



GROWER WELCOME PACK

2023/2024

YEN Zero is administered by  **ADAS**

Table of Contents

03

Message from the
YEN Zero team

05

Why YEN Zero?

06

What is YEN Zero?

07

What can you expect
from being part of the
network

09

Example interim
report

15

Example
benchmarking report

17

Data collection and entry
for carbon footprinting

23

Afterword

MESSAGE FROM THE YEN ZERO TEAM

Welcome to the third year of YEN Zero, following our last two successful years in 2021/22 and 2022/23. We're excited to have you join our industry network to calculate your crop C footprints and benchmark them against other growers, identify where the emissions hotspots are in your farming systems, and learn about which mitigation strategies have the best potential to reduce your C footprint.

This welcome pack has been put together to introduce you to YEN Zero, show you how the network works and to help you navigate through the range of activities available to participants. In this welcome pack we will:

- Introduce you to YEN Zero and the wider network (page 4)
- Provide insight of the two reports you will receive on the back of providing your data (page 9)
- Describe the discussion workshops that will take place during the year (page 8)
- Guide you through how to enter your data using the online portal (page 17)

YEN Zero is led by ADAS with crucial support and steer from our network sponsors. YEN Zero builds upon the success and experience gained from the original Yield Enhancement Network (YEN), which originated back in 2012. Achieving net zero agriculture is an industry wide challenge which needs a collaborative effort to make gains. We are therefore very thankful to have the support from this year's YEN Zero **sponsors**, whose activities are wide ranging across the industry.

The support from these organisations is a great asset to the network, helping to provide insight, knowledge, and ideas to YEN Zero.



AngloAmerican



GLENMORANGIE
SINGLE MALT SCOTCH WHISKY



UK FLOUR
MILLERS

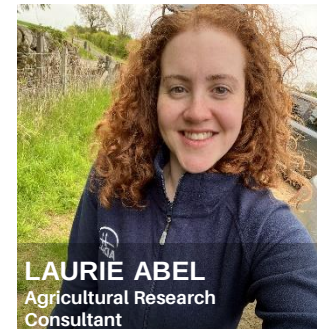
Information for participants and key dates

YEN Zero participants will be asked to provide crop management information, through the online data entry portal, between August 2023 and late December 2023. For 2023-24, participants can enter data for: 1) 6 different fields of crop data, or 2) 6 consecutive years of crop data in one field, so the carbon footprint of your rotation can be calculated. An interim report will be provided within ~4 weeks of data submission.

Once data entry is closed, a Benchmark report will be delivered in early April 2024, comparing GHG emissions from the range of sources across entrants within the network. In addition to the C footprint analysis and benchmarking, participants can attend discussion workshops to share and gain new knowledge on matters relevant to reaching net zero emissions in agriculture. The first discussion workshop will be held in November 2023, with the second taking place early in 2024, and the third being combined with the YEN Zero results meeting in April 2024.

The YEN Zero team

The YEN Zero team from ADAS consists of experts in agriculture and climate change. This team supports the day to day running of the network and ensures ideas, suggestions, and opinions on what YEN Zero delivers, is contributed by sponsors, growers, and their supporters. We see this network as a product of a collaborative effort from key players across the agriculture industry. If you have any questions about YEN Zero, we would love to discuss these with you. Please drop us an email at yenzero@adas.co.uk and we will be in touch.



WHY YEN ZERO?

The problem: climate change and agriculture

A third of our global greenhouse (GHG) emissions come from the food system with 70% of the food system greenhouse gas emissions being associated with the agriculture sector, predominantly land use change and the growing and harvesting of food. In the UK, agriculture accounts for approximately 10% of the total UK GHG emissions. The impact of the accumulation of these GHG emissions in the atmosphere is already evident. Challenging weather has become more frequent and is predicted to become more extreme. Agriculture needs to both adapt to the challenges of climate change and contribute to a global reduction in GHG emissions.

The solution: agricultural adaptation

Adapting agriculture to climate change needs to be undertaken in conjunction with changes that provide sufficient good quality food to feed the growing global population. The changing climate requires the building of resilience into our agricultural systems through means such as protecting our soils, breeding crop varieties better suited to changing climates, preserving ecosystem services by reducing agriculture's environmental impact and promoting biodiversity. Alongside these measures, agriculture needs to reduce GHG emissions as much as possible and maximise the carbon sequestration potential within agricultural systems, with the aim of achieving Net Zero. Targeting improved productivity is one of the solutions, as increasing yields whilst optimising inputs will protect gross margins and prevent the need to convert land elsewhere to meet the rising global demand for food.

It should be noted that agriculture is reliant on developments outside of the sector to achieve the target of Net Zero. This includes the development of carbon neutral fuels and the manufacture of fertilisers from net zero production, in addition to carbon capture and storage technologies.

WHAT IS YEN ZERO?

YEN Zero is a network of key players across the agriculture industry all with the objective to better understand the greenhouse gas (GHG) emissions associated with crop production, to ultimately identify and promote practices that can be implemented on-farm to help the agriculture sector reach net zero emissions.

YEN Zero was founded in 2021 with the end goal of helping the UK agriculture industry identify and test mitigation strategies which have the best potential to help us move towards net zero.

The main YEN Zero processes contributing to the inputs and outputs of the network



YEN Zero calculates and benchmarks crop carbon footprints, allowing growers within the network to see how they're performing compared to others. The network is building a valuable dataset of crop GHG emissions and their associated management inputs which will allow us to identify how and why GHG emissions of crops vary between fields and farms.

On the back of providing growers with their crop C footprints, YEN Zero will provide guidance on which mitigation strategies have the most potential to reduce their on-farm emissions.

WHAT CAN YOU EXPECT FROM BEING PART OF THE YEN ZERO NETWORK?

