



Fascination of
Plants Day
2024



How plant breeding sustains our agri-food systems

Amrit Nanda | Plants for the Future ETP

amrit.nanda@plantetp.eu



with support from



Promoting the flow of innovation to the market for the benefit of society



Academia

science organisations,
universities and
research institutes

Outline opportunities
and challenges for the
plant sector

Identify key R&I needs
in the short, medium
and long term



Industry

the seed and breeding
sector and agricultural
service providers

Organise and promote
outreach and science
communication
activities

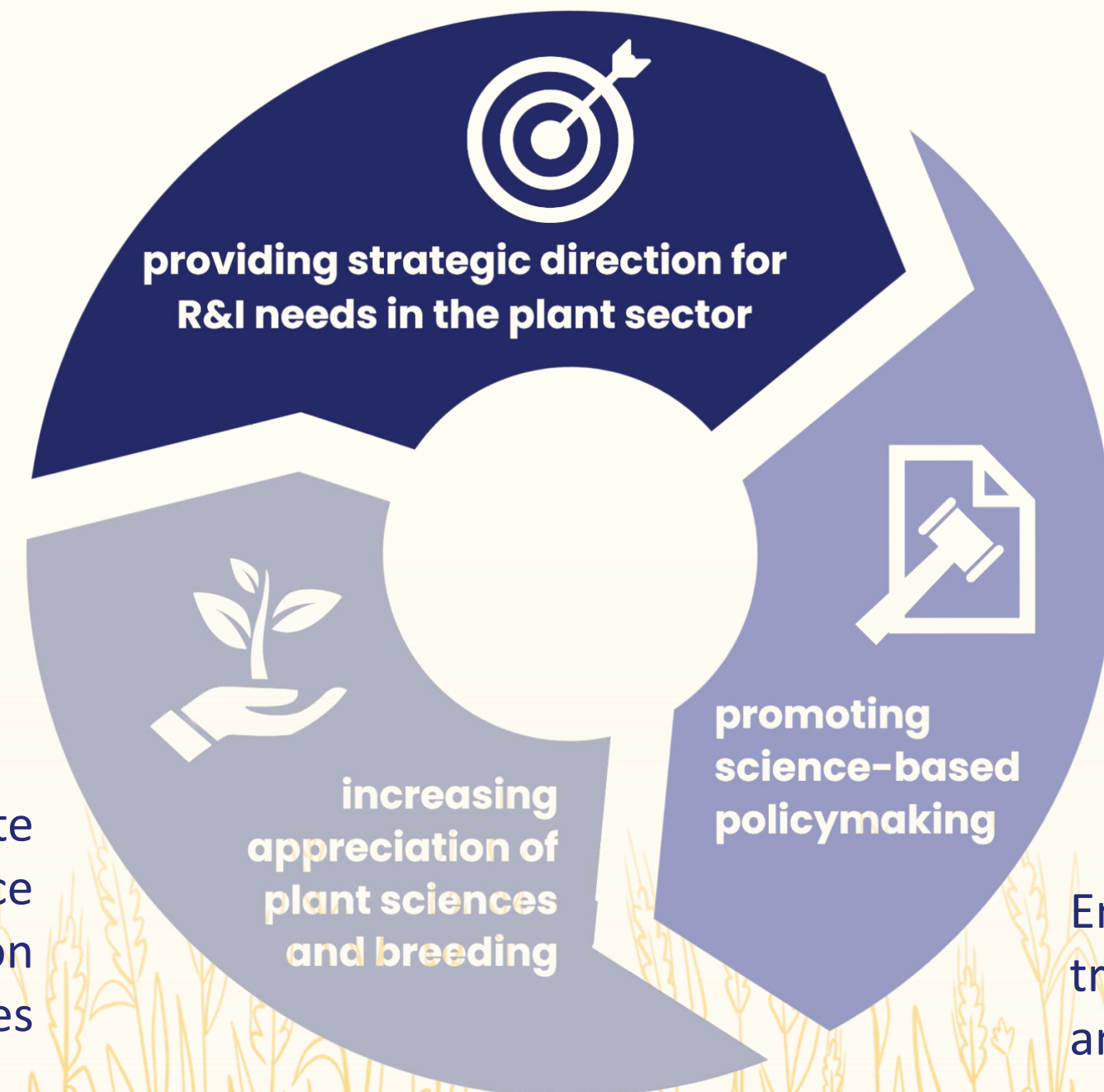


Farmers

farming organisations
and cooperatives

Promote an
innovation-
friendly regulatory
environment

Encourage more
translational research
and public-private
partnerships





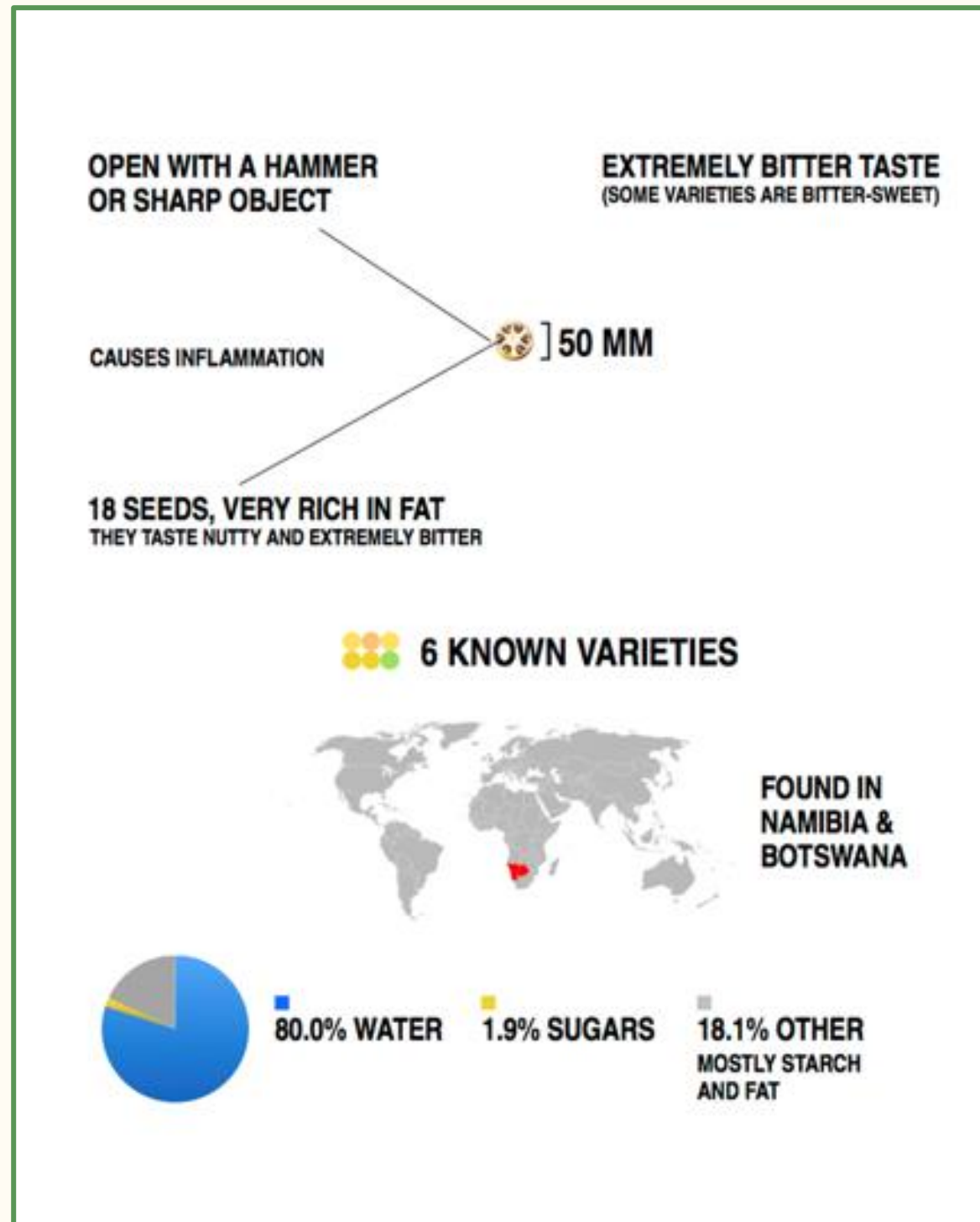
Fascination of
Plants Day
2024



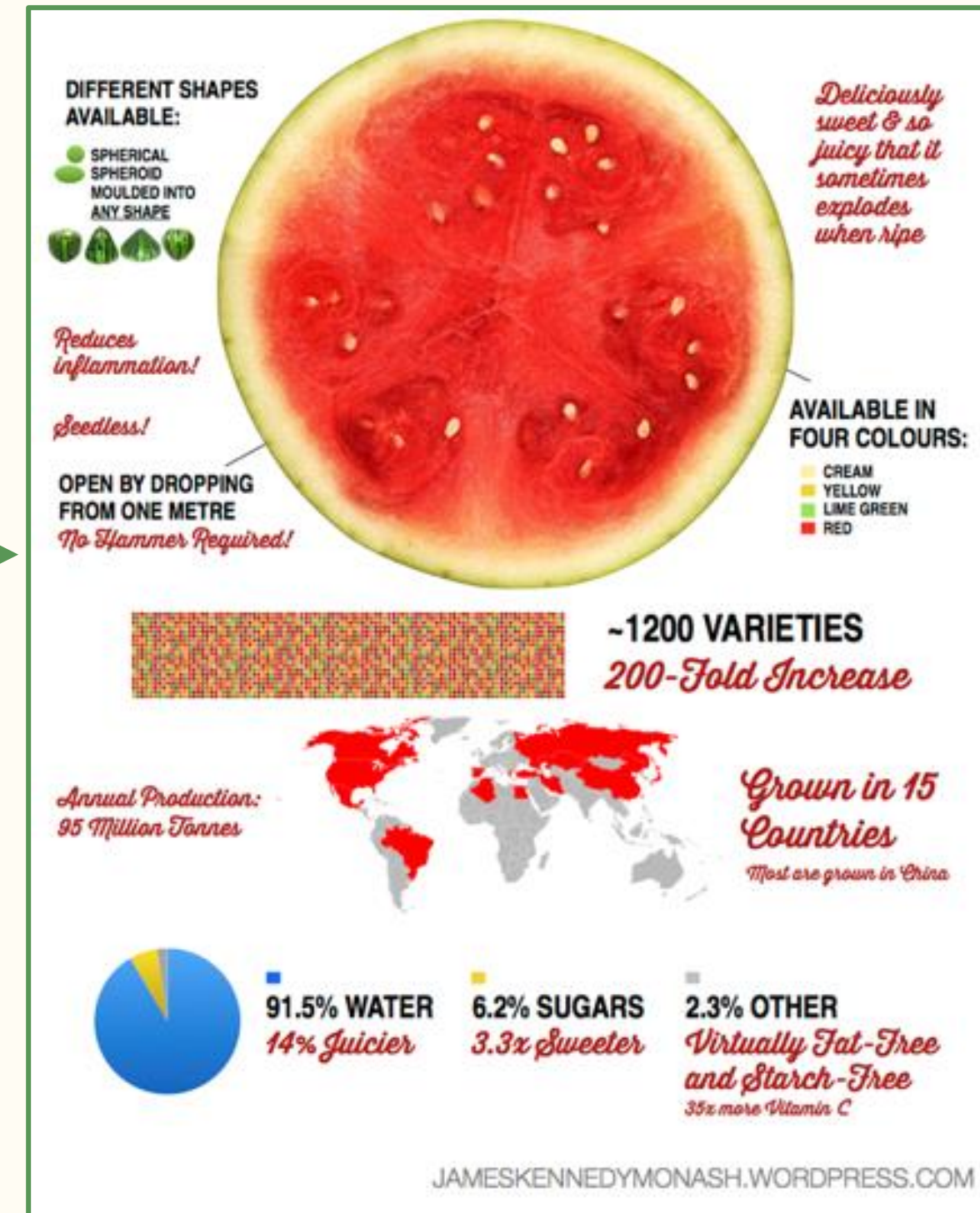
Breeding is the pillar of our agri-food systems
and the future of a circular bioeconomy

