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SESSION 7
ASSIST impacts and what's next

Photo: Claire Carvell

UK Centre for Ecology & Hydrology

ROTHAMSTED RESEARCH

BGS British Geological Survey

Chair: Richard Pywell

funded by

UKRI Natural Environment Research Council

UKRI Biotechnology and Biological Sciences Research Council

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ASSIST outputs and impacts

Photo: Claire Carvell

UK Centre for Ecology & Hydrology

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BGS British Geological Survey

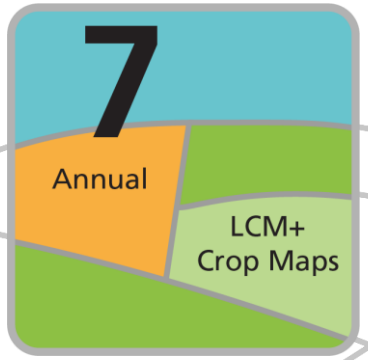
Claire Carvell, Emma Bennett,
Jonathan Storkey and Richard Pywell

funded by

UKRI Natural Environment Research Council

UKRI Biotechnology and Biological Sciences Research Council

Mapping & modelling of crops & yields



162
Pesticide active ingredients mapped against LCM+ CropMap

Almost **4 million**
point-based yield measurements

Measurements of **18** crop types in **1950** fields since **2006**

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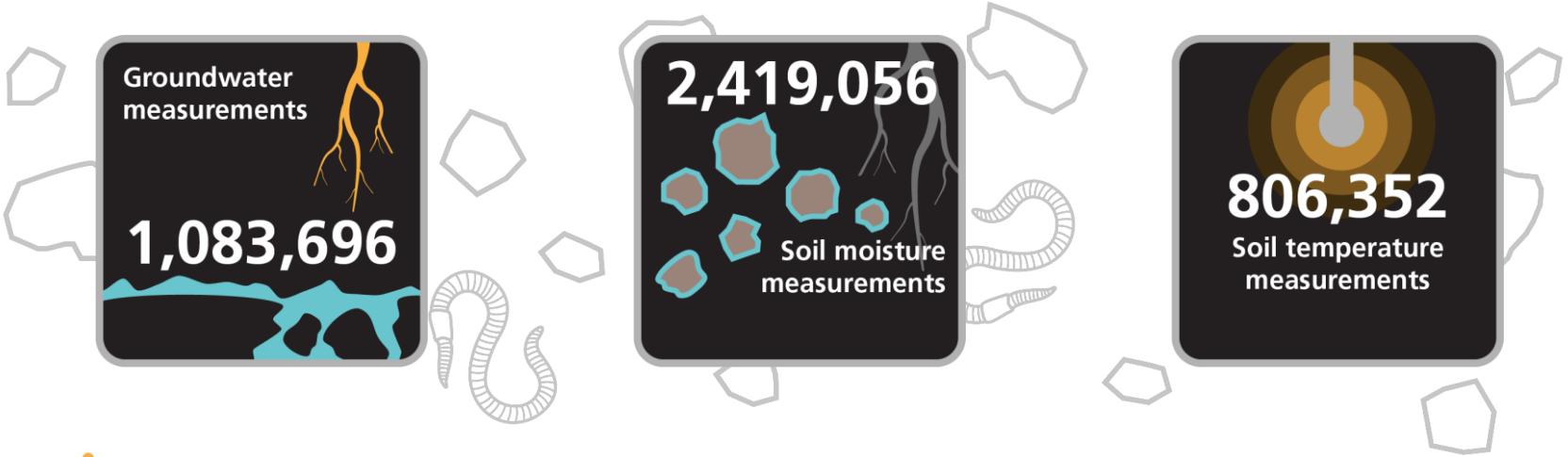
Soil measurements at 8 real-time BGS monitoring stations



