



# Farm Carbon Toolkit

July 2023





# Our Vision

A farming sector which is minimising GHG emissions and improving sequestration and natural capital through implementing practices that enhance soil health, safeguard resource use, support nature, improve energy resilience and produce nutrient dense food. Farmers feel empowered to share knowledge (with and outside the industry) on the positive changes that have been achieved and are involved in setting the agenda for research, technology and innovation which will allow them to evolve and thrive.





# Our Mission

FCT is a trusted advisor to the farming industry and beyond for carbon farming and nature friendly farming. Our Farm Carbon Calculator is recognised as a leading industry calculator trusted and used by actors across the UK Supply Chain and beyond. We provide the industry with clear and practical advice on emissions reductions and carbon removal strategies whilst empowering a thriving food and farming industry.





# Examples of our Resources – Factsheets and guides



- » [Monitoring Soil Carbon: a Practical Field, Farm and Lab Guide \(pdf\)](#)
  - » [Reducing Nitrogen Usage in Crop Production \(pdf\)](#)
  - » [Livestock Factsheet: overview of emissions and opportunities \(pdf\)](#)
  - » [Arable Farming Factsheet: overview of emissions and opportunities \(pdf\)](#)
  - » [Cover Cropping Factsheet \(pdf\)](#)
  - » [Farm Carbon Footprinting Factsheet \(pdf\)](#)
  - » [Soil Testing Explained \(pdf\)](#)
  - » [Best Practice for Fertiliser Use Efficiency \(pdf\)](#)
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# Examples of our Resources – Factsheets and guides



- » [Carbon footprint of the Real Food Garden \(pdf\)](#)
  - » [Grazing management \(pdf\)](#)
  - » [Hedgerows for carbon capture \(pdf\)](#)
  - » [Why Compost \(pdf\)](#)
  - » [Stop Digging! \(pdf\)](#)
  - » [Species Rich Lawn \(pdf\)](#)
  - » [Ponds and Rain Gardens \(pdf\)](#)
  - » [The Carbon Footprint of Trenance Farm \(pdf\)](#)
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# Examples of our Resources – Project research and methods

- » [Soil Sampling Methodology \(pdf\)](#)
  - » [Field Lab: optimised compost management for productivity and soil health](#)
  - » [Trial: Over winter grazing at Ennis Barton, Blable and Tregooden Farms \(pdf\)](#)
  - » [Trial: Rumination trial at Ennis Barton \(pdf\)](#)
  - » [Trial: Soil Recovery at Erth Barton](#)
  - » [Trial: Population wheat at Erth Barton \(online / PDF download\)](#)
  - » [Nutrient Comparison of Compost, Dirty Compost Bedding from Blable Farm and Farmyard Manure per Tonne \(pdf\)](#)
  - » [Trial: Grazed winter cover crops \(pdf\)](#)
  - » [Trial: Maize establishment at Tregooden Farm \(pdf\)](#)
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# Examples of our Resources – Videos and other



- » Erth Barton Farm – Introduction video
  - » Ennis Barton Farm – Introduction video
  - » Blable Farm – Introduction video
  - » Project overview flyer (pdf)
  - » Be a Soil Superhero! (pdf)
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## Toolkit Contents



### Wider Context »

Understanding how climate change, energy security and food security interact with farming, growing and food is important if you want to change your farming and growing system.



### Farm GHGs »

This section of the Toolkit is designed to make clear where greenhouse gases (GHG) are emitted or sequestered on a farm and to identify the changes that can be made to a farm operation to reduce emissions.

#### Subsections

[Soil »](#)

[Crops »](#)

[Livestock »](#)

[Buildings »](#)

[Energy »](#)



### Taking Action »

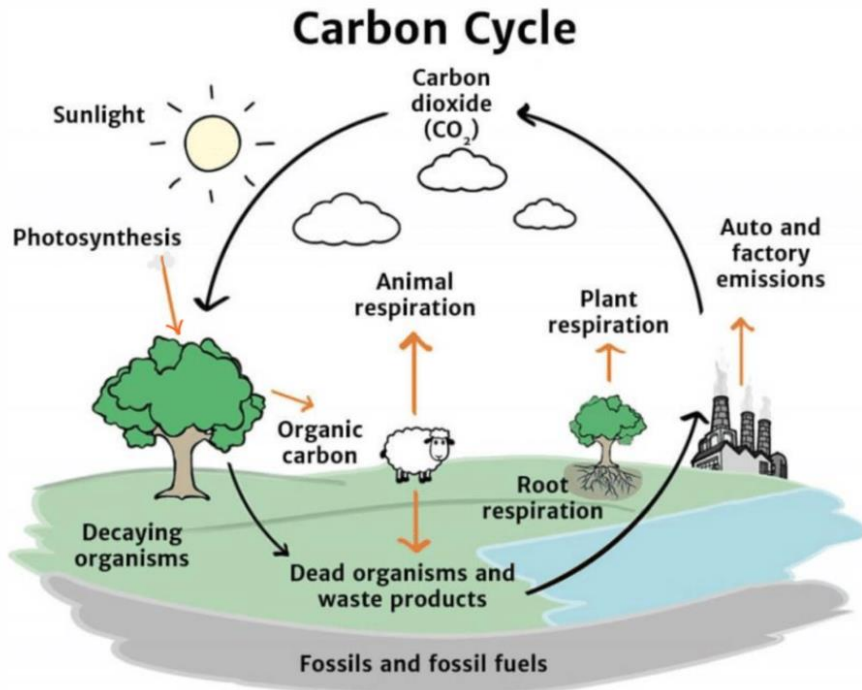
How can you start to make a difference? The pages in this section are designed to enable you to DO something – which in the end is what all of this is about.

