



# European fruit with traces of most toxic pesticides 'up 53% in nine years'

**Analysis of nearly 100,000 samples found residues in a third of apples and half of blackberries**

Organic is Clearly Better When it Comes to Reducing Toxic, Synthetic Pesticides

## Organic pesticides not always 'greener' choice, study finds

### **Pesticides explained: the toxic chemicals in up to 70% of produce**

Studies have linked long-term health issues, while regulators insist breaches of safe limits are rare

SCIENCE • ENVIRONMENT

### Pesticide residues could negate the health benefits of fruit and vegetables

An American study examined the eating habits of 160,000 people and their impact on mortality.

By Stéphane Foucart

**New Study: Agricultural Pesticides Cause Widespread Harm to Soil Health, Threaten Biodiversity**

# Measuring environmental impacts of fruit and vegetables from a life cycle perspective

*the role of harmonized and science based calculation rules*



**Nikki Hulzebos & Jeroen Weststrate | Fresh Produce Centre, the Netherlands**

Annual Biocontrol Industry Meeting | 26 October 2022 | Basel

Session 6: Food Industry work in agriculture and what biocontrol can contribute



# Introduction: Fresh Produce Centre



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# What about the Netherlands: a brief introduction into the world of fruits and vegetables

Fresh Produce Centre **represents interests** of businesses involved in the sales of F&V-products and is a source of **knowledge** and **inspiration**.

Fresh Produce Centre's members account for over **80% of total turnover** of fruit and vegetables, which are worth over **15 billion EUR**.

Fruit and Vegetable sector: a **key economic driver** by **adding value** through treatment, processing and transshipment of fruit and vegetables.

The F&V sector meets a need for **healthy & environmentally friendly** produced food for **billions of people** around the globe.





