

CREATING A BETTER FUTURE FORWARD THINKING FOR THE WHOLE FOOD SYSTEM

TAP THE BUTTONS TO NAVIGATE

FORWARD THINKING FOR THE WHOLE FOOD SYSTEM

SCIENCE STRATEGY 2021-2026
ONE YEAR ON



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 a story of scientific achievement and 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, biosecurity, biodiversity, and environment.

In a world of globalised supply chains, rising demands and the many threats 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 processing, packaging, and distribution. It is a great privilege to be Chair of such an inspirational organisation that has such a positive impact in all that it does, for both public and private sector clients.

At Fera we are not complacent about our role and the value of our services. 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.

This first Annual Review of Forward Thinking for the Whole Food System, Science Strategy 2021-2026 showcases 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 what Fera is doing as we are!

RICHARD MCCARTHY CBE



CHAIRMAN

FOREWORD FROM THE CHIEF EXECUTIVE

Fera's Science Strategy has been developed to respond to the changing global and national landscape, as inclusively as possible. As a science-led, expert services business, the quality of Fera's science underpins its strategic growth plan and prepares us for how we can best support future needs of our partners and clients which, in-turn, drives our commercial success.

Our Science Strategy has never been more relevant than here and now. In a world of political turbulence and economic uncertainty, there are a few constants that we neglect at the peril of our longevity on this planet; climate change, species loss, food insecurity, population growth, water, and air quality...to name a few.

It is increasingly recognised that a century of global industrial advancement has been achieved by mortgaging the natural capital of our planet. How we continue to advance in a way that restores the deficit whilst feeding all is a very tough exam question with no single solution but one which requires incremental advancement of innovations across the 'whole food system' along with their subsequent adoption.

At Fera, we pursue this goal under the key drivers of Protecting, Growing, Supplying, Consuming and Replenishing - translating discovery into impact in support of our partners and clients. I am pleased to be sharing with you this inaugural Annual Impact Report which illustrates some of our success against these objectives.

I hope that you welcome reading about our continued upper quartile growth rate and financial performance, but also seeing examples of our important new breakthrough projects and services and of where we have selected to invest in new scientific assets, academic partnerships and for social inclusion.

Finally, we make no apology for the emphasis on our people and talent development, without which these achievements would not be possible and it is that continued engagement that drives Fera's scientific direction.

DR ANDREW SWIFT



CHIEF EXECUTIVE

OUR SCIENTISTS SET THE AGENDA

As a translational science organisation, Fera is focussed 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.



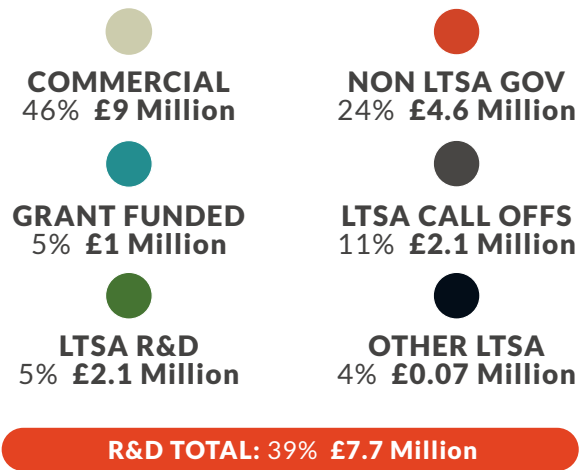
OUR SCIENTISTS SET THE AGENDA

NATIONAL & INTERNATIONAL RESEARCH

Fera has submitted 325 project bids with a total value of 19.62M GBP. Of this total bid value, 39% was R&D funding (Grant body funded, direct commercial and under the Long-Term Service Agreement with Defra). Of these R&D applications, success rate for the number of bids submitted was 75% and 71% for commercial.

Our largest R&D customers are Defra, the Food Standards Agency and Food Standards Scotland. One of our largest successful bids was for the Science and Technology Facilities Council called “Changes in established woodlands and their impact on achieving net zero”, which we are delivering in collaboration with RAL Space and Newcastle University. The case studies opposite demonstrate how our scientists are helping to set the agenda.

BID SUBMISSIONS 2022



A diseased / stressed tree in Norfolk, with canopy defoliation, trunk lesions / cracks.

