fera also actively supports national and local charities. In June, Fera staff took part in the Leeds 10K run fundraising for the British Thyroid Foundation, and in September staff supported the Macmillan Coffee Morning.

From a local perspective, Fera engages with Changing Lives - a York based charity - on an annual basis as part of their winter appeal and St Leonard's Hospice (also based in York). In July, Fera staff completed the Yorkshire 3 Peaks Walk; conquering the challenges of Whernside, Pen-y-ghent, and Ingleborough, covering a total distance of 24 miles!

In September, staff raised money for St Leonard's Hospice, and joined their moonlight walk.

In December, Fera joined with businesses across the city to support several charities including Changing Lives, via our partnership with York Cares.

Fera is also supporting Save the Children in December, as part of their Christmas Jumper appeal.

Fera was successful at the end of 2022 at the 31st York Press Business Awards and won with its inaugural entry in the 'Business Innovation of the Year' category and went on to win the top award of Press Business of the Year 2022.



# QUALITY STATEMENT

We are a caring and responsible company committed to making the world a better, healthier, and safer place. Fera's approach to quality demonstrates our commitment to the highest standards to meet the requirements of the highly regulated international scientific business world. We achieve this by:

- + Having a management team committed to showing leadership, bearing responsibility to ensure standards are met and for creating, implementing, and maintaining the Quality Management System.
- + Continually improve the effectiveness and implementation of the QMS.
- + Complying with the relevant regulations and standards including Good Laboratory Practice (GLP); ISO 9001:2015; ISO 17025:2017; ISO 17043:2010; International Seed Testing Association (ISTA).
- + Having clear quality objectives, providing a fundamental basis for all our processes and activities.
- + Ensuring that Fera personnel are aware of and have a clear understanding of their responsibility to comply with the management system and its processes as well as regulatory requirements.
- + Driving continual improvement and innovation based upon efficient business processes, validated methods, well-defined measurements, best practices, and customer surveys.
- + Maintaining the quality management system through a process of continual improvement supported by annual reviews and audits.
- + Working continuously to strengthen our industry relationships, working closely to develop new and far-reaching products and services, and conducting research that will drive innovative products and solutions across the agri-food industry.
- + Continuing to apply original thinking to develop new products and services that make our customers and us successful.

Our commitment to innovation in the science space is evidenced by the following which have occurred in the last year:

FERA HAS SECURED **2** EXTENSIONS TO OUR UKAS ISO17025 scope of accreditation and we have **two** new applications in progress.

FERA HAS APPLIED OUR FLEXIBLE SCOPE ACCREDITATION TO **49** NEW MATRICES / COMPOUNDS added to the fixed schedule.

- + We underwent a successful routine compliance inspection by the UK Medicine and Healthcare Regulatory Agency GLP Monitoring Authority confirming continued compliance with the OECD Principles of Good Laboratory Practice.
- + We have continued to demonstrate their commitment to achieve the highest standards of data Integrity as showcased by the 'Believe in Better Data Campaign'.



**2022**  
FULL YEAR

REPORTED  
REVENUE OF

**£45.3M**

AN INCREASE OF OVER

**+10.5%**

SEEING US CLOSE IN-LINE  
WITH BUSINESS PLAN



**STRONG REVENUE  
GROWTH** SEEN  
ACROSS ALL  
BUSINESS UNITS

most notably in Plant with growth and renewals of Government contracts with Defra and strong transactional growth in Food, Proficiency Testing and Data Sales services bolstered by price increases.

**15.7%**

OF FERA REVENUE  
QUALIFIED FOR R&D  
TAX CREDIT



**2023**  
FINAL YEAR FIGURES

REVENUE OF  
**£54M**

UNDERLYING GROWTH OF

**+13%**

FINISHING AHEAD OF  
FULL YEAR REVENUE BUDGET



SIGNIFICANT CAPITAL  
INVESTMENT IN 2023  
WITH GRANT FUNDED  
CAPITAL ASSETS OF

**£2M**

in addition to direct Fera Capital investment forecast of £1.1M.


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Original thinking... applied