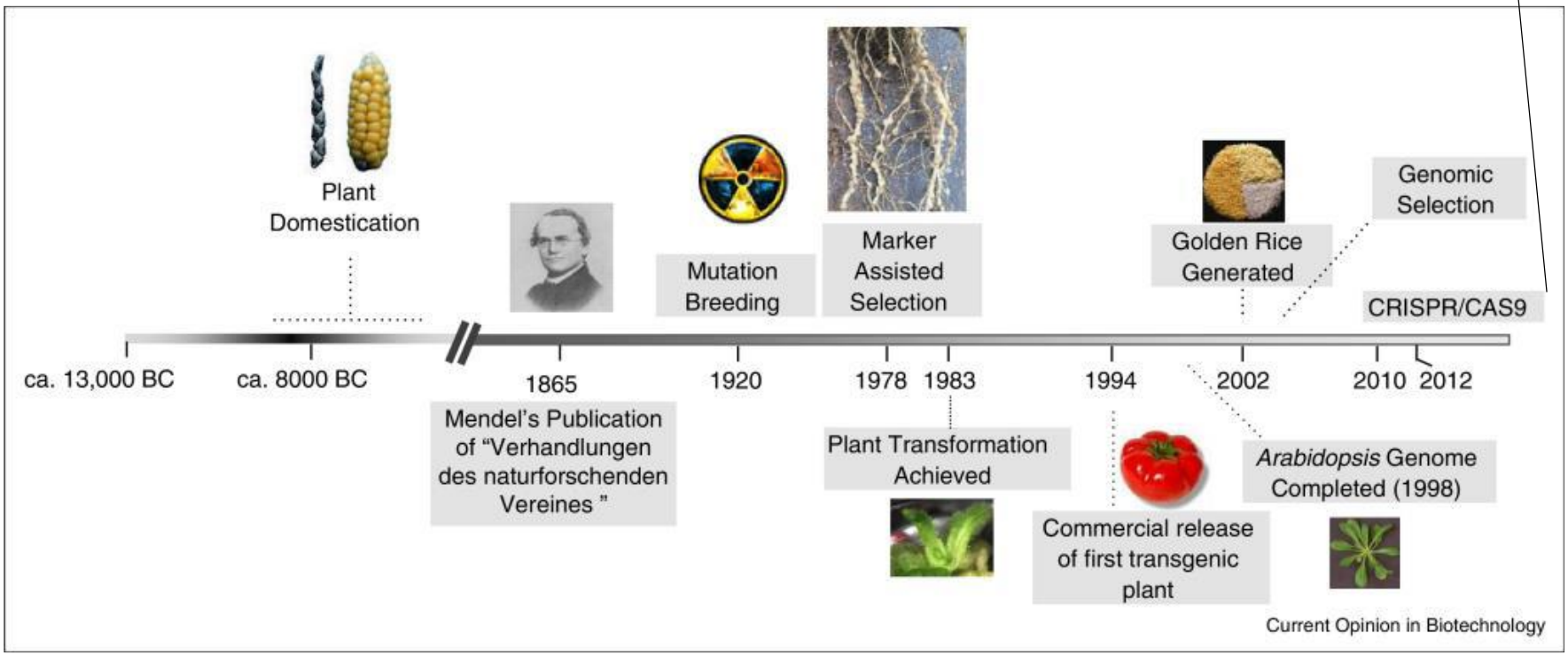
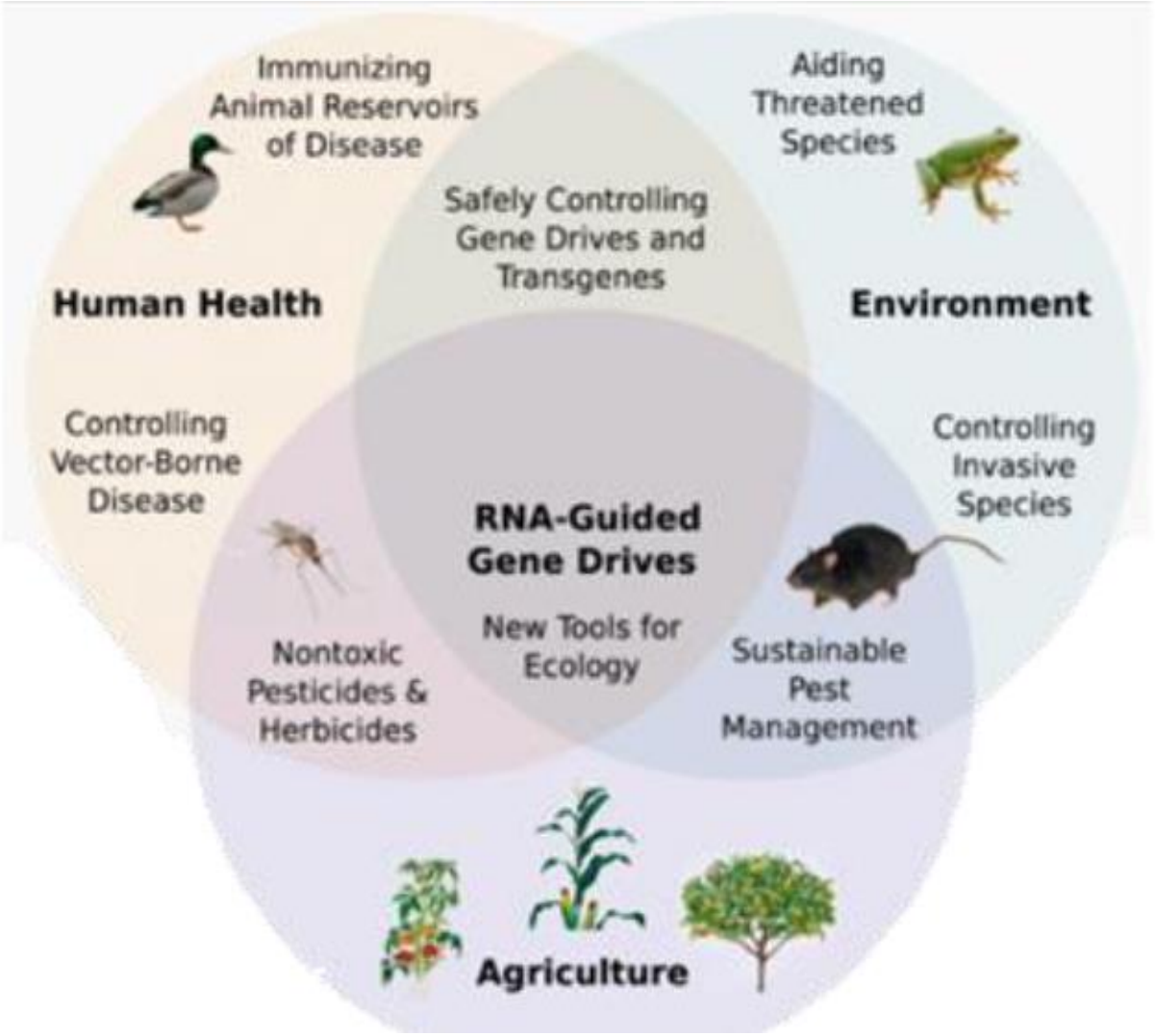
Environmental issues