CHANGES IN ESTABLISHED WOODLANDS AND THEIR IMPACT ON ACHIEVING NET-ZERO

The importance of trees in plans to achieve the goal of net zero by 2050 has been recognised at national and international levels and the need for additional tree planting is embedded in national initiatives and policies such as the 25-year Environment Plan for England and Woodland Carbon Guarantee Scheme.

Although there are many good arguments for the expansion of UK tree cover with new trees and woodlands, there also needs to be a better understanding of the status and health of existing woodlands, to preserve and optimise existing carbon stores.

Many of the tree species in UK woodlands are under increasing stress due to environmental changes and attacks by invasive and non-native pests and diseases. These pathogens and pests weaken the trees, for example through defoliation, reducing growth and consequently their ability to store and capture carbon dioxide, and may ultimately lead to tree death.

It is therefore critical to monitor existing trees and woodlands to assess impact on tree health, coverage and ultimately carbon dioxide sequestration of UK landscapes.

This project demonstrates the capability of remote sensing techniques mounted on unmanned aerial vehicles (UAVs) to allow mapping of tree species, structure and health across diverse woodlands and to detect changes in these factors over time. We also review the current and future potential for integration of such data into existing carbon modelling frameworks, which would act as a baseline estimation of the potential loss of carbon due to the decline of tree health at landscape scales.

EU CHINA SAFE

Common dioxin testing standards are important for underpinning safe trade opportunities between the EU and China and a core part of the EU Horizon 2020 research and innovation programme which drew to a close in 2022. Fera, with partners across research organisations, governments, and industry, embarked on an ambitious project to implement GC-MS/MS dioxin testing as part of the EU-China Safe Project for food safety standards and authenticity.



Sean Panton, Analytical Chemist working on the EU China Safe project

OUR SCIENTISTS SET THE AGENDA



ACADEMIC COLLABORATIONS & IAFRI

ACADEMIC COLLABORATIONS

Fera has a long history of supporting and sponsoring PhD studentships. Working in collaboration with several universities around the UK, we are currently supporting over 30 students.

We are an industrial partner in the Newcastle-Liverpool-Durham DTP (Doctoral Training Partnership) and have two students starting in 2022 as part of the NERC ECORISC CDT (Centre for Doctoral Training) with the University of York and the NERC Panorama DTP with the University of Leeds.

- + Ecotoxicological risk assessment towards sustainable chemical use
Isabel Navarro (York)
- + Veterinary medicines and feed additives in the environment following use in the poultry industry
Bethany Adams (Leeds)



BBSRC Doctoral Training Partnerships



AGRI-FOOD RESEARCH & INNOVATION INSTITUTE

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

IAFRI's mission is to conduct frontier research by bringing together the best multidisciplinary research talent in the social and natural sciences. The mission is linked to Fera's customers' needs.

Fera and Newcastle sponsor up to 6 studentships per year through IAFRI; 3 of the students for the 2022 intake have received prestigious Newcastle University Overseas Research Scholarships (NUORS) and will be undertaking the following projects:

- + The biodiversity and carbon benefits of wood pasture vs agro-forestry. *Broghan Erland*
- + Genomic tools to enable epidemiological monitoring of eukaryotic pests. *Sarah Griffin*
- + Determining the Potential of Enhanced Rock Weathering (ERW) of Rock Dust to Co-deliver for Healthy Soils and Improved Crop Protection against Pests in Temperate Agricultural System. *Apori Samuel Obeng*
- + Developing biopesticides for the control of lepidopteran pests. *Daniil Baranov*
- + Cyclic Peptides for use as Biopesticides. *Dimitra Valsami*
- + Applying eDNA / metabarcoding for the biomonitoring and assessment of Environmental Land Management Schemes (ELMs). *Ben Hawthorne*



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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.

Following the launch of LAND360 in early 2022, clients from a wider range of sectors have expressed an interest in learning more about Fera’s land use, biodiversity, and natural capital services. Several projects were undertaken for large estates, however Fera has also had discussions and projects from renewable energy companies and house developers.

The common thread across all the interest is the realisation that business models are changing as landowners and managers need to consider the options of using their land to ‘produce’ carbon, biodiversity and other facets of natural capital that are beginning to attract public and private funding.

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



A third area is also emerging – projects that are funded with a blend of public and private money to enhance natural capital.

