Commodity masterclass

Potato

November 7th 2024

THE CONSUMER GOODS FORUM - ANTITRUST CAUTION

"The Forum shall not enter into any discussion, activity or conduct that may infringe, on its part or on the part of its members, any applicable competition law. By way of example, members shall not discuss, communicate or exchange any commercially sensitive information, including non-public information relating to prices, marketing and advertising strategy, confidential individual company level innovation and R&D projects, costs and revenues, trading terms and conditions with third parties, including purchasing strategy, terms of supply, trade programmes, or distribution strategy."

MESSAGE TO NEW MEMBERS OR PEOPLE TAKING PART FOR THE FIRST TIME:

"Please take note that taking part in the Forum is subject to having read and understood the Forum's competition guidelines and list of Do's and Don'ts. If you have not yet done so, please do so now."

https://www.theconsumergoodsforum.com/wp-content/uploads/2023/09/The-Consumer-Goods-Forum-2023-Competition-Law-Governance-Guidelines.pdf

Agenda

- Provide overview on **commodity context**
- Share **regional specificities**
- Present **solutions** + case studies
- **Questions, answers & next masterclass** in series

Unrecorded section

- Discussion on **opportunities to partner & scale** for impact

Who is PepsiCo?

+ 2023 PERFORMANCE

$91B+ net revenue, organic growth **9.5%**

+ SCALE

200+ countries & territories and **1,000+** manufacturing sites

+ PEOPLE

~318,000 employees

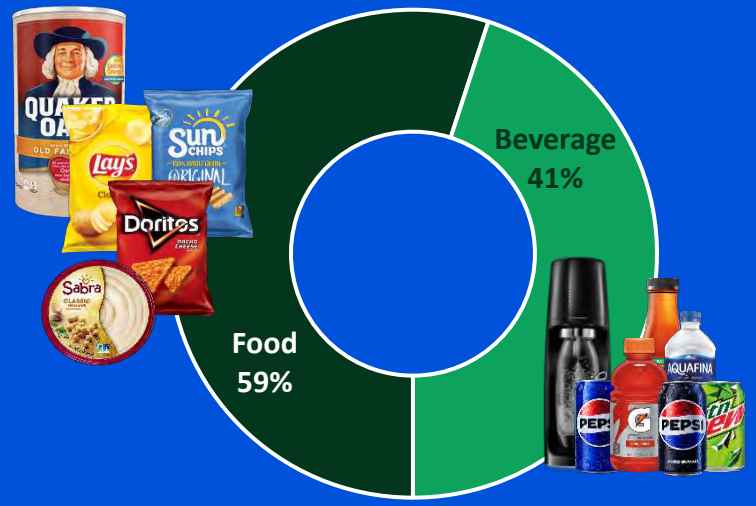
~100,000 suppliers

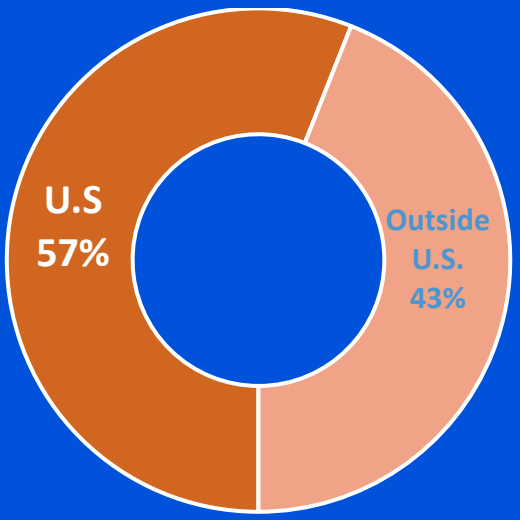
+ BRANDS

Many iconic billion-dollar brands

2023 Mix of Net Revenue

CATEGORIES





GEOGRAPHY

pep+ overview

pep+ is our strategic end-to-end transformation that places sustainability at the center of how we will create growth and value by operating within planetary boundaries and inspiring positive change for the **planet and people**.

pep+ HAS 3 INTERCONNECTED PILLARS:

POSITIVE AGRICULTURE

We are working to source our crops and ingredients in ways that restore the earth and strengthen farming communities.

POSITIVE VALUE CHAIN

We are helping to build a circular and inclusive value chain.

POSITIVE CHOICES

We are inspiring people through our brands to make choices that create more smiles for them and the planet.