What have we achieved through breeding?

WATERMELON
3000 BC



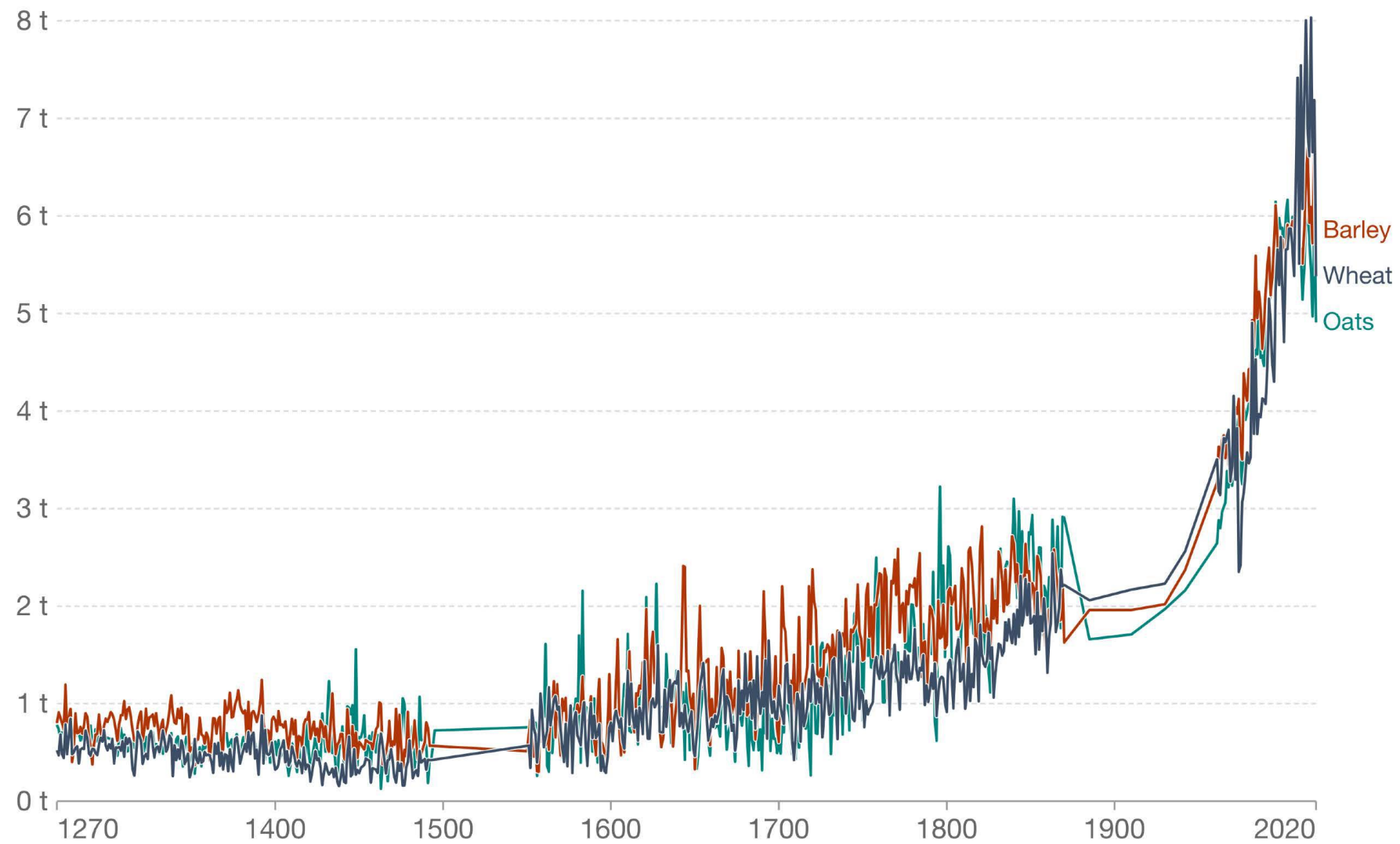
MODERN DAY
WATERMELON



Breeding has increased productivity massively

Cereal yields in the United Kingdom

Crop yields are measured in tonnes per hectare.



