Study on the status of new genomic techniques and next steps

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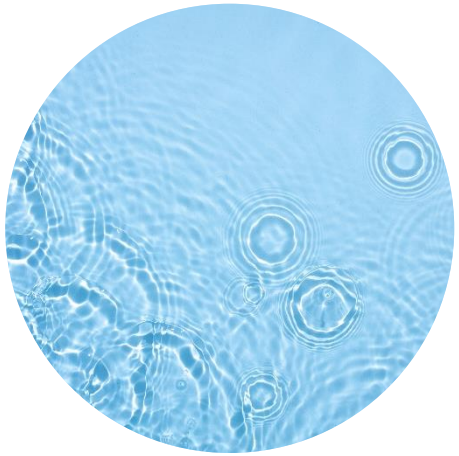
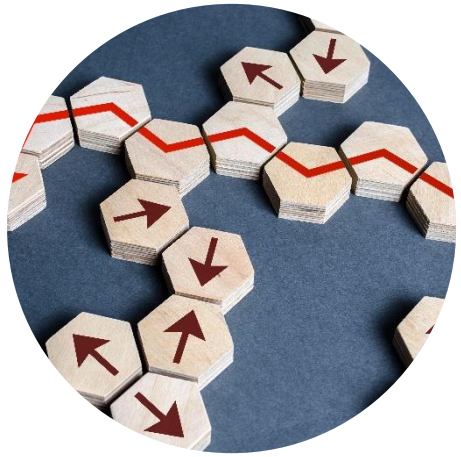
Live webinar "Genetic engineering for sustainable food systems?" – 13 July 2021

Objective and scope of the study



Provide clarity on new genomic techniques (NGTs)



Assist in deciding, any further action in this policy area, if appropriate

European Green Deal

Farm to Fork strategy

Pharmaceutical strategy

Use of NGTs in plants, animals and micro-organisms in the agri-food, medicinal and industrial sectors

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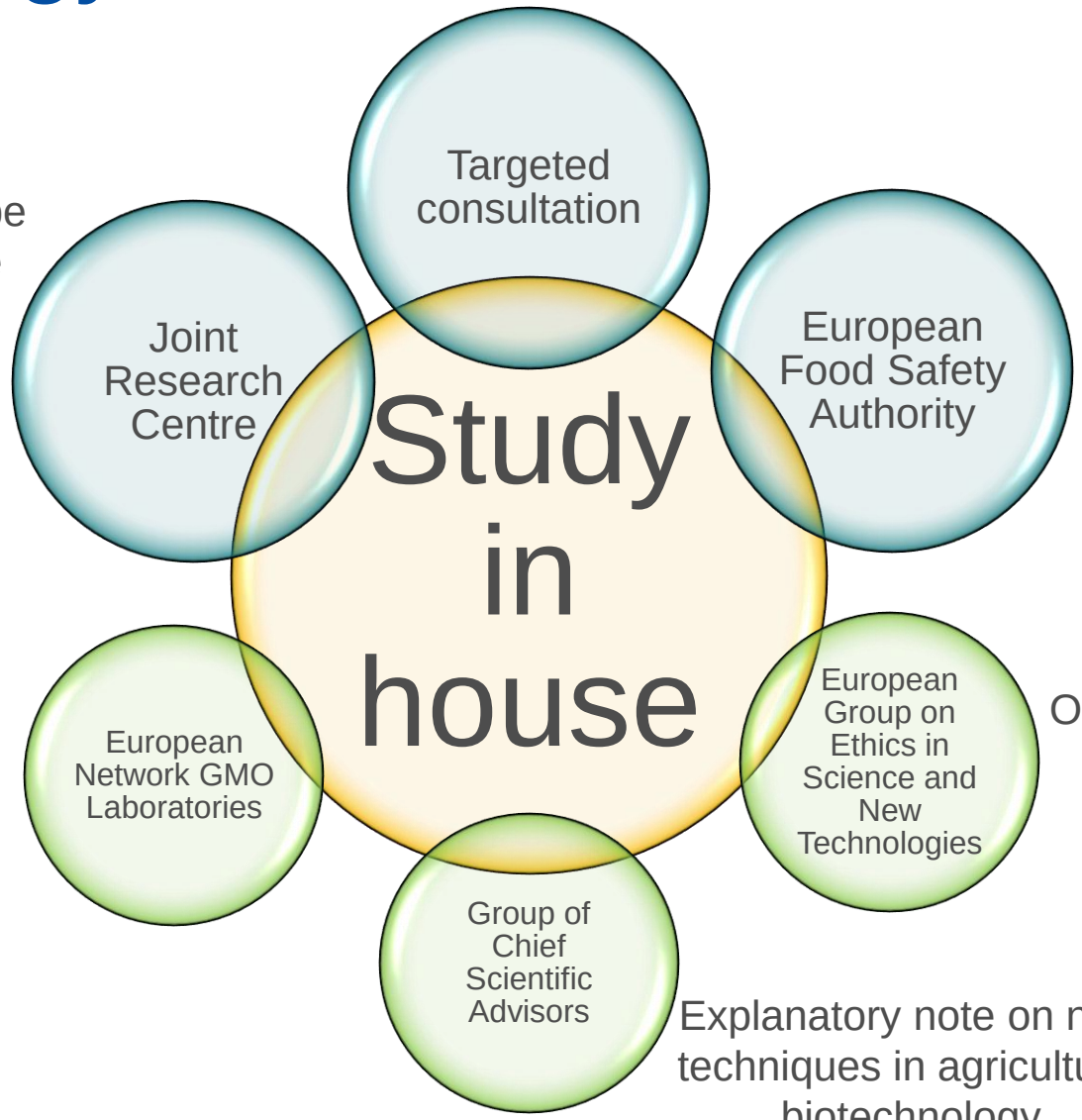
Methodology