PepsiCo is heavily grounded in Agriculture

35+ agricultural crops & ingredients from 60+ Countries

7MM+ acres of farmland in our agricultural footprint

Tens of thousands of farmers worldwide provide crops and ingredients

83 regenerative agriculture demonstration farms

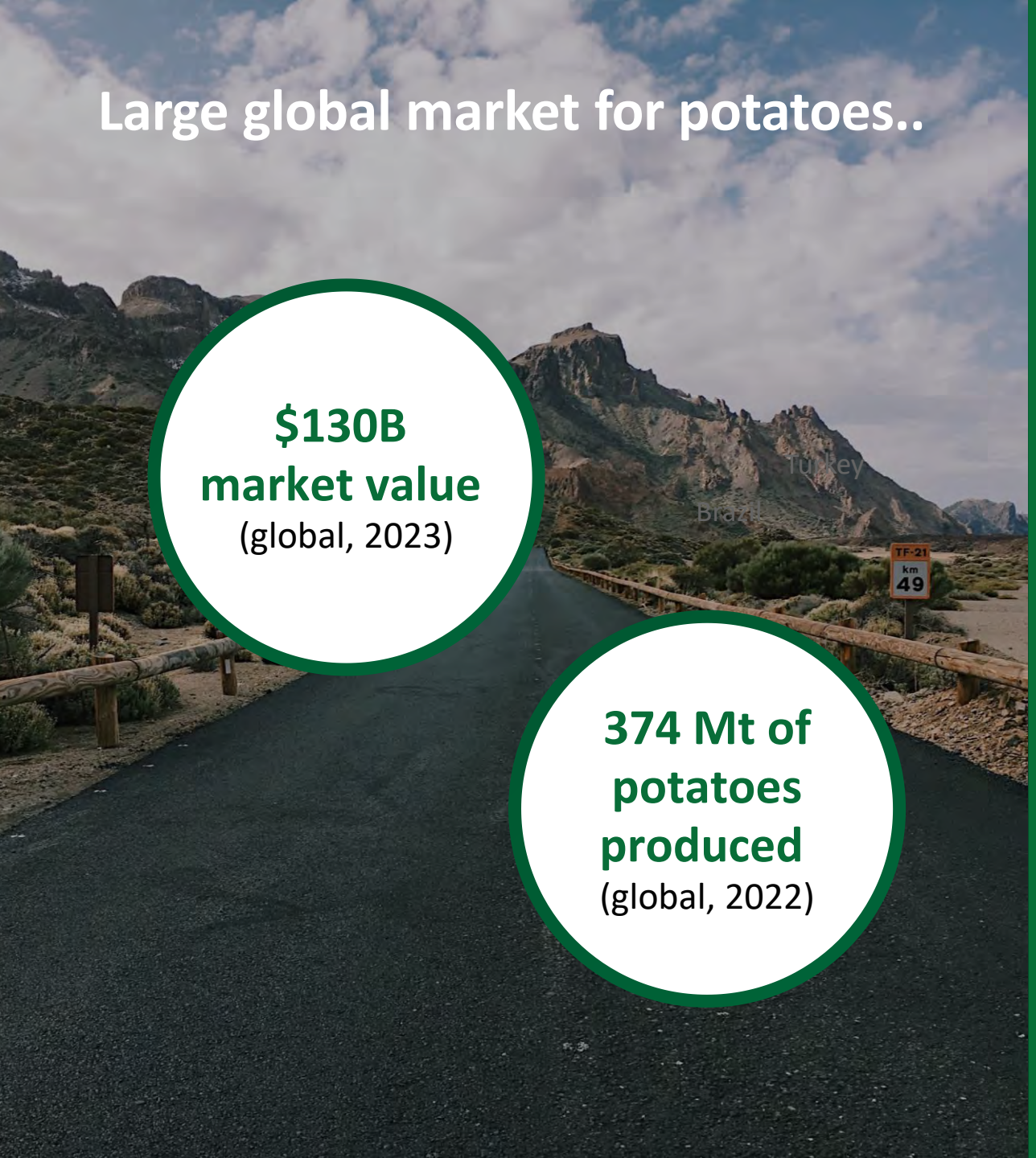
1.8MM+ acres farmed with regenerative farming practices

90%+ of our grower-sourced crops sustainability sourced[1]

[1]For grower-sourced crops, sustainable sourcing refers to meeting the independently verified environmental, social and economic principles of PepsiCo's Sustainable Farming Program (SFP). PepsiCo's Sustainable Sourcing goal applies to areas where PepsiCo has purchasing control and excludes joint ventures, franchises, co-manufacturers and co-packers, and other third parties over which we do not hold purchasing control

Context

Large global market for potatoes..