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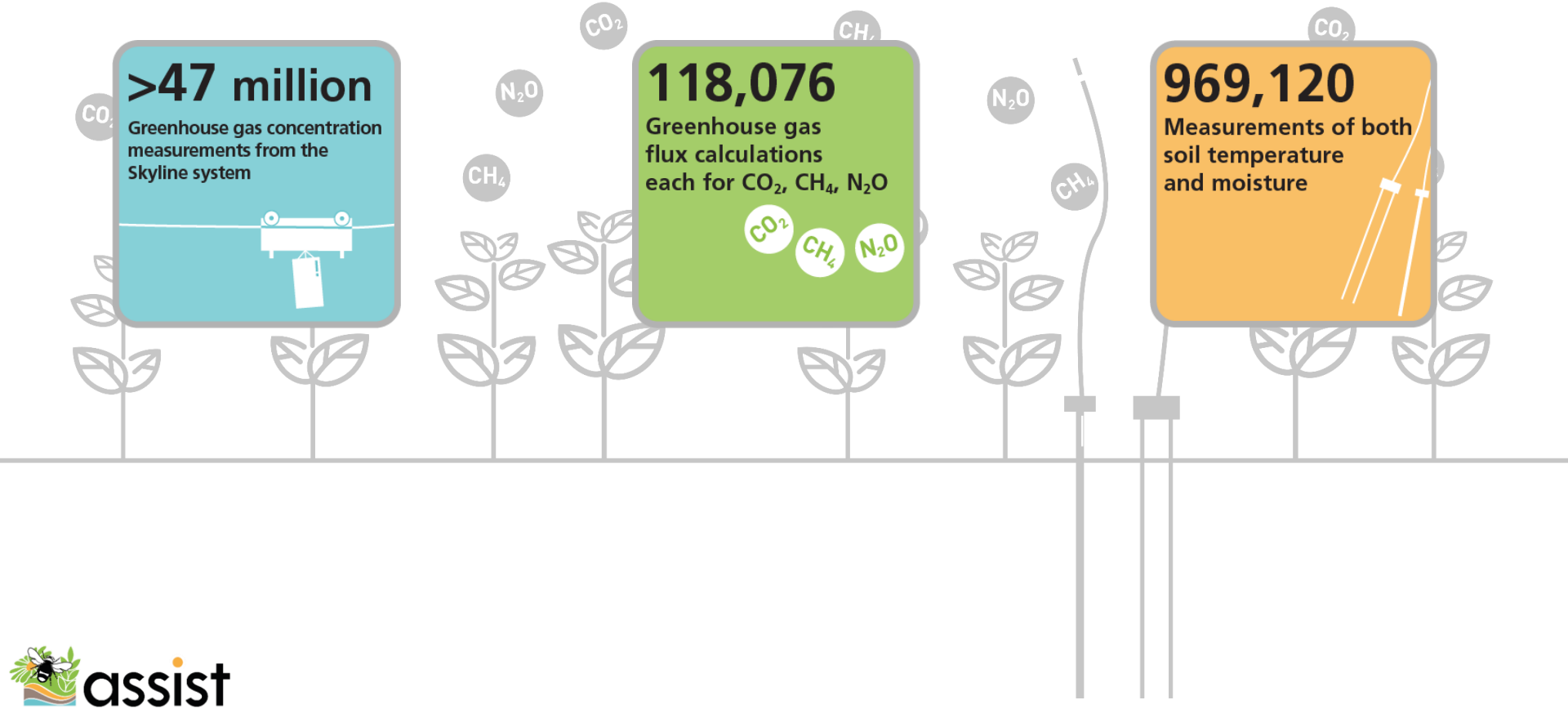
Continuous greenhouse gas monitoring over 3 years



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Field sampling across 18 farms over 4 years

51 km
of flower-rich field margins established

13,248
Pitfall trap samples

13,248
Invertebrate suction samples

6,336
Natural pest control assessments

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Field sampling across 18 farms over 4 years

6,210
Earthworm assessments

432 pollination assessments

3,312 transects walked

6,336
Yield assessments

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Grazing management experiments

2,015
Sheep on Rowden grazing plots

10,000+
Animal weighing events across the seasons

200,000+
Sward height measurements

600
Botanical assessments

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Research papers, datasets and tools

