



# Plant Breeding Innovation by Genome Editing - regulatory status, potentials & challenges

CropLife Europe Conference  
11 March 2021

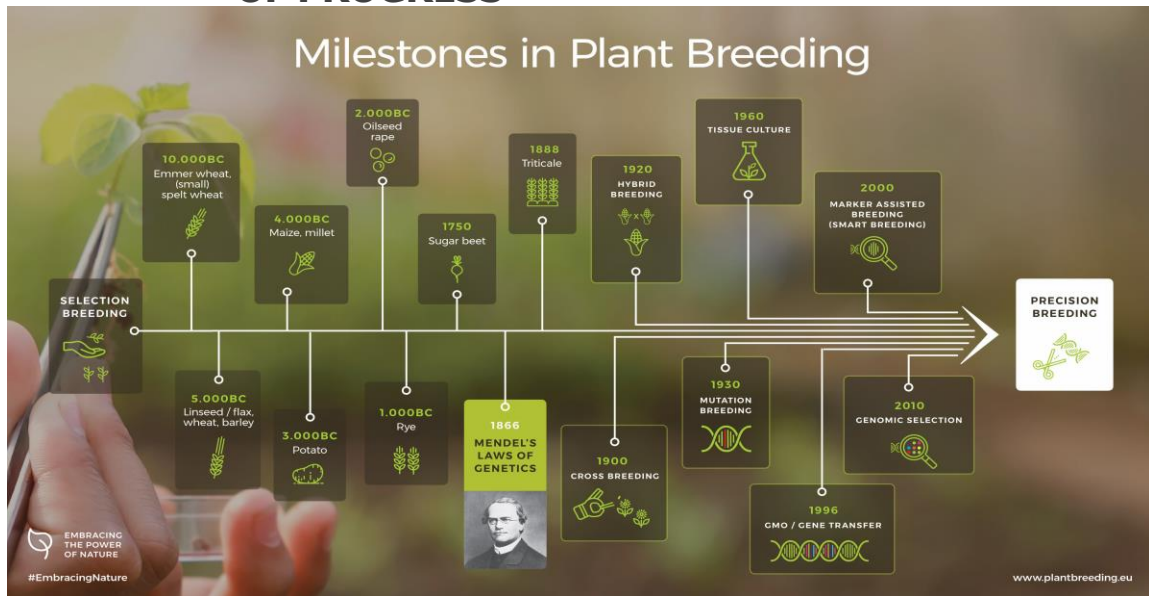
Dr. Petra Jorasch, Euroseeds  
petra.jorasch@euroseeds.eu



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## PLANT BREEDING INNOVATION: A HISTORY OF PROGRESS



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## ECJ Ruling (C528-16) and the Position of the Seed Sector

- The **CJEU concluded** that only organisms obtained by means of techniques or methods of mutagenesis, which have conventionally been used in a number of applications and have a long safety record, are exempted.
- Therefore, **the GMO legislation applies to organisms obtained by new mutagenesis techniques, which have appeared or have been mostly developed since Directive 2001/18/EC was adopted.**  
([https://ec.europa.eu/food/plant/gmo/modern\\_biotech/new-genomic-techniques\\_en](https://ec.europa.eu/food/plant/gmo/modern_biotech/new-genomic-techniques_en) )
- **Our Ask:** Plant varieties developed through the latest plant breeding methods should not be differentially regulated **if they are similar or indistinguishable from varieties that could have been produced through earlier plant breeding methods.**
- Euroseeds suggests a **targeted amendment of Directive 2001/18** that excludes plants of old & new mutagenesis breeding by GE from its definition and adapts the relevant Annexes of the Directive accordingly.



Euroseeds number

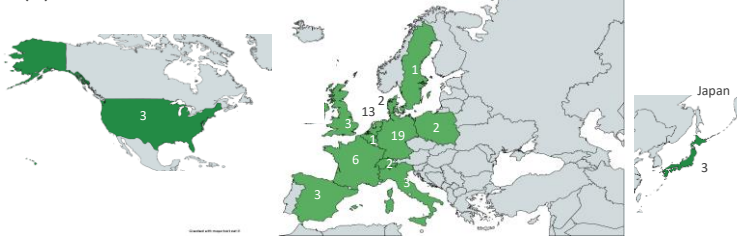
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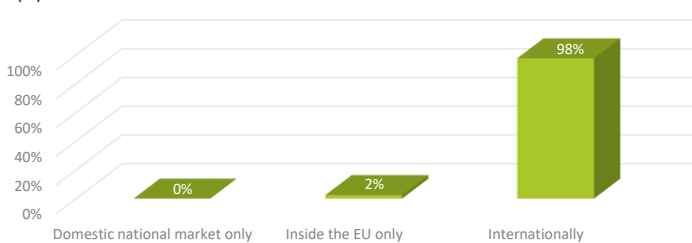
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(A) Location of company headquarters



(B) Where is your company in general active (R&D & Breeding & Seed Production/Sales)?