$130B market value
(global, 2023)

374 Mt of potatoes produced
(global, 2022)

...with top 7 producing countries having 60% production

China
~95 Mt

India
56 Mt

Ukraine
20 Mt

Russia
18 Mt

USA
17 Mt

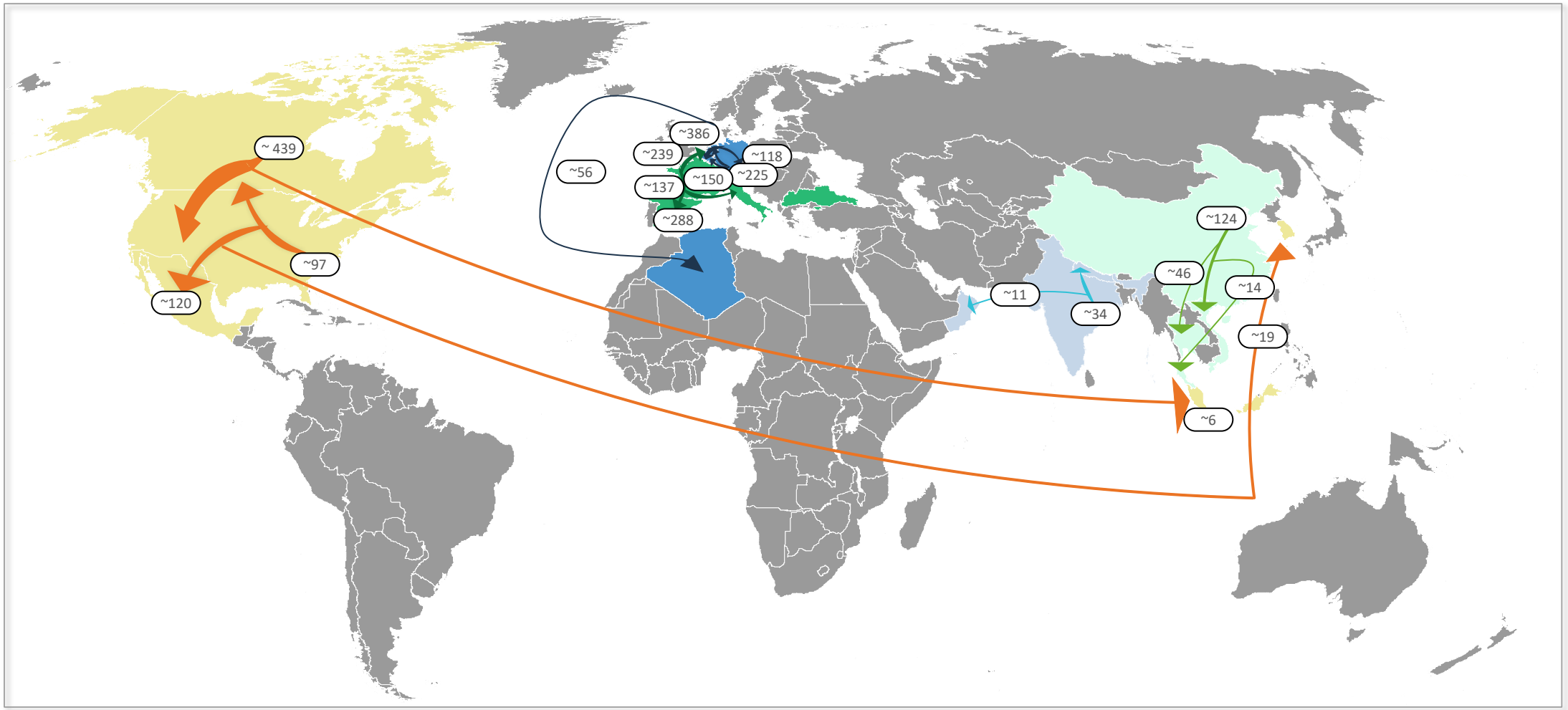
Germany
10 Mt

Bangladesh
10 Mt

Sources: FAO Stat
Note: Estimated production volume, million tonnes (Mt), 2022)