Source: Broadberry et al. (2015) and Food and Agriculture Organization of the United Nations

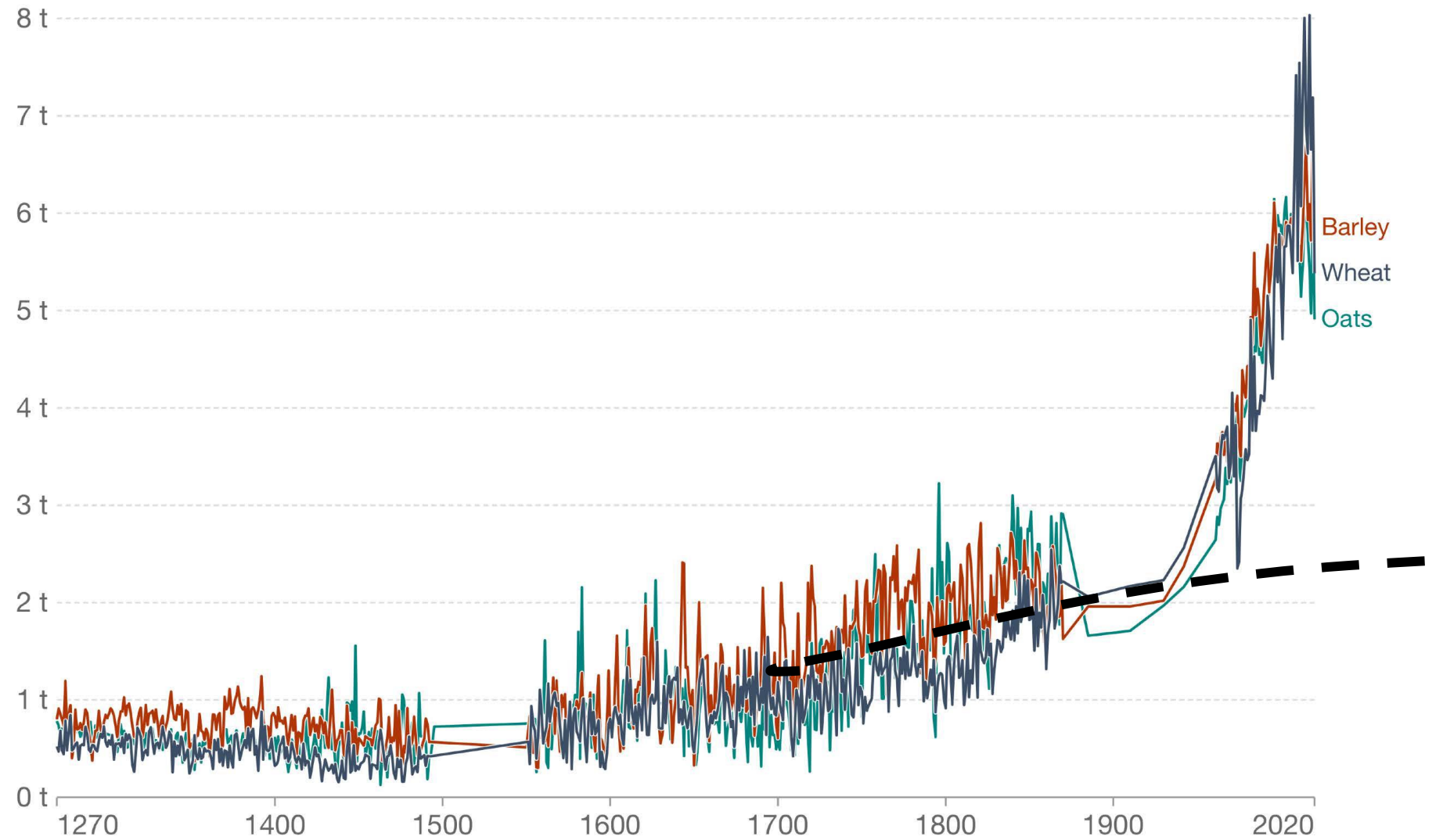
OurWorldInData.org/crop-yields • CC BY

Although cereal crops were domesticated 5,000-10,000 years ago, they barely improved over several millennia of human agriculture

Breeding has increased productivity massively

Cereal yields in the United Kingdom

Crop yields are measured in tonnes per hectare.



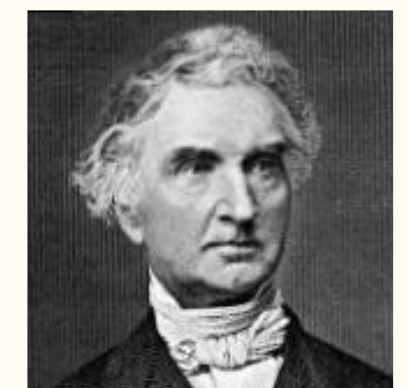
Source: Broadberry et al. (2015) and Food and Agriculture Organization of the United Nations

OurWorldInData.org/crop-yields • CC BY

Modern agronomy
and crop protection
Julius Kühn (1825-1910)