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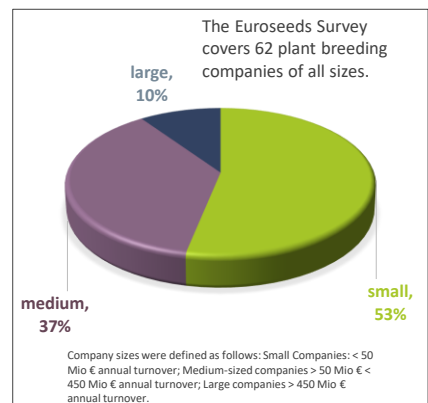


FIGURE 2 |

(A) Location of the headquarter of companies participating in the Euroseeds Survey. The figures indicate the number of company headquarters in a specific country.  
(B) Geographies in which companies active in NBT-related R&D are generally conducting their R&D, breeding or seed production/sales activities.

Source: <https://www.frontiersin.org/articles/10.3389/fpls.2020.582011/full>

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Please indicate the top three factors your company sees as most significant in limiting the potential of the use of new breeding methods?

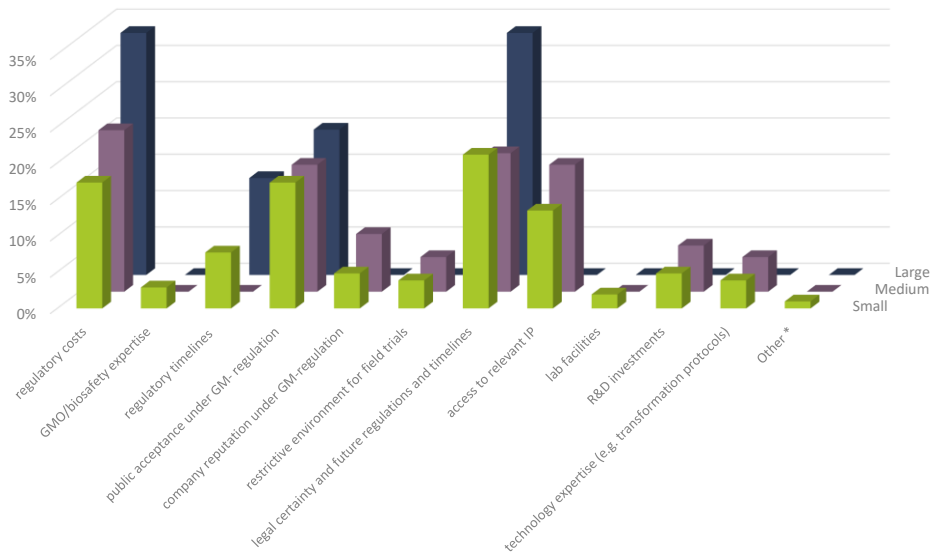


FIGURE 12 | Priority factors that companies regard as most significant as to negatively influence the potential use of NBTs in their breeding programs (3 answers possible). Percentages as to the total number of replies of companies grouped according to company size (multiple answers possible). Total number of replies: small companies, 104; medium-sized companies, 63; large companies, 15. The number of replies for small companies exceeds the number of possible answers (number of small companies multiplied by three) by 2 replies, because 2 companies provided 4 replies without indicating the top three factors. The number of replies for medium and large companies is smaller than the expected. Three medium sized and one large company indicated less than three priority factors. Under "other\*" one organic seed company mentioned restrictions due to private organic standards that exclude using NBTs.

euroseeds.eu Source: <https://www.frontiersin.org/articles/10.3389/fpls.2020.582011/full>

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When will your company most likely bring varieties resulting from NBTs to the market (globally)?