So there are three areas emerging, all of which require the skill sets within Natural Capital / LAND360:

- 1 Public: The Defra policy development strand
- 2 Private: The LAND360 offer for a varied range of businesses
- 3 Public / Private: where blended finance comes together to make land use changes that improve natural capital

Examples of these areas are discussed across this page.

RAPID REVIEWS OF POTENTIAL NET ZERO POLICY LEVERS’ IMPACTS ON BIODIVERSITY

This Defra-funded series of reviews investigates 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,

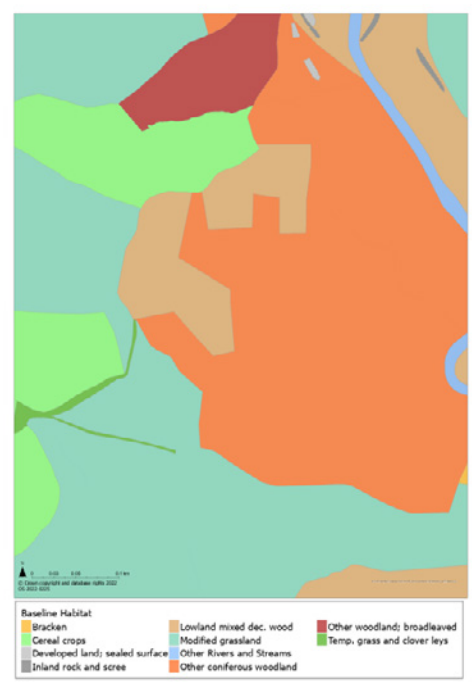
whether trade-offs or solutions that benefit both, with the further aim of informing the development of Defra’s biodiversity targets and strategies.

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

NORTH YORK MOORS TESTS AND TRIALS

Testing opportunities for blending public and private finance

Defra awarded the North York Moors National Park Authority a project through the third phase of the ELMS Tests and Trials, which is delivered jointly between Fera, Cumulus Consultants and Viridian. The work packages involve developing maps and models of opportunities for land managers in the North York Moors. Fera is leading on modelling spatial opportunities for carbon and biodiversity uplift as well as designing participatory workshops with land managers, local government, arms-length bodies, and others.



STRATEGIC LAND USE MODELLING

Competition for land implies that farmers will need to make strategic land use decisions to maximize their financial position over time. Selecting the optimal land use could be very complex. This decision may depend on several economic factors, like contract lengths, operating costs and costs of switching land use types, future price expectations, and the outlook horizon of the farmer.

This work develops a model that is used to derive economically optimal land use options for 10 hectares of arable land. The model captures the value of flexible decision making and dynamic land use choice selection over a defined time period (30 years).

Four distinct land-use options are considered:

- + dedicated energy crops
- + biodiversity improvement scheme (i.e., flower-rich plot)
- + amenity woodland creation
- + arable crop rotation

Additional land use options are considered that allow 8 hectares of arable crops or dedicated energy crops to be grown alongside the biodiversity improvement option.

The optimal land use results points towards uptake of biodiversity improvement schemes and supply of biomass for bioenergy. The outlook horizon (i.e., number of years in the future farmers base current decisions on to maximize returns) affects optimal land use choices, which highlights the need for policymakers and other stakeholders (i.e., housing developers, energy producers) to understand the strategic aims of land managers to meet their own objectives.

The approach developed in this work could be applied to a wide range of other related projects that consider competition for land, such as renewable energy production and housing development



Sir Patrick Vallance, Government Chief Scientific Advisor, in discussions around natural capital with Fera’s Land Use team.

MARKET LED SCIENCE DRIVEN



REPLENISHING

Over the last decade, 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 under a, near perfect, circular economy.

In 2022 Fera has invested £1m to build and commission its, 'first of a kind', insect research laboratory. Our new laboratory will upscale Fera's current insect services and help meet the needs of clients from across industry by demonstrating the economic and technical feasibility of insect bioconversion at pilot scale and twinning pilot insect farming to factory scale to de-risk prospective investments of new entrants, helping to accelerate adoption of this new technology by a much wider industrial user base.

The new laboratory was opened by Defra Permanent Secretary Tamara Finkelstein in August 2022 and will support businesses and government to provide robust scientific evidence

on the use of insects for alternative protein production for feed and food as well as for other novel products.

This will promote innovation in this nascent industry whilst ensuring that products and processes meet the required quality and safety standards to accelerate their market entry. This area of research supports the circular economy and sustainable food production.

