



Photo: Claire Carvell



Chair: Richard Pywell

funded by





ASSIST outputs and impacts

Photo: Claire Carvell

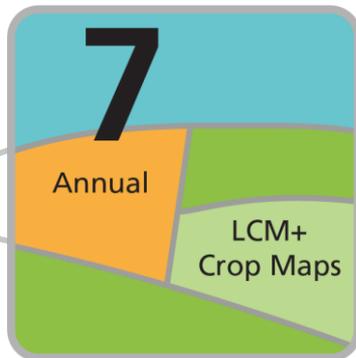


*Claire Carvell, Emma Bennett,
Jonathan Storkey and Richard Pywell*

funded by



Mapping & modelling of crops & yields



162

Pesticide active ingredients mapped against LCM+ CropMap



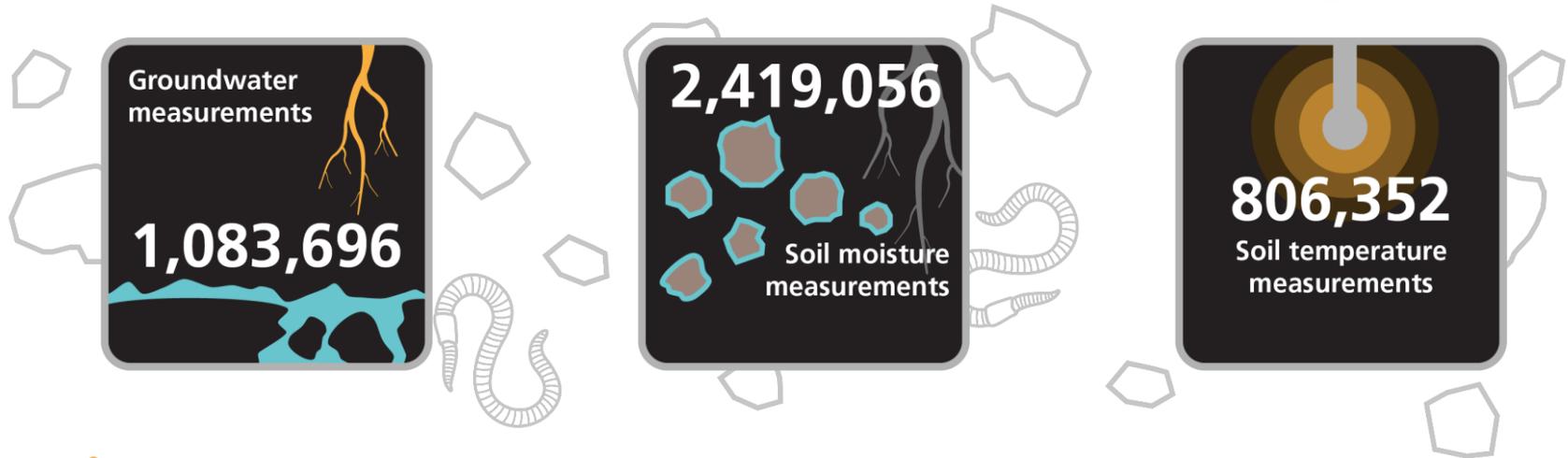
Almost **4**
million
point-based yield
measurements