## Health

Healthy Diet,  
Lifestyle, and Food  
Environment



## Sustainability

Striving for  
Progression in a  
Sustainable Food  
System



## Market & Economy

Innovation in the  
value chain



## Social

Social value far  
beyond our  
national borders



## Food Safety

Safeguarding food  
safety

# Global food system is not environmentally sustainable (yet)



1/3 of global  
GHG-emissions



80% of global  
deforestation



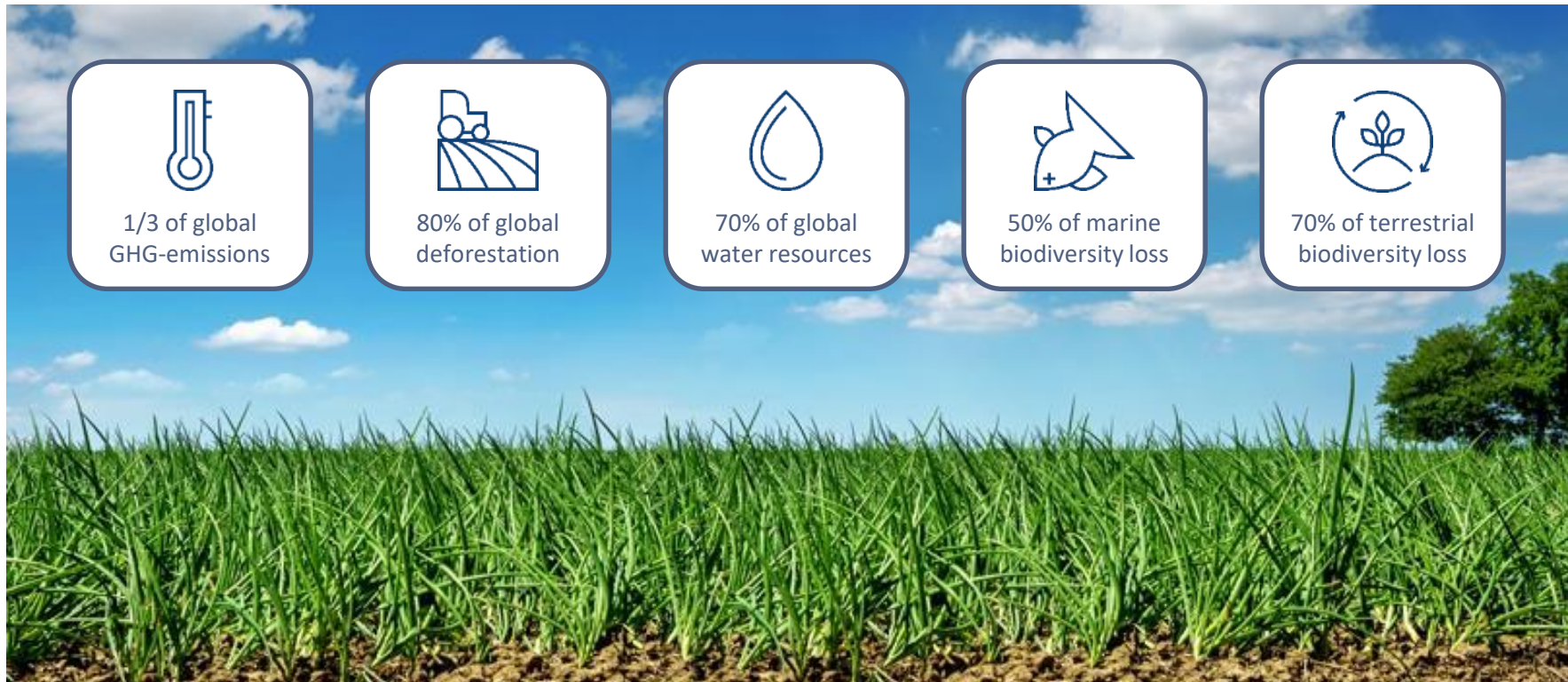
70% of global  
water resources



50% of marine  
biodiversity loss



70% of terrestrial  
biodiversity loss



# The demand for sustainability information is rising



Consumers integrate sustainability aspects into their purchasing decisions



Policy makers are putting sustainability metrics in place, the PEF method is most likely the method to be used



Investors encourage or even require a certain level of sustainability as a condition for financing



Increased demand from retailer to quantify sustainability efforts across the supply chain.

# Explosive increase of environmental labels, initiatives, certification and standards



This continued proliferation leads to confusion and mistrust on markets.

