

A woman with dark hair, wearing a yellow long-sleeved shirt, is shown in profile, reaching out to pick a red apple from a tree. The orchard is filled with green leaves and many ripe, red apples. The background is slightly blurred, showing more of the orchard.

# Measurements that count


Impact Report 2023

Cool  
Farm®



# Contents

<b>Introduction</b>	<b>3</b>	<b>Impact stories</b>	<b>5</b>	<b>Impact history</b>	<b>24</b>
<b>Highlights</b>	<b>4</b>	Caravela	6	Lactalis	15
		Cool Soil Initiative	7	McCain	16
		Cooperative Coffees	8	Soil Capital	17
		CottonConnect	10	Solidaridad	18
		Danone	11	Straus Family Creamery	20
		Fairtrade	12	Suntory	22
		Kynetec	14	Unilever	23
				<b>About Cool Farm</b>	<b>25</b>
				<b>Cool Farm Tool as driver for change</b>	<b>26</b>



Return to this page at any time by clicking on the house icon in the bottom left hand corner.

To skip to the page, Click on the title

“

The most significant and noteworthy aspect of this tool is that it's providing us with an opportunity to engage directly with producers and work closely with the community.

Technicians are training farmers to collect and measure the data for themselves. By farmers participating directly in measuring their carbon and greenhouse gas emissions using the Cool Farm Tool, they're able to understand and learn and to really become leaders in sustainability. They understand that how they are managing their land has direct implications and impacts on the environment and their decisions are affecting the entire industry. For example, in a training with 15 producers working to develop a 4-year implementation plan, the producers unanimously decided they wanted to prioritize the protection and reforestation of farms. This insight was only gained by the farmers completing the analysis and the data collection themselves.

They realised the importance of the protection of the environment and how they're really at the forefront of fostering long-lasting change.”

”

Coffee roaster working with smallholder coffee farmers in Colombia

# Introduction

Transforming the global food system is hard. In 2008, encouraged by estimates in the academic literature, a group of multi-national food and beverage companies set out to study the climate change mitigation potential available through agriculture by partnering directly with farms in their supply chains.

In the past 15 years, the Cool Farm Alliance has grown from 13 founding members to 159 members, from a handful of users (farmers and agronomist/technicians) to tens of thousands of users in 150 countries. The Tool has gone from an excel spreadsheet calculator to an online WebApp. It is now available in 17 languages. Currently 59 other software platforms connect to the Cool Farm Tool via the Application Programming Interface (API) so that data entered once may be useful many times.

**By now, through the API or the User Interface (UI), most of the world's leading multi-national food and beverage companies are connected to the Cool Farm Tool in one way or another. But how much progress have they made towards climate change mitigation?**

This report shines the light on the positive steps and progress of Cool Farm Alliance members. Its purpose is to boost momentum and enable stakeholders to build on the each other's efforts. Despite the continual growth in Cool Farm Alliance membership, userbase, and technology, the [New York Times](#) reports that for many big food companies, emissions head in the wrong direction (with some exceptions). No one said it would be easy but every step forward matters.

## Democratisation of knowledge

The Cool Farm Tool and the Cool Farm Alliance are built on the proposition that the power of knowledge should be shared - in this case knowledge of agricultural climate change mitigation, as well as biodiversity and water improvement options. When not just academics, sustainability professionals and senior executives, but also farmers can see and understand the sources and sinks of on-farm greenhouse gas emissions, they can work together to make necessary improvements. Teams can build action plans with the benefit of farmers' and agronomists' expertise and in-depth knowledge of the land they steward. The plans can be based not just on what is technically possible but also what is practical and pragmatic given the real world considerations and trade-offs that farmers contend with every day.

This is the vision of the Cool Farm Alliance and the “democratisation of knowledge,” that is at the core of the Alliance's mission to support the transition to more sustainable farming practices. The community works towards this transition not by asking farmers to change but instead by collaboratively building the systems that support the transition. A key element of this system is a common language and common quantification methodology – The Cool Farm Tool.

Throughout its decade-plus journey, the Cool Farm Alliance has dedicated resources to the calculation engine itself, not to sustainable agriculture projects that directly reduce emissions. “Project work” or Cool Farm Tool “implementation” or “deployment” has been left to the members — companies, agronomists, trusted advisors, consultants, project managers and/or service providers.

To support these projects, the Cool Farm Alliance has worked to ensure that any project using the Cool Farm Tool has access to the best possible calculator – one that balances ease of use and accessibility with accuracy and precision. The Cool Farm Alliance has also worked to build the community of users and supporters so that the industry can speak a common language for sustainable agriculture quantification. Consequently, the Cool Farm Alliance rarely has first-hand access to the on-ground changes enabled and informed by the use of the Cool Farm Tool.

For this and other reasons, there is no way to know the full impact of the tool. The Cool Farm Tool has always held to the principle of being free to farmers and it is available online for all to use without obligation to report back. Nevertheless, this report provides some insight into how the tool and the projects designed with it — and in some cases because of it — have impacted people and the planet.

This is an initial collection, a “harvest”, of project and impact descriptions, and one that the Cool Farm Alliance knows barely scratches the surface. This report's publication should make it easier to collect more impact stories – from both work already in motion not yet captured here and from work to come – so practitioners can generate a more coordinated and effective portfolio of activities. As these impact stories grow in number, breadth, and depth, the Cool Farm Alliance community will be building the movement and momentum for impact at scale.

# Highlights

This report provides examples but is not comprehensive and should not be taken as the complete picture of collective impact.

## The largest estimate of impact

**2 million tons CO<sub>2</sub> eq avoided**

and 49,000 tonnes CO<sub>2</sub> eq sequestered 2018-2021. A subset was directly measured, the rest extrapolated. Directly measured: 21,942 tonnes of CO<sub>2</sub> eq reduced on 16,840 ha ([Solidaridad](#)).

## Depth of impact

Impact from the use of the tool can be evaluated based on breadth but also depth.

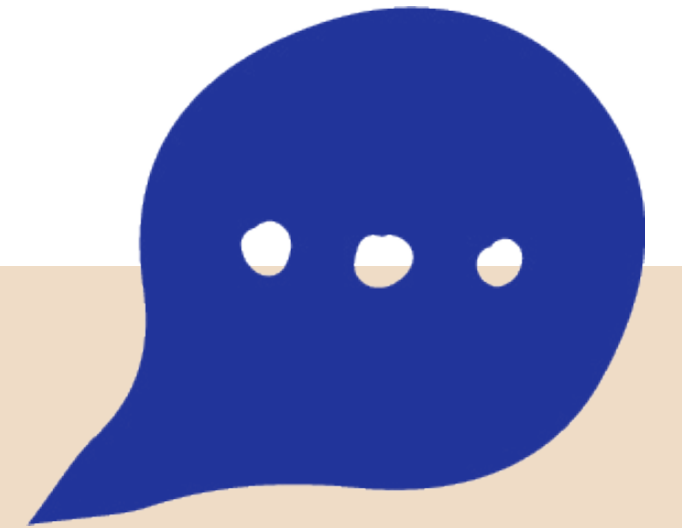
**Using the tool to bring humanity, dignity, fairness, justice and rebalance of power** emerged explicitly in a number of projects ([Cooperative Coffees](#), [Caravela](#), [Fairtrade](#), [Solidaridad](#))

**\$4,542,260 in additional funds distributed to farmers**

Many projects couple climate and farmer prosperity goals – building farmer prosperity and additional income through the use of the Cool Farm Tool or using climate projects to direct more funds to farmers with this total - as summed from all projects that report financial metrics.

**Multiple companies have built data dashboards**

to visualize, analyse, model and in various ways, utilise Cool Farm Tool data more fully. ([McCain](#) and [Solidaridad](#)).



## The largest verified report of impact

**180,000 tons CO<sub>2</sub> eq**

in reductions and enhanced removals with ~400 large scale arable farmers in Europe over two years, 2021-2022 ([Soil Capital](#)).

## Geographic reach

A number of projects are **active in more than 10 countries**

([McCain](#), [Danone](#), [Unilever](#))



**To baseline and build informed action plans**

is the most common reported Cool Farm Tool use by companies large and small.

Throughout most impact stories, the Cool Farm Tool emerges as **a bridge between farmers (suppliers) and buyers**

who want to move in the same direction but wouldn't otherwise have a way to communicate and work together.



# Impact stories

## Key

The Impact stories are colour coded by the following sectors

Large scale farming operations, private sector member

Smallholder farming operations and /or civil society member

Dairy

Private sector consortium

## Goal

To integrate farmer prosperity and environmental stewardship goals into a credible Environmental, Social, Governance (ESG) reporting ecosystem that is vertically aligned to the coffee supply chain and allows traceable flows of information and resources between stakeholders.

## Results

- Cool Farm Tool educational materials demystifying the sources and sinks of greenhouse gas emissions in coffee production.
- Detailed Cool Farm Tool analyses showing complex relationships between greenhouse gas emissions, waste water treatments, agroforestry and farmer incomes.

## Scale

- 146 farms assessed with Cool Farm Tool.
- 355 farms assessed with Prosperity Compass.
- 7 origins.
- 22 Coffee Communities.

## Crop(s)

Coffee.

## Region(s)/ Country(s)

Latin America - Perú, Ecuador, Colombia, Nicaragua, El Salvador, Guatemala and Mexico.

## Links

[Website](#), [White paper](#), [Impact report](#).

# Caravela

**Cultivating Care:** unveiling the interplay of greenhouse emissions and farm income in the Caravela supply chain in Latin American coffee farms.

Across the steep landscapes of Latin American coffee farms, a delicate balance unfolds, between greenhouse gas emissions, farm income, and the prosperity of coffee-producing households. Beyond the white flowering fields and hectic supply chains, Caravela seeks to understand the connections that shape the sustainability narrative in the coffee regions that supply them.

Caravela goes beyond conventional metrics to understand the impact of coffee production at the farm level and in doing so has uncovered a surprising relationship between emissions, productivity, and the socioeconomic fabric of the coffee-producing communities from which it sources. Traditional studies on greenhouse gas focus on factors like fertilisers and access to vital information such as prices-trends, weather information and pests and diseases management.

Caravela believes that in coffee producing communities, sequestering carbon, while essential, should not be the main goal. Rather, increasing the prosperity of coffee farms/ households and coffee communities comes first.

Caravela's analysis spans seven origins in Latin America. Using the Cool Farm Tool, it compares net greenhouse fluxes at the farm level, revealing that farms with net emitting factors have higher yields, increased synthetic fertiliser usage, and a sparser canopy of shade trees. Synthetic fertiliser usage leads to higher yields and higher emissions. However, this is only part of the story.

Net emissions are related to the prosperity of the household. Farms emitting more carbon could also yield higher incomes, allowing them to invest in more efficient infrastructure downstream in their farm processes. Thus, high-emission, highly productive farms can often outperform

net-sequestering and neutral farms in some environmental management practices like wastewater treatment and pulp residues management.

Net-sequestering factors from less productive farms correspond with higher density of shade tree canopies in their crop systems. However, due to their lower productivity, these farms often lack the financial resources to dedicate to waste-water treatment. This contradicts the expectation that lower-emission farms perform better environmentally across all metrics, and enriches the conversation on carbon emissions, carbon 'additionality' of shade trees, coffee production management practices, and the prosperity of coffee producers. Caravela's analysis shows that 40% of producers with incomes above prosperity prices<sup>1</sup> have wastewater treatment plants and 61% have functional pulp residue management pits. On the other hand, 21% of producers below prosperity prices have wastewater treatment plants and pulp residue management pits.

Caravela's commitment to understanding these dynamics leads the company to advocate within the industry for more companies to embrace prosperity as a goal alongside environmental stewardship instead of prescribing farming practices focused solely on carbon fluxes. While pursuing environmental conservation, Caravela acknowledges the diversity of farms and rejects the one-size-fits-all approach. Therefore, the Coffee Producer Education Program (PECA) team supports producers to increase the productivity and efficiency of their crops. The team does this by focusing on optimizing coffee plant density and fertiliser usage, properly implementing, or managing shade tree systems, and promoting the use of wastewater and pulp residues management systems. Caravela's role is as a guide towards a sustainable future where prosperity, productivity, and environmental stewardship work together.

<sup>1</sup> Prosperity Prices = prices covering costs of production and the living income benchmark.



The Caravela mission extends beyond mere observation, analysis and farmer technical assistance. Encouraging the sequestering potential of shade trees and the overall effect on net carbon fluxes, Caravela works to align systems to preserve existing trees and plant new ones for the future resilience of coffee farms. This commitment leads to tools and initiatives that inspire roaster partners to support producers in adopting and managing agroforestry systems profitably.

Caravela seeks other like-minded companies to join them in fostering a coffee industry where the prosperity of farmers and the health of our environment thrive hand in hand, promising a sustainable landscape for generations to come.

### Role of the Cool Farm Tool

The Cool Farm Tool reveals the sources and sinks of greenhouse emissions in coffee production and helps Caravela get to know and understand the producers in its supply chains.