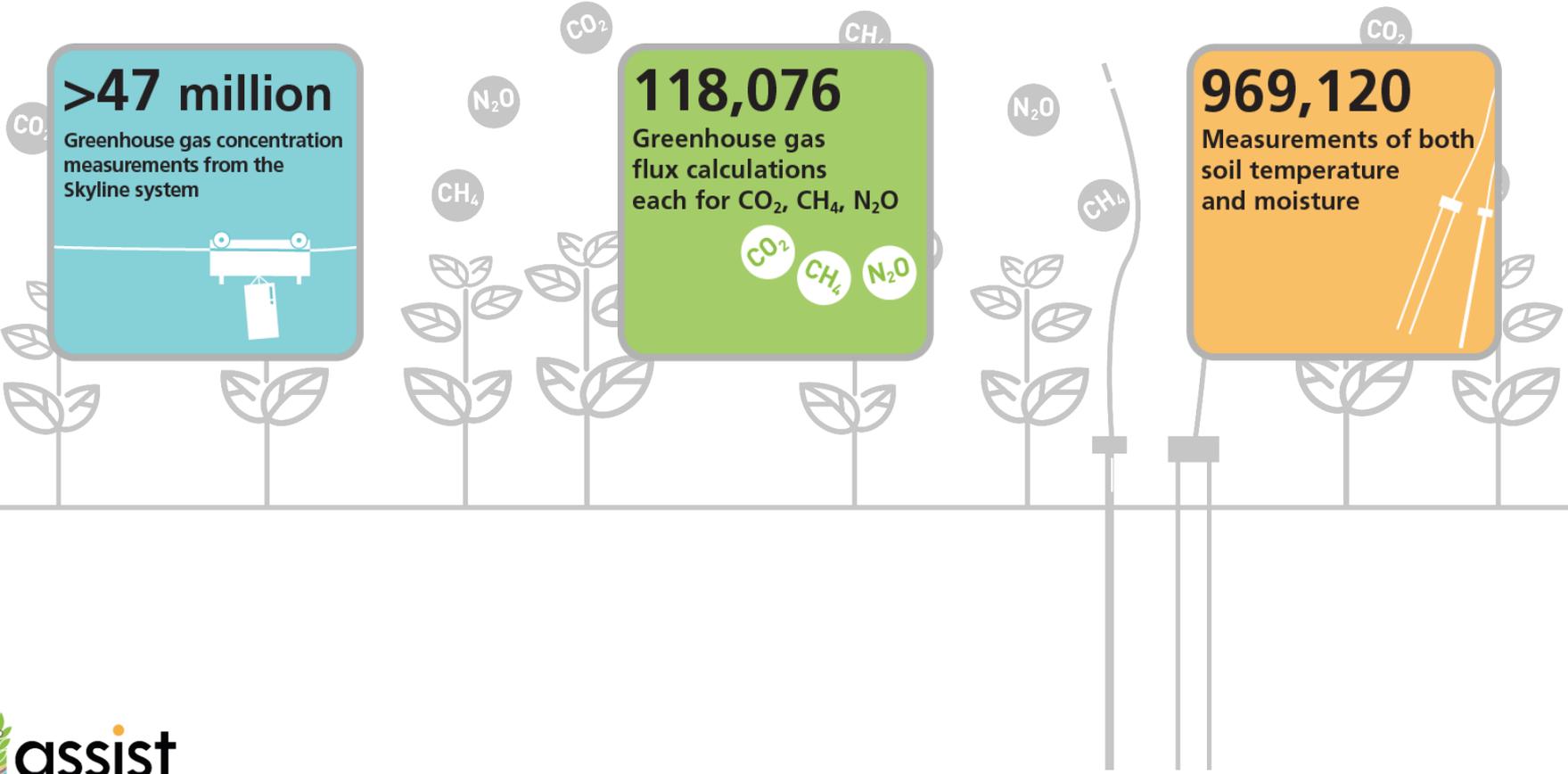
Measurements of **18** crop types
in **1950** fields since **2006**



Soil measurements at **8** real-time BGS monitoring stations



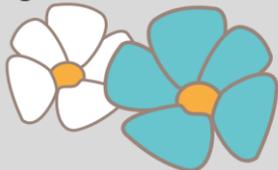
Continuous greenhouse gas monitoring over 3 years