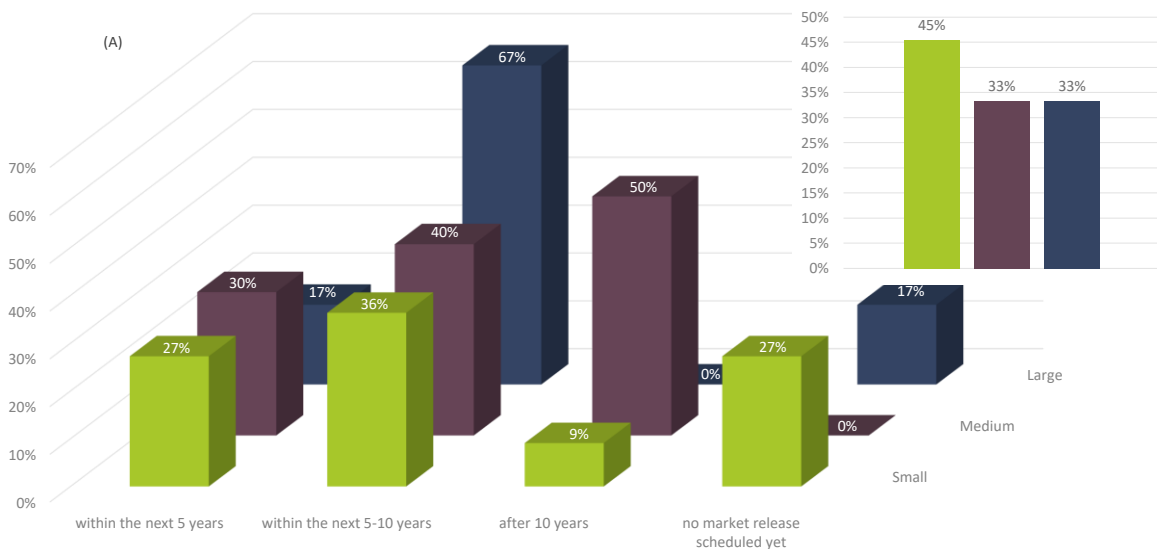


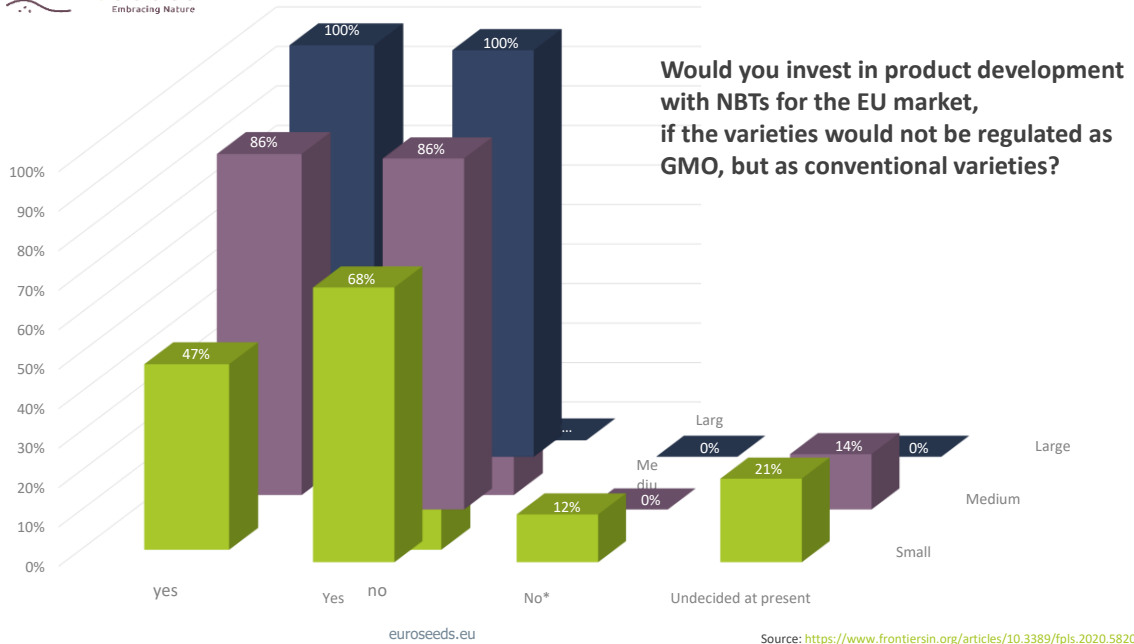
FIGURE 10 | (A) Potential market release (globally) for products resulting from NBT-related R&D activities as to the percentage of replies according to the total number of companies per company size group (multiple answers were possible). Depending on the respective crops companies might envisage different timelines for product releases. (B) Percentage as to number of companies according to size that answered in addition that their intended market releases are delayed due to the current regulatory situation (e.g., GMO regulation in the EU).