Technology landscape - Current and future market applications

Overview on EFSA and MS opinions on safety/risk assessment

Report on detection of food and feed plant products obtained by new mutagenesis techniques

Opinion on ethics of genome editing

Explanatory note on new techniques in agricultural biotechnology

Main findings

What are NGTs?

A diverse group of techniques to achieve different results, from limited changes to multiple and more extensive modifications

Mutagenesis

Changes without insertion of genetic material

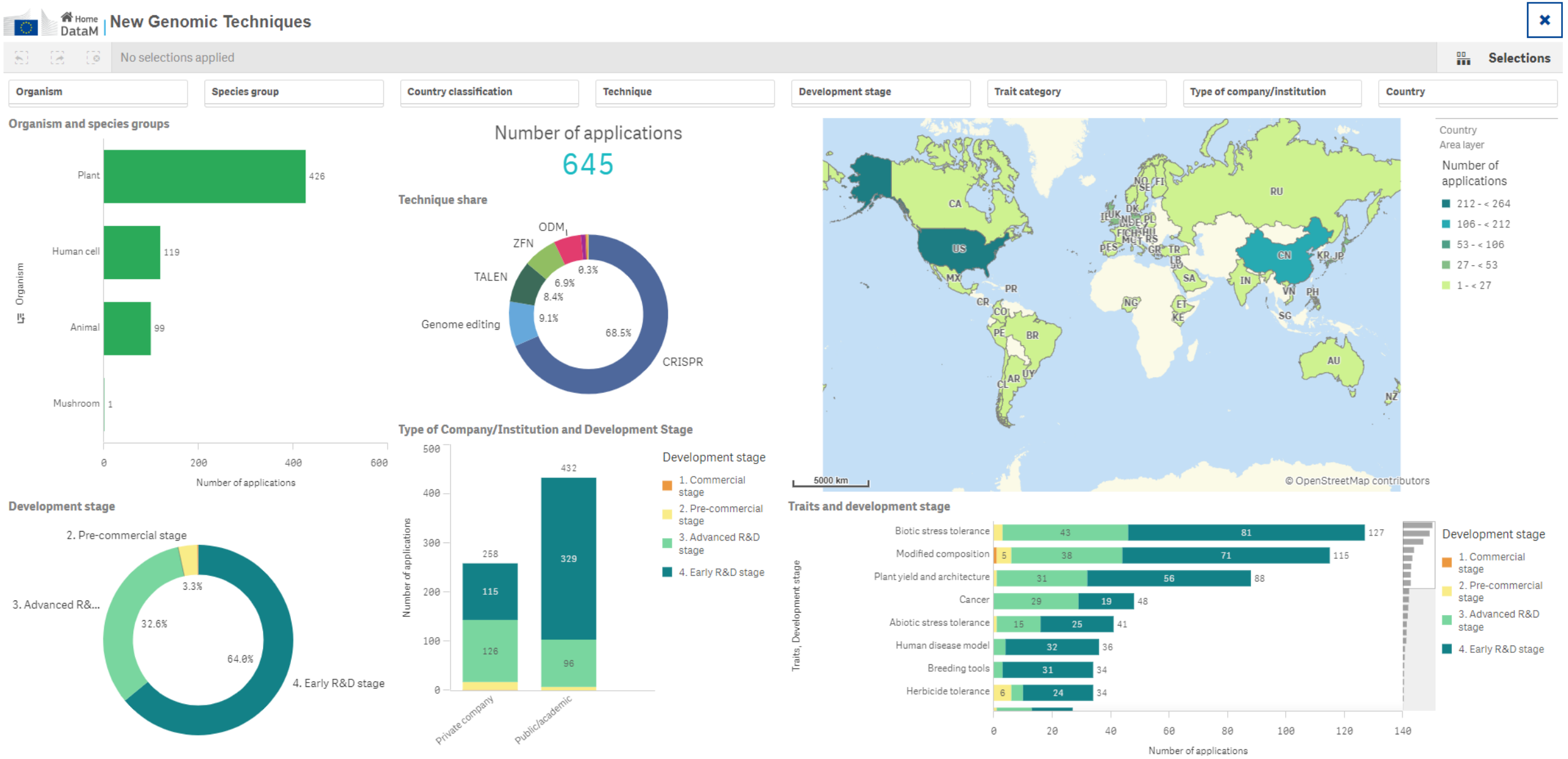
Cisgenesis/Intragenesis

Rearrangement of genetic material of same organism or insertion of genetic material from organisms that can cross in nature