120
Peer-reviewed papers

109
with open access

2,025
Citations since 2016

3 Highly cited papers with IF>15 in top 1% of their field

28
Datasets in ASSIST Catalogue (8 published)

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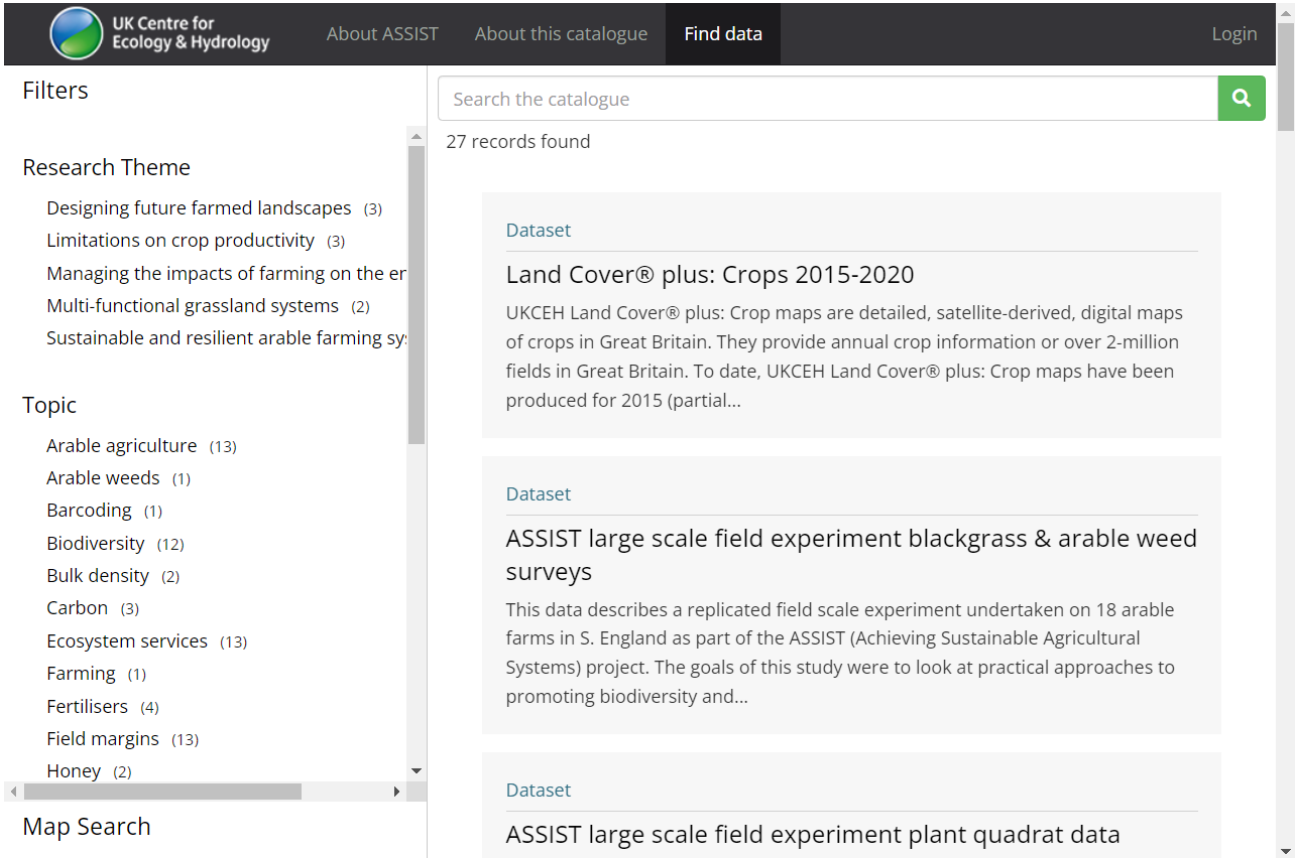
The ASSIST Data Catalogue



