HOW NEW GENOMIC TECHNIQUES CAN CONTRIBUTE TO SUSTAINABLE FOOD PRODUCTION IN EUROPE

CropLife EUROPE

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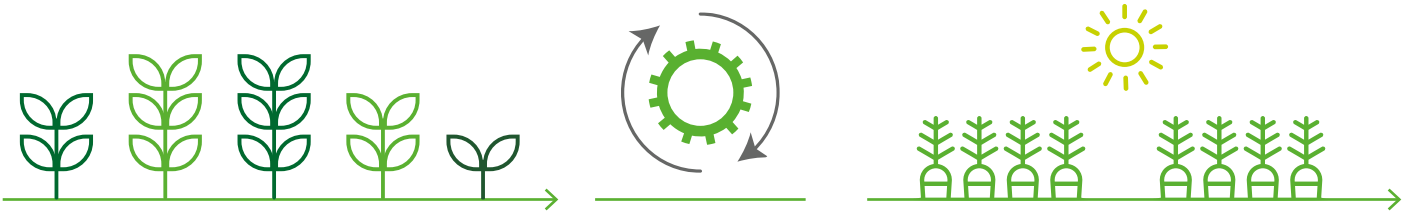
New Genomic Techniques (NGTs) have great potential to contribute to sustainable agri-food systems, in line with the objectives of the EU Green Deal. The EU currently regulates NGT products under the legislation for Genetically Modified Organisms (GMOs), which hinders the development and availability of NGT products for European farmers, and is negatively impacting EU innovation and competitiveness. No plant product obtained by NGTs has been registered in the EU under this framework to date.

CropLife Europe calls for a new **enabling and science-based regulatory framework for NGTs** by establishing a verification process to determine a plant's risk profile and their appropriate regulatory status on a case-by-case basis.

By enabling and accelerating the development of resilient plant varieties for sustainable food production, **NGTs can contribute to the Green Deal objectives.**



WHAT ARE NGTS?

- **NGTs are techniques used to alter the genetic material of an organism.**
- **The European Commission calls these techniques "new" if they were developed after 2001.**
- **NGTs enhance the precision and speed of plant breeding through targeted genetic changes.**
- **This allows for plant improvements to be obtained much faster, which would normally take years with conventional breeding.**
- **According to the European Food Safety Authority (EFSA), plants obtained by certain NGTs do not pose any new hazards compared to plants developed by conventional breeding and can lead to fewer unintended effects.[1]**

GMO COMPARED TO NGTS:

GENETICALLY MODIFIED ORGANISMS (GMOS)

GMO PLANT PRODUCTS ARE TRANSGENIC. THIS INVOLVES INTRODUCING DNA FROM A DIFFERENT SPECIES THROUGH GENETIC ENGINEERING.

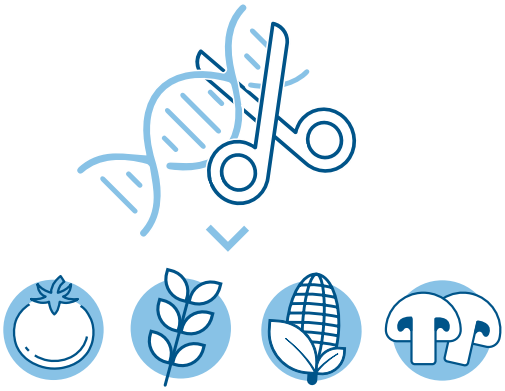
Technique:
A gene from a different species is inserted into the plant's DNA.

Outcome:
Transgenic plant with desired gene inserted.

NEW GENOMIC TECHNIQUES (NGTS)

NGTS CAN CREATE GENETIC CHANGES THAT DO NOT INVOLVE THE INTRODUCTION OF FOREIGN DNA.

NGT: TARGETED MUTAGENESIS



Technique:
Tool used to induce changes in plant genomes without inserting foreign genetic material.

Outcome:
Genome-edited plant with desired gene modified in specific location.

NGT: CISGENESIS

Technique:
Genes from the same or a compatible plant are inserted.

Outcome:
Non-transgenic plant with desired gene added.

COULD ALSO BE OBTAINED THROUGH CONVENTIONAL BREEDING METHODS OR RESULT FROM SPONTANEOUS PROCESSES IN NATURE

NGTS HAVE THE POTENTIAL TO CONTRIBUTE TO SUSTAINABLE FOOD PRODUCTION

Innovation in plant breeding has gained unprecedented importance in light of climate change, biodiversity and sustainability challenges, changing consumer diets, and increasing scarcity of natural resources such as arable land and water with a growing population.

