CHAP
CROP HEALTH & PROTECTION

CHAP's role in the agri-tech sector

Amy Farrington
Innovation Sector Lead

Funded by UKRI Innovate UK

WHO IS CHAP?

AGRI-TECH CENTRES

UK Agri-Tech Centres

The four UK Agri-Tech Centres work to support a successful and sustainable agrifood sector

CHAP'S PURPOSE

To transform agri-tech through innovation to feed the world sustainably.

VISION

CHAP's vision is for UK Agri-Tech innovation and expertise to drive sustainable farming systems which deliver economic, environmental, and societal benefits across the globe.

WHAT DOES CHAP DO?

NETWORK BUILDERS & COLLABORATORS

We develop **networks** to promote new opportunities for **collaboration**, innovation, demonstration, knowledge exchange and business networking.

Bringing stakeholders together to co-develop **solutions to current challenges** in crop production.

The CHAP Membership Community

CHAP
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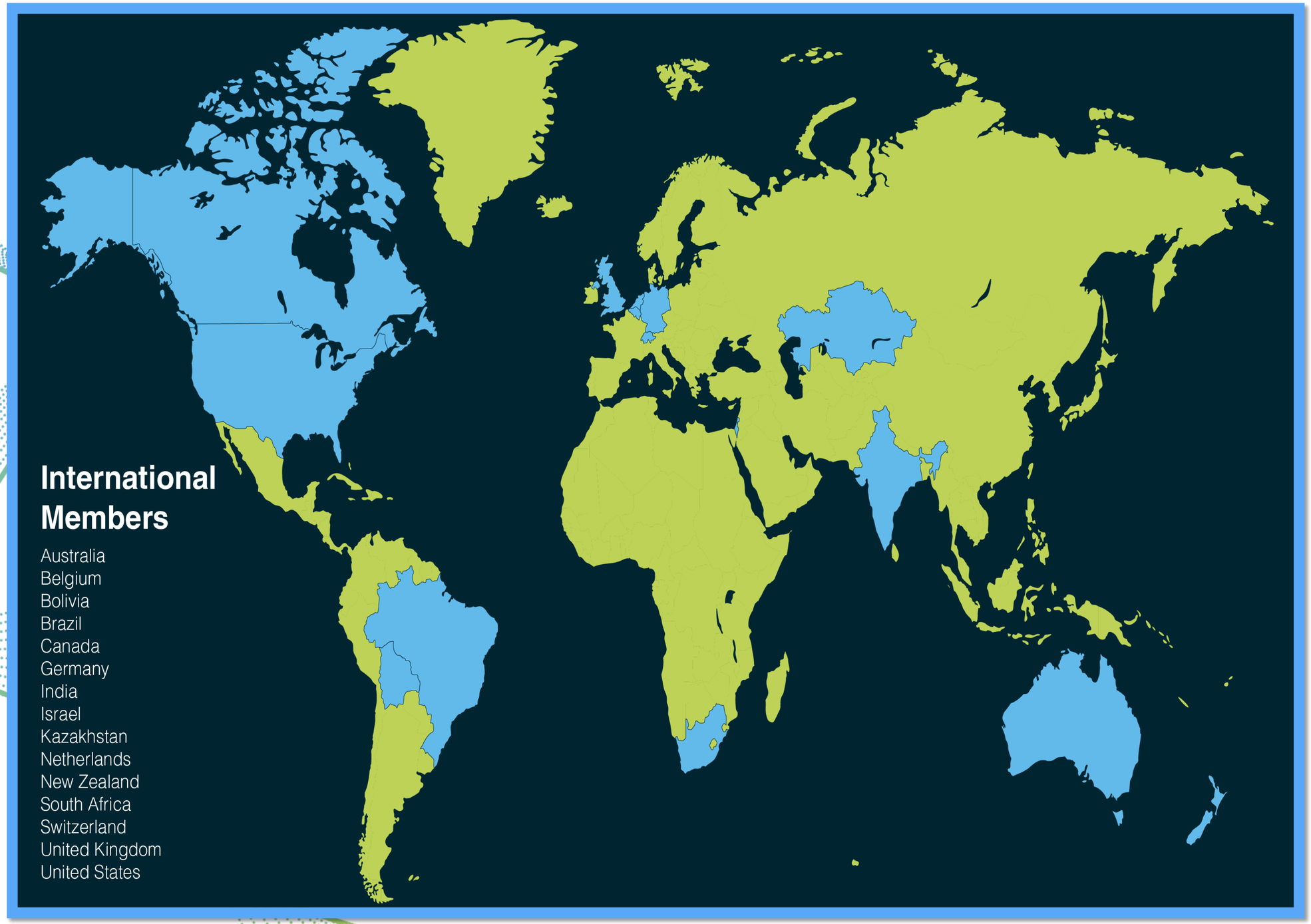
INTERNATIONAL MEMBERSHIP