## Goal

Combat drought and other climate change impacts by working with farmers and supply chain partners to improve soil quality, quantify and reduce greenhouse gas emissions.

## Results

- Built a replicable model for supply chain collaboration at scale.
- 95% farmer retention rate.
- Built a Scope 3 measuring, reporting and verification (MRV) framework for supply chain partners.
- Reduction in emissions of 31 kg CO<sub>2</sub> eq/tonne wheat<sup>1</sup>, reflecting mainly seasonal conditions, improved measurement as well as practice adoption.
- 50 percent increase in proportion of paddocks (fields) with a legume in rotation.
- 56 percent increase in proportion of limed-incorporated paddocks (fields).
- \$2 million commitment towards soil health and regenerative agriculture.

## Partners

- Mars Petcare, Kellanova, PepsiCo.
- Farming groups: Riverine Plains Inc. Central West Farming Systems, FarmLink, MIA, IREC.
- Cereal processors: Manildra Group, Allied Pinnacle, Corson.
- Non-profit: Sustainable Food Lab, Charles Sturt University, Food Agility Cooperative Research Centre.

## Scale

- From 20 farmers in 2018 to 200 in 2023.
- ~340,000 hectares involved.

## Crop(s)

Wheat, corn, canola.

## Region(s)/ Country(s)

New South Wales (including MIA), Victoria, Queensland.

## Links

[Website](#), [Kelloggs video](#), [Mars video](#).

# Cool Soil Initiative

In response to drought and other climate change impacts effecting Australian cereal crops, Mars Petcare, Kellogg's and (newly joined) PepsiCo joined forces with some of the largest grain aggregators, processors, and farmer groups in New South Wales and Victoria to test and increase innovative soil building practices and quantify and reduce greenhouse gas emissions.

Cool Soil Initiative connects farmers to timely agronomic advice and supports them with Cool Farm Tool data collection and seasonal planning. Cool Soil Initiative farmers receive free soil testing, practice change advice, individualized reports benchmarked regionally, that breakdown their greenhouse gas performance by category and highlights areas to improve. These crop-specific assessments paired with technical/agronomic support guide farmers towards changes that are regionally adapted and more climate resilient, resulting in soil resilience benefits for the farmers and greenhouse gas benefits for the consumer packaged goods (CPG) brands.

This project has grown to an over \$2 million commitment from its company-investors and is energized by the vision of large scale impact, achieving soil health and low emission grain for farmers and supply chain partners across Australia.

## Role of the Cool Farm Tool

The Cool Farm Tool enables a large scale pre-competitive, landscape-level MRV collaboration to build soil health and resilience while mitigating climate change.

<sup>1</sup> Using a rolling weighted average reduction of emissions from farmers in CSI from 2017-2022 sown crop years, where farmer time-in-program and weather-impacted yields have been weighted, has resulted in a reduction of 31 kg CO<sub>2</sub> eq/tonne wheat. More data is needed to establish a statistically significant trendline that can control for weather. Australia experiences huge annual variability in rainfall, which is a significant driver of yield and emissions intensity



Cool Soil  
INITIATIVE



From left to right: 1. Chris Stevens, Director, Global Agribusiness, Kellogg, 2. Dr Cassandra Scheffe, Project Lead, Cool Soil Initiative, 3. Andrew Russell, Lilliput Ag, participating farmer, 4. Peter Crane, Director, Research & Technology, Kellogg ANZ, 5. Anthony Holme, Managing Director, Kellogg ANZ

## Goal

To use climate action to improve producer livelihoods.

## Results

- Cash to support regenerative practices: \$150,000 in carbon payments delivered to the six participating cooperatives.
- Leadership: designed and piloted an inseting approach.
- Leadership: contributed novel primary data to the industry via the prototype of the new Cool Farm Tool perennials methodology.

## Scale

370 plots assessed with 253 farmers (25% women) representing 12,650 farmers and 32,800 hectares.

## Partners

- Root Capital.
- The Chain Collaborative.
- Sustainable Food Lab.
- CAC Pangoa, CENFROCAFE.
- COMSA.
- Manos Campesinas.
- Norandino.
- Sol y Café.

## Crop(s)

Coffee.

## Typical farm size

1-3 ha.

## Farm type

Fairtrade, organic certified agroforestry with average 140 shade trees per ha.

## Average yield

0.4 - 0.7 tonnes/ha of green bean equivalent (GBE).

## Region(s)/ Country(s)

Peru, Honduras, Guatemala.

## Links

[Website](#), [Blog](#), [Final Report](#), [Video](#).



# Cooperative Coffees

Cooperative Coffees has been wanting to demonstrate a way to **compensate** organic smallholder farmers for their environmental contributions and, in this way, to address the challenges of **farm profitability** while also working on climate change adaptation. The IDB EcoMicro funded project, “Moving the Needle, from Cool Farms to Soil Carbon Premiums,” provided this opportunity.

The starting point for the project is the premise that, “leading coffee farmers have already demonstrated that regenerative agroforestry practices—such as planting shade and applying organic compost to build soil health—lead to numerous social and economic benefits. In addition, these practices can draw down carbon from the atmosphere and increase resilience to climate shocks. Yet the industry largely does not recognise the value generated by agroforestry practices, including contributions toward corporate net zero and/or supply resilience objectives. Should the industry compensate producers for their work to combat climate change, they could support producer livelihoods and climate action in concert.”<sup>1</sup>

Project partners designed and piloted a carbon inseting approach<sup>2</sup> using the Cool Farm Tool to measure producers’ carbon performance and Cooperative Coffees provided carbon-based payments to cooperatives at a rate of \$66/tonne sequestered.<sup>3</sup> They paid cooperatives rather than individual farmers directly in order not to disadvantage the farmers who didn’t have the opportunity to participate. With this project, partners aimed to generate insights for the broader coffee industry about how to:

<sup>1</sup> <https://rootcapital.org/wp-content/uploads/2023/09/230927-Cool-Farm-Tool-Final-Technical-Report.pdf>

<sup>2</sup> Carbon benefits generated through inseting interventions may or may not be verified as carbon credits or offsets, depending on how companies wish to claim the benefits. In this project, Cooperative Coffees did not seek to generate carbon credits; rather, they sought to report supply chain carbon benefits against their own corporate carbon footprint in service of a net zero commitment in place at the start of this project.

<sup>3</sup> Calculated using the “Social Cost of Carbon of @ \$51 in 2022 per tonne CO<sub>2</sub> eq or \$0.023 per lb CO<sub>2</sub> eq. To recognize increased costs for cooperatives and farmers associated with data collection, Cooperative Coffees rounded up the price to \$0.03 per lb CO<sub>2</sub> eq. \$0.03 X 2204.62 (lbs per metric ton) = \$61

1. Recognise farmers’ previous and ongoing ecological contributions.
2. Centre farmer-cooperative partners as decision makers in the distribution of financial benefits within their organisations.

Cooperative	Carbon Payments	Additional Impact Fund Investment
Norandino	\$16,173	\$10,000 to respond to a climate emergency
CENFROCAFÉ	\$20,605	Increased trade price
Sol u Café	\$23,865	\$8,020 for satellite imaging; \$10,000 to inventory shade trees
Manos Campesinas	\$29,390	\$25,000 for a food security baseline
CAC Pangoa	\$31,945	\$7,000 for food support during COVID
COMSA	\$36,751	\$10,000 for reforestation efforts; \$5,000 to respond to a climate emergency

## Project outcomes

This project successfully designed and tested a flexible climate investment model directed by farmer leaders, prioritising climate justice. CoopCoffees distributed \$150,000 in carbon payments to the six participating cooperatives to support regenerative agriculture practices as well as additional impact investments, as shown in the table above. In addition, the project contributed novel primary data to the industry by using the prototype of the new Cool Farm Tool perennials methodology. This data is available in the [Final Report](#).

## Looking ahead

Going forward, project partners plan to make changes:

1. Work collaboratively with the industry to improve the scalability of primary data collection to support price premiums that recognise the value of low-carbon, biodiverse coffee. This could take the form of building default Cool Farm Tool input data sets per country/region so that new primary data collection efforts can focus on a subset of inputs. Alternatively, it could take the form of contributing to the user input design to improve the process.
2. The coffee roasters who purchase the coffee pay a climate “premium” of \$0.03/lb. above the price of the coffee. This goes into an “impact fund” that Cooperative Coffees uses to pay farmers. While continuing to use the Cool Farm Tool to gather insights, Cooperative Coffees plan to manage the payments as a fund that all farmer cooperatives can access based on need rather than pay for performance. Cooperative Coffees will evaluate need based on potential for impact in the areas of:
  - a. Resilience (food security, economic development, infrastructure)
  - b. Regeneration (organic best practices, reforestation, water, biodiversity)
  - c. Climate emergency relief (humanitarian aid in natural disasters)
  - d. South-south learning and cooperation (training at COMSA’s diplomado organico)
3. The significant variability in Cool Farm Tool results between and within farmer cooperatives indicates the value of continuing to perform carbon assessments for the purposes of learning and improving performance. In the future, payments may be based on producer typologies or performance thresholds rather than individual results.
4. Expand ambitions beyond carbon to “nature-positive” farming to recognise agroforestry farmers for more of the ecosystem services their farming practices provide.



## Cooperative coffee's farmer photo stories and Cool Farm Tool results<sup>1</sup>



Miriam "Bety" Perez, a third-generation coffee farmer with over two decades of experience, is a respected leader in Marcala, Honduras. She has become a fervent advocate for gender equality and fair trade in the coffee industry. Bety's journey began with her grandfather's initial hesitation to involve women in coffee farming. However, he eventually entrusted her mother with her own coffee farm, and Bety actively contributed on the farm to help her single mother.

Bety's Cool Farm Tool [footprint](#) showcases the possibility of maintaining a highly productive, carbon-negative coffee farm characterised by substantial shade tree density.

“  
**Today, I remain an organic coffee producer, aspiring to pass down this legacy to my four children and instil in them the same vision and values of cultivating coffee in harmony with nature.**”



As a young farmer and CENFROCAFE technical assistance team member, James leads reforestation and sustainable production efforts at the organisation and puts theory into practice on his own land.

His Cool Farm Tool [footprint](#) demonstrates how best practices can rapidly achieve carbon-neutral production.

“  
**It's important for clients to get involved in climate action, acknowledging farmers' vital role in sustainable, organic coffee production. Financial investment and compensation are crucial for reducing emissions and adapting to climate change impacts.**”



### Role of the Cool Farm Tool

The interactive nature of the Cool Farm Tool inspired this project and served as the central element enabling the project to link climate action with producer livelihoods through quantifying greenhouse gas emissions and carbon sequestration on smallholder coffee farms.

<sup>1</sup> Notice to the reader: The Cool Farm Tool perennials methodology continues to evolve, so the individual farmer results presented here are preliminary. The data belongs to the farmer organisations. Please contact Cooperative Coffees to obtain sharing permission.

# CottonConnect

CottonConnect is a social enterprise with a mission to reimagine the future for raw material supply chains. To achieve this, it develops transparent, traceable, and resilient supply chains that deliver sustainable raw materials to retailers. So far, the organisation has worked with over 770,000 farmers equipping them with the necessary skills and knowledge to produce sustainable fibres.

In 2021, CottonConnect took things a step further and introduced the **REEL Regenerative Cotton Code** to enhance agrobiodiversity, enrich soils, optimise water management, and develop ecosystems. To put this code into action, in 2022-23, CottonConnect launched a regenerative cotton pilot initiative across three villages in the Narmada district of India's Gujarat state. This project trained 354 smallholder farmers on regenerative agronomy, empowering them to cultivate cotton using economically viable, environmentally sustainable, and socially acceptable principles. Comprehensive training sessions and demonstrations in this programme laid the groundwork for a lasting shift in agricultural practices.

Based on a preliminary assessment of the first-year, 75% of farmers embraced practices to enhance biodiversity, including initiatives such as installing bird perches and identifying/preserving beneficial insects. Ten percent of farmers shifted to preparing and applying homemade bio-pesticides, replacing traditional chemical pesticides. The results indicate a significant 23% reduction in the use of chemical fertilisers by project farmers compared to control farmers.

Employing the Cool Farm Tool, CottonConnect analysed the project's effectiveness in reducing greenhouse gas emissions. The assessment showed that emissions per acre from the project farms were approximately 23% lower than those from the conventional control farms. This signifies a substantial reduction in the environmental footprint of the regenerative agriculture initiative.

In the upcoming year, CottonConnect will focus on fostering increased adoption of regenerative practices within farming communities. The second year promises increased engagement and implementation of regenerative practices, paving the way for more environmental and socio-economic impacts. CottonConnect is committed to empowering farmers with knowledge and resources to achieve a future where sustainable agriculture becomes the norm, benefiting the communities involved and contributing to a global paradigm shift towards regenerative practices.

## Role of the Cool Farm Tool

The Cool Farm Tool enables CottonConnect to quantify the positive outcomes of the organisation's training programmes and the benefits of regenerative agriculture.



## Goals

- To create supply of sustainable fibres.
- To use the REEL Regenerative Cotton Code to enhance agrobiodiversity, enrich soils, optimize water management and develop ecosystems.

