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Radical transformation of our agricultural system needed, not GMOs

A Greens/EFA perspective on genome editing in agriculture

Biodiversity and ecosystems are under extreme threat, with around one million species facing extinction. To avert the worst consequences of runaway climate change, urgent action needs to be taken now.

In order to respond to these unprecedented and closely interlinked crises, our food and agricultural systems need to be rapidly transformed. High input, industrial farming based on monocultures and factory farming must be replaced by high biodiversity, locally adapted food production systems, ones which produce healthy food while respecting animal welfare and the environment.

Indeed, according to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), 'feeding the world in a sustainable manner, especially in the context of climate change and population growth, entails food systems that ensure adaptive capacity, minimize environmental impacts, eliminate hunger, and contribute to human health and animal welfare'. Sustainable agricultural production options include agro-ecological practices and organic agriculture[1].

On the horizon, a new set of genetic engineering techniques, collectively known as 'genome editing', are being touted as part of the solution to the climate crisis. Despite the hype, however, these techniques are not compatible with agro-ecological and organic agriculture. Furthermore, since genome-edited crops and animals are being patented, small farmers and breeders will not be able to save and exchange their seeds, ruling out the possibility of them developing locally adapted crops and breeds. On the other hand, conventional breeding has already provided many useful traits, such as drought resistance and increased yield.

Patents on transgenic genetically modified crops have led to the monopolisation of the commercial seed sector by a handful of companies. Transgenic crops are, almost without exception, either herbicide tolerant or produce their own toxic insecticides, or both. Both traits have led to harmful impacts on biodiversity whilst posing risks to human health. With the seed giants profiting massively from the joint marketing of their patented herbicide tolerant GM seeds and the 'complementary' herbicides, this trend is likely to continue with genome editing. Indeed, the first commercially available genome-edited crop is herbicide tolerant.

In terms of its impacts on farmed animals, genetically modifying farm animals can have serious consequences for animal welfare as well as aiding intensive agricultural systems in pushing animals even

further beyond their physiological limits. It often involves cloning, which leads to birth defects, spontaneous abortions and early postnatal death.

On top of this, a growing body of scientific studies highlights the unintended off-target and on-target genetic changes brought about by genome editing, both in plants and animals. These changes may impact food safety as well as having environmental impacts.

In order to uphold the precautionary principle, we believe that genome edited products should not be placed on the market whilst a number of factors remain in place. These are that knowledge on associated risks for food safety and the environment remain incomplete, that gaps in the risk assessments of the European Food Safety Authority need to be closed and the fact that the risk assessments are almost exclusively based on industry led studies. As a bare minimum, full and strict implementation of the GMO legislation in relation to genome-edited products is urgently needed, as ruled by the European Court of Justice, as well as an assessment of broader considerations.

For more details, see our recently adopted communication paper on 'Genome editing in agriculture'**.**

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[1] https://ipbes.net/sites/default/files/inline/files/ipbes_global_assessment_report_summary_for_policymakers.pdf

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Genome editing in agriculture

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