New Techniques in Agricultural Biotechnology

High Level Group of Scientific Advisors
Explanatory Note 02
Brussels, 28 April 2017

Artificial organisms





Source: Mathematical Ecology Research Group (2016)
Ecological risks of gene drive technologies

Gene drives and new organisms

High depth of intervention: Technical targeting is the genome

High impact (as far as genes determine phenotype)

Designed to spread towards irreversible mutagenic chain reaction

- The level of ‚not knowing' is technically magnified
- Hi potential for exposition, especially when gene drives are released in nature because of mobility and ability to self-reproduce
- Persistent, self-sustaining / enhancing contamination of unclear fate (vs self-limiting)
- Monitoring, control / reversal questionable
- High depth of intervention in ecosystems
- Unprecedented potential to change multiple (any) genes simultaneously (may lead to novel organisms by induced mutagenesis)
- Potency to eradicate species (at east regionally)
- Stability / Safety of techology questionable (technical failure, side effects)
- There is continuation of evolution and possibility of cross species transfer

Some questions

- Is basic risk/benefit assessment sufficient and application of the precautionary principle not needed ? – what action is needed ?

- How can commodification be controlled?

- Are there staff safety/biosafety issues

- Should an observatory be established (ARIGE as a structure) ?
  - Clearing house (collection of statements and regulations)
  - Tracking of conceptual developments
  - Vehicle for meetings and outreach

  Working groups, codes of conduct

  Would a registry of ‚critical' gene editing approaches provide transparency?

COMMENT 21 March 2018 **A global observatory for gene editing**
Sheila Jasanoff and J. Benjamin Hurlbut call for an international network of scholars and organizations to support a new kind of conversation.