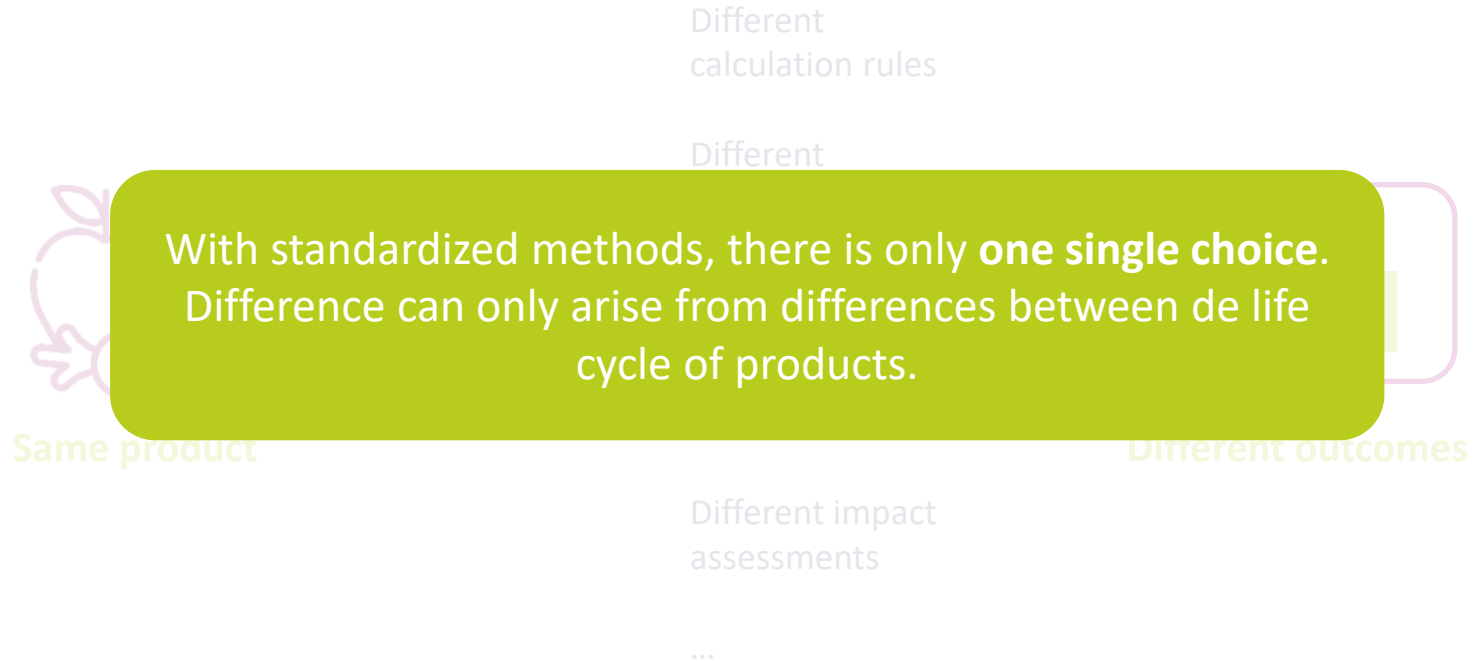


How to anticipate  
consistent to these  
developments?





# Why is harmonization needed?



# The European Commission offers a promising framework: PEF is “the way to go”!



- The European Commission developed the **Product Environmental Footprint (PEF) method** to support valid and fair comparisons for a product environmental performance.
- The European Commission enables individual sectors to build sector consensus in a so called: **Product Environmental Footprint Category Rules (PEFCR)**
- PEF is likely to be employed in EU legislation impact the European fresh fruit and vegetable sector.
  - Substantiating green claims (GCI) – Q4 2022
  - Empowering consumers in the green transition (UCPD) – Q1 2022
  - Green Public Procurement for Food (GPP) – n.a.
  - Sustainable Food System Framework Initiative (SFS) – Q4 2022
  - Sustainable Finance (EU – Environmental Taxonomy, Corporate Sustainability Reporting Directive) – Q2 2021