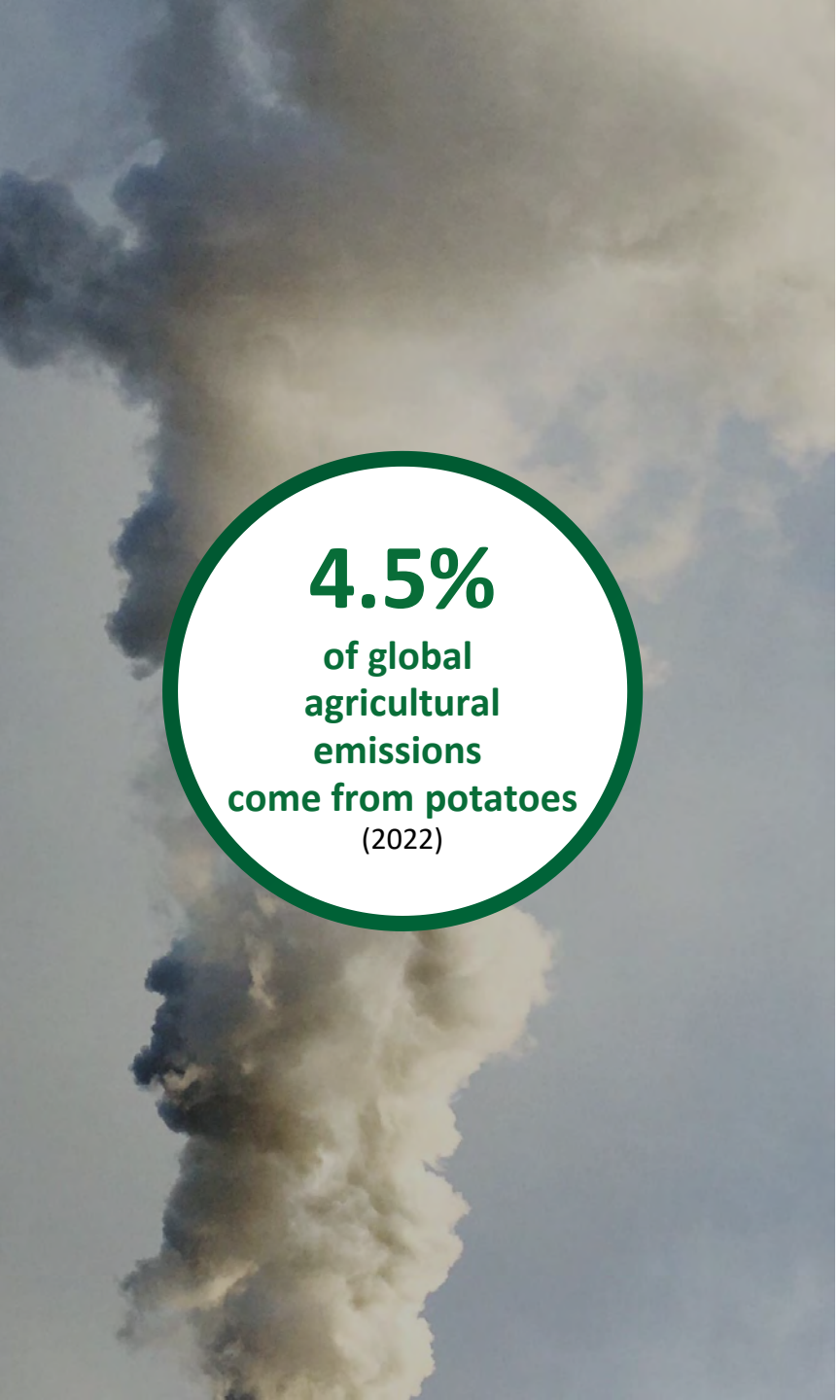
Potato movements tend to be largely regional

Non-exhaustive



Note: base year 2023, [Commodity code used at UN Comtrade data base = code XX], considering top 3-5 export countries in $M USD UN Comtrade

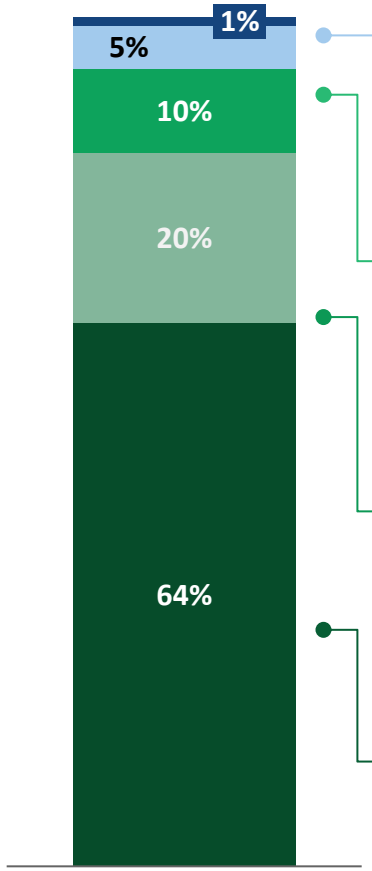
XXX **$M USD export value** (top 3-5 export countries shown per market, '23) **Different colors to represent different market flows** **Commodity flows** (size relates to $USD export value)



4.5%
of global agricultural emissions come from potatoes
(2022)

4 main drivers for potato emissions

Emissions breakdown for British potatoes



Packaging
Emissions from packing energy use

Transport
Fuel emissions

Storage
Emissions due to energy use by long-term storage of potatoes

Agriculture
Emissions due to fertilizer use, soil tillage, on-farm machinery and energy usage.