https://catalogue.ceh.ac.uk/assist/documents

Impact through engagement

303
Engagement activities on ResearchFish

>5,000
Farmers & beekeepers reached via field or online meetings

>240
Features in the farming or mainstream media

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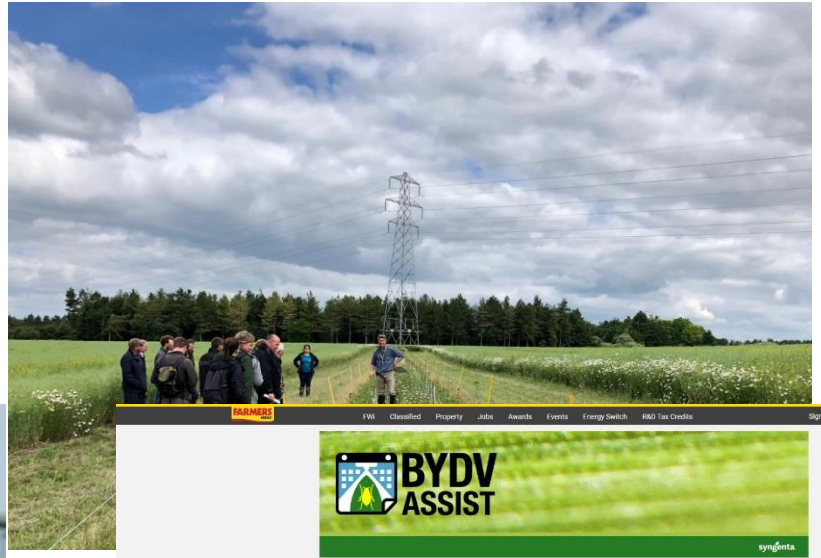
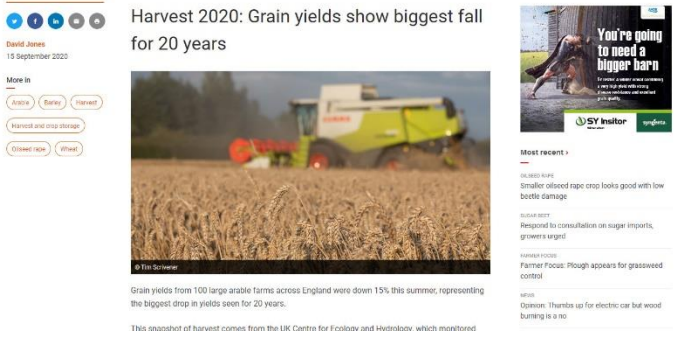
Outreach and media





Where can I find out more?

Useful links to ASSIST E-tools and outputs:

UKCEH Land Cover® plus: https://www.ceh.ac.uk/services/ceh-land-cover-plus-crops-2015

ASSIST Scenario Exploration Tool (ASSET): https://assist.ceh.ac.uk/asset-v2

ASSIST Environmental Planner (E-planner): https://assist-e-planner.ceh.ac.uk/About

ASSIST Environmental Surveyor (E-surveyor): https://assist.ceh.ac.uk/e-surveyor

Hydrological Outlook UK Current Conditions: https://hydoutuk.net/current-conditions

ASSIST Data Catalogue: https://catalogue.ceh.ac.uk/assist/documents

National Honey Monitoring Scheme: https://honey-monitoring.ac.uk

Latest News: https://assist.ceh.ac.uk/latest-news

#ASSISTagri
@UK_CEH
@Rothamsted
@BritGeoSurvey

Contact us at ASSIST@ceh.ac.uk

ASSIST programme evaluation survey March 2022

Please take a few minutes to complete our online survey and give us your feedback on the overall impact of the ASSIST research programme to date.

Scan the QR code, or visit
https://ceh-online-surveys.onlinesurveys.ac.uk/assist-survey

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Towards Clean, Green & Net Zero+ Agriculture

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UKRI Natural Environment Research Council

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PML Plymouth Marine Laboratory

Supporting the transition to productive, net-zero and less polluting agriculture whilst enhancing biodiversity, soil and water health (‘**net zero+**’)