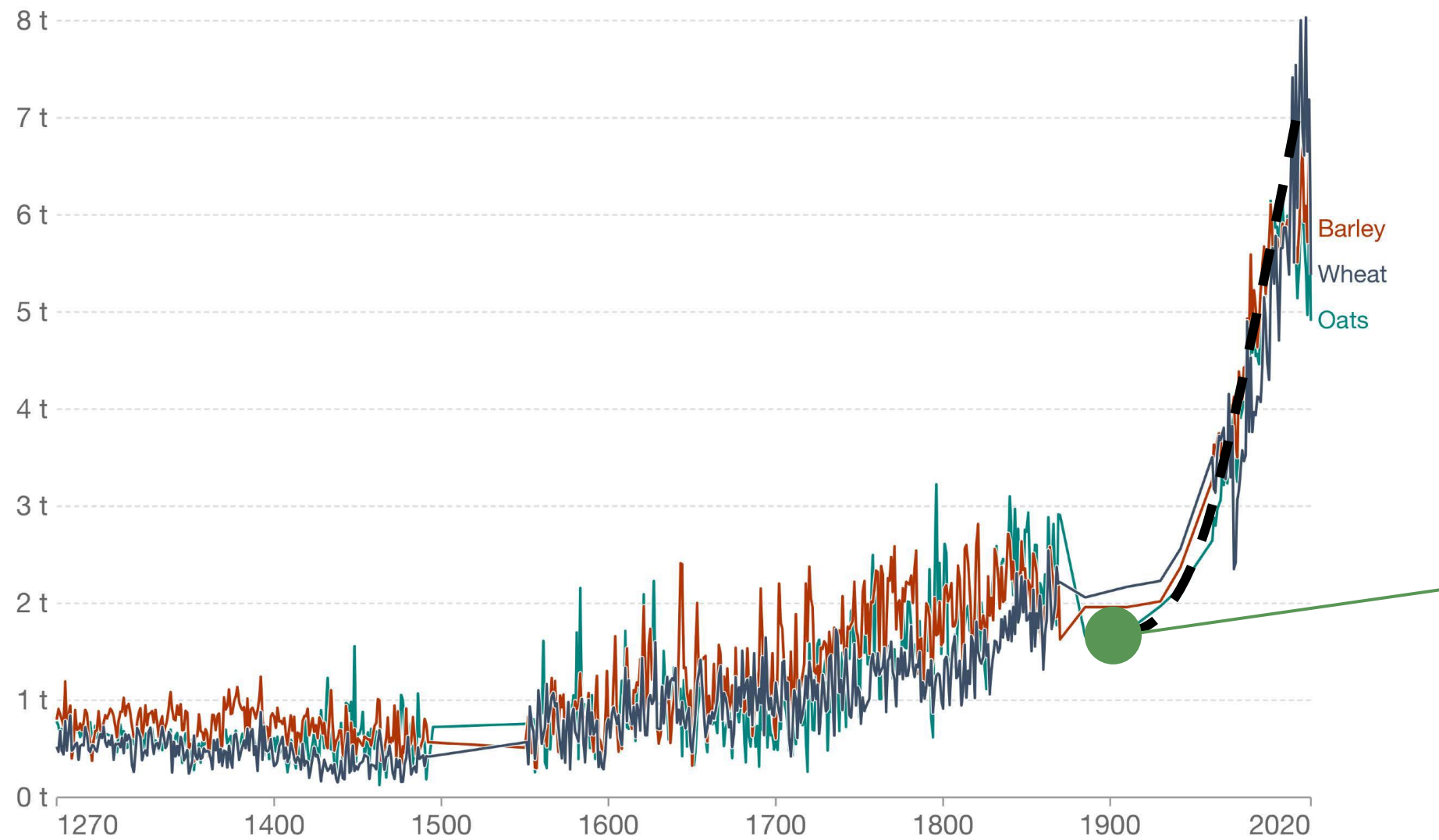
Mineral fertilisers
Justus von Liebig (1803-1873)



Breeding has increased productivity massively

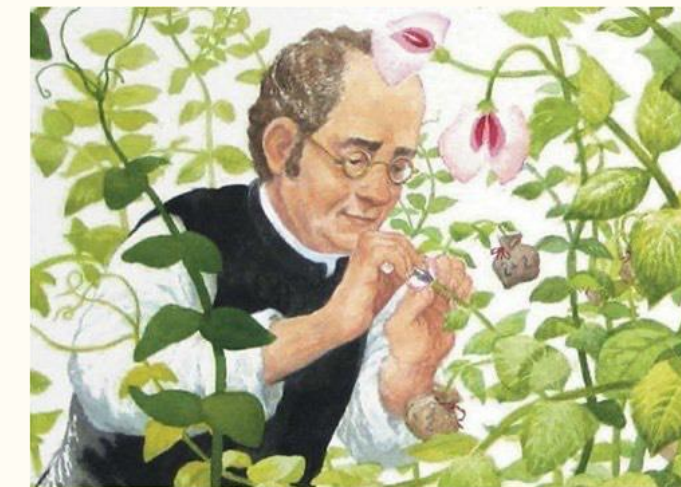
Cereal yields in the United Kingdom

Crop yields are measured in tonnes per hectare.



Source: Broadberry et al. (2015) and Food and Agriculture Organization of the United Nations

OurWorldInData.org/crop-yields • CC BY



Rediscovery of Mendel's findings in 1900 (from 1865)