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



Field sampling across **18** farms over **4** years



6,210
Earthworm
assessments



432 pollination
assessments

3,312
transects
walked



6,336
Yield assessments



Grazing management experiments

2,015

Sheep on Rowden
grazing plots



10,000+

Animal weighing
events across the
seasons



200,000+

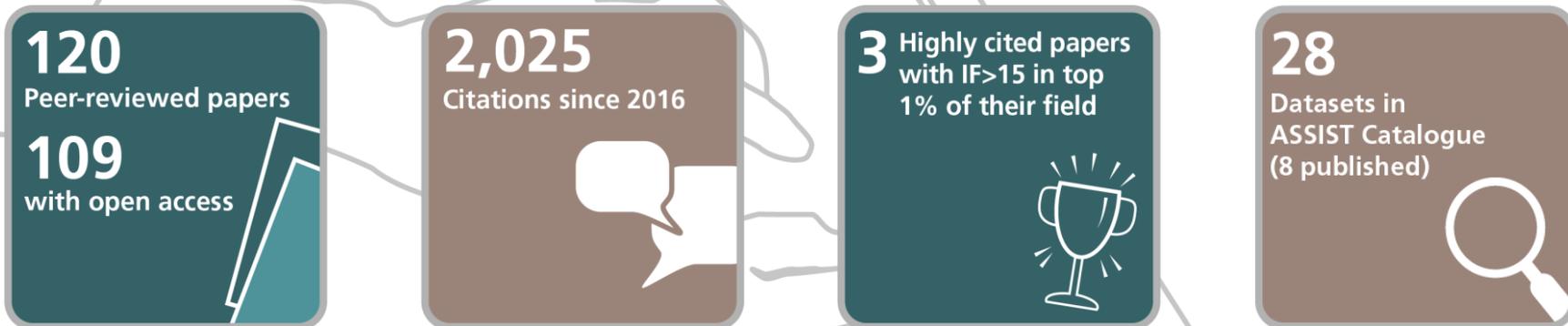
Sward height
measurements

600

Botanical assessments



Research papers, datasets and tools



The ASSIST Data Catalogue

 UK Centre for Ecology & Hydrology About ASSIST About this catalogue **Find data** Login

Filters

Research Theme

- Designing future farmed landscapes (3)
- Limitations on crop productivity (3)
- Managing the impacts of farming on the environment (3)
- Multi-functional grassland systems (2)
- Sustainable and resilient arable farming systems (2)

Topic

- Arable agriculture (13)
- Arable weeds (1)
- Barcoding (1)
- Biodiversity (12)
- Bulk density (2)
- Carbon (3)
- Ecosystem services (13)
- Farming (1)
- Fertilisers (4)
- Field margins (13)
- Honey (2)

Map Search

Search the catalogue 

27 records found

Dataset

Land Cover® plus: Crops 2015-2020

UKCEH Land Cover® plus: Crop maps are detailed, satellite-derived, digital maps of crops in Great Britain. They provide annual crop information on over 2-million fields in Great Britain. To date, UKCEH Land Cover® plus: Crop maps have been produced for 2015 (partial...

Dataset

ASSIST large scale field experiment blackgrass & arable weed surveys

This data describes a replicated field scale experiment undertaken on 18 arable farms in S. England as part of the ASSIST (Achieving Sustainable Agricultural Systems) project. The goals of this study were to look at practical approaches to promoting biodiversity and...

Dataset

ASSIST large scale field experiment plant quadrat data

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



Outreach and media



David Jones
15 September 2020

- Articles
- Barley
- Wheat
- Harvest and crop storage
- Cereal rick
- Other

Harvest 2020: Grain yields show biggest fall for 20 years



Grain yields from 100 large arable farms across England were down 15% this summer, representing the biggest drop in yields seen for 20 years.

This snapshot of harvest comes from the UK Centre for Ecology and Hydrology, which monitored



Most recent

- VALUED RAPE**
Smaller oilseed rape crop looks good with low beetle damage
- PLUKA BEET**
Respond to consultation on sugar imports, growers argue
- HARVEST FOCUS**
Farmer Focus: Plough appears for grassweed control
- WOLF**
Opinion: Thanks up for electric car but wood burning is a no

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>

Contact us at ASSIST@ceh.ac.uk

#ASSISTagri
@UK_CEH
@Rothamsted
@BritGeoSurvey



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>



Acknowledgements

Andy Sier (infographic design); Kate Randall (Event programme); Jodey Peyton (online survey); Alice Hope, Clare Usher, Simon Williams, Paulette Burns (UKCEH Comms team); Rothamsted and BGS Communications teams

Thanks to Emma Bennett for support with the Data catalogue and reporting, and for organising today's event behind the scenes!