# It covers a product's entire life cycle



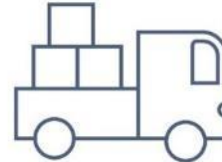
Primary production



Storage



Packaging



Distribution



Retail



Consumption



End-of-Life

# It covers a wide array of environmental topics



climate change



water scarcity



land use



acidification



ozone depletion



human toxicity  
non cancer effects  
health risk



marine  
eutrophication



eco-toxicity  
freshwater



terrestrial  
eutrophication



particulate matter  
respiratory inorganics



resource use mineral



resource use energy  
carriers



aquatic freshwater  
eutrophication



human toxicity  
cancer effects



ionizing radiation

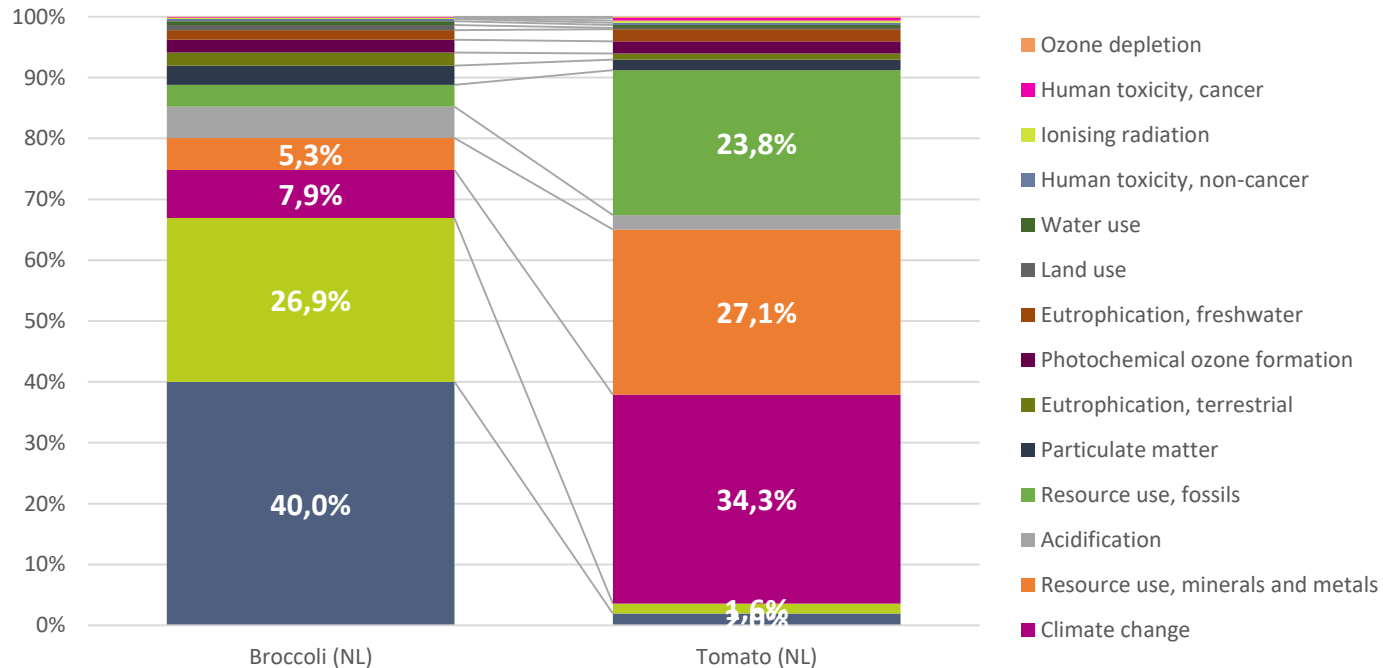


photochemicals  
ozone formation

# Comparing environmental impacts of open and protected production systems



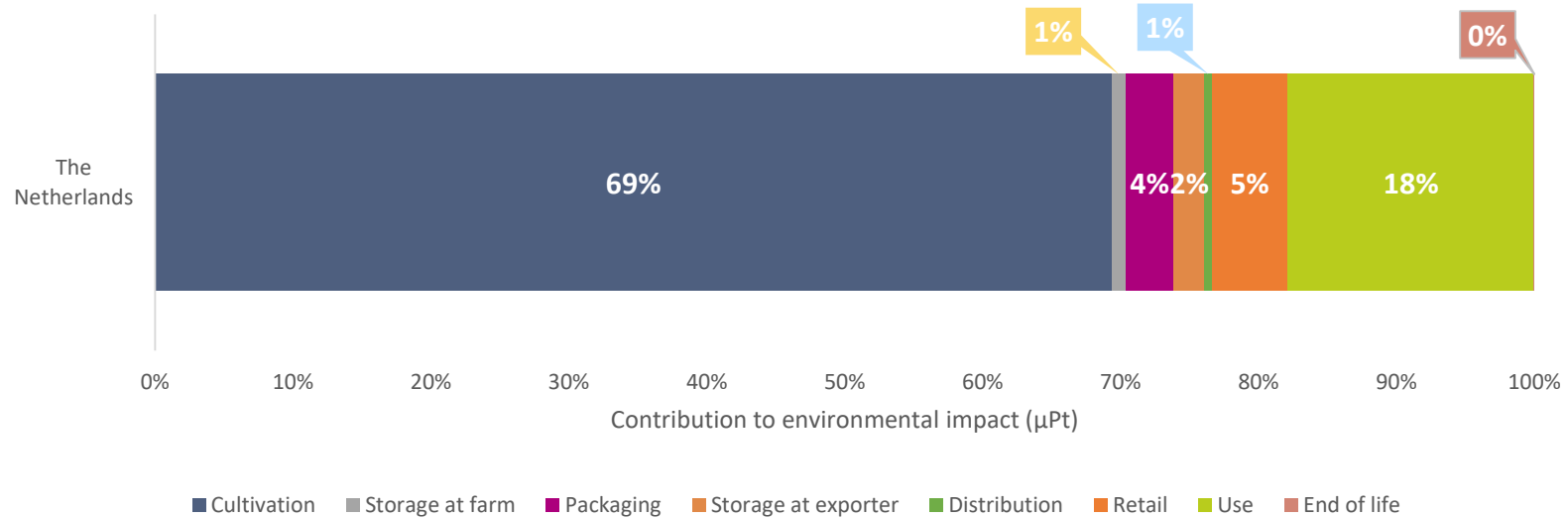
Relative contribution of impact-categories to single score results