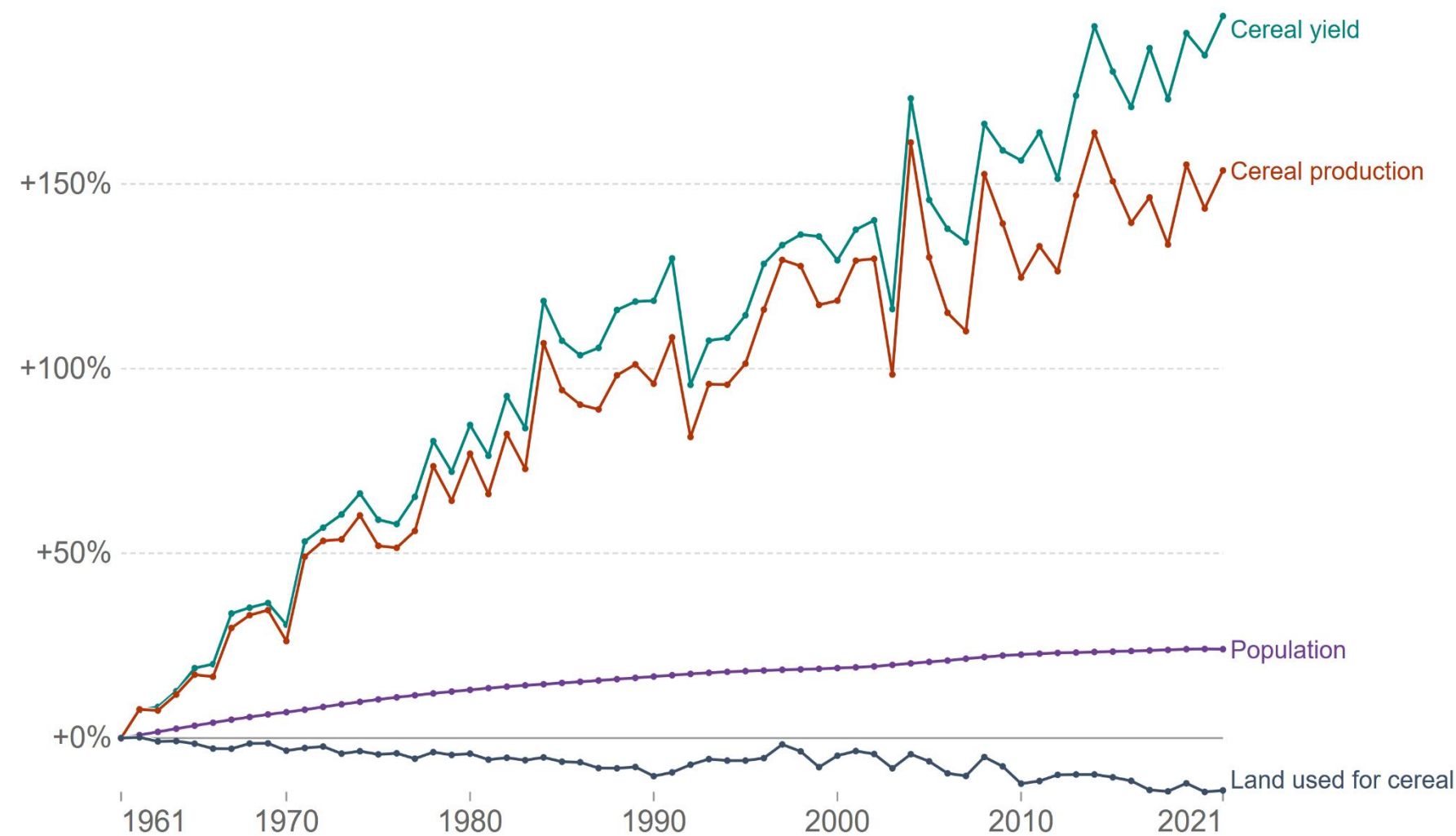
Breeding becomes a science

Breeding enables us to produce more with less land

Change in cereal production, yield, land use and population, European Union (27)

Our World in Data

All figures are indexed to the start year of the timeline. This means the first year of the time-series is given the value zero.



Source: Our World in Data based on World Bank; Food and Agriculture Organization of the United Nations
OurWorldInData.org/crop-yields • CC BY

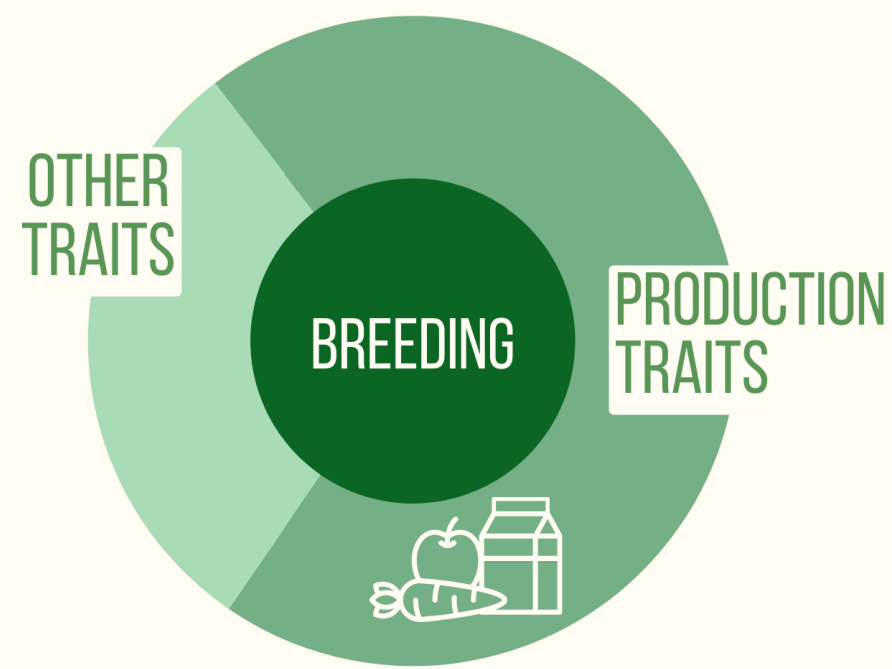
In the past two decades, plant breeding alone has contributed to **~67% increase of crop production** in the EU*, ensuring a stable supply of food and feed for the EU and beyond, while reducing the need for agricultural land

*[Noleppa and Carlsburg \(2021\)](#)