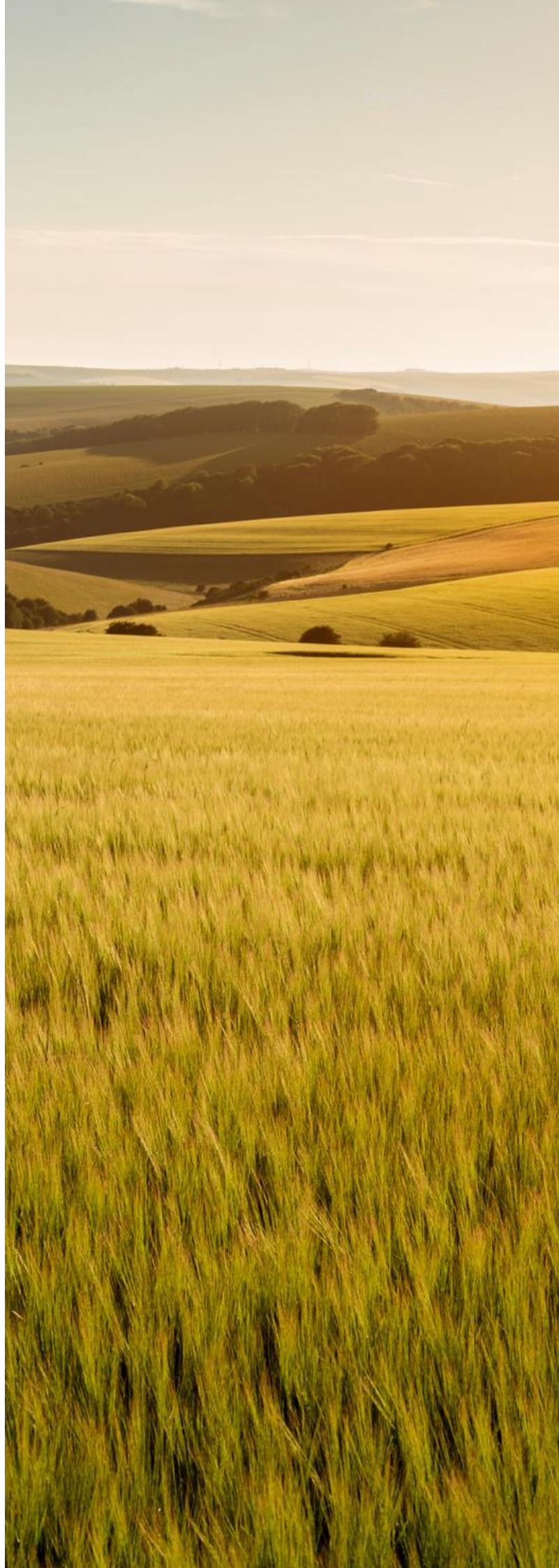
At the centre of YEN Zero is the calculation and benchmarking of crop carbon footprints. ADAS will guide you through putting together the relevant data and will use this to create a carbon footprint of your combinable or forage crops.

A carbon footprint on its own does not necessarily provide you with sufficient information to manage your crop GHG emissions. It is by understanding where the emission hotspots exist, and where targeted actions can be introduced to address those emissions, that a carbon footprint becomes valuable. YEN Zero works to give you that understanding.

By calculating crop carbon footprints from a wide range of fields and farms, we can benchmark your carbon footprint to provide context and the ability to compare your results against others. We can then give you the tools and confidence to tackle these emission hotspots through the reports, workshops, and presentations that we will be providing over the course of the season.

Interim results report

Once data entry is open in early September, participants will be able to submit their agronomic data through the data entry portal on the YEN Zero website. The instructions for this can be found on page 17 of this Welcome Pack. The C footprint will be presented in an Interim results report which will be delivered ~4 weeks after data submission.



Discussion workshops

Discussion workshops will be held throughout the year to share knowledge between the sponsors, growers, and their supporters. These will be held online. Previous workshops included discussion around the science and uncertainties of soil carbon sequestration; and what mitigation strategies can be used on-farm to reduce crop C footprints, based on the GHG emissions reported within the network.

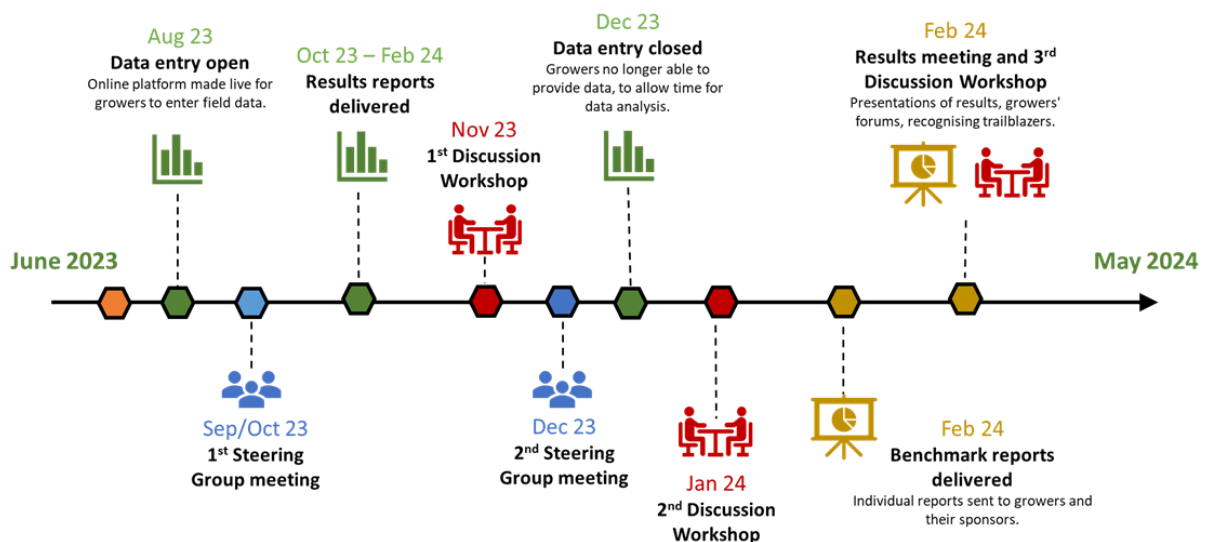
If there is a topic related to net zero that you would like to know more about, please send your suggestions to yenzero@adas.co.uk.