Towards Clean, Green & Net Zero+ Agriculture

Photo: Lucy Hulmes



Biotechnology and
Biological Sciences
Research Council



Natural
Environment
Research Council



UK Centre for
Ecology & Hydrology



ROTHAMSTED
RESEARCH



British
Geological
Survey



National Centre for
Earth Observation
NATURAL ENVIRONMENT RESEARCH COUNCIL

PML

Plymouth Marine
Laboratory



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

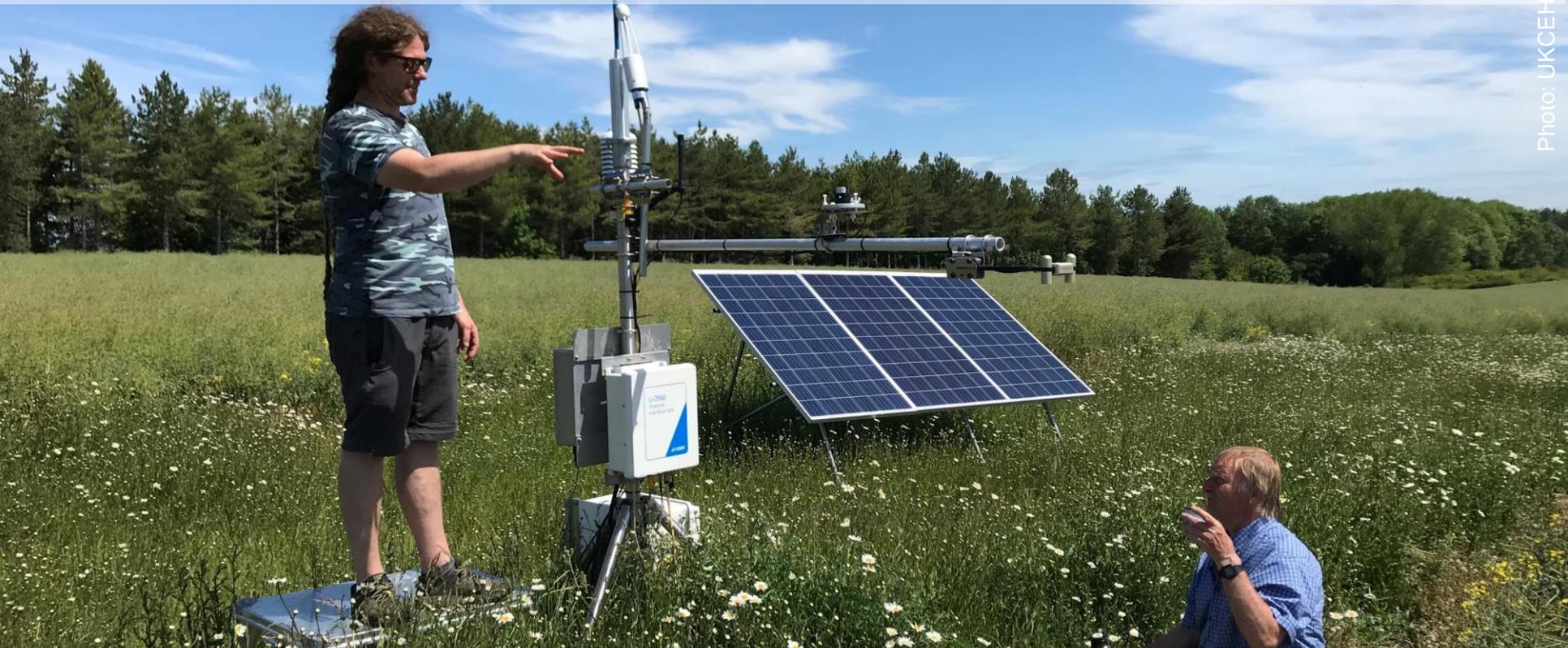
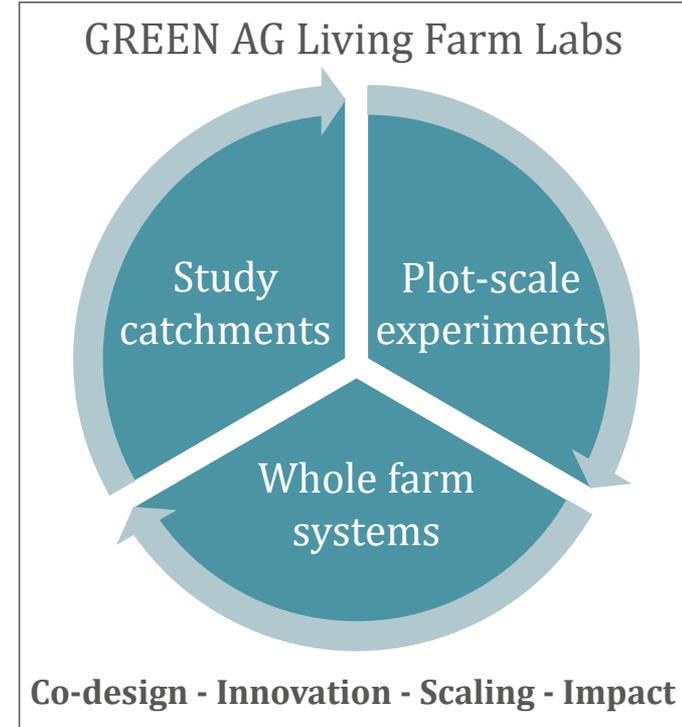