## Results

- 75% of farmers embraced biodiversity practices.
- 10% of farmers shifted from chemical pesticides to bio-pesticides.
- 23% reduction in use of chemical fertilisers by project farmers.
- 23% lower CO<sub>2</sub> eq in on-farm emissions compared to control farms.

## Scale

354 smallholder farmers.

## Product(s)

Cotton.

## Region(s)/ Country(s)

India, Narmada district of Gujarat state.

## Links

[Website.](#)

## Goal

- Reduce 30.3% FLAG GHG footprint by 2030 vs. 2020.
- Reduce 30% Methane footprint by 2030 vs. 2020 for liquid milk for Dairy business.
- Net Zero by 2050.

## Scale

15 countries, 800+ farms, 3000+ assessments.

## Product(s)

Dairy.

## Region(s)/ Country(s)

Belgium, Poland, Spain, Romania, Germany, USA, Brazil, Argentina, Mexico, Algeria, Egypt, Morocco, South Africa, Turkey, Ukraine.

# Danone

Danone has been using the Cool Farm Tool since 2017 to assess dairy farms' greenhouse gas (GHG) footprint. In 2023 Danone deployed it in over 15 countries and in France Danone is using CAP2ER. This has enabled the company to develop a very good understanding of dairy farms GHG footprint drivers and mitigation levers across geographies and farming systems.

Cool Farm Tool implementation has allowed Danone to set its 2020 baseline, monitor and report progress for its annual reporting and set concrete action plans to deliver GHG reductions year on year through agriculture transformation projects and innovative technologies. In some countries, Danone has designed farm incentive models that embed the results of the Cool Farm Tool. Emboldened by this progress, Danone submitted a Science Based Target in 2022 to deliver 30% reduction in GHGs between 2020 and 2030.

Danone has also been using the Cool Farm Tool to monitor and report progress on feed (soy) traceability from farms, and to refine its strategy towards 100% traceability and Deforestation and Conversion Free soy for animal feed.

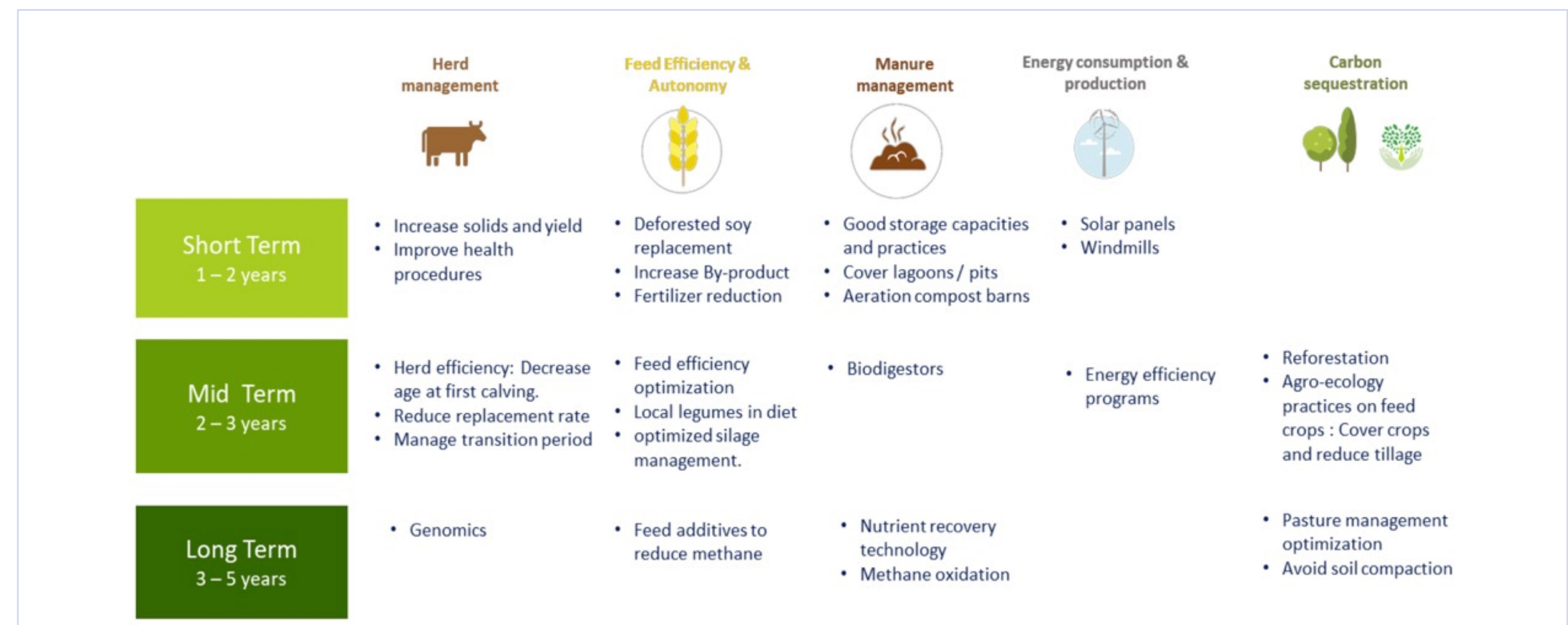
Most recently the company has led the industry in announcing a Methane Pledge to reduce 30% of Methane emissions from fresh milk from 2020 to 2030. Danone is now using Cool Farm Tool to monitor and report progress towards this target.

Danone has worked with farmers, academic partners and NGOs to identify key on-farm GHG mitigation levers and adapt those based on farm types. These interventions are in the categories of herd management, feed efficiency and autonomy, manure management, carbon sequestration and energy consumption and production.

Danone engages and supports farmers towards decarbonisation through a wide range of initiatives, including, Cool Farm Tool assessments on farm for dairy and feed, best practice case studies, on farm demonstrations, trainings and webinars.

## Role of the Cool Farm Tool

The Cool Farm Tool provides climate impact measuring and modelling and enables the company to set and achieve emissions reduction targets.



## Goal

To increase farmers' income and climate resilience via adoption of fairly compensated agroecological practices.

## Results

Studies that improve the market competitiveness of Fairtrade products:

- Carbon and water footprint studies in key cane sugar origins to support improvements and insights.
- A study comparing Fairtrade organic cotton to non-Fairtrade non-organic cotton farmers.

## Scale

- Seven cane sugar origins indicative of 36,118 farmers, 79,216 ha, 366,000 tonnes of Fairtrade certified sugar.
- Four cotton sourcing districts in India.

## Crop(s)

Sugar, cotton.

## Average yield

Cotton: 402 – 687 kg lint/ha<sup>1</sup>.

## Region(s)/ Country(s)

Mauritius, Eswatini, El Salvador, Costa Rica, Belize, Fiji, India.

# Fairtrade

Fairtrade works to empower producers and increase their climate resilience via the adoption of agroecological practices and fair prices<sup>1</sup>.

To this end, one of the first steps is to track the product carbon footprint as this enables informed decisions on the type of investments needed to achieve climate goals. It also serves to help Fairtrade understand the costs associated to achieve climate resilience at farm level, and how much of these costs can serve as a return on investment – in the value of their products. In other words, how much reward can come from the extra efforts of restoring and protecting ecosystems.

Thus, Fairtrade tracks producers' material impacts, including their products' carbon footprints, in order to scale adoption of agroecological practices, and then works to reward positive impacts towards ecological restoration.

The Fairtrade target is 2 million agricultural producers in more than 70 countries empowered to lead the fair transition towards climate resilience and sustainable livelihoods. Fairtrade pursues this by seeking financial contributions from companies who are keen to support producers and are sourcing Fairtrade products. These financial contributions are in the form of premiums for certified ingredients (and in the future, possibly also from grants), which more fairly share the costs of production with farmers while contributing to their corporate climate targets by reducing global greenhouse gas emissions. The envisioned result is distributed value and low carbon value chains, thereby strengthening sustainable livelihoods and community resilience and hopefully, serving as an inspiration to the industry.

The studies conducted using the Cool Farm Tool in sugar and in cotton provide insights on where to invest and how to

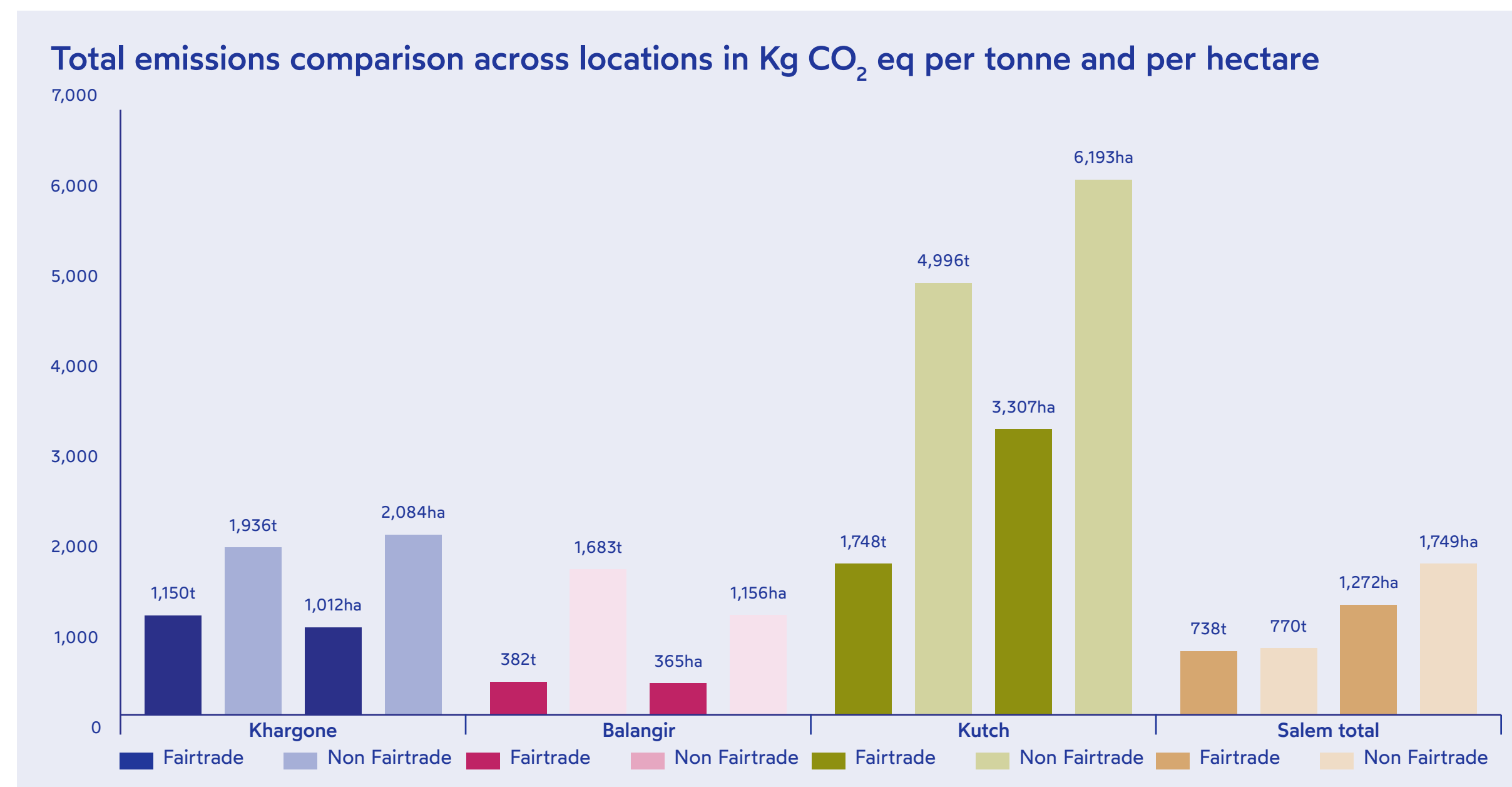
support agroecological and livelihood goals. They also serve to build consumer support for Fairtrade producers and make Fairtrade products more competitive in the market. In addition to financial contributions from grants, more Fairtrade sales means more premiums and their associated benefits to producers.

The work Fairtrade does with Cool Farm Tool helps redirect carbon initiatives towards an insetting approach, where companies that have set greenhouse gas targets (SBTi or similar) can invest in carbon reduction in their supply chain.

From the Cool Farm Tool study in cotton:

## Role of the Cool Farm Tool

With Cool Farm Tool analysis, Fairtrade products can become more competitive in the market and more fairly compensated while gaining better sustainability credentials.