Benchmark report

A Benchmark report will be delivered to each grower entrant just prior to the Results meeting. The report will present cropping carbon footprint data compared against other growers in the network. GHG emissions will be presented as a total carbon footprint on a per hectare and per tonne of yield basis; and separated into emissions from the different agronomic practices. It will also include a key performance indicator (KPI) table, highlighting the efficiency of current agricultural activities, such as nitrogen application and fuel use, therefore pointing to potential changes needed to reduce emissions.

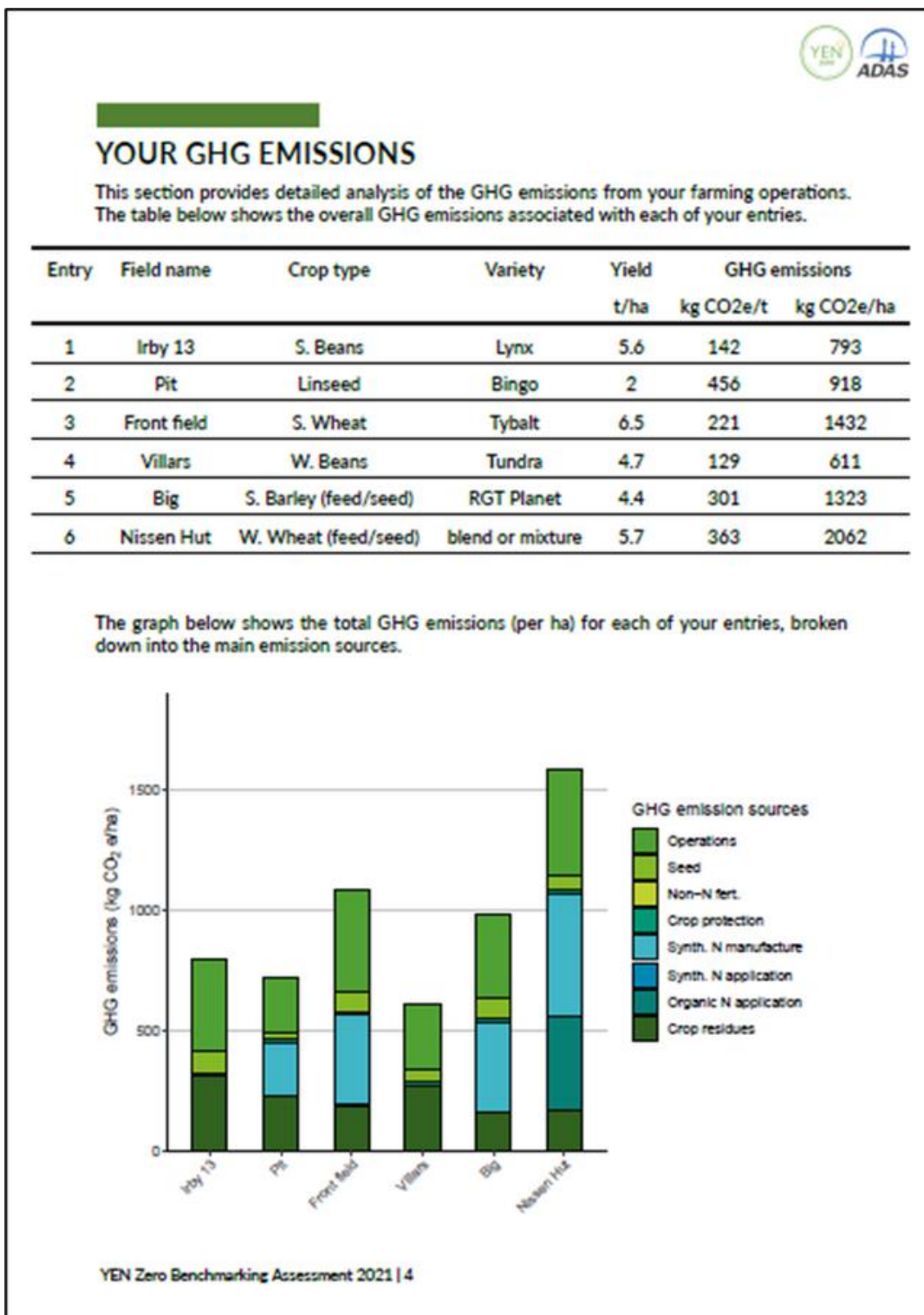
Results meeting

A Results meeting will be held in late winter. After feedback from the pilot year, the results meeting will be combined with a discussion workshop. The results meeting will be a chance to discuss the main findings of the benchmark analysis and highlight successful practices in action. In addition to the above activities, you can also expect to see webpage articles and newsletters sharing the current net-zero activities, research, and related policy.