# Environmental footprint of 1 kilogram broccoli

*contribution per life cycle stage: single score*



# How to start the development of a PEFCR?

## Step 1: establish a consortium to develop a PEFCR

- Requirement of European Commission: the consortium shall represent at least 51% of the EU market in terms of turnover in the EU.

Development of the PEFCR is a 'bottom-up multi-stakeholder process'. Collaborative efforts of industry, governments, NGO's and knowledge institutions etc.



Broad acceptance of the methodology by stakeholders, if the consortium is representative.







# Freshfel Initiative on Environmental Footprinting

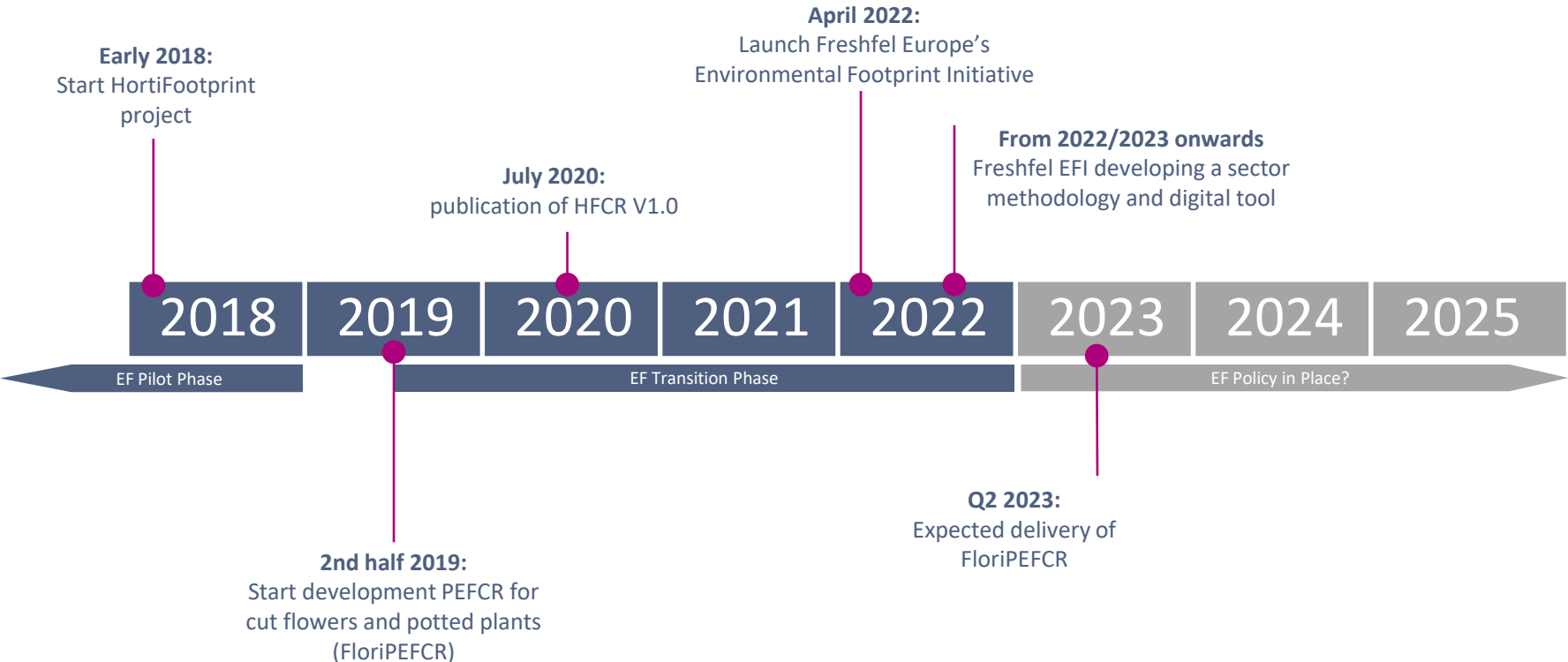
The objective of the Freshfel Environmental Footprint Initiative is to develop an objective, standardized environmental footprint methodology, database and digital tool for the fresh produce sector that is broadly accepted by the industry, stakeholders as well as consumers.