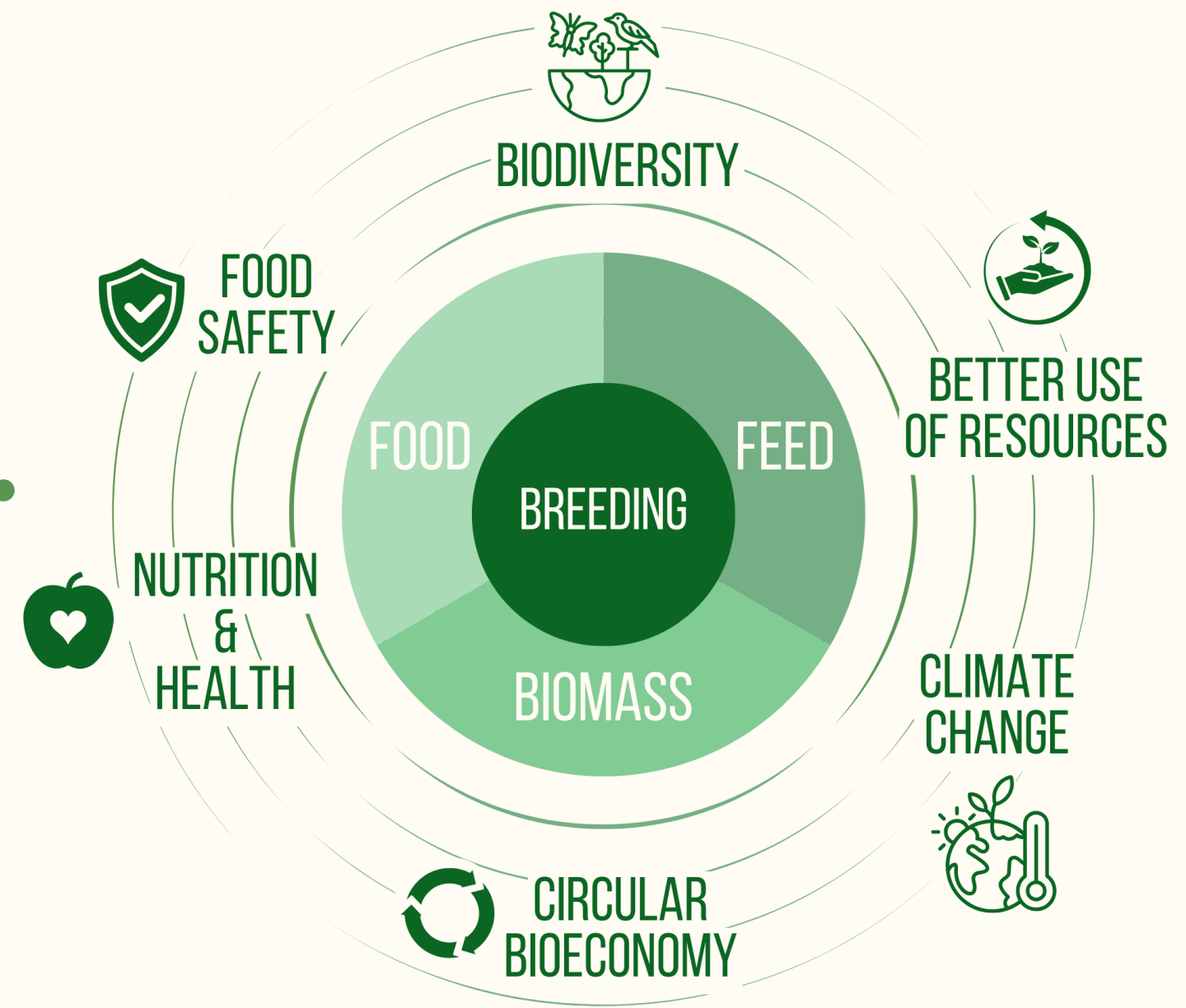


Breeding contributes to all aspects of agri-food systems

In the past decade, breeding goals have diversified needs across agri-food systems



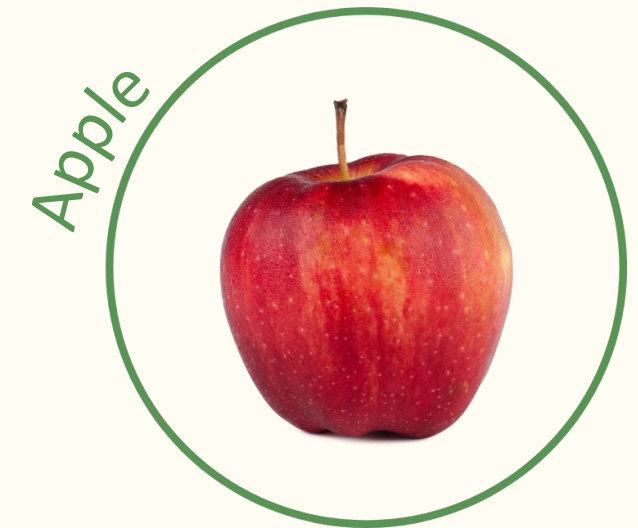
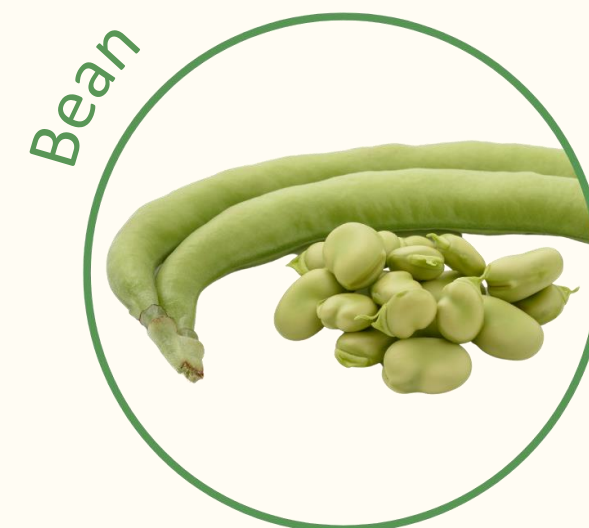
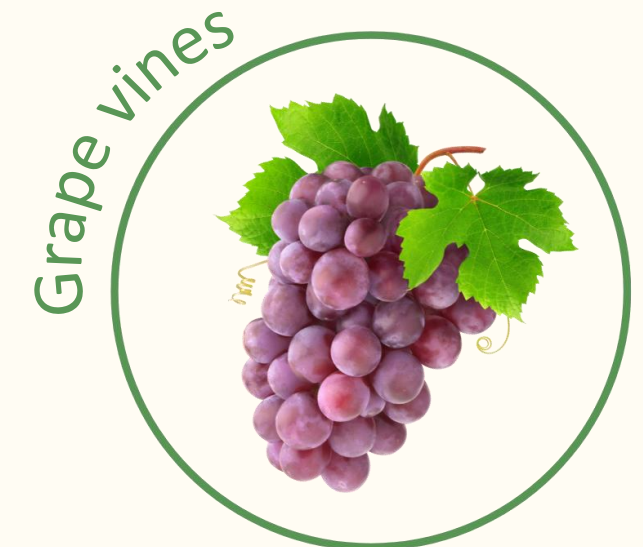
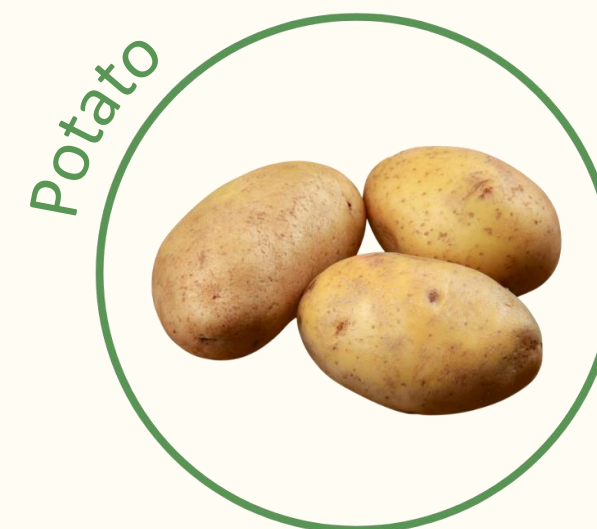
1970'S - 1980'S