Sources: Carbon Brief, Climate Hub, BCG Analysis

Key challenges to address for potato decarbonization

Key decarbonization challenges

Large & fragmented supplier landscape

High degree of variability in systems across regions

Limited awareness on **solutions available** (e.g., at farm level)

High upfront carbon reduction **costs**

Lack of financing for adoption of low-carbon and regen. practices

Potential short-term reduction in yield & farmer revenues

Speed and rate of adoption of best practices on farm

Lack of low-carbon technologies available at scale

Lack of accurate carbon data at farm level

Lack of measurability & common certifications

Lack of **unified and stable regulatory** & policy landscape

Strong dependency on Nature (land, climate)

Challenges with highest impact for commodity | Other applicable challenges

Regional specificities

Significant regional specificities exist for potato decarbonization

	Consolidated			Fragmented			
Supplier dynamics[1]							
Productivity kg/ha	49K	16K	40k	25K	17K	21K	17K
Production MT	17	95	10	56	20	10	18
Carbon baseline (Unit)[3]	0.29	0.29	0.17	0.26	0.20	n/a	0.19

1. Producer landscape in the market; 2. Productivity = Average yields by region in respective unit (2022) 3. Unit for carbon baseline = kg CO_2 per kg potatoes from WFLDB version 3.9.1
Source:

Significant regional specificities to be aware of for potato decarbonization

	Supplier/processor dynamics[1]	Primary farm type	Productivity (kg/ha)[2]	Production[3]	Trade[3]	Carbon baseline (kg CO2/kg)[4]	Regulatory environment
	Consolidated	Smallholder	16k	95 Mt	Import: $1k Export: $200M	0.287	• Promotion of potatoes as a staple crop • Green & sustainable ag development (modernization of rural areas and farming techniques)
	Fragmented	Smallholder	25k	56 Mt	Import: $400k Export: $100M	0.258	• Development of cold-chain and subsidies to support storage
	Fragmented	Smallholder	17k	20 Mt	Import: $6M Export: $5M	0.197	• Promotion of sustainable agriculture practices (such as IPM and crop rotation)
	Fragmented	Smallholder & large-scale	17k	18 Mt	*Data unavailable*	0.194	• Modernization of agriculture initiatives incl. subsidies, and crop insurance

1. Producer landscape in the market 2. Average commodity yields by region in respective unit (2022) based on OECD-FAO Agricultural Outlook Database 2022 3. Estimated annual production & trade (2022) 4. Carbon baseline data is from WFLDB 3.9.1 - ecoinvent 3.9.1, DRYAD 1.4

Significant regional specificities to be aware of for potato decarbonization

	Supplier/processor dynamics[1]	Primary farm type	Productivity (kg/ha)[2]	Production[3]	Trade[3]	Carbon baseline (kg CO2/kg)[4]	Regulatory environment
	Consolidated	Smallholder & large-scale	49k	14 Mt	Import: $400M Export: $300M	0.290	• Promotion of sustainable practices through government incentives
	Consolidated	Large-scale	40k	10 Mt	Import: $200M Export: $600M	0.166	• Common Agricultural Policy (CAP) and Green Direct Payments, EU policies for sustainable agriculture
	Fragmented	Smallholder	21k	10 Mt	*Data unavailable*	*N/A*	• National Agricultural Policy, broad framework to improve productivity and sustainability

1. Producer landscape in the market 2. Average commodity yields by region in respective unit (2022) based on OECD-FAO Agricultural Outlook Database 2022 3. Estimated annual production & trade (2022) 4. Carbon baseline data is from WFLDB 3.9.1 - ecoinvent 3.9.1, DRYAD 1.4