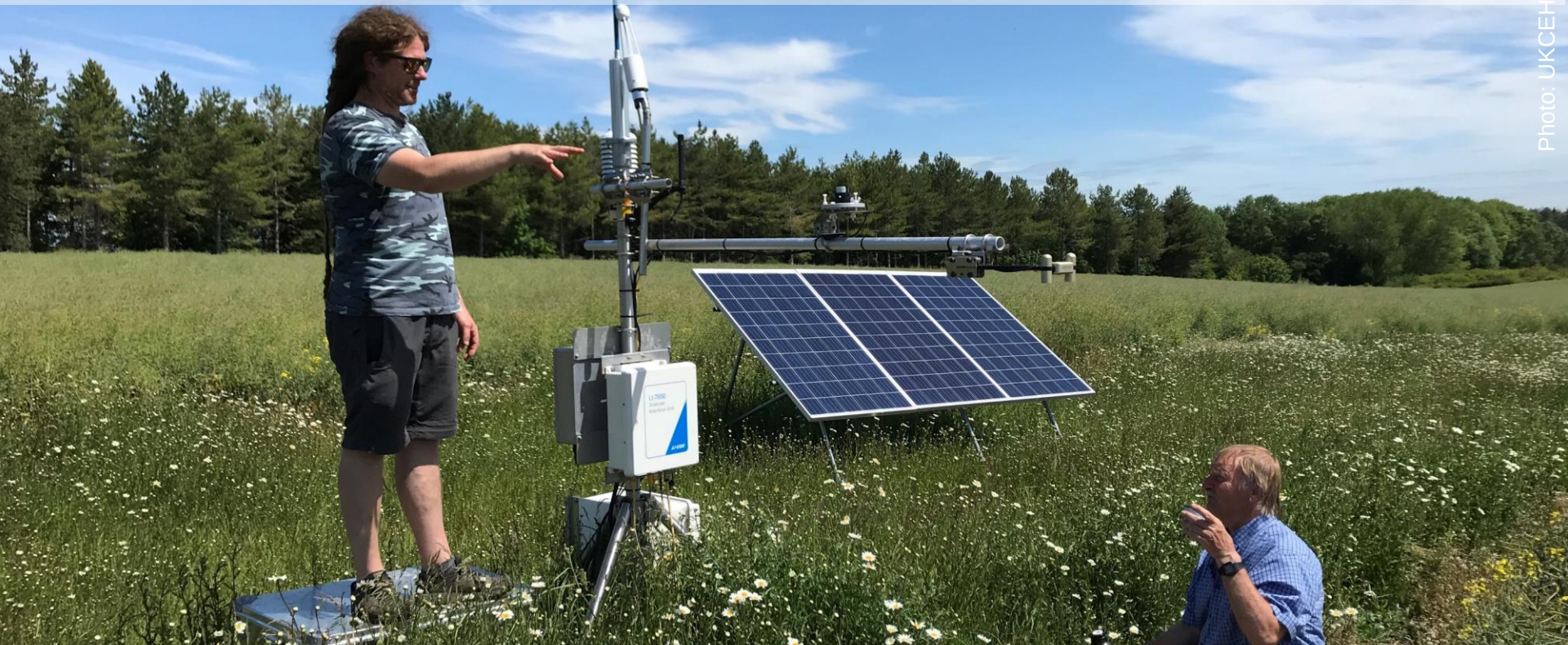
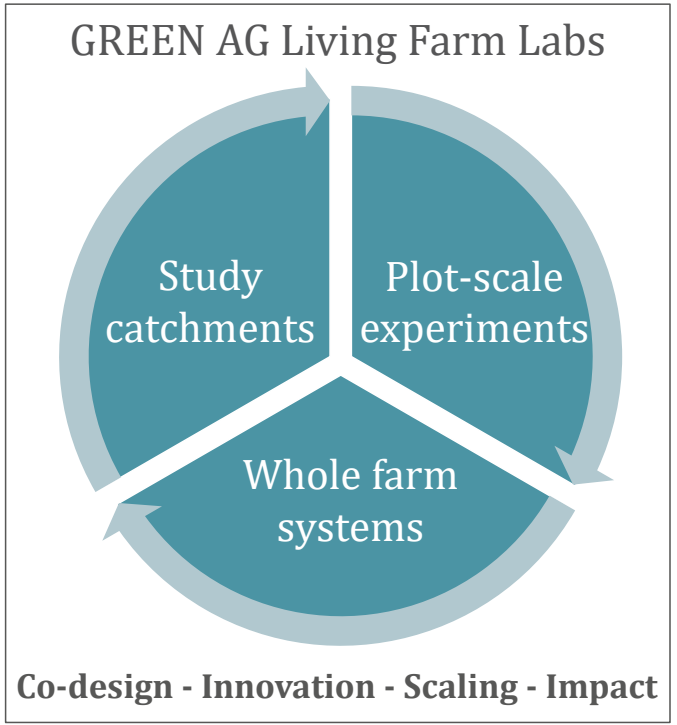