The Initiative will align with the Product Environmental Footprint (PEF) methodology as recommended by the EU and builds further on the work done already in the HortiFootprint Category Rules.





# What steps are already taken in the fruit and vegetable sector?



# What about pesticides?



# Modelling of pesticides

- A systematic modelling approach is followed to determine the toxic impacts of pesticides:



- In the HortiFootprint Category Rules the toxic impacts of pesticides are considered for mainly three impact-categories



eco-toxicity  
freshwater



human toxicity  
non cancer effects  
health risk



human toxicity  
cancer effects



# Challenges in assessing toxic impacts of pesticides

- **Biological pest control:** rarely any background data available in LCI databases on the production of biologicals.
- A large number of substances widely used in agriculture are not characterized in terms of their toxicity (due to specific effects of pesticides).
- Methods to assess the environmental impacts of pesticides on freshwater eco toxicity are currently the most mature methods. Methods to evaluate any other toxic impacts such as marine- and terrestrial eco-toxicity and the effects on pollinators.
- There is no scientific consensus model available on how to estimate fractions emitted to environmental compartments during application of the pesticide.

# Modelling of Pesticides



- Default emission fractions to environmental emission compartments (air, water, soil) are needed in LCI-modelling, but still missing today.
  - General consensus current PEF-approach is not appropriate: 1% to air, 9% water, 90% to soil
  - Inaccurate for protected cultivation – (almost) no emissions to soil and air
- Models that might fill this gaps in the further:
  - **Open field:** [PestLCI](#) – of Technical University of Denmark (DTU)
  - **Protected:** [Environmental Indicator Crop Protection \(EICP\)](#) of Wageningen University and Research

# Take home messages

Proving sustainability is becoming a business imperative. Driven by both market requirements and legislative demands, fruit and vegetable suppliers have to prove their level of sustainability. There is a strong need for a **harmonized approach**.

The European Commission offers individual sectors a promising framework: the PEF method. In a **multi-stakeholder process** sectors can build up sector **consensus**. It's a continuous process.

Sustainability is a complex science with trade-off's. Evaluating all activities within the supply chain and considering several environmental themes, gives an **integrated view** on sustainability.



# Thank you for your attention!

For all inquiries, please feel free to reach out to:



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