We will apply our expertise to support and advise clients to become effective producers of insect-derived products, establishing a forefront position with insect farming companies, waste operators, novel feed and food producers.

A CIRCULAR REVOLUTION IN THE FORECAST FOR AQUACULTURE FEED

Innovators Future By Insects with strategic partner Fera, winners of WWF and Tesco's Innovation Connections accelerator scheme award, are working collaboratively with commercial partners to revolutionise the production of aquaculture feed.

The collaborative project will validate Future By Insects' innovative and sustainable solution which will repurpose organic waste streams and captured CO₂ emissions to grow algae as food for insects to produce animal feed ingredients. Hilton Food Group and Greencore, both major suppliers to Tesco, are centrally involved in supporting the project.

Fera's collaboration with Future By Insects will enable them to work with our extensive scientific and practical technical knowledge and our new laboratory specialising in insect farming. The new facility will provide large scale trial facilities utilising the huge volumes of organic food waste required to carry out the scaled-up testing to build the evidence base necessary to support Future By Insects project work.

This is one of a number of strategic projects that Fera will be delivering over the coming year, all with the aim of kick-starting the agri-food manufacturing sectors to adopt insect farming technology.



FERA SCIENCE LAUNCHES £1M LABORATORY FOR INSECT BIOCONVERSION AT YORK BASE



Tamara Finkelstein, Defra Permanent Secretary opening the new facility Aug, 2022 and hearing about the potential of insect bioconversion.

MARKET LED SCIENCE DRIVEN

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.

EU EXIT

Leaving the EU has led to significant changes in the Sanitary and Phytosanitary (SPS) testing regime for the UK.

Plant related exports to the EU must now have a Phytosanitary certificate and high-risk EU imports are being checked by Animal and Plant Health Agency (APHA) Inspectors. Fera’s laboratory capacity and capability is key; as the UK government looks closer at its SPS policies, both in respect of the EU and in line with expansion of trading partners, further changes are likely to lead to more consignments needing to be being checked in the future.

Our scientists have an in-depth knowledge of pest and disease epidemiology enabling the provision of R&D and advice alongside our diagnostics.

Fera’s new facilities and trained staff are currently handling an increased level of samples from UK ports of entry and the Plant Health Inspectors increased surveillance efforts. Fera now has over 150 experts focused on providing diagnostics, advice, training and R&D to uphold the UK’s Plant and Bee Health Biosecurity.

BORDERS – HEATHROW LAMP TRAINING



The UK has an ambitious 2025 Border Strategy that support our ambition for secure, but friction free, trade that drives growth for a global United Kingdom.

One element of this strategy is to deliver border crossing points that make the experience smoother for passengers and traders, whilst better protecting the public and environment. Fera is working with its partners to enable the use of triaging and diagnostic techniques at the new Border Control Points.

Fera has developed a framework with the Animal and Plant Health Agency to enable the use of LAMP technologies by the inspectors for certain commonly intercepted organisms.

The framework stipulates how this option can be used, the training and competency testing required and the circumstances in which these approaches should be considered.

Plant Health Inspectors from Heathrow have been trained and are currently undergoing competency assessments prior to use of the tests on real samples.

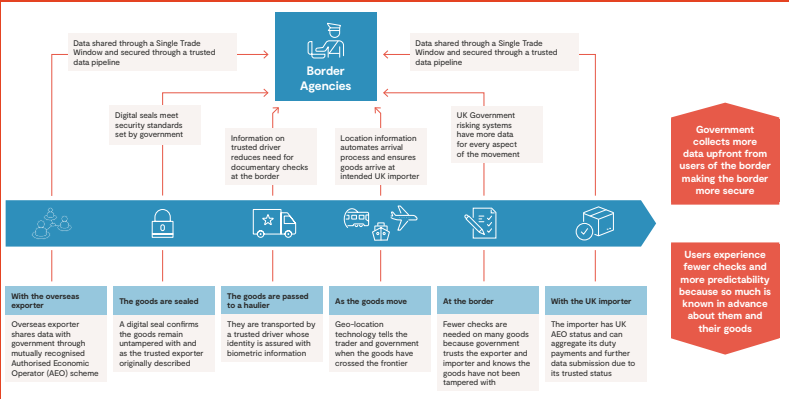
Fera has developed plans to provide diagnostic options at Border Control Posts (BCPs) (including use of LAMP, remote microscopy and satellite laboratories) and will work with Government to implement once it has become clear what will be the sample flow at these BCPs when in full operation.