Funded by UKRI Innovate UK



TESCO

frontier

Bayer CropScience

ADAS

UNIVERSITY OF GREENWICH

Natural Resources Institute


01
Innovation Hub for Controlled Environment Agriculture


01
Crop Research Track Sprayer


02
Regenerative Agriculture Tools


02 03 04
Lab to Field (Mobile Crop Science Labs)


03
E-Flows Mesocosm


03
Resistance Diagnostics Lab


04
Advanced Glasshouse Facility


04
Vertical Farming Development Centre


04
Field Scale Precision Equipment


04
Plant Clinic Support Services


05
Natural Light Growing Centre


06
Molecular Diagnostics


07
Soil Health Facility


08
Digital Phenotyping Lab


09
National Reference Collection


09
International Pest Horizon Scanning


09
Biopesticide Development Lab

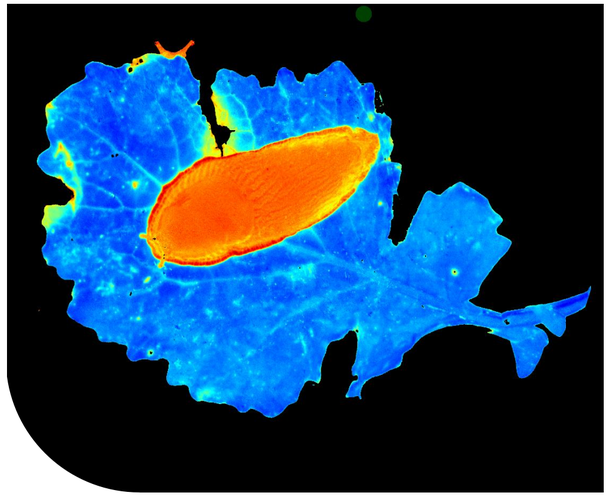

Liberty Produce
The James Hutton Institute
01
Newcastle University
02
HQ
04
STC
NIAB
WARWICK
RIPE
05
06
07
08
ROTHAMSTED RESEARCH
Cranfield University
09
CABI

ROTHAMSTED RESEARCH

DIGITAL PHENOTYPING

A cutting-edge multifaceted service facility that uses a range of advanced imaging equipment to automate the quantification and remote detection of plant traits

- Phenotyping conducted in controlled environments
- Distinguish and quantify subtle features not visible to the naked eye
- Non-destructively monitor disease impact on plant growth
- Determine the spectral signatures of pests and diseases for remote-sensing applications



In Partnership with CABI

FUNGAL BIOPESTICIDE DEVELOPMENT LABORATORY

Tests and screens for potential fungal biopesticide isolates to treat existing and emerging pests and diseases impacting crops in the UK and beyond.

- Open access facilities for manufacturers and developers of biopesticide products
- Working to develop novel biopesticide solutions
- Answering increased demand for biologicals as chemical resistance increases and the pool of available synthetics is reduced

VERTICAL FARMING DEVELOPMENT CENTRE

Allows commercial growers to focus on improving the energy efficiency, sustainability, yields, and economies of vertical farming technologies before taking the decision to invest

- Two identical four-tier growth rooms with full climate control (temperature, relative humidity, CO_2, light)
- Test larger technological innovations (robotics, automation)
- Compare the impact of different climate control strategies
- Speed breeding

In Partnership with

PLANT PHENOTYPING AND SOIL HEALTH FACILITY

Designed to replicate the whole crop cycle to test for optimum growing conditions using the glasshouse and growth rooms

- Agri-EPI phenotyping platform allows above- and below-ground imaging
- Unique combination of soil, crop and water research
- Precision tillage for seedbed preparation
- Bio-remediation of soil structure

OUR CHALLENGES

Climate Change & Net-zero

Food Security & Nutrition

Sustainable Production

Resilient Food Systems

Climate Change / Net-Zero Food Security and Nutrition Sustainable Production Resilient Food Systems

Intelligent Agronomy

Innovative Crop Health

Soil and Crop Health

CEA

Crop & Protein Diversification

SOIL AND CROP HEALTH SYSTEMS

Current farming practices are degrading soils, depleting their ability to generate food and effectively function as part of the wider ecosystem. A better understanding of the plant, soil, water, nutrient interface will enable the sector to:

- Effectively balance yield
- Increase systems resilience
- Contribute to carbon sequestration
- Support sustainable production
- Advance to net-zero targets

SOIL AND CROP HEALTH SYSTEMS

The objectives of the Soil and Crop Health Systems research pillar are:

- Independently examine and evaluate farming systems/approaches
- Examine, research and improve adoption of carbon sequestration in soils
- Develop improved tillage systems for greater environmental and costs benefits

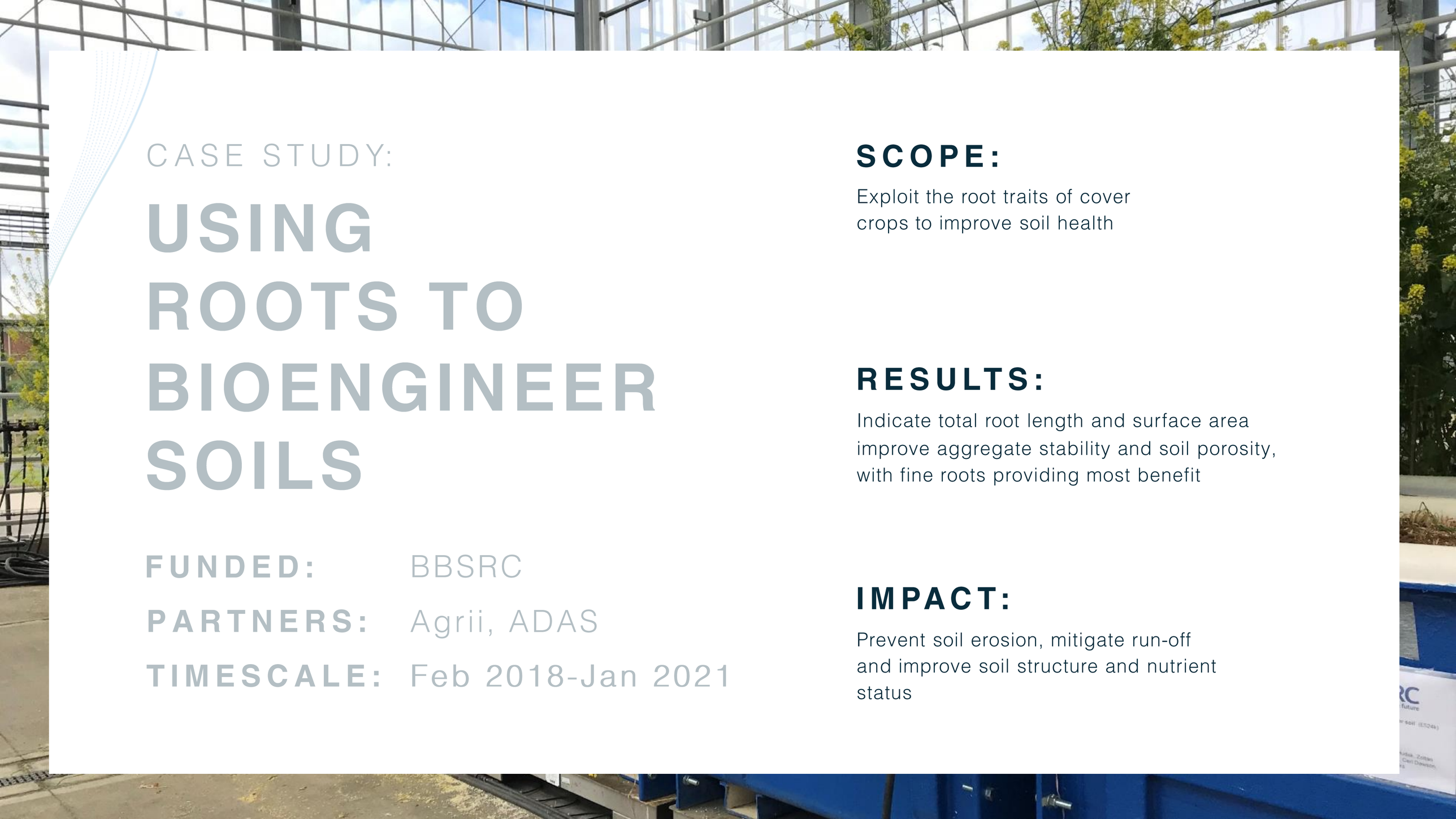
CASE STUDY:

USING ROOTS TO BIOENGINEER SOILS

FUNDED: BBSRC

PARTNERS: Agrii, ADAS

TIMESCALE: Feb 2018-Jan 2021



CASE STUDY:

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TIMESCALE: Feb 2018-Jan 2021

SCOPE:

Exploit the root traits of cover crops to improve soil health

RESULTS:

Indicate total root length and surface area improve aggregate stability and soil porosity, with fine roots providing most benefit

IMPACT:

Prevent soil erosion, mitigate run-off and improve soil structure and nutrient status

SOIL AND CROP HEALTH - RESOURCES

Webinar recordings on our YouTube Channel focused on Regen ag:

The future of spray applications

Innovative tools to overcome the challenges of Regen Ag webinar

Regenerative agriculture – from principles to practice

SOIL AND CROP HEALTH - RESOURCES

Insightful thought leadership articles developed by the Innovation team experts at CHAP or by our guest bloggers:

Getting to know your soil

Soil consists of biological, physical and chemical components that collectively provide a medium in which plants can grow, forming a 'living organism'. Beyond ...