EXAMPLE INTERIM REPORT

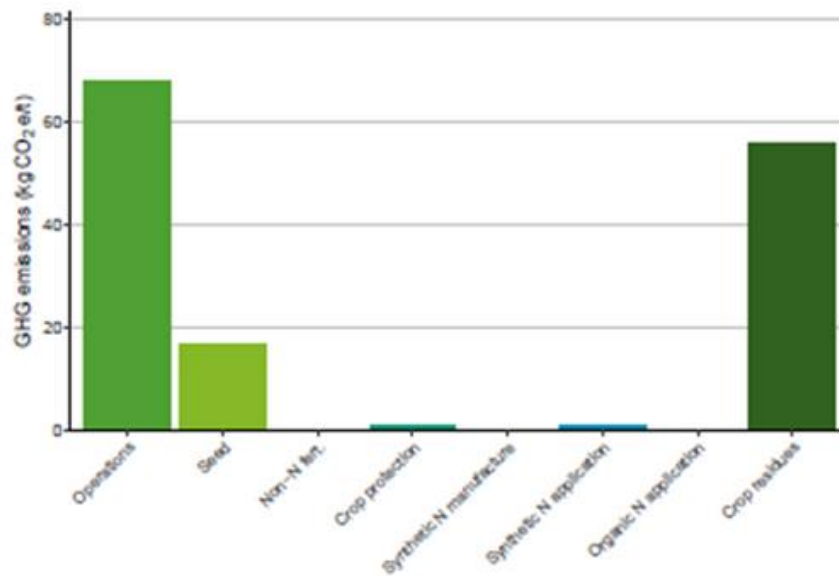
Below you'll find examples of what data is presented in the interim report and what the report will look like, starting with your GHG emissions per entry, followed by graphs displaying the sources of your emissions and a summary of the crop management, for each field entered.



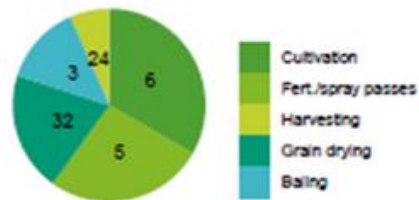


The following charts describe the emission sources within your crop production system, on a per tonne of output basis, for each field entered into YEN Zero.

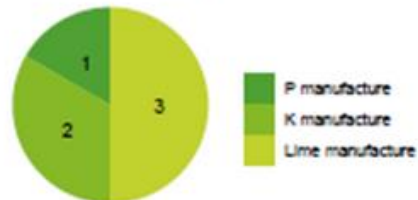
Irby 13 - S. Beans



Operations




Non-N fert. manufacture



Cultivation type	Total N applied (kg/ha)	P applied (kg/ha)	K applied (kg/ha)	Lime applied (kg/ha)	Manure applied (t/ha)	Main manure type	No. ag-chem applications	Grain drying (%)	Straw fate
Direct drill	0	0	0	0	0	none	3	3	Remained

The report then presents information on current and potential levels of soil organic matter in your fields. This is quantified based on the level of clay in your soil and the amount of rainfall you receive on an annual basis:



YOUR SOIL ORGANIC MATTER

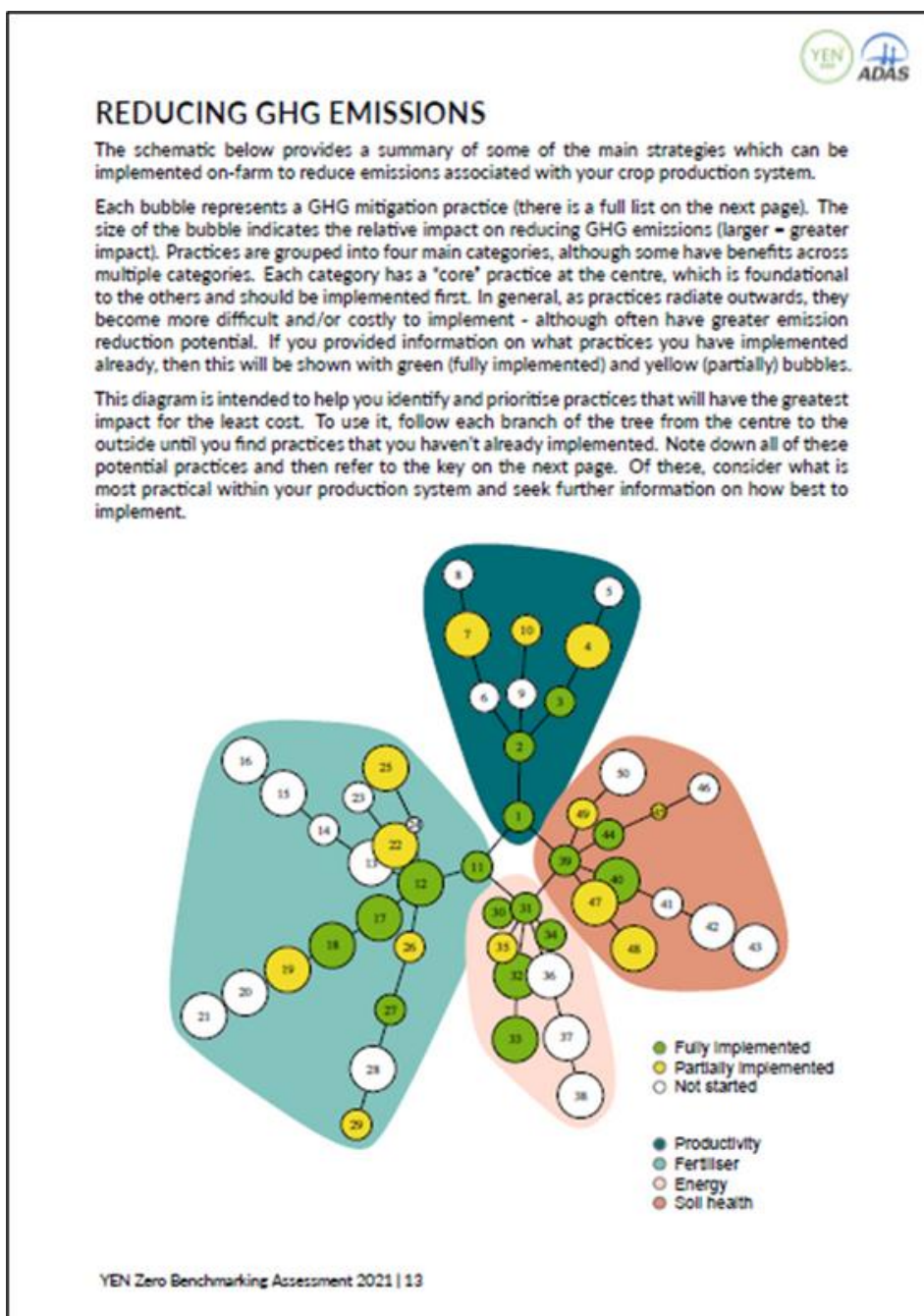
YEN Zero has determined the potential level of SOM your soil can achieve, using the AHDB/BBRO Soil Health Scorecard benchmarking guidance (Griffiths et al., 2018), which gives a range of 'typical' SOM contents according to clay content, rainfall region and cropping (grass vs. arable). The upper values in this guidance are considered to be what is potentially achievable on your soil type with a significant and sustained change in practice, although factors such as land use/management history, drainage class, soil pH and position in the landscape will also affect the final equilibrium value. It is important to note that any achieved increases in organic matter can be rapidly reversed unless the change in practice is maintained.