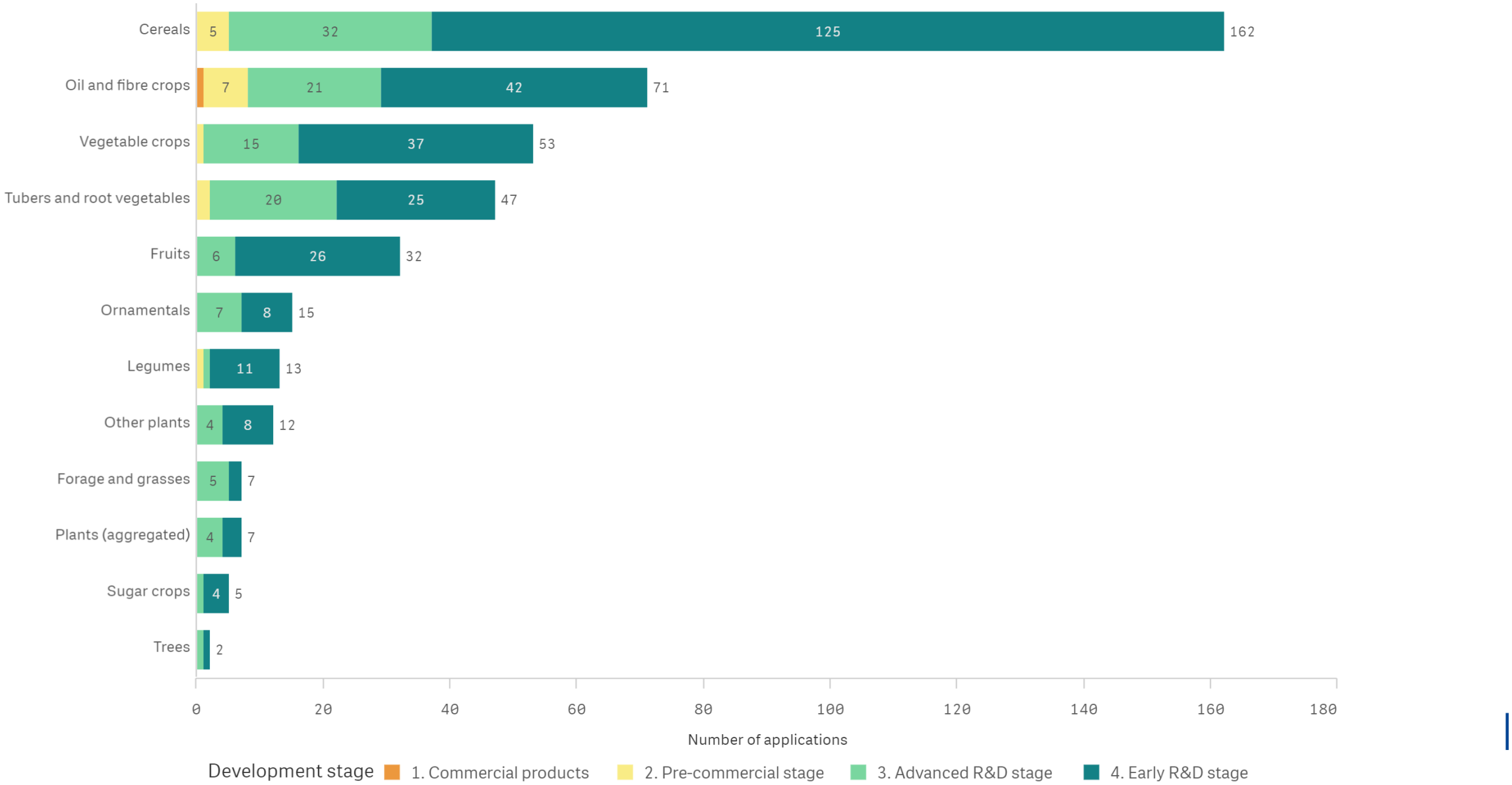
Transgenesis

Insertion of genetic material from other organisms that are