Photo: UKCEH

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



Whole farm system approach

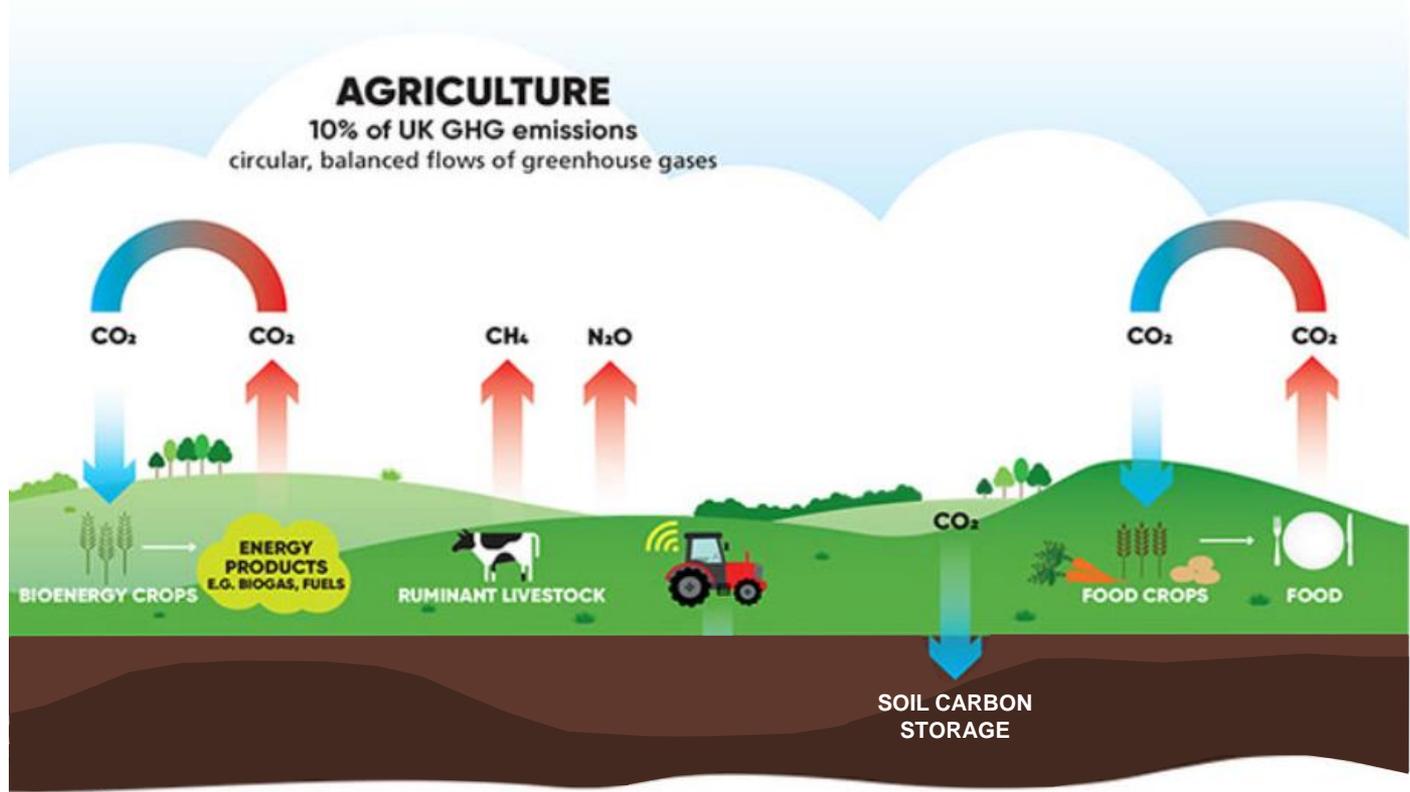


Diagram adapted from Campaign for Farmed Environment

Whole farm system approach

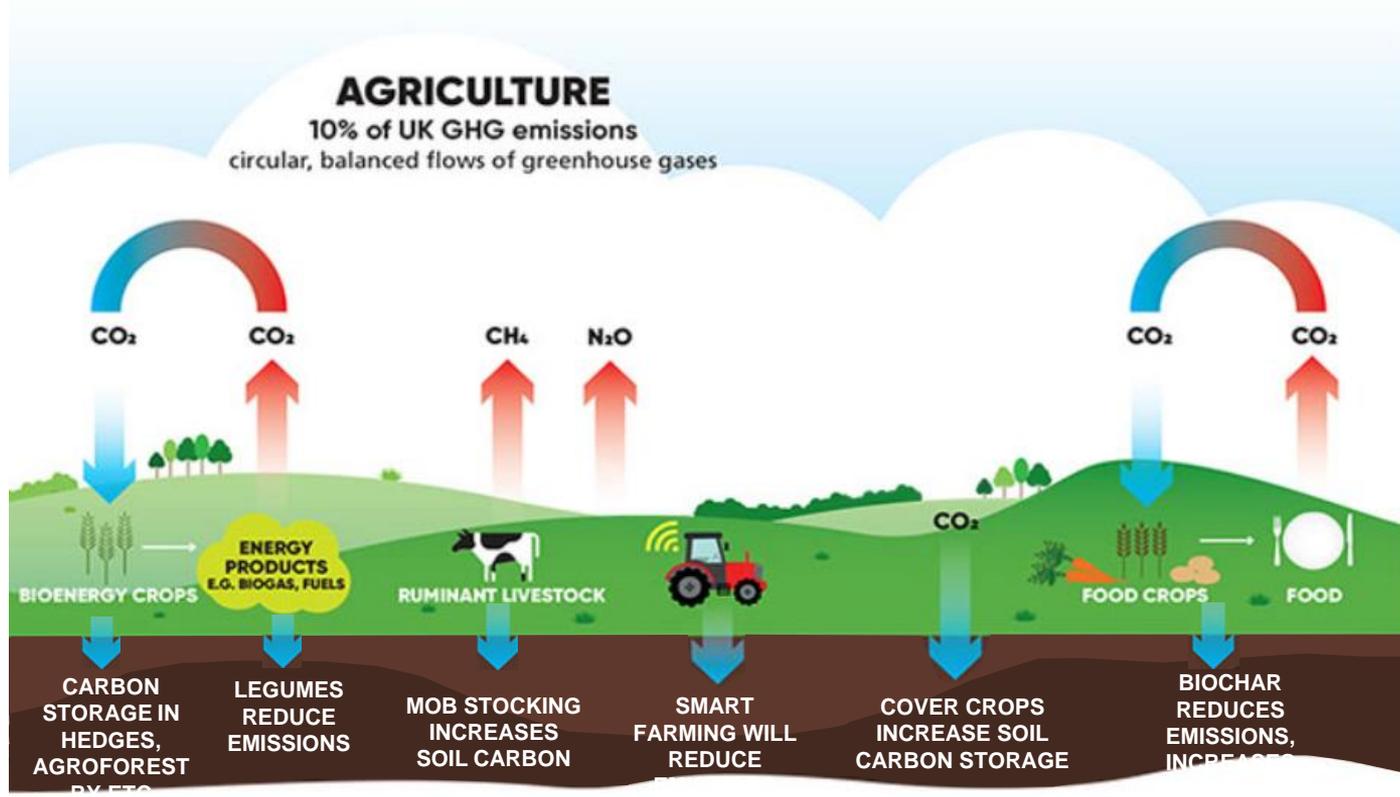


Diagram adapted from Campaign for Farmed Environment

Whole farm system approach

Soil degradation