Entry	Field name	Proportion of clay in soil (%)	Long term annual rainfall (mm)	Current SOM level (%)	potential SOM level (%)
1	Irby 13	Heavy	650	5	4.5 - 6.6
2	Pit	Heavy	650	8	4.5 - 6.6
3	Front field	Heavy	650		4.5 - 6.6
4	Villars	Heavy	650		4.5 - 6.6
5	Big	Heavy	650		4.5 - 6.6
6	Nissen Hut	Heavy	650	7.1	4.5 - 6.6

YEN Zero Benchmarking Assessment 2021 | 12

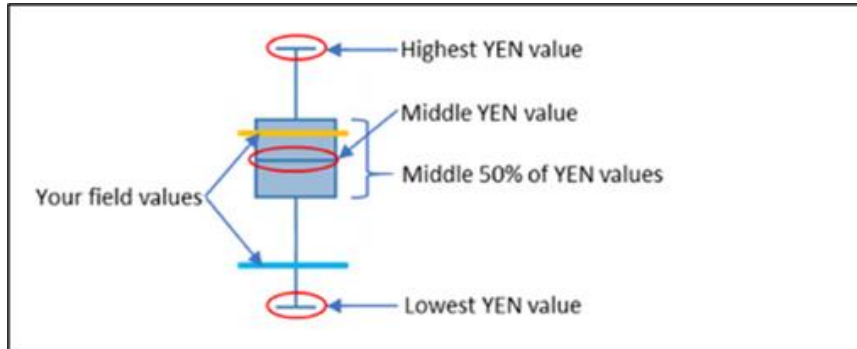
The report ends with a personalised mitigation decision tree. Each circle on the tree represents a GHG mitigation practice. The size of the bubble indicates the relative impact on reducing GHG emissions (larger = greater impact). Practices are grouped into four main categories, although some have benefits across multiple categories.

In general, as practices radiate outwards, they become more difficult and/or costly to implement - although often have greater emission reduction potential. If you provided information on what practices you have implemented already, then this will be shown with green (fully implemented) and yellow (partially) bubbles.

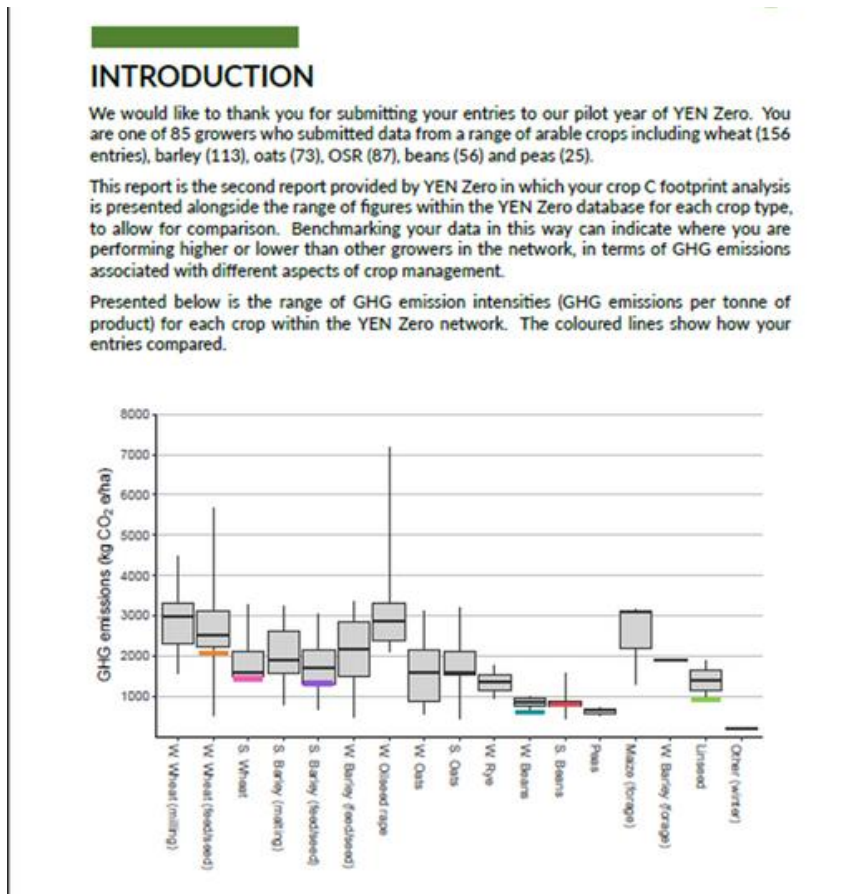


EXAMPLE BENCHMARKING REPORT

The Benchmark report utilises benchmark charts as seen below. The 'whiskers' show the range of YEN Zero values whilst the box shows the middle half of values, with a line for the mid-value. The coloured lines show the values for your entries.