sexually incompatible

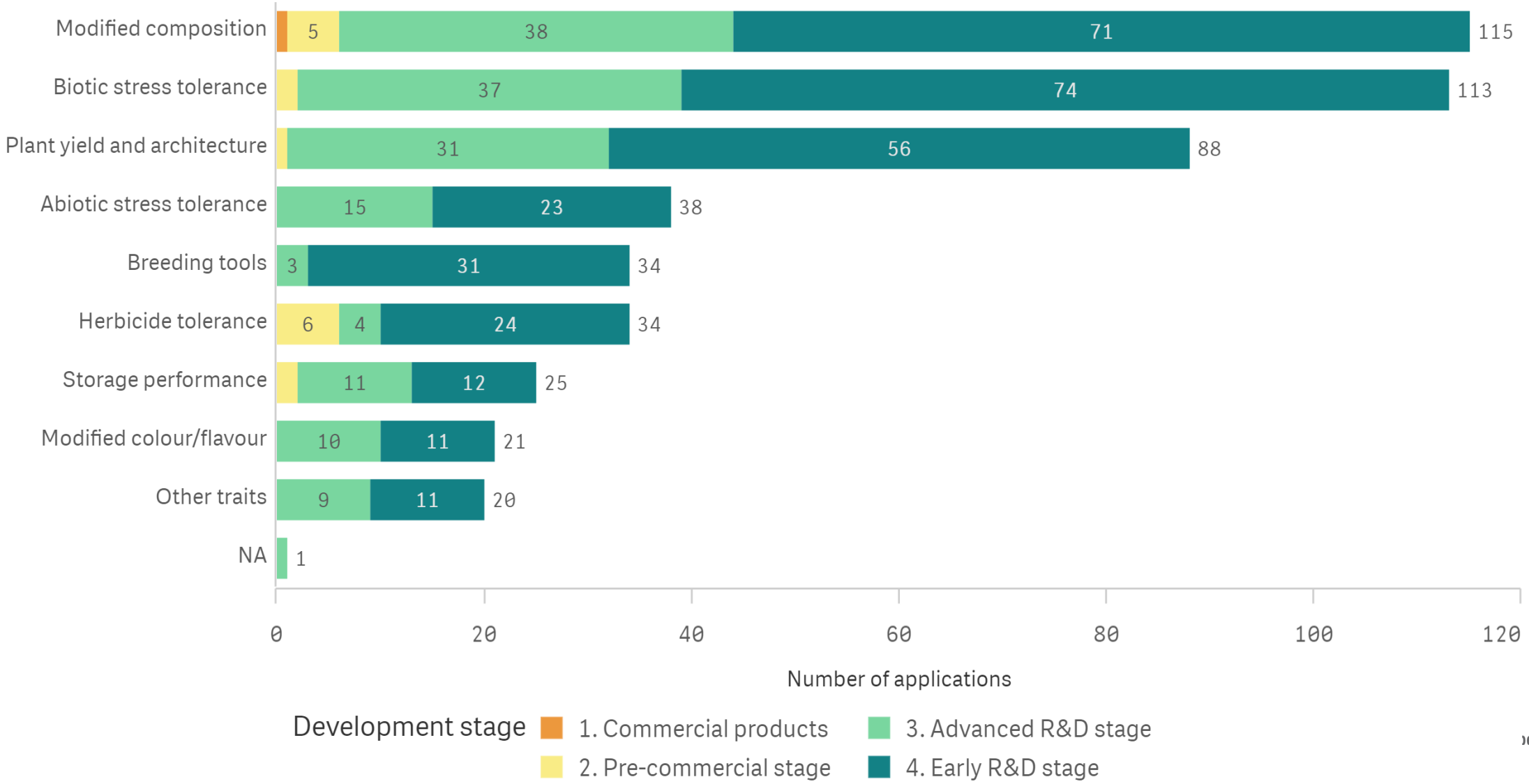
Main findings: research and development (source: JRC)