Photo: UKCEH

Integrated science – practical solutions

- **5 year, multi-centre programme** uniting NERC and BBSRC institutes
- **Builds a community** of scientist, policy, industry and farmer stakeholders
- **Integrates our expertise** - *crop & livestock science, socio-economics, earth obs, ground sensors, emissions (soils ⇨groundwater ⇨estuaries), pollution fate, biodiversity, data science & modelling*
- **Multi-scale approach** – embracing the concept of living farm labs to test innovations



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Whole farm system approach

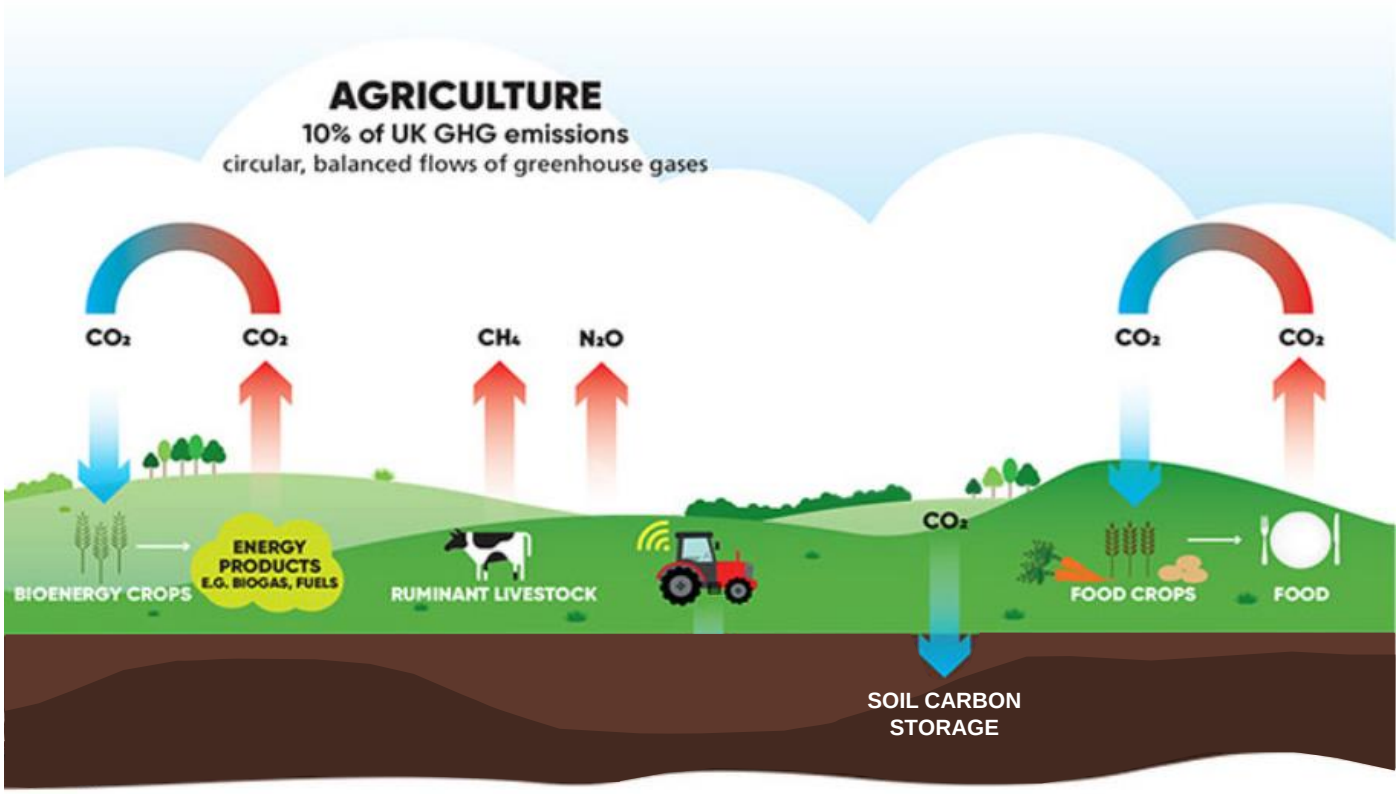

Diagram adapted from Campaign for Farmed Environment

Whole farm system approach