<sup>1</sup> Defined via Fairtrade Minimum Prices, Fairtrade Premium, and/or Fairtrade Living Income Reference Price

<sup>1</sup> By comparison typical yield (kg lint/ha) in India: 511, China 1581, USA 972



Clockwise from the top: Alice Bolaños, producer of Coopevictoria cooperative in Costa Rica. CLAC, David Quesada, producer of Coopevictoria cooperative in Costa Rica. CLAC, Coopevictoria cooperative in Costa Rica. Credit = CLAC

### Cool Farm Tool study in sugar

	KG CO <sub>2</sub> eq / kg sugar	After accounting for emissions displaced by electricity produced from sugar biomass	Notes
<b>Mauritius</b>	0.36	-0.17	Minimum waste: Almost every by-product is reused in the production cycle and to produce sugar, drinkable alcohol, ethanol, food grade CO <sub>2</sub> , biofertilisers and electricity. Fairtrade co-ops are piloting a biofertiliser programme using crop residues to further reduce the emissions from sugar production.
<b>Eswatini</b>	0.548	0.389	Producers in Eswatini using drip irrigation have the lowest sugar carbon and water footprint
<b>Costa Rica</b>	0.69 and 0.65 depending on coop		Whilst it is common practice in Costa Rica to burn sugarcane crop residues, many Fairtrade producers have abandoned this practice. Fairtrade's agro-ecology policy encourages and supports the entire industry to follow their example.
<b>Belize</b>	1.036	0.691	Estimates of soil carbon sequestration amount to 12.7 kg CO <sub>2</sub> per tonne of sugarcane produced – 28% of the total emissions per tonne.
<b>Fiji</b>	0.54	0.48	The net carbon stock removal in those coops studied amounts to -9.16 kg CO <sub>2</sub> eq per tonne of sugarcane, mostly due to organic fertilisation and plant stone sequestration. In the logic of carbon emissions and sequestration, a positive value means emissions and a negative value means sequestration.

### Studies assessing agricultural production only

	KG CO <sub>2</sub> eq / kg sugar	Notes
<b>El Salvador</b>	0.025 (only ag production)	Recommendation to reduce crop residue burning. Fertiliser use in El Salvador is the most efficient (kg of fertiliser per kg of product) due to excellent resource management and the agro-climatic conditions enjoyed by producers.
<b>India</b>	0.019 (ag production only)	Mawana mill in Uttar Pradesh uses press mud from the factory, spent wash from the ethanol distillery and harvested rainwater to produce high quality, low emission organic fertiliser.

# Kynetec

## Goal

To support scope 3 emissions management and reduction with annually collected primary data collected from a statistically representative sample of farmers for each commodity/country.

## Results

Depends on client use.

## Crop(s)

**Crops:** Apple; Barley, Spring; Barley, Winter; Coffee; Cotton; Dry Beans; Grapes / vine; Green Peas; Maize; Sweet; Oats, Spring; Oranges; Peanuts; Potato; Pumpkin; Rape, Spring; Rape, Winter; Rice; Rye, Winter; Snap bean; Sorghum millet; Soybean; Sugar beet; Sugarcane; Sunflower; Triticale, Winter; Wheat Durum; Wheat, Spring; Wheat, Winter.

## Livestock

Beef, Dairy, Swine, Poultry (Eggs and Meat).

## Region(s)/ Country(s)

Argentina; Australia; Brazil; Canada; China; Denmark; France; Germany; Hungary; India; Indonesia; Italy; Mexico; Poland; Romania; Russia; South Africa; Spain; Thailand; Turkey; United Kingdom; USA; Vietnam.

Kynetec deployed Cool Farm Tool in both v1 and v2 over 3 million times to assess carbon emissions and water footprints for 30 crops and livestock commodities in 23 countries. This data enables clients to calculate carbon footprints by using primary data collected from a statistically representative sample of farmers for each commodity in each country.

The data is collected from farmers at field level and this enables Kynetec to estimate commodity crop/livestock production emissions at high levels of geographic resolution (1km grid square, county, state, national). This solves companies' needs for data. Kynetec sustainability data can feed into other environmental impact models and be used for other environmental assessments (biodiversity, soil erosion...).

These results are then useful in:

- Reporting Scope 3 emissions and water use
- Calculating baselines and the potential for additionality
- Directing carbon reduction/ removals for insetting and offsetting
- Calculating CO<sub>2</sub> eq reductions, when combined with data collected from farmers enrolled in carbon programme (MRV/ MRV-lite)
- Contributing agriculture data to food-label initiatives
- Claiming 45Z tax credits in USA
- Marketing and consumer communication

The Cool Farm Tool results describe above are a subset of Kynetec work to collect a broader base of data in over 80 countries. The company measures more than 50 countries and over 90 crops annually with their FarmTrak tracking panels and thus FarmTrak Sustainability (which utilises Cool Farm Tool) can be easily expanded.

In addition, using this data and the Cool Farm Tool, Kynetec has been able to develop software to show the interplay of different regenerative practices and how they impact overall farm performance and economic sustainability. As the name suggest it focuses is on regenerative agriculture practices such as adoption, cover crops, tillage, fertilisers and carbon programme enrolment.

While the positive impacts of the data and software described here can only be reported by Kynetec clients, the company is part of the Farmers for Soil Health initiative that was the largest winner of the USDA Climate Smart Commodity Grant. In this sense, Kynetec efforts can be seen to make a substantial contribution towards the enrolment of 1.3 million acres of regenerative agriculture in the USA.

Like Cool Farm Alliance, Kynetec exists to help all organisations interested in sustainable agriculture.

### Role of the Cool Farm Tool

The Cool Farm Tool enables the creation of a global database of crop/region specific emission factors based on primary data collected annually.



## Goal

Carbon Net Zero by 2050.

## Scale

1,000+ assessments completed in these countries.

## Product(s)

Dairy.

## Region(s)/ Country(s)

Australia, Belgium, Brazil, Italy, Spain, USA, Poland, South Africa and Turkey.



# Lactalis

The Lactalis joined the Cool Farm Alliance in 2021 as part of its journey towards Carbon Net Zero by 2050.

Lactalis uses the Cool Farm Tool in several countries to assess the carbon footprint of direct partnering farms. The first group of countries to start using the tool were Australia, Belgium, Brazil, Italy, Spain and the USA, and more recently Poland, South Africa and Turkey. Between 2021 and 2022, the company completed more than 1,000 assessments in these countries. Lactalis is now continuing in other countries.

For Lactalis, performing carbon footprint assessments with Cool Farm Tool is the starting point for understanding the most significant sources of greenhouse gas emissions. The next step is identifying key opportunities for improvement to propose potential reduction plans to partnering farms.

Use of Cool Farm Tool is also changing the role of Lactalis' teams in the field and building skills in this complex issue. The company sees the tool as a way of giving the sector a voice. Only by immersing itself in the subject can the company understand the role it, as an actor in the dairy sector, can play in mitigating climate change. Lactalis will continue to use the Cool Farm Tool as it works towards a sustainable dairy farming model that benefits the planet and the sector, economically and socially.

### Role of the Cool Farm Tool

Through quantification, The Cool Farm Tool opens a window into understanding the sources of greenhouse gas emissions and what the company can do to support partnering farms.



## Goals

- Reduce CO<sub>2</sub> eq by 25% by 2030.
- Implement regenerative agriculture practices across 100% of McCain potato acres by 2030.

## Results

- Scenario tool that allows regional teams to review the carbon reduction potential of certain management changes.

## Crop(s)

Potato.

## Region(s)/ Country(s)

All continents except Antarctica.

## Links

[Website](#), [Scorecard](#).

# McCain

To achieve carbon reduction, and continue to make progress, the company has developed an internal, global methodology to calculate carbon footprints on a field- by-field basis. This tool uses the Cool Farm Tool API. The results offer clear guidance on the sources of the emissions and indicate where McCain could reduce emissions most effectively per field, region, or country. These insights drive actions within the company's growing regions, empowering McCain to reach its commitment to reduce CO<sub>2</sub> eq by 25% by 2030.

Further, to review the impact of potential measures, McCain has created a scenario tool that works on aggregate data to allow regional teams to review what certain management changes yield in terms of carbon reduction. This tool can model changes in fertiliser application rates, nitrogen inhibitors, changes in irrigation, transportation, or storage. For example, a scenario that models the use of nitrogen inhibitors shows a potential 9.16% reduction in CO<sub>2</sub> eq per ha (see image).

McCain's data analysis and scenario tools provide insights for informed decisions about regional greenhouse gas mitigation strategies. This has enabled, McCain to initiate a variety of projects to reduce CO<sub>2</sub> eq. Some examples include: usage of biodiesel for transportation, replacing CIPC sprout suppressing treatments with ethylene, changing the fertiliser product type, and installation of solar panels on potato storages.

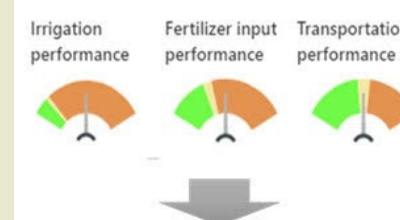
Due to fluctuating weather patterns, there has been an increase in demand for water in key growing regions. Together with reduced yields in crop year 2023, the CO<sub>2</sub> per ton increased compared to previous crop years. To meet the carbon reduction commitment, McCain is actively rolling out tailored emission reduction initiatives, along with implementation of regenerative agriculture agenda globally.

### How does Cool Farm Tool data support our transition?

#### Reduce our emissions by 25% in 2030

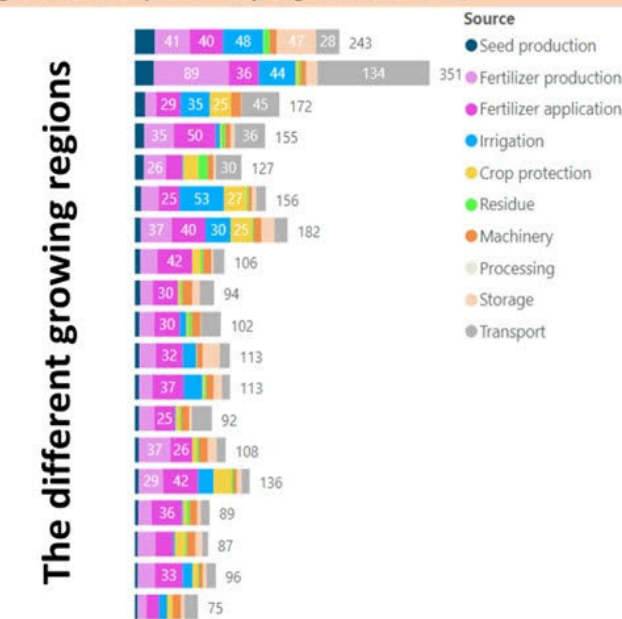
#### Calculated by CFT via API:

Field by field Co2 calculations with global, regional- and grower specific insights



#### Implementing regenerative agricultural practices across 100% of McCain potato acres by 2030

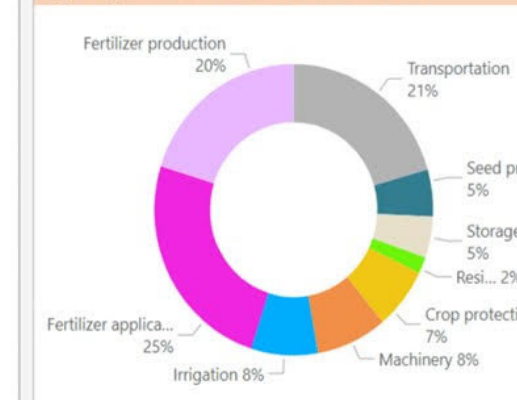
#### Kg co2/Ton of product by region and source



#### Global Co2/ton emissions over the crop years



#### Kg Co2/Ton % contribution of sources



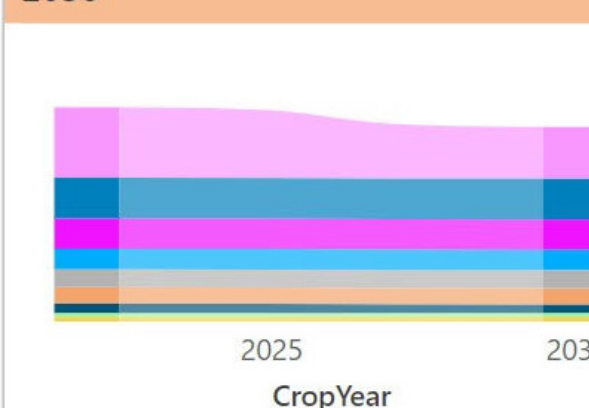
#### kg Co2/hectare for fertilizers in scenario by 2030



#### % Co2/hectare difference scenario

**-9.16%**

#### Co2/ha implementing scenario by 2030



## Role of the Cool Farm Tool

The Cool Farm Tool enables setting and achieving emissions reductions targets through detailed analysis and scenario modelling.

McCain's custom tool, the first of two data dashboard examples included in this report, enables the company to analyse results by emissions category, by field, region, country, continent or year and model reduction scenarios.



# Soil Capital

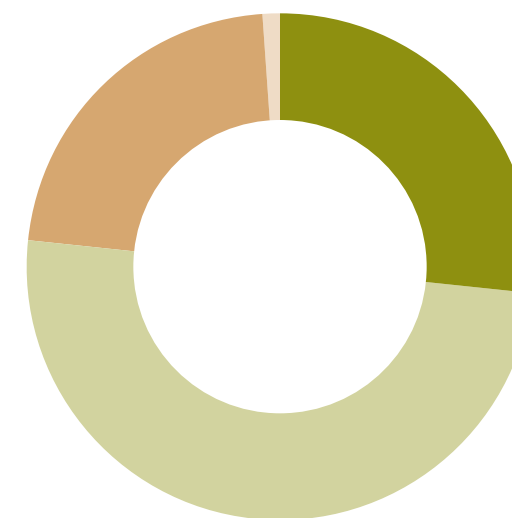
In 2020 Soil Capital launched its regenerative agriculture transition programme, which rewards farmers for their ecosystem services and critical contribution to a healthy planet and society.