Plants – breakdown by crop groups (source: JRC)



Plants – breakdown by traits (source: JRC)



Main findings: potential benefits

Plants resistant to effects of climate change

Reduced content of harmful substances such as toxins and allergens

Plants resistant to pests and diseases, needing less chemical pesticides

Vegetable with improved nutrient content

Farm animals resistant to certain diseases

Potential uses in the areas of microorganisms and pharmaceuticals

Main findings: potential concerns

- possible risk and environmental impact
- coexistence with organic and GM-free agriculture
- labelling and consumers' right to information

Some stakeholders consider that benefits are hypothetical and achievable by other means.

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Main findings: safety aspects

- NGTs constitute a diverse group of techniques and each technique can be used in various way to change the genome.
- Need for a case-by-case approach to identify potential hazards and the necessary experimental data.

EFSA opinions on targeted mutagenesis and cisgenesis in plants:

- No new hazards compared to both conventional breeding and established genomic techniques.
- Modifications introduced with targeted mutagenesis and cisgenesis in plants can also take place naturally in the environment without human intervention.

Limited information on other NGTs and microorganisms or animal applications

Main findings: implementation and enforcement

- Organisms obtained through new genomic techniques are subject to the EU GMO legislation.
- Developments in biotechnology since the legislation was adopted give rise to certain ambiguities in the application of the legislation to some NGTs.
- There are challenges relating to the detection and differentiation of certain NGT products that contain no foreign genetic material.

Conclusions

- GMO legislation needs adaptation to scientific and technological progress to be suited to certain NGTs and their products.
- NGTs can contribute to the Green Deal and Farm to Fork objectives of innovation and sustainability of the food systems, and to a more competitive economy.
- NGT applications in the agricultural sector should not undermine other aspects of sustainable food production, e.g. as regards organic agriculture.
- Knowledge gaps identified in the study need to be addressed.
- More effort should be made to inform and engage with the public and assess their views.

Next steps

The Commission’s follow-up action

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The Commission's follow-up action

- ✓ The Commission plans to initiate policy action on **plants derived from targeted mutagenesis and cisgenesis**.
- ✓ The policy action will aim at a proportionate regulatory oversight, which would:
  - maintain a high level of protection of human and animal health and the environment
  - allow reaping benefits from innovation
- ✓ Impact assessment, including public consultation, will be carried out in the next months.
- ✓ For **other organisms and other NGTs**, the Commission will continue to build up the required scientific knowledge, in view of possible further policy actions.
- ✓ Considerations related to the **use of NGTs in medicinal products** will be addressed in the Commission's Pharmaceutical Strategy.

Thank you

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