ECOSYSTEMS OF TRUST

Fera is playing an important role in the Ecosystem of Trust pilot, one of the central tenets of the Governments 2025 UK Border Strategy.

Alongside our partners we are developing a system that will enable a rigorous risk-based approach to the movement of goods in trade that will contribute to a frictionless border for all but the high-risk items. Specifically, Fera is providing Plant Health expertise, advice and data to ensure that the pilot can provide the best approach as well as other requirements.

These pilot schemes will lead to the implementation of a significantly revised approach to the import of goods into the UK, combining significantly enhanced IT, trusted trader schemes and risk-based approaches to inspection.



PLANT HEALTH



REBECCA WEEKES
Rebecca is a key operational leader and has over 20 years of experience working in Plant Health. Her expertise and organisational planning have been fundamental in the redevelopment of Fera’s laboratory and staffing infrastructure to support the increase in diagnostic requirements following the UK’s departure from the European Union. The long-established close relationships between Defra, APHA and Fera are critical to the ongoing biosecurity of the UK and Rebecca’s role maintains and enhances these links.

LYNN LAURENSEN

Lynn has over 20 years of experience in molecular biology and its implementation within Plant Health diagnostics. She is leading Fera’s input into the projects reviewing and developing new ways of working at the border to ensure that Biosecurity is maintained but the experience for traders smoother and swifter.



PHIL NORTHING
Phil is the Head of the Plant programme and has overall responsibility for Fera’s interaction with its partners in Plant and Bee Health. His role in the Ecosystem of Trust pilot is to ensure that the detailed knowledge of how the overall Plant Health service functions helps to build the new approaches and that the biosecurity of the UK is a key driver in their development.

MEASURING OUR SUCCESS

Our science quality is measured not only by our commercial success, but also by a demanding set of bespoke key performance measures governed by Fera’s Science Committee generating a strong cited publications record, an enviable catalogue of impact case studies and pipeline intellectual property and innovation for translation impact.

MEASURING OUR SUCCESS

R&D & IMPACT

The science quality KPI is driven by our performance in the success rate of R&D bids, the number and impact factor of our peer-reviewed published outputs, and customer feedback from the quality of submitted reports to our customers.

The Science key performance indicators originally set out to reflect the structure of the Research Excellence Framework (REF) applied nationally to the UK universities to assess their research performance.

This approach has been modified and continues to be under review to reflect the role of Fera as a translational research and technology organisation. The science KPIs are a set of quantitative and qualitative metrics taken

from internal datasets and external databases to give an unbiased assessment of Fera's in year science performance.

These metrics feed into a KPI dashboard and give an overall score for both Defra and Fera financial years; but are divided into three sub-categories for science quality, impact, and innovation.

The Science KPIs are reported and signed off by the Fera Science Committee annually for review and approval by Defra.

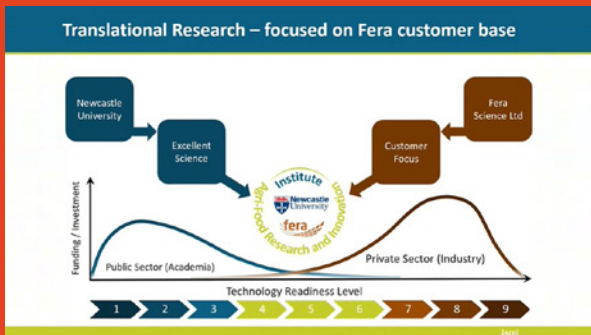
Our science impact is measured by internal impact assessment of R&D activities; currently impact case studies.

For 2021 Chris Sinclair reported on Monimax® – A new poultry anticoccidial feed additive for Europe, Glyn Jones presented the impact of the Ash Dieback Toolkit and Larissa Collins gave an update to the BRIGIT project – A consortium for enhancing UK surveillance and response to *Xylella fastidiosa*.

In addition to the impact case studies we also consider our Field Weighted Citation Index (FWCI) score and any new products and services which have been launched in year.

2021 saw the launch of:

- + Endocrine Disruption Studies (long term fish studies in particular)
- + Aged Sorption (environmental fate)
- + ENIGMA
- + Nematodes as Bio-indicators



FERA'S ANNUAL SCIENCE SYMPOSIUM PROVIDES AN **EXCELLENT PLATFORM** FROM WHICH TO **DEMONSTRATE** THE **IMPACT** AND **QUALITY** OF **OUR SCIENCE KPIs**.