Solutions

There are 6 key levers to address potato decarbonization

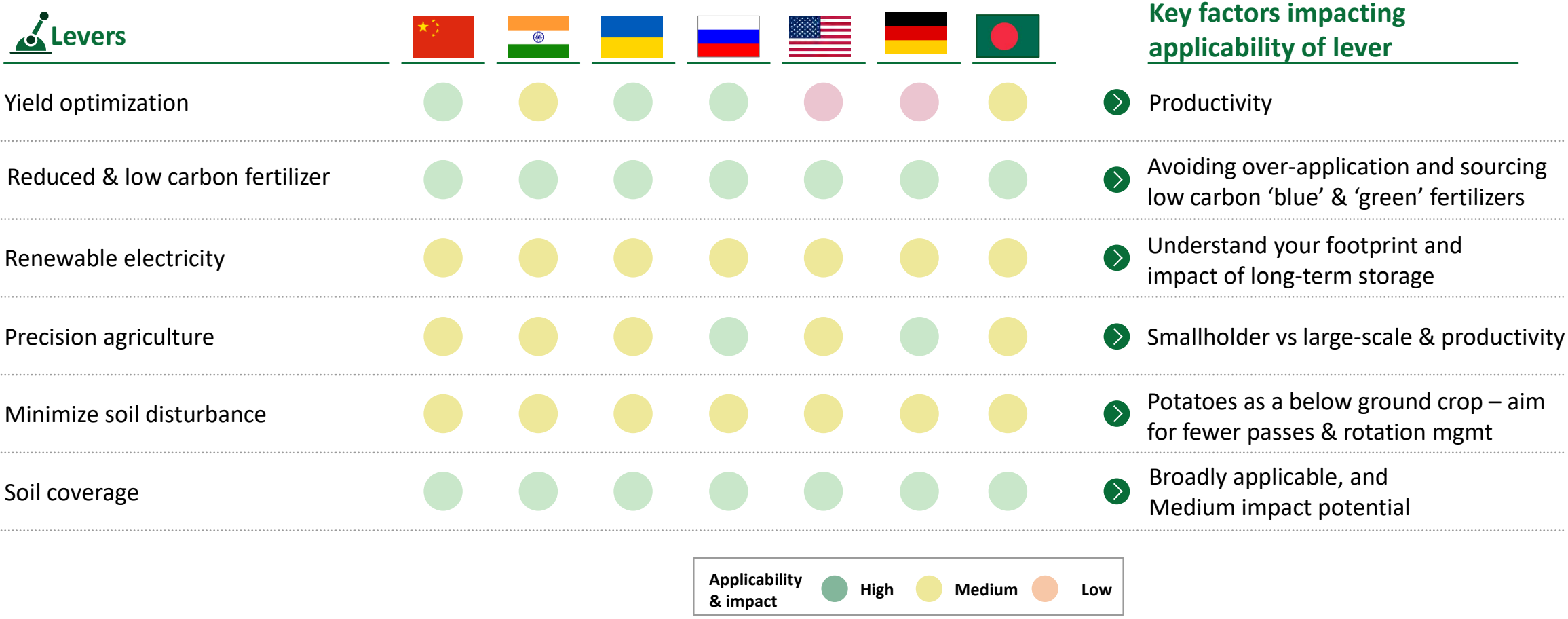
Levers	Typical carbon reduction potential	Typical time to impact	Expected ROI for farmers
Yield optimization	High	1-2 years	High
Reduced & low C fertilizer	High	Immediate	Medium
Renewable electricity	Medium	Immediate	It depends …
Precision agriculture	Medium	1-2 years	High
Minimize soil disturbance	Medium	3-5 years	Medium
Soil coverage	Medium	3-5 years	Medium

High – addresses large portion of carbon footprint with direct impact

Medium – addresses portion of carbon footprint, or risk of reversal

Source: BCG Experts & Analysis

Applicability and impact of levers varies across markets



Source: BCG Experts & Analysis

3 case studies supported our commodity decarbonization journey

Renewable Electricity

Supporting use of RE to offset electricity in-season and storage

Reduced Soil Disturbance

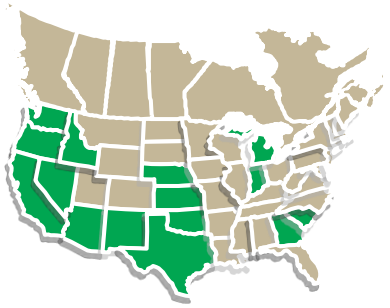
Measuring fuel use and sharing impact of heavy tillage

Fertiliser Optimization

Using low carbon fertilisers & best practices to reduce the overall GHG footprint

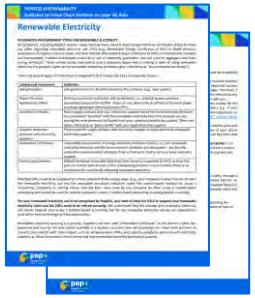
Use of renewable electricity to cover on-farm grid electricity is a cost efficient means of reducing emissions in long-term storage areas

‘23 & ‘24 pilot programs



Pilot program in-place with three suppliers covering ~35% of supply – learnings to drive full scale commercialization

High impact vs. low cost to implement



Renewable electricity purchases within recognized criteria is available to many growers

Loss of Agricultural Land

Critical to prioritize purchases via sources of renewable energy not generated on Class 1 or 2 Ag Land

At full scale, we anticipate a meaningful reduction in our total GHG footprint driven by renewable electricity to cover on-farm energy use. Given its high impact, immediate impact, and ease of implementation, it is a critical lever to drive improvement.