2000'S - TODAY

Breeding is a long and resource-intensive process

Typical duration from an
initial cross to a new,
registered variety

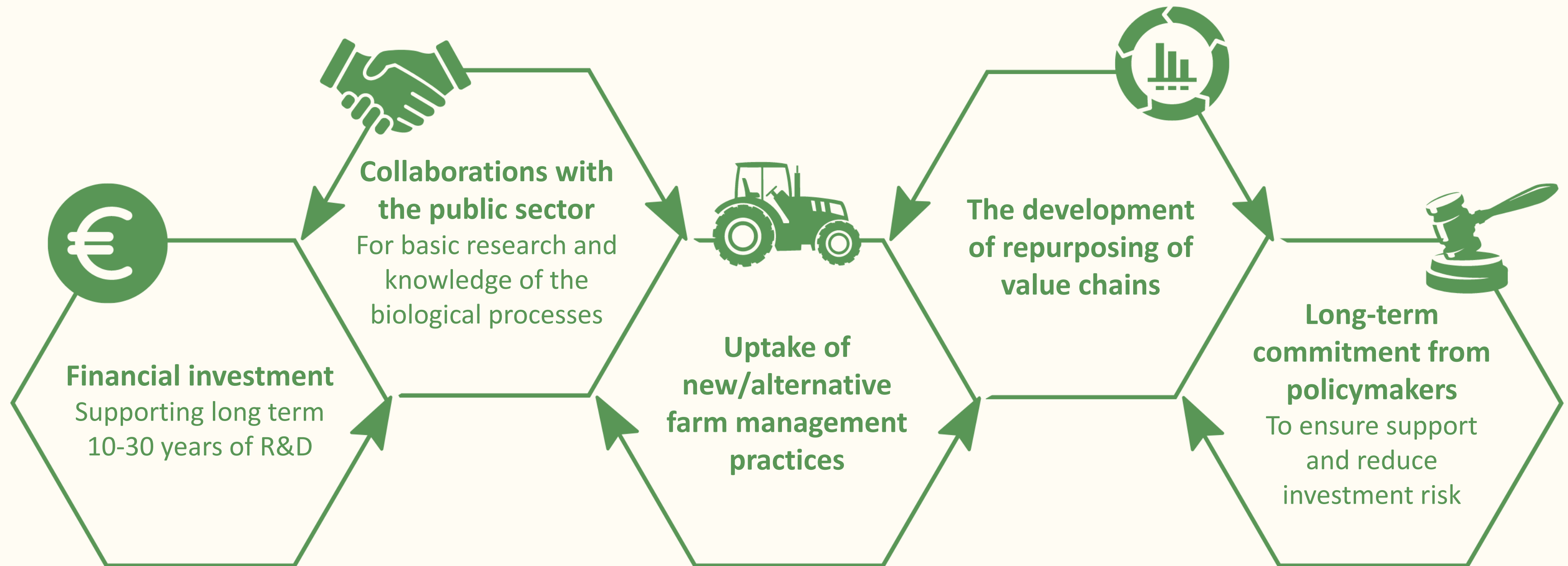


8 – 10 years

14 – 15 years

20 – 25 years

Breeding new plant varieties for diverse production systems, requires





Fascination of
Plants Day
2024

Plants
for the Future
European Technology Platform

Thank you for your attention!

-  [plants_for_the_future](#)
-  [@Plant_ETP](#)
-  [plantetp.eu](#)
-  amrit.nanda@plantetp.eu

Plants
for the Future
European Technology Platform

with support from

 epsso

 Euroseeds
Embracing Nature

 copa*cogeca
european farmers european agri-cooperatives

 ILVO
Flanders Research Institute for
Agriculture, Fisheries and Food