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Source: <https://www.frontiersin.org/articles/10.3389/fpls.2020.582011/full>

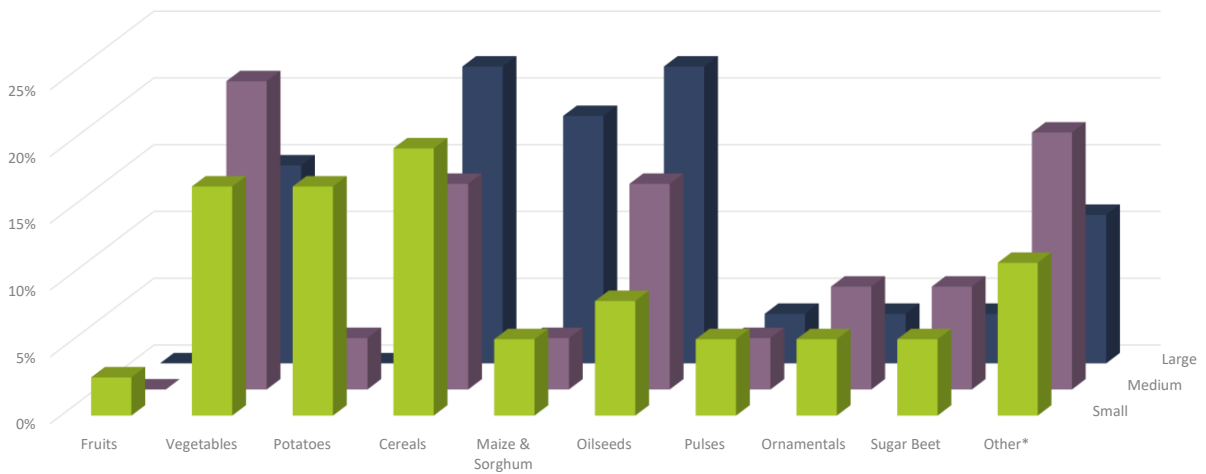
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## Does your company currently have research and development (R&D) activities for NBTs?



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## In which crops/crop groups is your company currently active in R&D with NBTs?



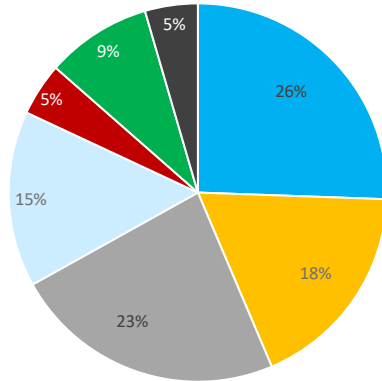
\* soybean, cotton, rice, forage crops (grasses, legumes), chicory, model plants for gene discovery research, poppy for pharmaceutical industry, peanut, ornamentals as food and medical plants, hemp, dandelion, legumes, and stevia

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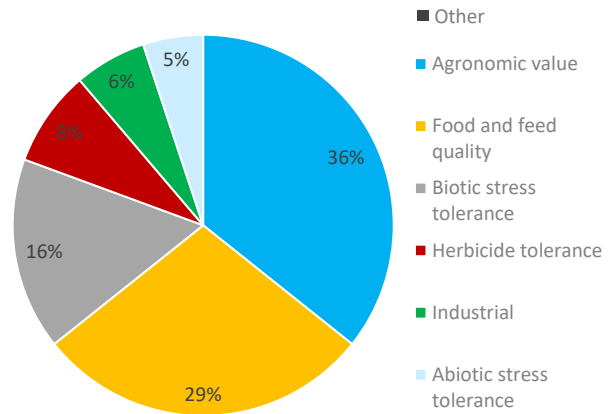
<https://www.frontiersin.org/articles/10.3389/fpls.2020.582011/full>

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## Which kind of goal/trait does your company address in R&D with NBTs? Comparison of the Euroseeds data with the data from Modrzejewski et al. (2019)



Euroseeds Survey



Modrzejewski et al. (2019)

Other: flavor, shelf-life, digestibility, ornamental value (flower color) and post-harvest quality

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<https://www.frontiersin.org/articles/10.3389/fpls.2020.582011/full>

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## How can Breeding & improved Seeds contribute?



Euroseeds number

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Avenue des Arts 52  
1000 Brussels

[www.euroseeds.eu](http://www.euroseeds.eu)

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