Reduced soil disturbance supports GHG reductions from lower fuel use and improves soil health

Fewer passes = less fuel

Key elements in the journey

Carbon Accounting	GHG Impact	Feedback & engagement
Sharing best practices	Recognizing improvement	Institutionalizing

Less disturbance supports C staying put

Incentive to:

- Drive adoption
- Support equipment & practice changes
- Own crop rotations

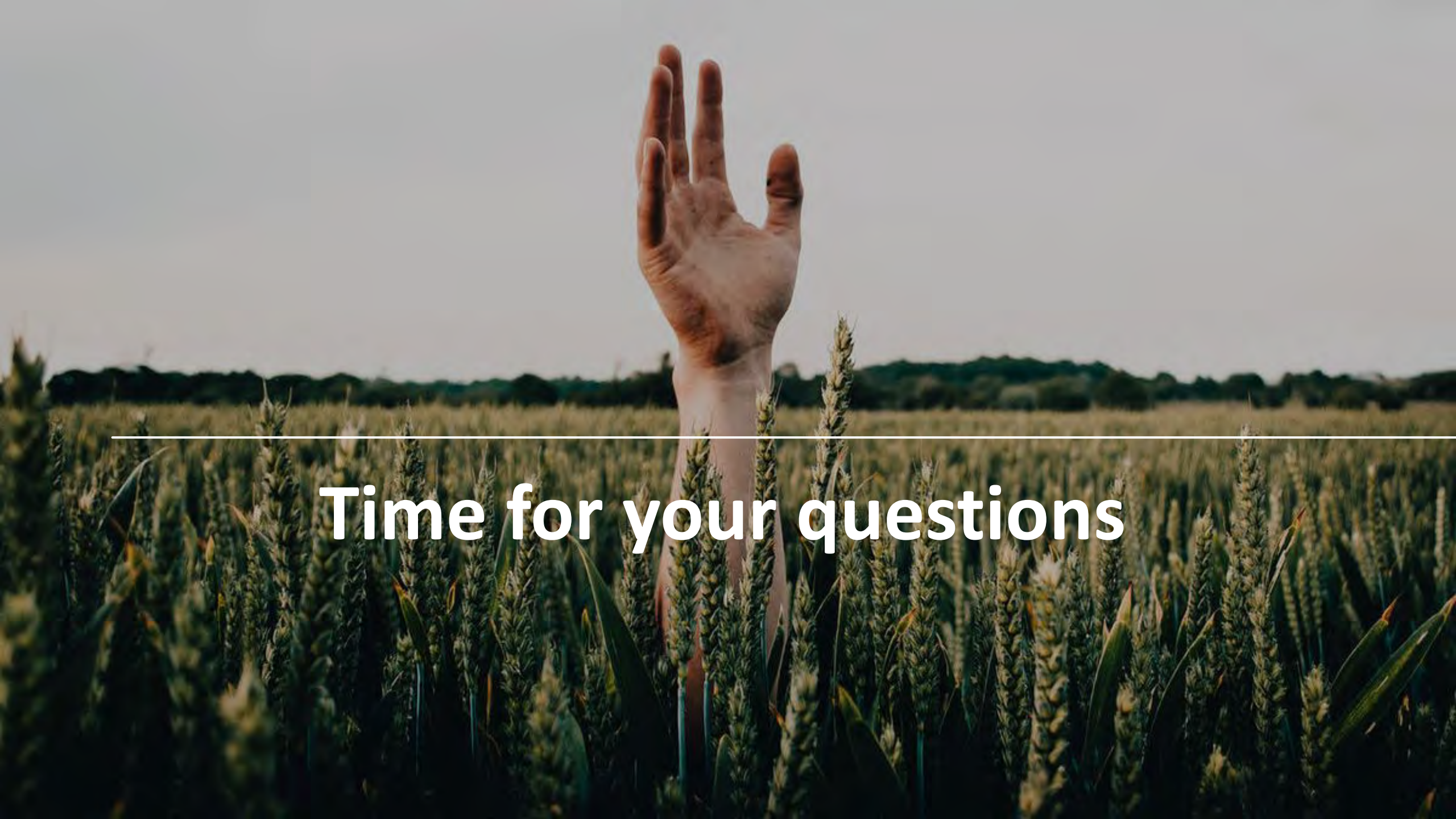
Fewer resources

Cover crop integration

CFT Recognition

Impact C & soil health

Case study 3:


Time for your questions

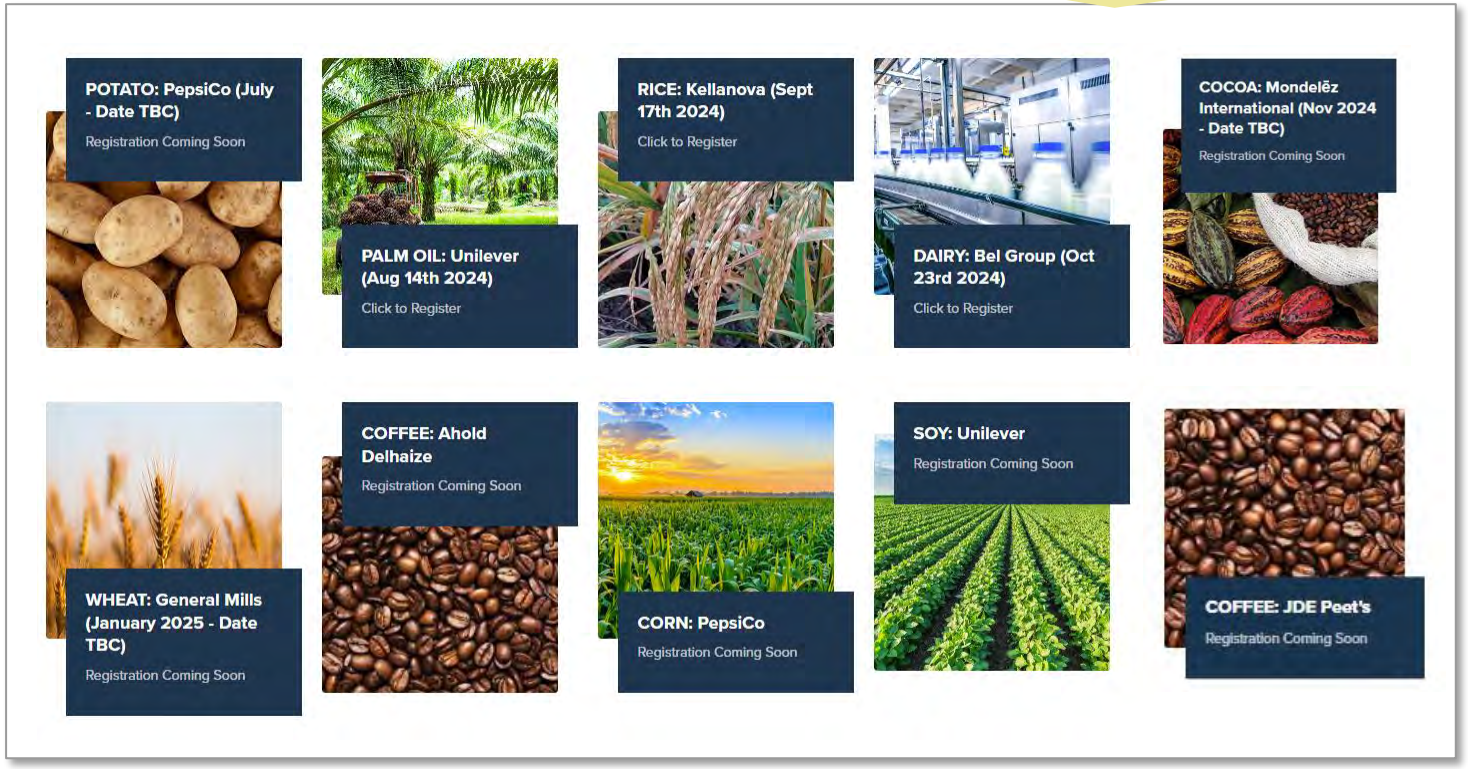
Not recorded – will not be available to the public

Open discussion - Do we see opportunities to partner & scale for impact?

Next masterclasses in series

Stay tuned for our next masterclasses

Please update with latest screenshot from CGF website – (Commodity masterclasses page)



All information and resources available on CGF website: HERE


Thank you