Ambitious reduction targets for fertiliser and crop protection in the EU and the rapid erosion of available conventional crop protection products present EU farmers with important challenges, create competitive disadvantages, and reinforce the need for reliable alternatives such as NGTs.

Over the past years, more precise, affordable, and efficient plant breeding methods have been developed.[3] **NGTs can complement existing plant breeding methods to speed up the development of resilient plant varieties** that are better adapted to the effects of climate change, better protected against pests and diseases, while ensuring food and nutritional security, and increasing sustainability.

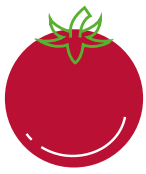
They can therefore make an important contribution towards the UN Sustainable Development Goals and the EU's Green Deal and Farm to Fork Strategy objectives and support the transition to more sustainable food systems.

PLANTS IMPROVED BY NGTs COULD CONTRIBUTE TO REDUCING CARBON EMISSIONS, FOOD WASTE, AND IMPROVE THE NUTRITIONAL PROFILE OF FOODS

Examples of plant traits that can be improved with NGTs include:

Pest-and disease resistant plants that reduce the need for crop protection applications and consequently reduce carbon emissions.	Nitrogen use-efficient plants that need less input resources (e.g. fertilisers) and reduce environmental impact.	Stress-tolerant plants that deliver stable yields under weather conditions exacerbated by climate change.
Plants with longer shelf life to reduce food waste.	Plants with higher vitamin and nutrient content that contribute to healthy diets.	Plants with specific health benefits, e.g. low gluten wheat.

DID YOU KNOW THAT GENOME-EDITED TOMATOES THAT HELP FIGHT HIGH BLOOD PRESSURE ARE ALREADY COMMERCIALISED IN JAPAN?



THE CURRENT LEGAL FRAMEWORK FOR NGTS IS NOT FIT-FOR-PURPOSE

Despite the urgent need for plant innovation and the many benefits of NGT plants, their current regulatory framework is not fit for purpose.

Plants developed through NGTs must undergo a stringent safety assessment applied to GMOs, even in cases where they are identical or similar to conventional plants, which are not subject to a risk assessment. This approach is not scientifically justified.

The lack of an enabling framework puts EU developers, farmers, academics, and research institutions at a competitive disadvantage vis-à-vis their counterparts in other regions and jeopardises the EU's sustainability goals.

WHAT THE NEW FRAMEWORK SHOULD LOOK LIKE

The regulation of NGT plants should be:

- Non-discriminatory and apply the same regulatory oversight to similar plants, taking as the basis the regulatory system for conventionally bred plants.
- Based on a plant's characteristics, rather than the technique used to generate it.
- Based on science and future-proof, to accommodate continuous scientific progress.
- Aligned with other geographies to reduce uncertainty and regulatory burdens for food and feed chain operators while keeping consumers safe. This can be done via a verification system to determine plants' risk profile.
- Enabling access to innovative technologies and products for breeders, farmers, processors, traders, and scientists across Europe.

CROPLIFE EUROPE CALLS ON THE EUROPEAN COMMISSION AND EU LEGISLATORS TO TAKE ACTION AND DRIVE FORWARD AN ENABLING AND SCIENCE-BASED EU REGULATORY FRAMEWORK FOR PLANTS DEVELOPED THROUGH NGTS.

1 "Applicability of the EFSA Opinion on site-directed nucleases type 3 for the safety assessment of plants developed using site-directed nucleases type 1 and 2 and oligonucleotide-directed mutagenesis." EFSA Journal, 24 November 2020. https://efsa.onlinelibrary.wiley.com/doi/full/10.2903/j.efsa.2020.6299

2 "Plant ETP Factsheet: Plant breeding is the heart of our food systems". Plants for the Future, 29 July 2022. https://www.plantetp.eu/wp-content/uploads/2022/07/plant-breeding-is-the-heart-of-our-food-systems.pdf

3 "Position: Plant Breeding Innovation Applying the latest Plant Breeding Methods for the benefit of sustainable Agriculture, Consumers and Society". Euroseeds, 1 December 2018. https://www.euroseeds.eu/app/uploads/2019/07/18.1010-Euroseeds-PBI-Position-1.pdf

4 "Genome Editing for Crop Improvement".ALLEASymposium Report, 29 October 2020. Available here: https://allea.org/wp-content/uploads/2020/10/ALLEA_Gen_Editing_Crop_2020.pdf

5 "EASAC and the New Plant Breeding Techniques".EASAC, July 2018.Available here: https://easac.eu/fileadmin/PDF_s/reports_statements/Genome_Editing/EASAC_and_New_Plant_Breeding_Techniques_July_2018_final.pdf

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