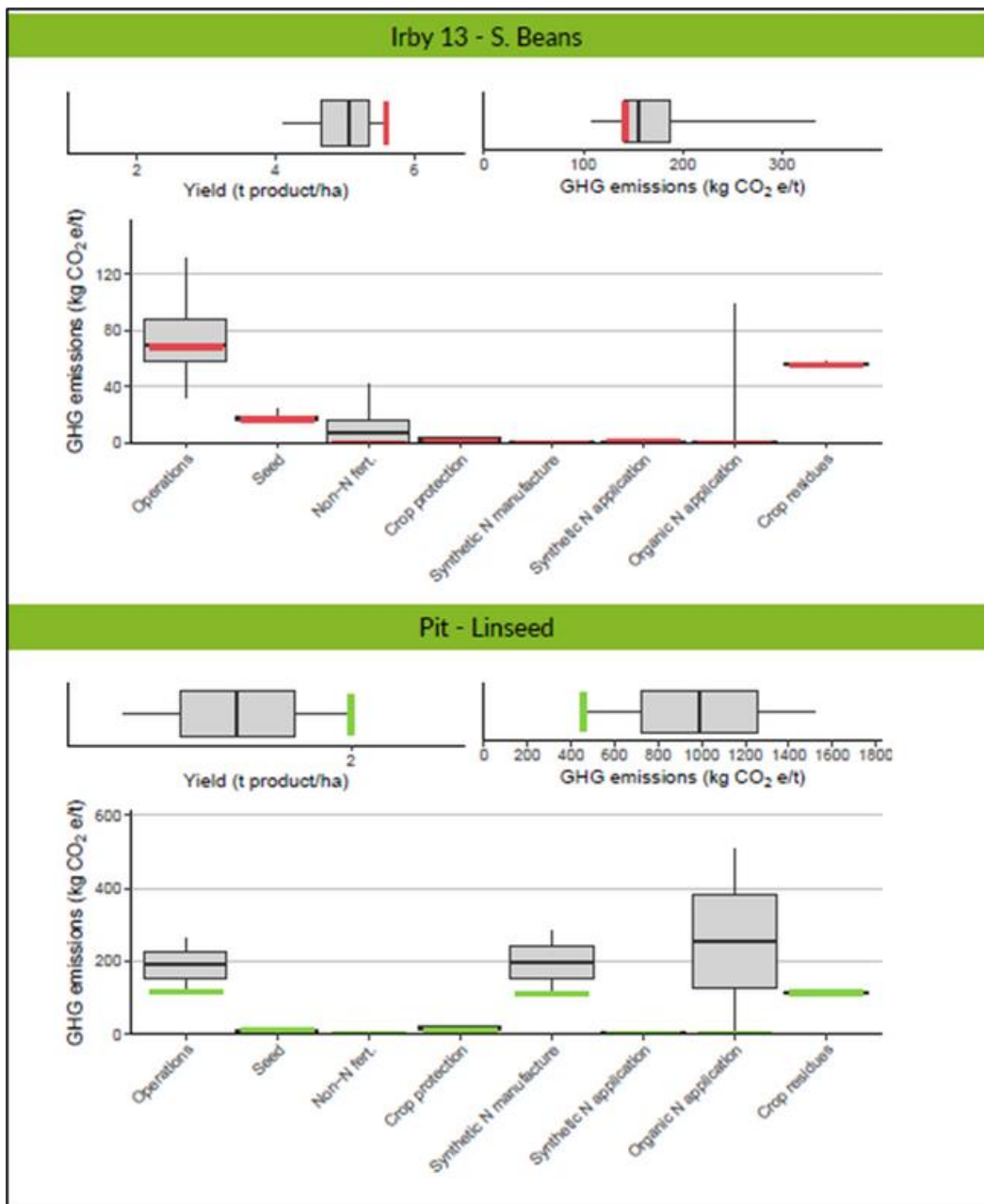


The Benchmark report begins with a graph showing the range of GHG intensities (GHG emissions per tonne of production) for each crop within the YEN Zero network. The coloured lines show how your entries compare.



Benchmarking assessment

This is followed by the benchmark assessment comparing your yields, total GHG emissions intensities and GHG emissions by source (symbolised by the coloured lines), compared to the rest of the YEN Zero network



DATA COLLECTION AND ENTRY FOR CARBON FOOTPRINTING

The YEN Zero website

The YEN Zero website contains some useful documents associated with YEN Zero and the latest news and learnings coming from the network. You can access the [YEN Zero website here](#). If you scroll down the page, you will reach the “Key documents” and “News” sections where you can find things such as the YEN Zero C footprint accounting methodology and the most recent relevant articles.

KEY DOCUMENTS

-  [YEN Zero C footprint accounting methodology](#)
-  [YEN Zero Results report example](#)
-  [YEN Zero Benchmark report example](#)
-  [Discussion workshop summary 1: Introduction to YEN Zero](#)
-  [Discussion workshop summary 2: Soil C sequestration](#)
-  [Discussion workshop summary 3: Mitigation Strategies](#)
-  [Summary of 1st Discussion workshop of YEN Zero 2nd year: Land sparing/sharing](#)
-  [Summary of 2nd Discussion workshop of YEN Zero 2nd year: Organic materials](#)
-  [About YEN Zero leaflet](#)

NEWS

DATA COLLECTION AND ENTRY FOR CARBON FOOTPRINTING

In this section we describe the data collection and data entry for calculating your carbon footprints. A data entry portal has been created on the YEN Zero website that allows you to provide the key data on crop management.

The data entry portal will open in early September and will close for submission at the end of December. The data submitted will be used to produce an interim report which you should receive within ~4 weeks of data submission.

Entrants who were part of the YEN Zero pilot year will notice the data entry portal has been developed to improve the accuracy of the crop GHG emission calculations. This includes more detailed information on the use of inhibitors within each nitrogen application split, and more information on the measured N content of manures (if available) and the method of application.

Checklist of required data

Below you can find a checklist of information required to input your agronomic information.