Over two annual cycles, external auditors have verified emissions reductions and enhanced removals totalling more than 180,000 tonnes CO<sub>2</sub> eq, achieved by around 400 large scale arable farmers in Europe.

The combination of payment and agronomic support seems to work. With the combination of the Cool Farm Tool for quantification and Soil Capital's programme, more farmers are implementing regenerative agriculture practices and finding that these practices result in carbon, biodiversity, water and food quality co-benefits.

The programme started with 100 farmers in 2020 and the fact that it grew to over 1000 in 2023 and spread across France, Belgium and the UK shows the pull of payments as an effective incentive. The farmers enrolled tend to implement not one but multiple soil improvement practices. Programmes that pay for practice adoption rather than performance might miss the opportunity to encourage and reward farmers for combinations of practices that work holistically for their fields and farms. The latest data shows that more than 75% of carbon removal certificates generated on fields were the result of at least two different soil improvement practices and more than 25% resulted from at least three improvement practices. Importantly, 75% of participating farmers recorded improvements in their greenhouse gas results at a median rate across all farms and all years of 0.23 tonnes CO<sub>2</sub> eq per ha per year.

Soil Capital's agriculture transition program leaves farmers in full control over decision-making of which set of practices to implement while supporting them through tailored advice and agronomic expertise. This allows for ownership and for practice change that is adapted to local contexts.



More than 75% of removal certificates generated on fields with 2 regenerative practices

3 Practices	26.8%	1 Practices	21.1%
2 Practices	50%	0 Practices	1.09%

## Role of The Cool Farm Tool

Cool Farm Tool quantification contributes to the monetization of climate impacts resulting from regenerative practices.



Credit: Soil Capital"



## Goal

To support farmers to reduce emissions and increase greenhouse gas removals via a performance-based regenerative agriculture transition programme delivering verified Scope 3 reductions.

## Impact

- 180,000 tonnes CO<sub>2</sub> eq in reductions and enhanced removals.
- €4'000'000 paid to farmers.

## Scale

Supporting 1000+ farms.

## Crop(s)

Wheat, legumes, barley, rapeseed, corn, sunflower, sugarbeet, oats, potatoes, flax, lentils, spelt.

## Example partners

Royal Canin (Mars), Cargill, Cefetra, Nestle, Roquette, FoodDrinkEurope.

## Region(s)/ Country(s)

France, Belgium and UK.

## Links

[Website](#), [GHG and Verification Reports](#), [Impact blog](#).

# Solidaridad

## Goals

1. **Act:** facilitate the implementation of solutions with coffee growers at the centre.
2. **Educate:** build understanding of agricultural greenhouse gases.
3. **Enable:** propose quantified solutions within the reach of coffee growers.

## Results

- 21,942 tonnes of CO<sub>2</sub> eq reduced on 16,840 ha – measured in the programme Cool Farm Tool.
- Estimated from programme: 2 million tonnes CO<sub>2</sub> eq avoided, 2018-2021.
- Estimated from programme: 49,000 tonnes CO<sub>2</sub> eq sequestered 2018-2021.
- 1,720 producers started implementing climate smart agricultural practices.
- 25,000 ha under sustainable production systems.
- Carbon footprint literacy built among farmers throughout company supply chains contributing to on-going emissions reductions and learning.

## Scale

- 506 farmers from six regions of Colombia – feeding into a dashboard.
- 2,640 (additional) farmers in Honduras and Colombia – providing comparative insights.

## Crop(s)

Coffee.

## Typical farm size

1-3 ha.

## Average yield

0.6-1.0 metric tonnes/ha of green bean equivalent (GBE).

## Region(s)/ Country(s)

Honduras, Mexico, Peru, Colombia - Regions: Antioquia, Caldas, Huila, Nariño, Risaralda, Santander and Tolima

## Links

[Coffee Forest and Climate Agreement](#), [Sustainable Coffee Impact Report Dashboard](#), [Dashboard report](#), [Todos al Agua](#).

Solidaridad facilitates action in supply chains to mitigate climate change. It also builds the enabling conditions for this action by building coalitions to harness the collective power of multi-stakeholder initiatives and educating farmers and other supply chain partners. This includes conducting Cool Farm Tool data analysis to determine the most appropriate and strategic practice changes for farmers in different regions.

## Act

Facilitate the implementation of solutions with coffee growers at the centre.

**Example:** Climate Smart Agriculture programme led by Solidaridad in Colombia.

Between 2013 and 2021, Solidaridad led the implementation of a Climate Smart Agriculture programme, which sought to make coffee crops more resilient to climate change, in turn increasing productivity, improving soil health, reducing the carbon footprint, and protecting the water. Some of the practices promoted by this programme were: increasing the density of coffee trees planted per ha; planting shade trees to reduce soil erosion; improved fertiliser use to reduce greenhouse gas emissions; and more efficient post-harvest processes to reduce water use and pollution. Solidaridad used the Cool Farm Tool to both define the baseline and to estimate the reductions in the carbon footprint of the farms linked to the programme.

Between 2016 and 2021, 3,265 Colombian farmers adopted climate-smart agriculture practices. The practices with the greatest adoption were the establishment of shade, the improvement of processing practices (especially reducing the volume of water used, as well as the impact of the waters resulting from the wet mill) and the implementation of soil conservation practices such as maintaining soil with permanent cover, sowing in the opposite direction to the slope, and additions of plant material (harvest residues).

As a result of the adoption of these practices by producers, project implementers estimate that approximately 21,942 tons of CO<sub>2</sub>eq were avoided and around 29,966 tons of CO<sub>2</sub>eq were captured. Quantification done using the Cool Farm Tool.

## Educate

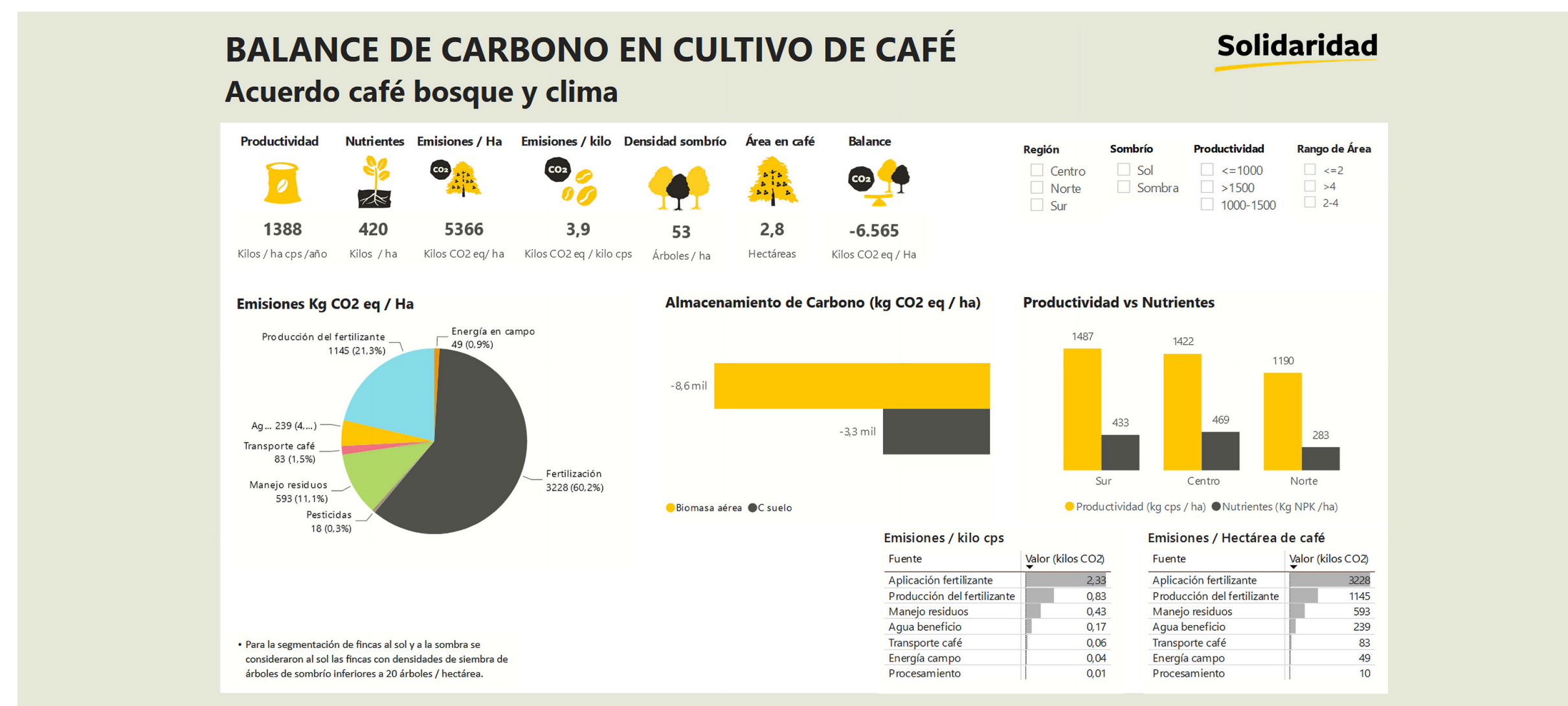
Build understanding of agricultural greenhouse gases

- Training activities for technical teams in carbon measurement
- Guides and teaching tools
- Carbon footprint measurement

**Example:** [dashboard](#).

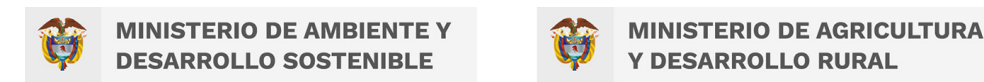
Cool Farm Tool served as a core enabling component to the historic, multi-sector initiative called the, [Coffee Forest and Climate Agreement](#)<sup>1</sup>, a voluntary public/private agreement with 29 signatories (see logo image on the next page) working together towards common objectives to fight climate change and improve forest conservation. This agreement works as a platform and involves the most relevant actors in the Colombian coffee chain. Solidaridad has led this coalition since 2011. A previous iteration of this collaboration was called the Sustainable Trade Platform, which evolved in 2021 to the current agreement.

<sup>1</sup> See also, GIZ supported video presentation of the Coffee, Forest and Climate Agreement



This interactive dashboard, collectively created, provides insights into the relative size of different emissions categories by region, by farm type, by farm size and productivity, providing a reference greenhouse gas analysis for region and subregions.

# Signatories to the historic “Coffee Forest and Climate Agreement” built with the Cool Farm Tool



Comparing the Colombian and Honduran supply chains revealed that fertilization and presence of shade trees are the two factors most responsible for the large difference in carbon footprint between Colombia and Honduras.

Together, the signatories of the Coffee, Forest and Climate Agreement collected Cool Farm Tool data from 506 coffee farms and built a shared interactive (Power BI) dashboard and report defining the region’s baseline insights. This dashboard is for public use and serves as a reference for companies’ own supply chain. It is through the trust built in this space that the Cool Farm Tool has become more useful – as a backdrop for collaborative effort, consolidation, analysis and refinement of data.

**Enable**  
Propose quantified solutions within the reach of coffee growers based on data analysis. Example: Todos al agua program.

The Todos al Agua initiative prioritized acquiring data on the carbon footprint of the RGC Coffee’s main supply chains in Colombia and Honduras during 2022. Through this effort, undertaken in collaboration with Solidaridad and employing the Cool Farm Tool, project partners identified wide variability in coffee footprints between regions. The effort has also enabled partners to analyse the source of this variability and learn from this about which factors make the most difference. Overall, the methodology, enables them to track the impact of their regenerative agricultural practices on carbon footprint indicators.

Proposed solutions based on data analysis include:

- Coffee pulp composting.
- Green fertilisers for coffee cultivation.
- Community agroforestry nurseries.
- Coffee cultivation under agroforestry systems.
- Use of fertilisers with lower nitrogen losses.
- Reduce and treat waste water.
- Promote cover crops.

Country	Number of farmers	Average emissions in kg CO <sub>2</sub> eq per kg of coffee parchment	Average emissions in CO <sub>2</sub> eq per hectare	Productivity kg/ha	Fertilizer kg/ha	Shade tree density trees/ha
Colombia	1,400	3.18	4.18	1,316	960	43
Honduras	1,240	1.92	3.68	1,912	141	66
Regional benchmark from dashboard	506	3.9	5.34	1,388	420	53

**Role of the Cool Farm Tool**  
The Cool Farm Tool enables Solidaridad to estimate the carbon footprint in specific projects and to develop a portfolio of services and products aimed at carbon neutrality. This portfolio serves both Solidaridad projects and companies linked to the Coffee Forest and Climate Agreement, thus amplifying the impact of the Cool Farm Tool.

