



Innovation in plant breeding and societal goals

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PLANT = LIFE

- Our food
- Clean air to breathe
- Renewable raw materials

**We have
changed weeds
into crops ...**



**... and crops into a
multitude of
varieties**



- **10,000 BC farmers**
 - » **planting crops**
 - » selection breeding
- **1694 Camerarius**
 - » **sexual reproduction**
 - » cross breeding
- **1864 Mendel**
 - » **laws of heredity**
 - » scientific predictive breeding
 - » 1910s population genetics
 - » 1920s hybrid breeding
 - » 1930s mutation breeding
- **1956 Watson&Crick**
 - » **structure of DNA**
 - » molecular biology
 - » **transgenesis - GM**
 - » marker-assisted selection
 - » gene editing & cisgenesis



All farmers need good seed

Home garden



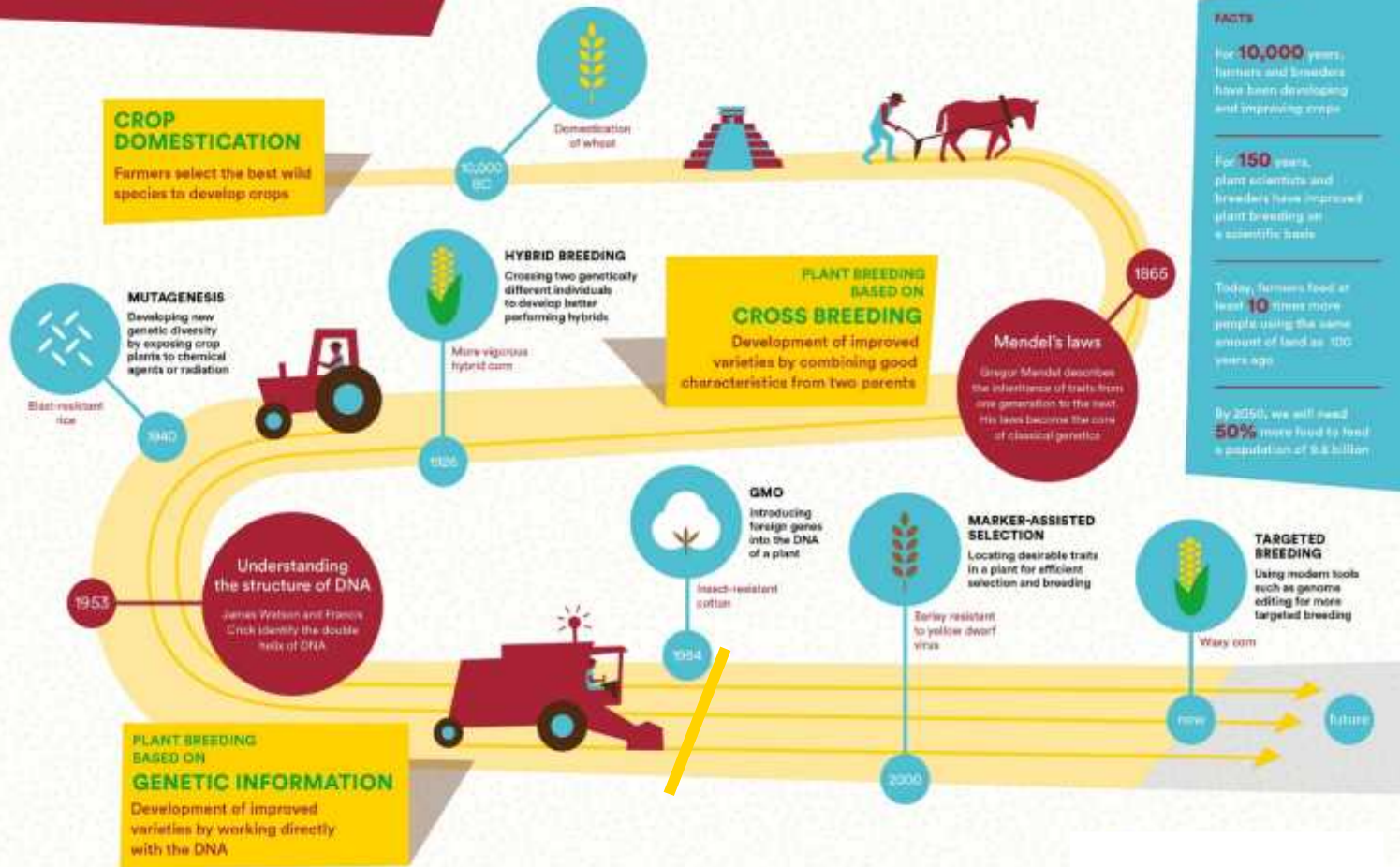
Professional organic



High-tech production



MILESTONES IN PLANT BREEDING



FACTS

For **10,000** years, farmers and breeders have been developing and improving crops

For **150** years, plant scientists and breeders have improved plant breeding on a scientific basis

Today, farmers feed at least **10** times more people using the same amount of land as 100 years ago

By 2050, we will need **50%** more food to feed a population of 9.8 billion

- 10,000 BC farmers

planting crops

» selection breeding

- 1694 Camerarius

sexual reproduction

» cross breeding

- 1859 Mendel

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Unlike GM, targeted mutagenesis does not produce plants that could not result from non-regulated methods

Targeted mutagenesis produces less side-effects than random mutagenesis

EU “Common Agricultural Policy”

- **Sustainability / environment / food waste**
- **High quality, affordable, nutritious and diverse food**
- **Bringing research and innovation out of the labs and into the fields**

Sustainability / environment / waste



High quality, affordable, nutritious and diverse food

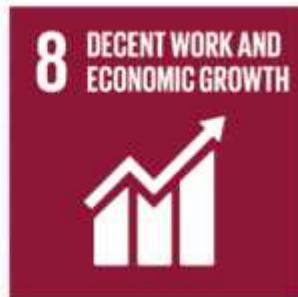


Enjoy your tomato!

Bringing research and innovation out of the labs and into the fields



SUSTAINABLE DEVELOPMENT GOALS



Breeding is powerful

but

Breeding takes time

- **Expanding the toolbox**
- **allows breeders to contribute to the urgency of policy objectives**





It is up to policy makers

- To decide on the future of European plant breeding
- To decide to which plant varieties regulations will apply – i.e. who can afford to use them
- To decide whether plant breeding can contribute to urgent problems



Fascination of
Plants Day

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