GEORGE FREEMAN,
MINISTER OF STATE,
BEIS,

hears how Fera, as one of the founding partners in BioYorkshire, will be harnessing scientific expertise and driving innovation.



MEASURING OUR SUCCESS

Fera’s innovation performance metric is driven by IP assets, science potential- such as number of PhDs started in the year, staff skills and knowledge and its annual investment in science infrastructure and facilities. ENIGMA, a strategic R&D model and Nematodes as Indicators of Soil Health are just two examples of some of our innovations.



Patrick Vallance, Government Chief Scientific Advisor, presenting to Fera on science impact and innovation



Fera welcomed Emily Miles, Chief Executive at Food Standards Agency Emily joined Fera Programme Leaders and Principal Scientists to review current priorities for the food system and to tour several of our specialist laboratories



INNOVATION

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, Enigma relies on industry collaboration in the agri-food sector.

Each Enigma project will be 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, **Enigma I – Sustainable Wireworm IPM**, was established following an upward trend in wireworm damage in root vegetable and cereal 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 for the sector. Representatives from Syngenta, Frontier, G’s Fresh, Elveden Estate, Pearce Seeds, Inov3PT and Blackthorn Arable are collaborating on Enigma I over the next three years to understand wireworm and its changing patterns of damage in greater detail.

NEMATODES AS INDICATORS OF SOIL HEALTH

Over the last five years Fera has focused on the development and deployment of new methods and metrics to assess soil biological health, including the use of DNA analysis to understand the complex biological communities present in the soil.

Traditionally Fera has focused on understanding pest and disease threats to crops, however the Nematology Team at Fera have spent the last year evaluating different approaches which look at the whole population of soil and plant nematodes as an indicator of soil health. Now Fera’s scientists are using their expertise to offer a new testing service which analyses the breadth and quantity of different nematode species present in the soil sample to provide a bioindicator of soil health.


Bioindicators are organisms which can be used to indicate the quality of an ecosystem and, given their distribution and diversity, nematodes can provide a reliable indication of soil status and soil health.



Fera has been trialling this new approach to soil health assessment, including a project looking at soil health in potato rotations, with AH Worth and the M&S Farming with Nature Programme, together with the Game & Wildlife Conservation Trust, Hutchinsons and Sustainable Soil Management.

Not only has Fera’s team of experts been building up a greater understanding of how nematodes interact with other elements of the soil ecosystem, but their studies have identified new species of nematode which were previously unknown to science and recorded other species in UK soils for the first time.

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 progressing apprentices to help Fera 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, and the Data Scientist degree apprenticeship at level 6 and Research Scientist at level 7 (Masters) in 2022.

Our partnerships on apprenticeships are with both local provider York St John 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 attends careers events at local schools to inform students about our apprenticeships. Fera are also members of the Yorkshire and Humber Apprenticeship Ambassador Network.

We are extremely proud of all our apprentices and their wide reaching achievements.