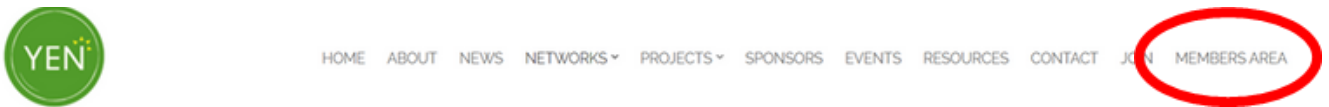
Crop information	Soil information
Entry name (field name or description)	Topsoil texture
Latitude	Subsoil texture
Longitude	Which best describes your cultivation strategy?
Total entry (field) area (ha)	Total number of fertiliser (macro & micronutrients) application
Crop type	Lime applied in current season (kg/ha)
Seed rate (kg/ha)	Lime product applied
Crop yield (t/ha)	Number of manure applications
Crop moisture content at harvest (%)	Timing when all/majority of manure applied
Straw chopped at harvest?	Method of application
Grain drying method	Main type of manure applied
Crop production and protection	Total applied over all applications (t or m ³ /ha)
Total synthetic N Fertiliser applied kg N/ha	Was a seed dressing used?
Manufacturer	Number PGR applications
Product name	Number herbicide applications
Product type	Number insecticide applications
Application rate (kg N/ha)	Number fungicide applications
Was a urease inhibitor used in this application?	Total number of spray passes for all pesticide types
Was a nitrification inhibitor used in this application?	
Product name of inhibitors	
Fertiliser P ₂ O ₅ applied	
P ₂ O ₅ application rate (kg P ₂ O ₅ /ha)	
P product applied	
K ₂ O application rate (kg K ₂ O/ha)	
K product applied	

Entering your data in the YEN Zero data portal

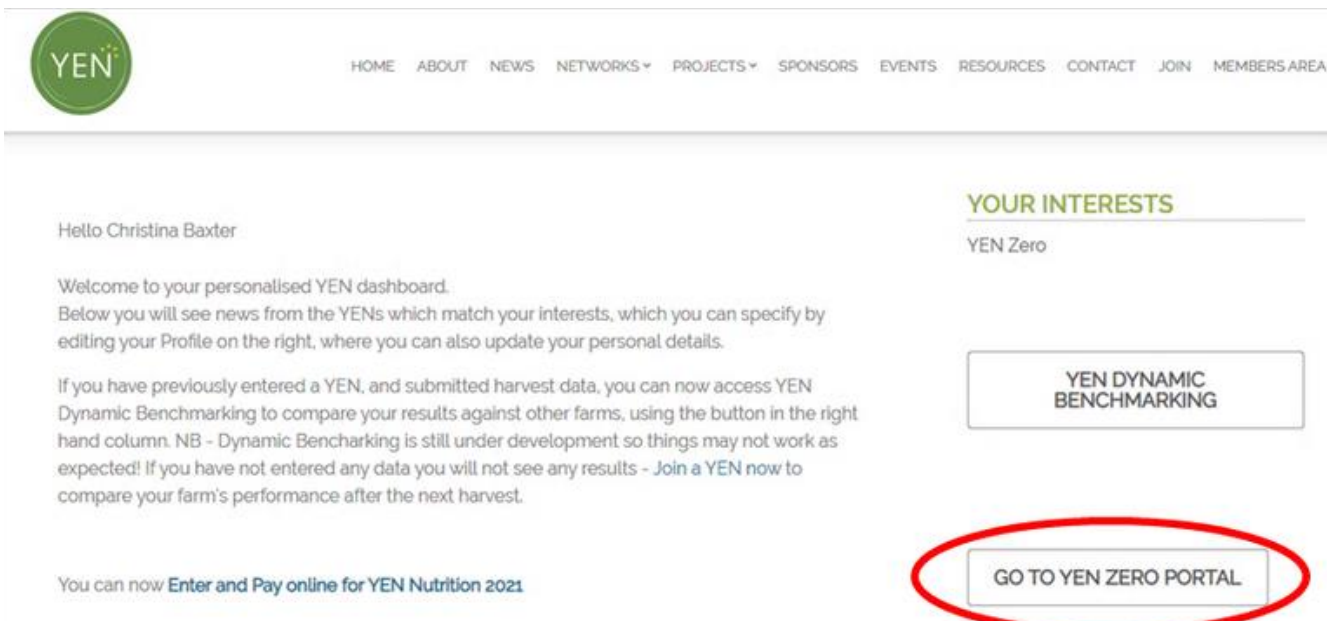
To access the YEN Zero data entry portal, you need to have an account on the YEN website and be associated with the YEN Zero network:

- Create an account on the YEN Zero webpage if you don't already have one
<https://www.yen.adas.co.uk/register>
- Once logged in on the YEN website "apply" to become a YEN Zero member here
<https://www.yen.adas.co.uk/apply-yen-zero> or contact us through the YEN Zero email address:
yenzero@adas.co.uk
- ADAS will then give you access and notify you via email when this is complete

To access the data entry portal, click on the "MEMBERS AREA" link on the top right-hand side of the webpage:



In the Members Area page click the button on the right-hand side of the page labelled "GO TO YEN ZERO PORTAL". This will take you to the data entry page. You may need to log out and in again if you cannot access the YEN Zero Portal.



The home page of the data entry portal is the YEN Zero Dashboard where you can see the farm/s you have entered into YEN Zero or are associated with as a Sponsor or Supporter. This page tells you the status of your data entry process. Green boxes indicate where data is still to be entered:

ORDER NUMBER	STATUS	FARM	SELECT FIELD(S)	ENTER DATA (CROP & SOIL)	ENTER DATA (MITIGATIONS)
YZ29999	Enter Mitigations	Tim Kindred	ENTRIES	CROP & SOIL	MITIGATIONS
YZ29888	Enter Mitigations	ADAS Test Farm	ENTRIES	CROP & SOIL	MITIGATIONS

YEN Zero field entries

Use the “ENTRIES” button on the Dashboard to begin entering data. For 2023-24, you have two options for entering data. You can either 1) enter data for 6 chosen fields in the same year, or 2) enter data for 6 consecutive previous crops grown in the same field representing your typical rotation, so the carbon footprint of your whole rotation can be calculated. Entries can be from any harvest year from 2023 or earlier. Any fields previously entered into YEN will be in the “ENTER FIELD” drop down box.