#### Subsections

[Getting Started »](#)

[Resource Resilience »](#)

## The Carbon Cycle



Over 99.9% of all of the earth's carbon is stored and fixed in the earth's crust – the lithosphere. This is around 60 – 100 million billion, or gigatonnes (Gt) with just under 0.01% of that stored as fossil fuels (5 – 10,000 Gt). All this carbon is fixed and does not participate in the earth's carbon cycle, until we bring fossil fuels into use and burn them when the carbon is then released as  $\text{CO}_2$ .



## Soil

### Contents

#### [Emissions from Soil »](#)

#### [The Carbon Cycle](#)

#### [Soil Carbon Emissions](#)

#### [Nitrogen Emissions](#)

#### [Methane Emissions](#)

#### [Carbon Sequestration »](#)

#### [Soils for Sequestration](#)

#### [Sequestration for Biomass](#)

## Fertiliser Operations

Focussing on where emissions are found in arable production systems and what we can do about them.

The most significant Greenhouse gas (GHG) emissions from arable cropping in the UK are associated with the use of artificial nitrogen fertilisers. The other significant operation is cultivations (frequency, intensity, and depth) and the effect that has on Soil Organic Matter and subsequent GHG emissions.

### Summary of emissions:

For arable cropping in general in the UK, the breakdown of GHG emissions is:

- » 60 – 70% of all GHGs are related to artificial nitrogen (fertilizer) production and application
- » 20% are related to fuel use and field operations
- » 10 – 15% from P and K fertilizers, organic manures and liming
- » 10% from sown seeds (emissions associated with its growing, processing etc)
- » 1% from crop protection chemicals

— Clearly understanding how nitrogen fertilizers contribute such a proportion of the total GHG emissions and the opportunities for reducing these is where to focus first.



## Crops

### Contents

[Taking Action »](#)

[Fertiliser Operations »](#)

[Fertiliser Production »](#)

[Arable Production Systems »](#)

Module for Duchy College agriculture degree on carbon farming

Module for the University of Cumbria – upland farming for net zero

Module for agriculture degree for Reaseheath on carbon farming

BASIS course – Principles of carbon and Net Zero

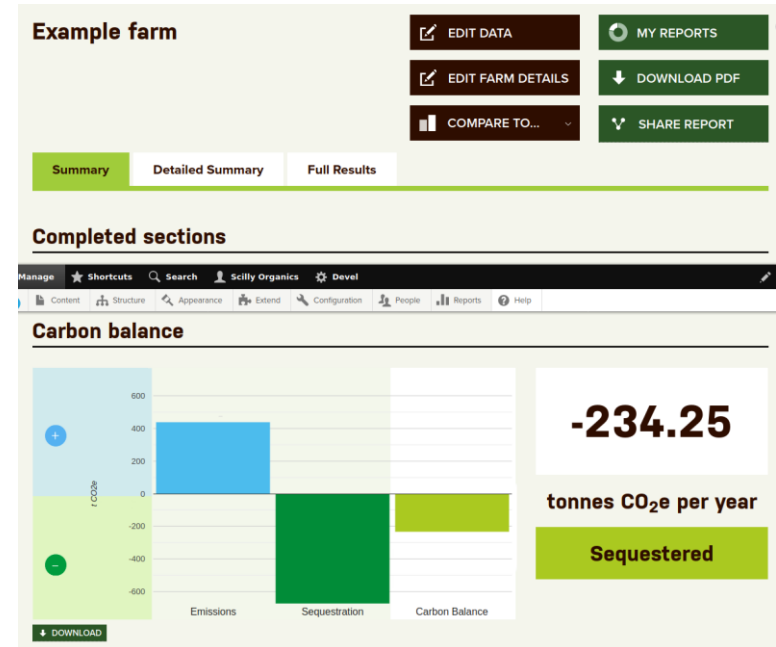
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- ✓ Identifying the C footprint of a business is the first vital step in being able to quantify the contribution that the farm is making to climate change
- ✓ A carbon footprint identifies the quantity and sources of CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emitted from the farm and highlights areas where improvements or changes can be made to reduce GHGs.
- ✓ Highlights current sequestration and offsetting options and evaluates future farm options
- ✓ Increases awareness and informs decision making
- ✓ Metrics need to be relevant, practical, consistent and inform behavioural change



# Our Farm Carbon Calculator

- ✓ Developed for farmers by farmers
- ✓ Free for farmers to use
- ✓ Accounts for soil carbon sequestration
- ✓ Linked into soil carbon research project to populate models
- ✓ Allows monitoring of the farm's footprint annually
- ✓ Provides footprint as CO<sub>2</sub>e showing the volume of the different GHGs



# Our future work – driving the agenda

Transition for farmers, growers and supply chains from naive to knowledgeable on climate and nature friendly farming

Setting ourselves targets for change e.g.

- o Change in the emissions from UK agriculture over time
- o Farming practice change measurement
- o Validation for our services
- o Increase in farmers/ growers who use our calculator performing at net zero or better
- o Input providers doing more to reduce the impact of their products on our climate



# Thank you



Contact: [info@farmcarbontoolkit.org.uk](mailto:info@farmcarbontoolkit.org.uk)

[www.farmcarbontoolkit.org.uk](http://www.farmcarbontoolkit.org.uk)