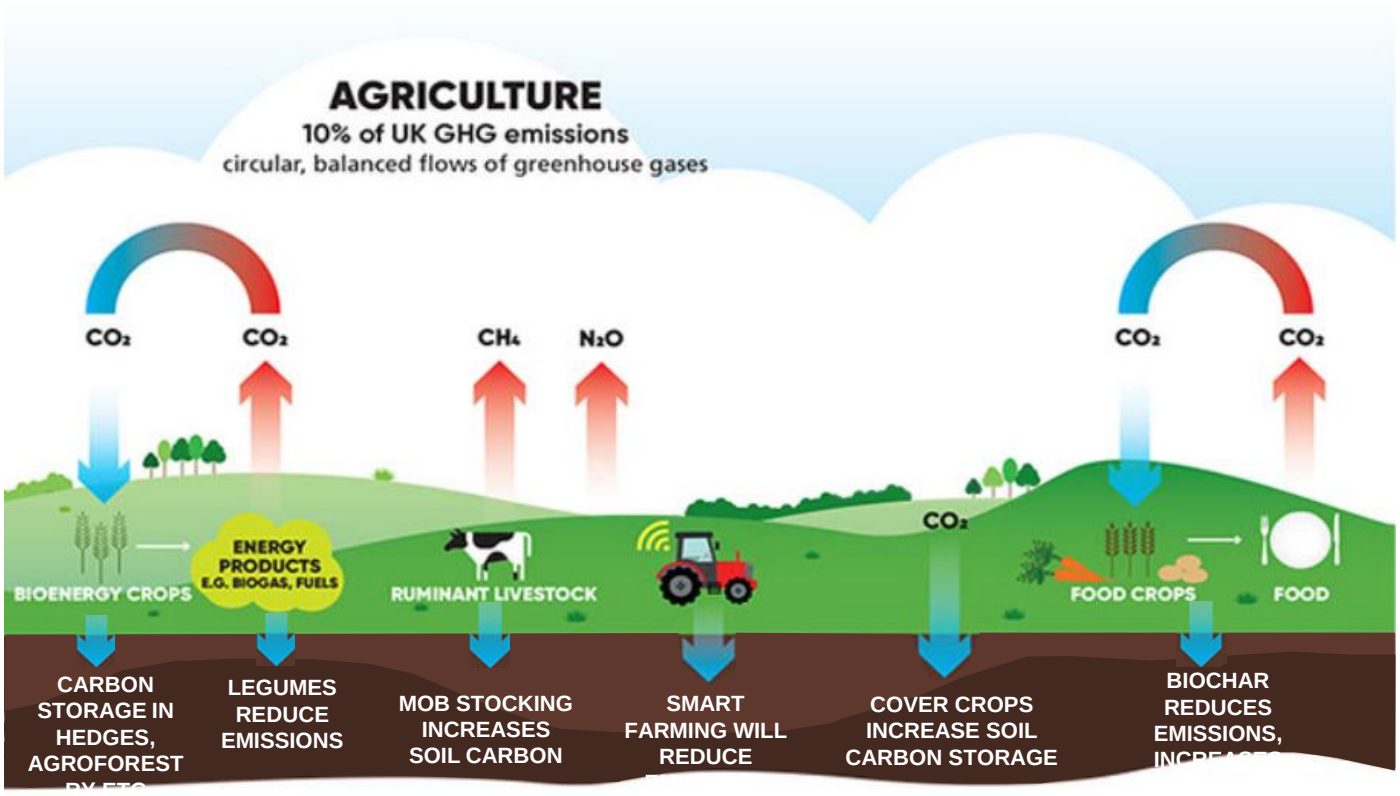

Diagram adapted from Campaign for Farmed Environment

Whole farm system approach

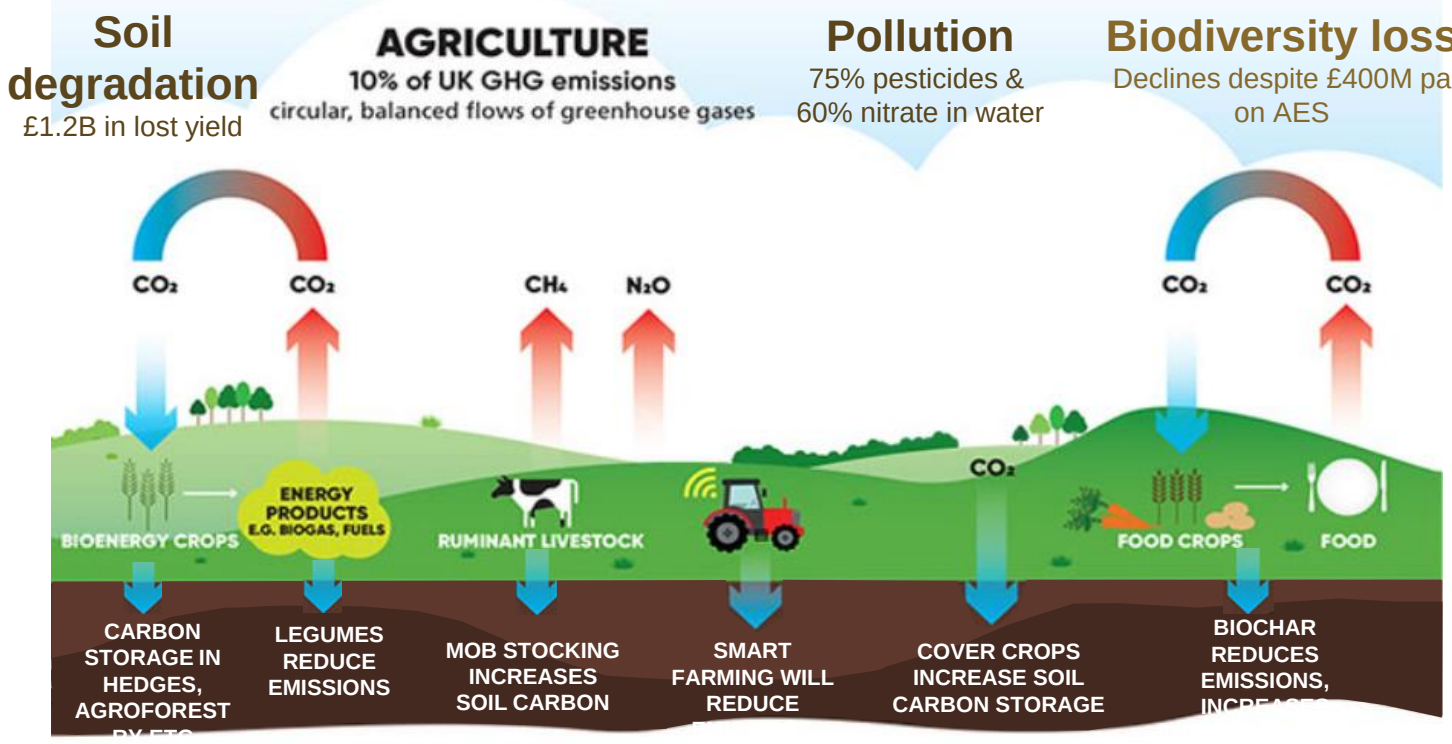

Diagram adapted from Campaign for Farmed Environment

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Testing solutions at scale

1

Contextual national data on biodiversity, natural capital, emissions, etc.

4

Farm-scale accounts for:

- Food production
- Emissions
- Pollution
- Biodiversity
- Natural capital

Enables **co-design** of new farming systems

5

2

Farm-scale accounting of innovations

VHR Satellite sensors

Professional survey

Farmer-led survey tools (citizen science apps)

Ground sensors e.g. Skyline

Farm machinery sensors

3

Data integration & analysis:

- APIs
- Pipelines
- Machine Learning
- Digital Twins

6

Goal: The balance between efficient, resilient food production with minimal emissions, pollution and environmental damage

Underpinned by plot and field-scale experiment

- Enable causal mechanisms to be identified and hypotheses tested under controlled conditions
  - ***Long-term, plot-scale experiments***
  - ***Very high resolution/ high frequency GHG measurements***
- Responses tested in variety of farming systems


Skyline: previous NERC capital investment


Rowden Long-term Experiment

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Thank you

Photo: Lucy Hulmes

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