To enter new fields:

- Type the field name into the “CREATE NEW FIELD” box.
- Then select the “CREATE NEW FIELD” button and this field will now be in the “ENTER FIELD”
- ~~Select the field above~~ dropdown list and then select the “ENTER FIELD” button.
- The field will then appear in the “Entry Information” section below.
- If you are entering data for a rotation (same field, different years) then add the same field up to six times and choose the correct harvest year. Then save by selecting the “SAVE CHANGES” button.
- When you have finished entering information for your your field(s), select the “SUBMIT ALL ENTRIES” button. DO NOT select this button unless you are happy that all your chosen field entries are entered, and the information is correct.

YEN Zero agronomic information

Once you have submitted your chosen fields you can now enter the agronomic data associated with them by using the “CROP & SOIL” button on the data entry portal Dashboard page. This page will list your chosen field(s) in columns and the green cells indicate information which is mandatory to calculate the crop C footprints.

Other information is valuable to the YEN Zero database. The more data you input, the more will be returned in the benchmark report.

The screenshot shows the YEN Zero data entry portal. The top navigation bar includes links for HOME, ABOUT, NEWS, NETWORKS, PROJECTS, SPONSORS, EVENTS, RESOURCES, CONTACT, JOIN, and MEMBER AREA. The main content area is titled "Crop information" and is divided into two sections: "Crop information" and "Field history".

Crop information section:

	Fields to be submitted	ADAS Test 4 2021	ADAS Test Field 1 2021	ADAS Test Field 2 2021	ADAS Test Field 3 2021
Crop type	select	Winter wheat - feed or seed	Please choose an option	Please choose an option	Please choose an option
Variety	select				
Month of sowing?	select	Please choose an option	Please choose an option	Please choose an option	Please choose an option
Seed rate	kg/ha				
Crop yield	t/ha				
	Method of measurement				
Crop moisture content at harvest	%				
Straw chopped at harvest?	select	Please choose an option	Please choose an option	Please choose an option	Please choose an option
Grain drying method	select	Please choose an option	Please choose an option	Please choose an option	Please choose an option

Field history section:

	Fields to be submitted	ADAS Test 4 2021	ADAS Test Field 1 2021	ADAS Test Field 2 2021	ADAS Test Field 3 2021
Previous crop - 1	select	Please choose an option	Please choose an option	Please choose an option	Please choose an option

Option 1: Entering data for 6 fields

The screenshot shows the YEN Zero data entry portal. The top navigation bar includes links for HOME, ABOUT, NEWS, NETWORKS, PROJECTS, SPONSORS, EVENTS, RESOURCES, CONTACT, JOIN, and MEMBER AREA. The main content area is titled "Crop information" and is divided into two sections: "Crop information" and "Field history".

Crop information section:

	Fields to be submitted	18ha 2023	18ha 2022	18ha 2021	18ha 2020	18ha 2019	18ha 2018
Crop type	select	Winter wheat - feed or seed	Winter wheat - milling	Winter barley - feed or seed	Winter barley - malting	Winter oilseed rape	Spring oilseed rape
Variety	select	Alchemy	Alderon	Amistar	Bazooka	Aardvark	Anastasia
Seed rate kg/ha	kg/ha	1	2	3	4	5	6
Crop yield	t/ha (at harvested moisture content)	6	5	4	3	2	1
	Method of measurement	a	b	c	d	e	f
Crop moisture content at harvest (%)	%	1	2	3	4	5	6
Straw chopped at harvest?	select	Yes	No	Yes	No	Yes	No
Grain drying method	select	Floor drying	Oil fired batch dryer	Gas fired batch dryer	Other	Floor drying	Oil fired batch dryer

Field history section:

	Fields to be submitted	18ha 2023	18ha 2022	18ha 2021	18ha 2020	18ha 2019	18ha 2018
Previous crop - 1	select	Please choose an option	Please choose an option	Please choose an option	Please choose an option	Please choose an option	Please choose an option

Option 2: Entering data for the same field across 6 consecutive years (rotation)

You do not need to enter all the data in one sitting. You can save any data entry inputs using the “SAVE CHANGES” button at the bottom of the screen. This will allow you to come back and complete data entry at a later date.

Only select the “SUBMIT ALL ENTRY INFORMATION” button when you are happy all the data has been entered.

YEN Zero mitigation strategies

The final section to complete on the data entry portal is within the “MITIGATIONS” area. This consists of a simple table of strategies which can be introduced on farm to help reduce crop C footprints. Please select “YES”, “NO”, “PARTIALLY”, or “NOT APPLICABLE”, for each of these strategies to indicate whether you’ve implemented this strategy within your system. This data will allow us to provide tailored guidance on which strategies can be introduced into your system which have the most potential to reduce your crop C footprint.

If you do have any difficulties with data entry or would like to query any of the data requirements, please get in touch with us using our email address: yenzero@adas.co.uk

Data entry deadlines

The data can be submitted at any time between the start of this year’s YEN Zero and the deadline of Sunday 31st December 2023.

AFTERWORD

Thank you for entering the YEN Zero network to calculate and benchmark your crop C footprints and learn and share knowledge on how we can reduce emissions associated with crop production. The wider this network reaches and the more growers that take part, the more we can learn about what management strategies associate with high emissions, how we can cultivate productive crops with low emissions, and which mitigation strategies have the best potential to reduce crop GHG emissions.

We hope the information in this welcome pack is a useful introduction into YEN Zero, if you have any questions, ideas, or suggestions, then please don’t hesitate to contact us at yenzero@adas.co.uk.