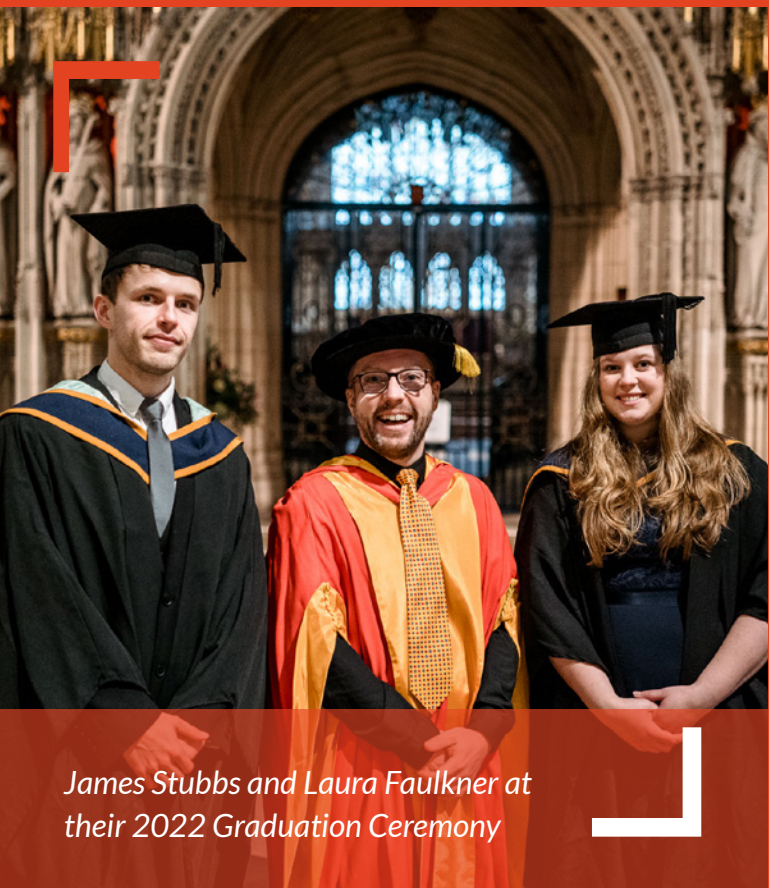


In November 2022, we were proud to see the graduation of our first degree level apprentices, James Stubbs from the Plant Protection Programme and Laura Faulkner from Chemical Safety and Stewardship, who had both previously completed our level 3 apprenticeship

Both apprentices have achieved fantastic results in their BSc (Hons) Biological Sciences degree from York St John University.

James Stubbs has additionally achieved the coveted Royal Society of Biology top student prize, in recognition of being the top-performing student in the 2022 graduation cohort.

With further degree apprentices currently underway at Fera, we continue to support and encourage our staff to achieve their best potential through our apprenticeship programmes in Science and Corporate roles.



APPRENTICE SPOTLIGHT: CALLUM LOGAN

After finishing college, I wanted to be able to gain on the job experience while studying so decided to look for an apprenticeship. I attended an Apprenticeship Recruitment Event at City of York Council where I found out about a Level 3 Lab Technician vacancy at Fera Science Ltd. I applied and was lucky enough to get the position, starting in September 2019.



Since becoming an apprentice, I have grown as a person as well as improve my communication and time management skills. It has also increased my confidence, developed my interpersonal skills with colleagues and helped me develop my report writing.

Tasks I am involved with include the identification of quarantine plant parasitic nematodes along with non-plant parasitic nematodes from various samples both entering and exiting the UK and internationally. I recently found out about Fera's degree apprenticeship, which shows the difference opportunities and apprenticeship can bring and how you can progress within a company.

Within my job at Fera, I am now studying a fully funded Level 6 degree apprenticeship in Biomedical Science at York St John University, which I am really enjoying. It's enabled me to pick up new roles, allowing me to contribute greatly to the Nematology team.

In the future, I would like to get more into management and mentoring of future apprentices to share my experiences with them and help guide them.

Callum Logan, Nematology Delivery Manager, Fera Science
Level 6 BSc (Hons) Biological Sciences (Degree Apprenticeship)

DEVELOPING THE NEXT GENERATION



PHDS, CAREER PATHWAYS & REGIONAL CAREER ACTIVITY

Connected to our Science Strategy, in 2021 Fera’s JV Board 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 have 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 2 of its existing graduate staff, with 2 members of staff currently completing a PhD and will be graduating in 2024 and 2023.

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 in-house delivery, enable pursuit of Doctorate level study most closely aligned purely to Fera’s scope of expertise and growth agenda.



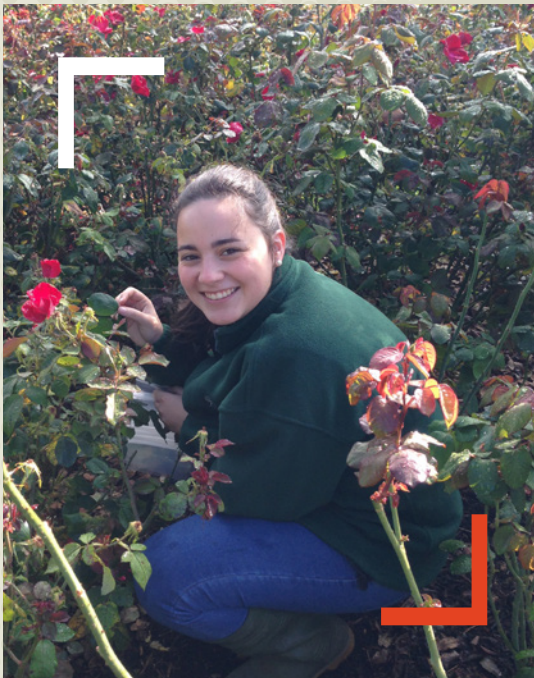
Fera regularly attends external regional career days and fairs to help attract the next generation of scientists.