In 2022, the Cool Farm Alliance Knowledge and Literacy team supported Solidaridad in delivering training and support in utilising the tool.

## Goal

Create a replicable net carbon neutral dairy farm model by 2030.

## Results

- Over 50% reduction in greenhouse gas emissions at Straus Dairy Farm measured against a 2003 baseline.

## Scale

- 13 organic dairy farmers.
- ~8,000 acres.

## Product(s)

Dairy & Pasture Forage.

## Region(s)/ Country(s)

California, US.

## Links

[Website.](#)



# Straus Family Creamery

## Measuring emissions with Cool Farm Tool

The Cool Farm Tool is an essential element to measuring climate impact, progress, and integrity of brand messaging at Straus.

Dairy gate Emissions MT CO <sub>2</sub> e	Baseline (2000) MT CO <sub>2</sub> e	Current (2019) MT CO <sub>2</sub> e	Target (2025) MT CO <sub>2</sub> e
Pastures (grazing & fertilisation)	300	292	250
Manure management	794	90	90
Enteric fermentation	933	933	187
On-farm feed production	50	50	50
Energy & fuels	134	28	28
Carbon farming (sequestration)	0	-382	-555
<b>Total (farm gate)</b>	<b>2,211</b>	<b>1,011</b>	<b>50</b>

Building on the success at Straus Dairy Farm to dramatically reduce emissions from dairy farming, the company has set a goal for all participating farms to produce carbon neutral milk by 2030.

Straus Dairy Farm is the flagship farm of Straus Family Creamery and one of 13 in the company's dairy supply chain. This goal is now built into the dairy suppliers' milk contracts which require timebound climate action. The company is using a combination of practice-based incentives and direct support to supplier dairy farms to reach this goal.

The practice-based incentives of an additional 1-5% on top of premium milk payments are for:

- Carbon farm planning and regenerative soil projects.
- Methane mitigation practices.
- Climate impact measurement and monitoring using the Cool Farm Tool.

In addition, the company provides:

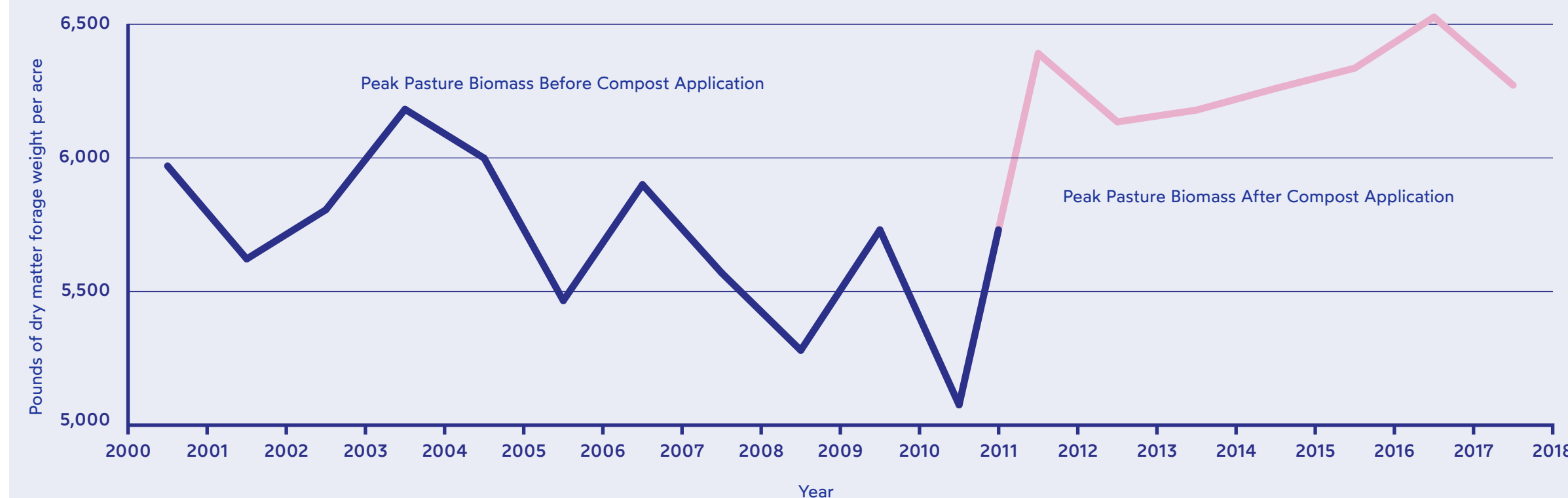
- Climate and farming technical assistance.
- Grant application and administrative support for the finance needed.
- Cost-share payments for required activities.
- Climate solution research and development.
- Policy advocacy.

Straus dairy has done substantial economic modelling to ensure that the guidance and advice they provide will have positive financial implications for their farmers. As the graph shows, the addition of compost results in significant increase in dry matter forage per acre, enough to offset the cost and produce an annual \$100/acre economic benefit.

The practices employed have resulted in strikingly high organic matter percentages in soil on Straus Dairy farm. While typical US farmland measure 3-6% organic matter, Straus farms measure 6-12%.

## Carbon Farming Regenerates Soil.

The Impact of Compost Application at the Straus Organic Dairy Farm



## Climate solutions and on-farm value

Make the economic business case for farmers

In order to reach the goal of producing carbon neutral milk, the company is relying on five key practices:

- Novel micro-anaerobic biodigester technology that can work with small-scale dairies like those in the Straus network to reduce methane emissions by 90% while producing on-farm renewable energy.
- Electrifying the vehicle fleet using the renewable energy generated on-farm.
- Red seaweed fed at a rate of 0.25% daily feed intake. This has the potential to reduce 90% of a cow's enteric emissions.
- Rotational grazing for soil health and carbon sequestration.
- Compost application for soil health and carbon sequestration.



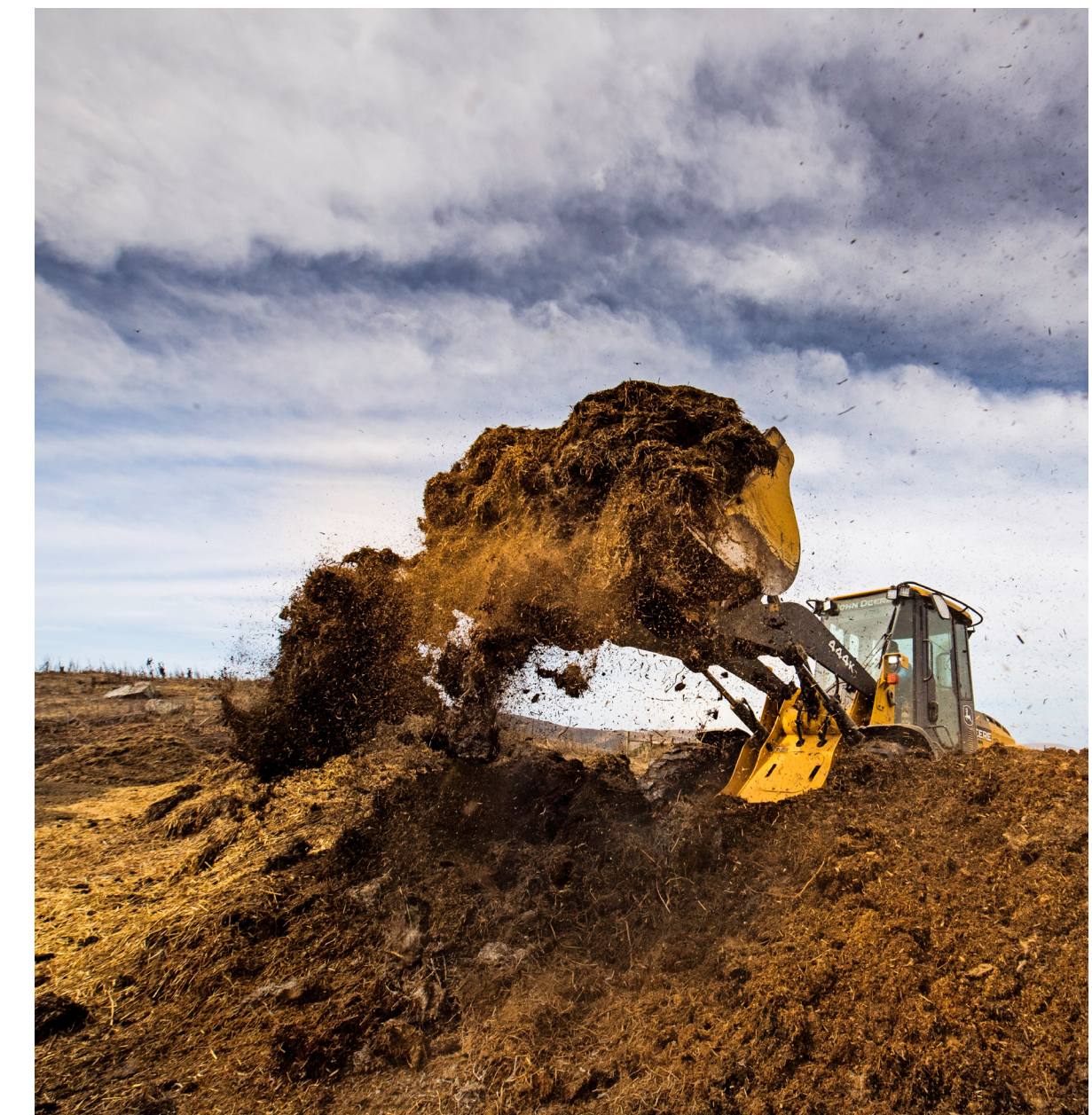
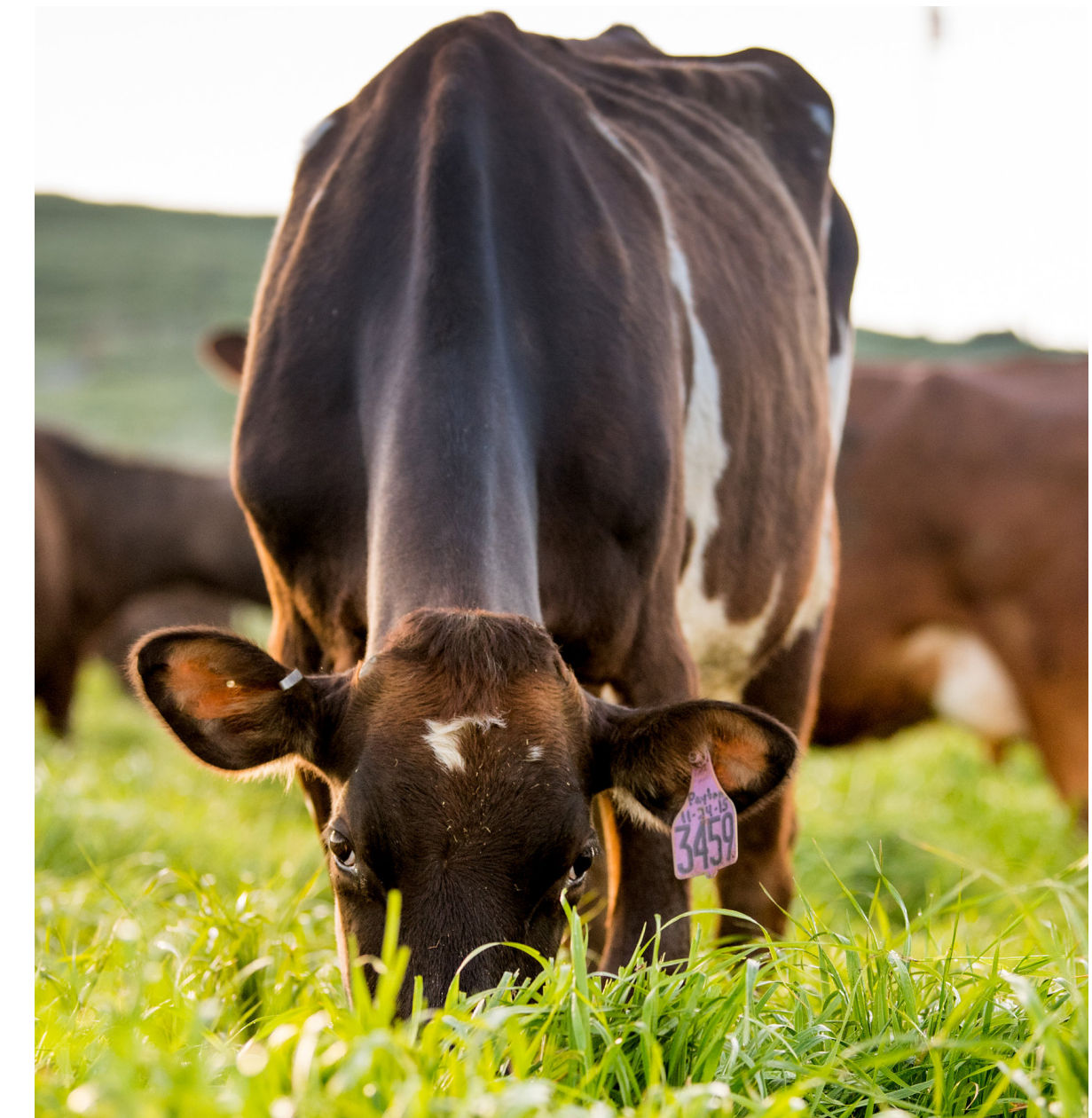
Cool Farm Tool helps quantify, prioritize and ultimately enable climate activity on our path to our 2030 dairy supplier carbon neutral goal.”