£1.2B in lost yield

AGRICULTURE
10% of UK GHG emissions
circular, balanced flows of greenhouse gases

Pollution
75% pesticides &
60% nitrate in water

Biodiversity loss
Declines despite £400M pa
on AES

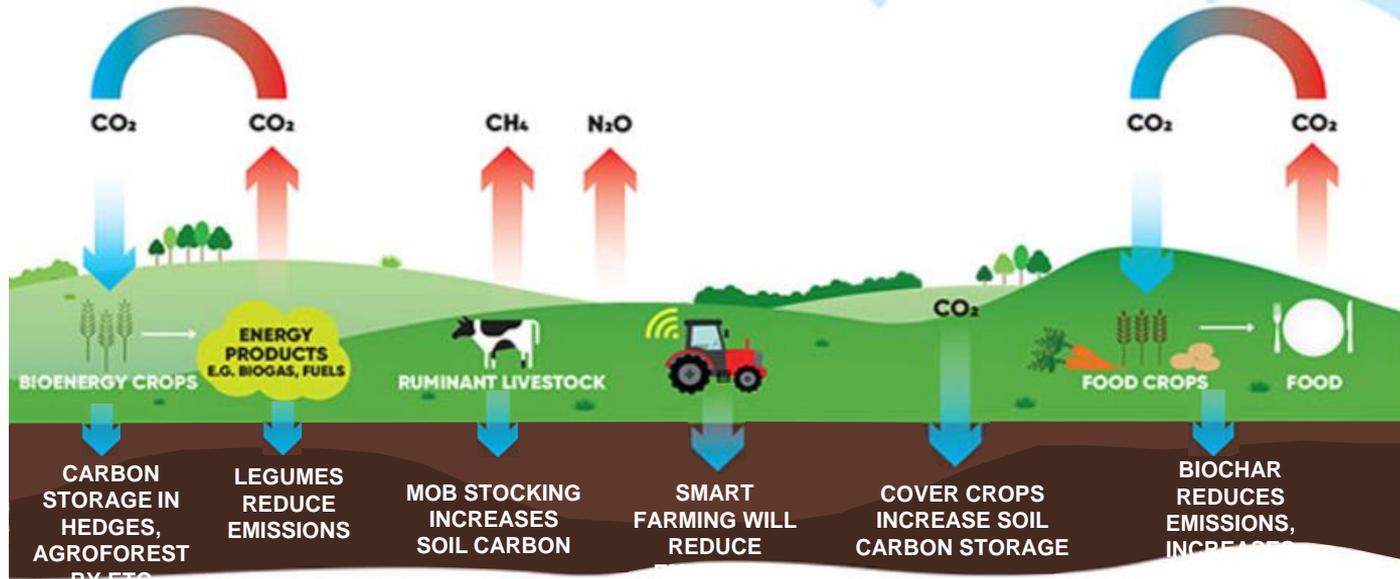


Diagram adapted from Campaign for Farmed Environment

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

5 
Enables **co-design** of new farming systems

2 **Farm-scale accounting of innovations**

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



UK Centre for
Ecology & Hydrology



ROTHAMSTED
RESEARCH



British
Geological
Survey



National Centre for
Earth Observation
NATURAL ENVIRONMENT RESEARCH COUNCIL

PML

Thank you

Photo: Lucy Hulmes



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