PHD SPOTLIGHT: INES VAZQUEZ-IGLESIAS

I developed my PhD studies working on understanding the current status of rose viruses and protecting the future of the UK rose sector at Fera Science. Working on my PhD research based at Fera, gave me a different insight of working in industry.

I was introduced to all academic, industry and real-world connections. I was a witness on how the work done at Fera impacts in real life. One of the key aspects of developing my research at Fera, was the access to novel technologies, such as high throughput sequencing platforms (HTS). Having access and being able to work on this technique myself, opened the door to my career and this is where I am currently working as a Fera employee. One of the best things is the collaboration among different departments, and the access to a wide range of expertise from multiple disciplines. It also gave me the chance to learn about other projects and fields and allowed me to see the daily work of a diagnostic laboratory and other R&D projects. During my PhD at Fera, I worked in a nice working environment and this is one of the reasons I decided to stay and work here as a Scientist, continuing my career in the field that I enjoy the most: Plant Virology and the application of HTS.

Ines Vazquez-Iglesias, Molecular Scientist (Former PhD Student)



DEVELOPING THE NEXT GENERATION



EMPLOYEE ENGAGEMENT

Fera staff are allocated one day per annum to spend volunteering, which is used to support several local initiatives. Fera is partnered with York Cares to support community projects, with multiple members of staff joining the efforts in 2022 to help build a community garden in the centre of York. Due to ongoing support, Fera received the York Cares Golden Moments Awards for the team challenge programme for continued support for the Good Neighbours Garden.

Fera also actively supports national and local charities, including the Macmillan Coffee Morning, and from a local perspective engages with Changing Lives on an annual basis as part of their winter appeal. Earlier this year, Fera Staff took part in the Leeds 10K Clarion Corporate Challenge and raised over £1,000 in support of charities Tommy's and Our Angels.

In late 2022, Fera entered the York Press Business Awards under the category of Business Innovation of the Year.

Having been shortlisted as a finalist in the category that highlights businesses bringing about change for the better by the application of new thinking and ideas, Fera will be attending the awards ceremony in November of 2022. Innovation could be from the application of creativity to new or better products or services, better ways of working that have produced great results and investing in research and development.

FERA SEES SUCCESS AT THE YORK CARES GOLDEN MOMENTS AWARDS IN THE GOOD NEIGHBOURS GARDEN CHALLENGE



Fera runners raising over £1k at the Leeds 10k Clarion Corporate Challenge



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 in order 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 HAVE SECURED
3 EXTENSIONS TO OUR UKAS ISO17025
scope of accreditation.

PLUS HAVE SECURED
2 NEW APPLICATIONS IN PROGRESS

FERA HAVE APPLIED OUR FLEXIBLE SCOPE ACCREDITATION TO
25 NEW MATRICES/ COMPOUNDS ADDED
to the fixed schedule.

- + Fera 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.
- + Fera have continued to demonstrate their commitment to achieve the highest standards of data integrity as showcased by the ‘Believe in Better Data Campaign’.

FINANCIAL REPORTING

2021
FULL YEAR

REPORTED
REVENUE OF

£40.9M

AN INCREASE OF OVER

+13%
YOY

AND IN LINE WITH BUDGET



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

In particular Plant, bolstered by the Defra plant health border control work, Chemicals benefitting from an increasing order book and strong growth across Food's transactional business.

LEVEL OF REVENUE
THAT **QUALIFIED** FOR
R&D TAX CREDIT WAS

10.1%
(VS 9.2% IN 2020)



2022
YTD OCTOBER

REVENUE OF
£40.6M

UNDERLYING GROWTH OF

+9%
YOY

ON TRACK TO HIT FULL
YEAR REVENUE BUDGET



APPROVAL GAINED TO
INVEST IN & BUILD FIRU: A

£1M

investment which completed 08/2022

FERA'S FIRST
DIVIDEND
APPROVED
AND PAID TO
SHAREHOLDERS

as a result of 2021
performance

ADDITIONAL
TO THE FIRU BUILD,
A FURTHER

+£1M

Capital investment
forecast for 2022