Joseph Button, VP of Sustainability and Strategic Impact shared his latest insight.

See also Joseph's interview with the Cool Farm Alliance featured in the [2022 Annual Report](#) (p 20).

### Role of The Cool Farm Tool

The Cool Farm Tool provides climate impact measuring and modelling and enables the company to set and achieve emissions reduction targets.



# Suntory

The Suntory Group is embracing regenerative agriculture with newsworthy projects starting in four different crops and three countries with many more to come.

## UK Barley

With barley being one of the company’s main ingredients, the company has launched a project with Malt supplier Muntons PLC (Muntons), sustainable agriculture and supply chain consultancy Future Food Solutions Ltd (FFS), and local barley farmers in the East Anglia region of the UK. The project has a 50 in 5 goal, to produce barley with 50% lower greenhouse gas emissions within five years.

This project started in 2023 by calculating the baseline of barley greenhouse gas emissions. The results inform efforts to reduce emissions and enhance crop performance. The 16 farmers who have committed 400 acres to the project are looking to improve nutrient levels, texture, water content and biodiversity of the soil and reduced dependency on chemical fertilisers and pesticides through the use of cover crops and no-till farming.

## UK Blackcurrant

Also in 2023, Suntory Beverage and Food in the UK (SBF GB&I) launched a three-year regenerative farming project to shift away from conventional agricultural practices in blackcurrant production in the UK. The project will run on 60 hectares of black currant production in Norfolk growing for Ribena as a test case. Project partners say the key regenerative agriculture principles they plan to use are backed by credible science but have yet to be commercially tested in mainstream perennial fruit production. The goal is to reduce the company’s Scope 3 emissions from blackcurrant production and improve soil health so that it can support plant resilience and increase the amount of carbon it can sequester.

In partnership, the University of East Anglia, SBF GB&I, Suntory Holdings Limited and Soil Ecology Laboratory will focus on minimising external inputs while improving soil, plant and environmental health by:

1. Sampling the sap to provide optimal nutrition, balancing macro and micro nutrients to improve pest and disease resistance
2. Replace conventional inputs with organic fertilisers and crop protection measures
3. Install alleyways and swards with diverse species mixes to nourish the soil and sequester carbon
4. Utilize compost extracts to support soil microbiological restoration.

Learnings should apply to many other crops creating a blue print for supporting farmers through their regenerative agriculture transition.

## Agave in Mexico

Beam Suntory Mexico is working with Casa Sauza and Red BioTerra on a one-year pilot project to maximise carbon sequestration in agave fields - the key ingredient of Casa Sauza's tequila - by introducing native plants that absorb carbon during the day between the rows of agave that absorb carbon at night. If successful, the program could neutralise 50% of Casa Sauza’s emissions by 2026. This builds on Casa Sauza’s work to support the protection and restoration of a sub-basin of the Lerma-Santiago River and promote reforestation, soil conservation and recharging the aquifer.

## Wheat in the United States

In the United States, Maker’s Mark’s became the first distillery in the world to receive recognition from Regenified, a leading agricultural certification, for its progress in regenerative agriculture at its 1,110-acre Star Hill Farm.

**Role of the Cool Farm Tool**  
 The Cool Farm Tool provides baselines, enables informed action planning and scenario modelling and quantifies the benefits of regenerative agriculture.

In 2023, 6 members of the global Suntory team completed the Cool Farm Alliance Certified Advisor training - and they all passed, Congratulations!



## Goals

- Net zero greenhouse gas emissions across the entire value chain by 2050.
- Reduce emissions across whole supply chain by 30% by 2030 from 2019 baseline.

## Results

None yet. Three regenerative agriculture projects launched with greenhouse emissions reduction and carbon sequestration potential.

## Scale

Pilot scale.

## Crop(s)

Barley, Wheat, Blackcurrant, Agave.

## Region(s)/ Country(s)

UK, Mexico, USA.

## Links

[UK Barley press release](#), [UK Barley media](#), [UK blackcurrant press release](#), [UK blackcurrant Food Navigator](#), [UK blackcurrant FarmingUK](#), [MX Agave press release](#), [MX Agave BeverageDaily](#), [Sustainability Report \(p. 16\)](#), [US Wheat](#).

## Goal

To use the Sustainable Agriculture Code (SAC) (established in 2010) and Principles of Regenerative Agriculture (established in 2021) to encourage practices that nourish soil, biodiversity, water and climate stability.

## Results

By 2022

- 81% of key agricultural materials were sourced in compliance with Sustainable Agriculture Code.

Results in partnership with tomato supplier Agraz:

- 37% decrease in greenhouse gas emissions per kg tomatoes.
- 0.27% increase in soil organic matter, up from 1.00% in 2020.
- 173% increase in pollinators.
- 27% increase in wildflower diversity.

## Scale

- 1.5 million hectares of arable land, forest and oceans.

## Crop(s)

All major crops.

## Region(s)/ Country(s)

Global.

## Links

[Website.](#)

# Unilever

Unilever, one of the world's largest consumer goods companies, has been using the Cool Farm Tool in its global supply chains since 2011 including using the Cool Farm Tool to collect data on aspects of the Sustainable Agriculture Code and the Regenerative Agriculture Principles.

In a 2018 study of global farm-specific data from 890 observations across 14 countries<sup>1</sup>, Unilever saw a 25% reduction in emissions of processed tomato farmers over a three-year period (2013–2015). This tomato supply represents approximately 3% of annual global production of field-grown tomatoes, and includes the top five producing countries (US, China, Italy, Spain, and Turkey).

## Unilever: Sustainable agriculture code

Unilever released the first version of its **Sustainable Agriculture Code** in 2010 with the intention of codifying what sustainable agriculture meant in practice, allowing it to drive **sustainable development** and responsible sourcing practices along its supply chains. The code provides a consistent set of criteria on a full spectrum of social, environmental, and economic issues, for assessing the sustainability of suppliers and the farmers who supply them. By 2022, Unilever sourced 81% of key agricultural materials "sustainably."

All suppliers of sustainably sourced raw materials must demonstrate compliance with the code through a third-party auditing process. If a certification body finds that the supplier and farmers data are compliant with the requirements of the code, they certify them to supply Unilever with sustainably sourced raw materials. Annual surveillance audits ensure continuous compliance. Auditors collect compliance data using the TELUS (formally Muddy Boots) Greenlight Assessment Software.

Suppliers must also provide metrics data on a range of code requirements to check the impact of sustainable practices.

<sup>1</sup> <https://pubs.acs.org/action/showCitFormats?doi=10.1021/acs.est.7b04361>

The Greenlight Assessment App integrates with Cool Farm Tool through an Application Processing Interface (API), enabling score generation on a number of sustainability areas, including greenhouse gas emissions, water use and nitrogen use efficiency.

## Unilever: Assessing the impact of regenerative agriculture

Building on the Sustainable Agriculture Code, in 2021, Unilever published its **Regenerative Agriculture Principles**. These aim to help farmers implement agricultural practices that can nourish the soil, increase farm biodiversity, improve water quality and climate resilience, capture carbon, and restore and regenerate the land. The farmers in these programmes use Cool Farm Tool to measure the impact of regenerative practices.

Unilever designed several projects to kick off the implementation of these principles, addressing the unique challenges and opportunities of different crops and landscapes, while also providing a framework to measure the impact of implementation.

One of these projects – for the Knorr brand – partners with Spanish tomato supplier Agraz. The project aims to help farmers in the Badajoz region protect their crops from the effects of decreased rainfall and depleted underground water reserves, as well as protect the area's biodiversity.

The first set of Agraz's Cool Farm Tool results are very encouraging. In 2022, the project saw a 37% decrease in greenhouse gas emissions per kg of tomatoes, as compared to emissions before the project. Soil organic matter increased from 1% in 2020 to 1.27% in 2022; the more organic matter soil contains, the more fertile it is and the more carbon it can absorb. There was a 173% increase in pollinators and a 27% increase in wildflower diversity in the areas farmers had planted wildflower borders.

New, cutting-edge sensors and soil probes for the irrigation systems inform farmers about the precise amount of water needed, resulting in significant financial savings and a more resilient production system. In parallel, farmers planted wildflower borders to increase biodiversity.

The first set of projects lay the ground for an extensive scaling-up of regenerative agriculture in Unilever's supply chain. By 2030, Unilever aims to have expanded to more than 100 programmes, contributing to Unilever's commitment to restoring and regenerating 1.5 million hectares of land, oceans and forests.

## Role of the Cool Farm Tool

Unilever builds sustainability into procurement by integrating the Cool Farm Tool into its Sustainable Agriculture Code. The tool also quantifies the benefits of regenerative agriculture.



Jose Manuel Esteban, Sustainability Manager, Agraz.

# Impact history

Cool Farm Alliance members use the Cool Farm Tool in a wide variety of ways to support their sustainability programmes. They use the tool to engage, to baseline current practices, identify hotspots, design improvement programmes and projects, support decision making, monitor and track progress over time, benchmark suppliers, capture data for external reporting against Science Based Targets (SBTi), develop product attributes to sell premium products, or illustrate the synergy between more resilient farming and greenhouse gas emissions mitigation. These are just some of the ways that members and project partners use the Cool Farm Tool.

## Previously reported impacts

All of Costco's organic egg producers in the US used the Cool Farm Tool to quantify greenhouse gas emissions from their operations. Through use of the tool, and by encouraging dialogue and sharing of good practice among producers, the company observed a 25% reduction in greenhouse gas emissions. This achievement was made in 3 years without emission reduction targets being set.

Solidaridad worked with 7,361 coffee farmers in Mexico, Colombia, and Peru, achieving yield improvements of 21% and at the same time a reduction of 27,869t CO<sub>2</sub> eq and sequestration of 97,818t CO<sub>2</sub> eq through the introduction of shade tree production systems and climate resilient varieties, an increased density of coffee trees and soil fertility and especially improved waste-water management practices.

A study supported by the International Centre for Tropical Agriculture (CIAT) in Central America shows that agroforestry (polycultural) coffee systems can conserve on average 81t CO<sub>2</sub> eq per ha in comparison to monocultures with an average of 27t CO<sub>2</sub> eq per ha, thus being able to reduce about 67% more greenhouse gas emissions.

Nestlé started in 2018 to establish a baseline and plans to use the Cool Farm Tool on an annual basis to support the company in reducing greenhouse gas emissions by 50% between 2018 and 2030. Initial results have already helped to identify a list of priority interventions per fresh milk market.

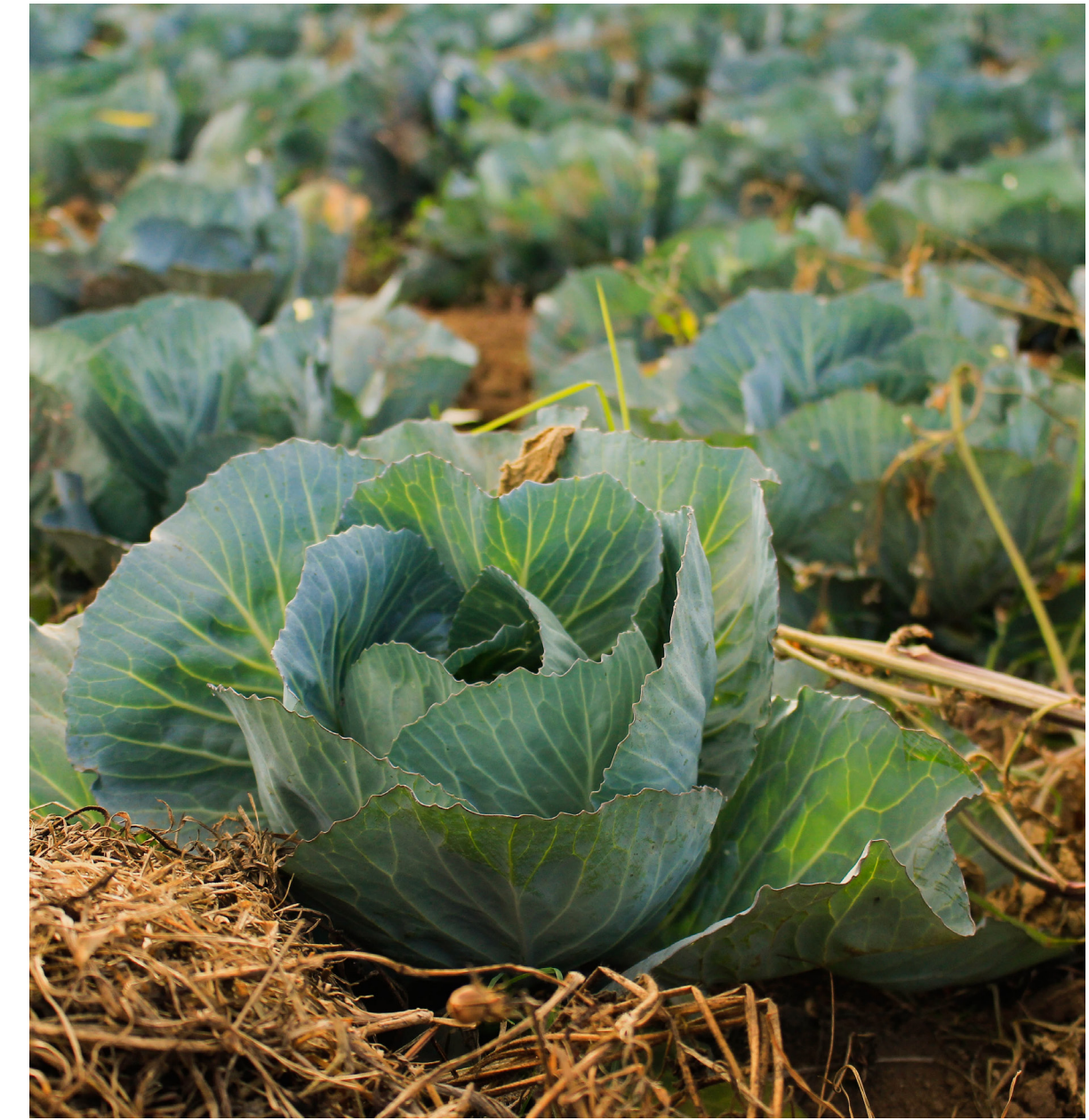
Danone was able to show an average reduction of emissions per FPCM of 12% within one year on the sample farms in the 13 countries in which they rolled out the Cool Farm Tool. This was achieved through tackling the main levers of greenhouse gas emissions through improved feed and energy efficiency, manure, and herd management as well as the promotion of carbon sequestration in the feed production.