What is the soil microbiome and how do you measure it?

What is the soil microbiome? The soil microbiome is the community of microorganisms present in the soil, incredibly complex with more ...

Why is the soil microbiome important for sustainable agriculture?

How does the soil microbiome affect crops? It's been known for decades that microorganisms in the soil can be beneficial or detrimental ...

Creating fairness in soil health incentives

There is a lot of discussion taking place at the moment regarding soil health and carbon policies and, as a result, the role of farmers in helping to look ...

Three ways 'Omic' technologies are lifting the lid on the soil microbiome

1.Genomic technologies Genomic technologies, in particular DNA sequencing, have revolutionised our understanding of ...

Getting to the heart of regen ag

I love working with farmers. Especially those looking to develop, change, improve and seek new solutions and innovation to the ever-changing challenges. ...

Renewed perspectives on regen ag

"For my Nuffield study tour, I was lucky to spend 10 days in Canada exploring the likes of Ontario and Alberta, before spending 14 days in the States, ...

The Regen Ag toolkit supporting sustainable farming practices

Farmers play a key role in addressing these challenges and face various pressures, such as reduced availability to chemicals for crop protection, improving ...

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Sustainability in agriculture businesses

"Over the past two years, numerous initiatives and frameworks have emerged to address the growing awareness of nature loss and the role of business as ...

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In review: the role of genetic editing in crops

Nowadays, we have numerous ways to control introduction of heritable mutations into a plant's genetic material. For instance, the development of computing ...

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Financing a low-emission, nature-positive agricultural sector

"In 2019 the GFI was established to sit at the nexus of the public and private sectors, convening sectoral coalitions to identify and unlock barriers ...

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Sustainable farming – creating an inclusive community for all

"We first welcomed the public onto the farm back in 2010, when we took part in a Higher Level Stewardship (HLS) scheme that included the educational ...

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A Conversation with...Dr Geraint Parry

What is the AAB? The AAB is a learned society and charity, that ...

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Building confidence through peer-to-peer learning

"The purpose of my role is to translate science into practice, but for this to be successful, translation needs to flow both ways. This is because as ...

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Renewed perspectives on regen ag

"For my Nuffield study tour, I was lucky to spend 10 days in Canada exploring the likes of Ontario and Alberta, before spending 14 days in the States, ...

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How can botanic gardens support the agriculture sector?

"In general, botanical gardens would not be regarded by the public as key players in the wider field of biodiversity conservation. Many would be surprised ...

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How can robotics and automation revolutionise the CEA sector?

"Robotics and automation have markedly become more prominent in our food production system, mainly in pre- and post-production. Progress in AI has led ...

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Five steps towards a great idea

1. **Identify the need** "It might seem obvious, but an innovation needs to solve someone's pain-point, whether that's a customer ...

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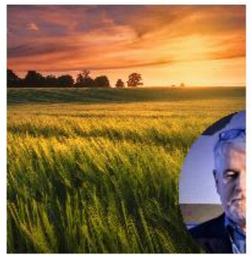

Improving nutrition and biostimulation through...

"In the 1980s and 90s, I led a team of agronomists at Yieldcare, which later became UAP and then Agrii. The team came to believe that through a more ...

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Improving cover crop viability for pest control

"In my previous blog, we looked at four different ways in which cover crops behave to control nematodes, whether that's by acting as a poor host, or ...

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Using cover crops for nematode control

"The wide-ranging benefits of cover crops are well documented, examples include their ability to improve soil health, increase organic matter and reduce ...

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Understanding how vertical farming can support sustainabl...

Here in a guest blog with CHAP, Dave Scott, Founder and Chief Technical Officer for Intelligent Growth ...

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Defining a clear vision: how regulation impacts innovation in...

Before we deep dive into the complex realm of regulation, we should start with why we need it at all. Regulation is a process of putting balances in place ...

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Insight to impact – CHAP's innovation cycle

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How do agri-tech ideas develop from first steps through to delivering impact? At CHAP, the innovation cycle underpins the process we follow when guiding and mentoring collaborators through agri-tech projects.

This includes discovery and scoping, proposal development, delivery and dissemination....

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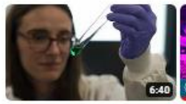

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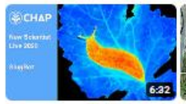

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WORKING WITH YOU TO SECURE THE FUTURE

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