The assessment of greenhouse gas emissions in cotton production, carried out by Marks & Spencer and World Wildlife Fund on 48 sample plots, showed that traditional cultivation uses almost twice as much fertiliser and higher doses than better managed plots. By using the Cool Farm Tool, the project partners could illustrate that better management practices and especially improved fertiliser

management can reduce CO<sub>2</sub> eq per ha and per kg of seed cotton produced by 65% without sacrificing yield. Average greenhouse gas emissions of seed cotton from traditional cultivation were 3,236kg CO<sub>2</sub> eq per ha and 1.5kg CO<sub>2</sub> eq per kg, while for plots with better management the emissions were 1,032kg CO<sub>2</sub> eq per ha and 0.43kg CO<sub>2</sub> eq per kg.

Soil & More used the Cool Farm Tool at an on-site visit of a tea cooperative in India that was struggling with yield decrease of 30-40%. By using the Cool Farm Tool, farmers gained a better understanding of carbon dynamics and were motivated to utilize local resources that were previously part of a waste stream. The farmers started to use crop residues to make compost and apply it to the soil. After one year, production was up by 20%, water holding capacity in the soil increased 40% and greenhouse gas emissions went down by 30%.

At Overbury Farms, Jake Freestone used the Cool Farm Tool to understand the key drivers of greenhouse gas emissions and monitor the impact of changes in his management practices like cover cropping, no-till and application of organic amendments. He was thus able to show a 32% reduction in fuel use, £270,000 saving in capital in 10 years not being reinvested in new machinery - 250 horsepower saving - and 55% reduction in CO<sub>2</sub> emissions. The Cool Farm Tool calculations showed a considerable reduction in emissions from the conversion of conventional farming to sustainable or regenerative organic agriculture.





# About Cool Farm

The Cool Farm Alliance is a science-led, not-for-profit membership organisation (community interest company) that owns, manages, and improves the Cool Farm Tool and cultivates the leadership network to advance regenerative agriculture at scale.

The Cool Farm Tool is an on-farm greenhouse gas calculator now used by most of the world's largest food and beverage companies to reveal changes that farmers can make to reduce emissions and sequester carbon with co-benefits for soil quality, water, biodiversity, and farm economics.

The purpose of the Cool Farm Alliance is to put knowledge in the hands of farmers and empower the full supply chain to support agro-ecological restoration by providing a respected, standardized calculation engine to measure and report on agriculture's impact on the environment. The Cool Farm Tool has established widely endorsed, science-based metrics for water, climate, and biodiversity.

The Cool Farm Tool engages and empowers users through quantification and modelling "what-if" scenarios. The Cool Farm Tool is simple to use yet scientifically robust in the complex arena of carbon accounting, characterised by:

- It is farmer focussed, reflecting common farm management practices and requiring only input data a farm manager would typically have easily to hand.
- The use of robust, deterministic site sensitive, peer reviewed models and methods to calculate greenhouse gas emissions, carbon sequestration and other environmental impacts of agricultural activities.
- Uncovering in a practical and pragmatic way, practices and actions which are associated with positive (and negative) environmental performance.

By utilising the tool to support Scope 3 greenhouse gas calculations, companies can track greenhouse gas emissions across their supply chain.

The Cool Farm Tool is used by tens of thousands of users in 150 countries supplying global markets.

## Origin story

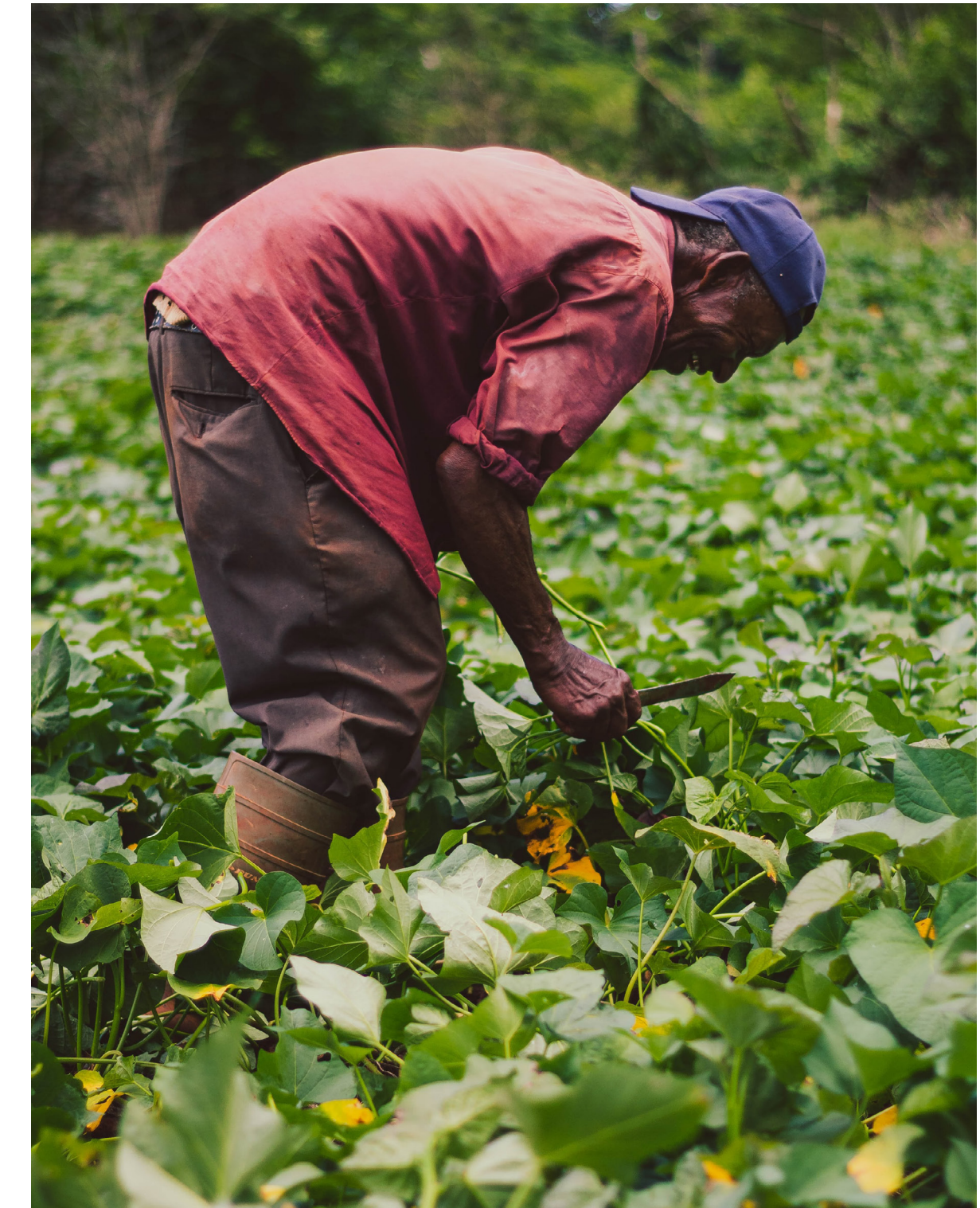
In the autumn of 2008, the multinational consumer goods company Unilever was looking for a way to take the conversation about the climate change mitigation potential of agriculture to fields and farms everywhere in its global supply chains.

They turned to Prof. Pete Smith, professor of soils and global change at University of Aberdeen and coordinating lead author of IPCC's 2007 assessment report, with the question: Would it be possible to take the global aggregate picture of climate change mitigation potential, and "reverse engineer" the data into a tool that provides tailored results based on the fields and farm characteristics entered (crop, soil type, climate etc)?

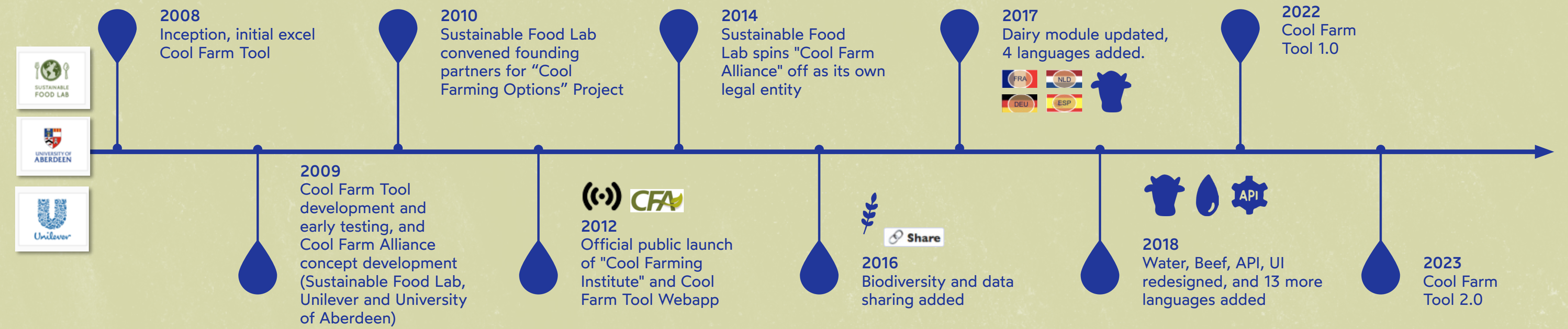
They combined a simple greenhouse gas calculator Unilever had built with Aberdeen's research and the Cool Farm Tool was born.

Unilever never intended to do this alone and turned to the Sustainable Food Lab to convene, coordinate, and facilitate a consortium of like-minded companies from across the world to work together on bringing in the farmers' knowledge and expertise. The project initiators wanted to know not just what was academically feasible but what was possible when considering a farmer's perspective on what is practical and pragmatic. And they wanted to do this at a global scale. Thus, the Cool Farm Alliance was born.

The intent has always been the same, to is to motivate, measure, encourage and reward good practice and to teach and facilitate learning across sectors - from the board room to the field, from the ivory tower to the halls of government.



## A brief history of the Cool Farm Alliance



# Cool Farm Tool as driver for change

While reductions in greenhouse gas emissions and increases in soil carbon in global supply chains is a key impact target, the Cool Farm Tool is clearly instrumental in other ways: giving members the confidence to design and enact programmes and projects with farmers and other supply chain partners, building more collaborative working relationships up and down the supply chain as well as sideways, between peer companies, and across sectors - between academic and private sector actors. The Cool Farm Tool is instrumental also in building capacity among farmers in technical conversations about farming and greenhouse gas emissions so they can participate as equals in these conversations. The Cool Farm Tool helps to valorise the work of early adopters so they can be fairly recognized, serves as a backdrop for technical/agronomic support and education, enables companies to gain more insight into the risks, trade-offs, very real pressures, challenges and joys that come with farming. Taken together, the tool provides a framework for collective impact, tracking progress, and more.

The Cool Farm Tool holds promise. It is up to the community, to put it to work in helping to restore climate stability, ecosystem health and a more just and equitable society.

## Cool Farm Alliance

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## Get in touch

If you're ready with an impact story of your own, please get in touch so we can feature it in the next edition of this document.

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