

What lies beneath

New GMOs: how big business gets control over our food

BIODIVERSITY, FARMERS AUTONOMY AND CONSUMERS' CHOICE THREATENED

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Summary



BIODIVERSITY, FARMERS AUTONOMY AND CONSUMERS' CHOICE THREATENED

We know how to fix the world's broken food system. We need agroecology, to respect and promote biodiversity, and centre crop resilience and knowledge-sharing. We need a system that places diversity, fairness, and balance with nature at its core.

Lobby groups for new genetically modified organisms (GMOs) claim to have the answers too - but their 'solutions' are very different.

According to agribusiness corporations like Corteva and Bayer, GMO technology like CRISPR is the solution to the broken food production industry - a technology they describe as democratising, sustainable and necessary. Looking deeper, we find that these GMOs promoted by Corteva, Bayer and other corporations are also the ones they own the patents to.

Biotech, agribusiness and their lobbyists are already pushing for the European Commission to deregulate new GMOs and reject evidence of all attached risks. The European Commission is listening to their demands and seems more than willing to put the lobby's demands in a new law with weakened safety checks and bypassed GMO labelling.¹

Not only are agribusiness and the EU Commission presenting the new generation of GMOs as a key tool for sustainable food systems, but some global biotech corporations are also pursuing two main legal changes:

- Patents on new GMOs should include all conventionally bred plants with similar genetic characteristics to gain unprecedented control over plants and seeds.
- The same corporations want to keep farmers and consumers in the dark by marketing their products without any labelling and safety checks, so as to minimise their costs at the same time.



Footnotes:

¹ https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13119-Legislation-for-plants-produced-by-certain-new-genomic-techniques_en

Who owns new GMOs?

Patenting gives the patent owners exclusive rights to a certain technology or technique for twenty years. The owners become the gatekeepers of the technology and its output. Others are either banned from using the same technology, or must pay royalties and follow strict restrictions.²

The new GMO industry is dominated by a few key technologies, but by far the most-used is CRISPR/Cas (hereon in referred to as CRISPR) technology, which makes up 68.5% of genetically engineered plants.³ Ever since the patenting licenses for CRISPR were first made available, one major corporation has been buying up the rights to gatekeep this technology: Corteva.

The original inventors of CRISPR technology - MIT-Broad Institute, the University of California, the University of Vilnius and the University of Vienna - have been locked in a patenting battle for years.⁴ However, two people are usually credited as the key developers: Jennifer Doudna and

Emmanuelle Charpentier. Doudna and Charpentier set up their own licensing organisations in 2011 and 2013 called Caribou Biosciences and ERS Genomics. These organisations then set about creating licensing agreements for CRISPR technology with different agriculture companies.

The most important of these is DowDuPont (later called Corteva and referred to as Corteva from hereon in). Corteva made deals with both Caribou Biosciences and ERS Genomics granting Corteva the exclusive use of CRISPR in most areas of agricultural production. Altogether, Corteva has built a pool of around 50 patents.⁵

To put the scale of their agricultural takeover in perspective, in 2017 as much as 70% of the seed and agrochemical industry was in the hands of only three merged companies (Dow-DuPont, Bayer-Monsanto and ChemChina-Syngenta).⁶



Footnotes:

- 2 Breeding Business, the future of plant breeding in the light of developments in patent rights and plant breeder's rights https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1720088
- 3 European Commission, 2021. Study on the status of new genomic techniques under Union law and in light of the Court of Justice ruling in Case C-528/16. https://ec.europa.eu/food/plant/gmo/modern_biotech/new-genomic-techniques_en
- 4 Synbiobeta, 2021. Who Owns CRISPR in 2021? It's Even More Complicated Than You Think.

- 5 <https://synbiobeta.com/who-owns-crispr-in-2021-its-even-more-complicated-than-you-think/>
- 6 Then, C. 2019. Gentechnikverfahren und Pflanzenzucht: Patente-Kartell für große Konzerne. Forum Umwelt & Entwicklung. https://www.forumue.de/wp-content/uploads/2019/06/5_Neue-Gentechnikverfahren-und-Pflanzenzucht_Then.pdf

Patent cartels feed big business, not the world

Jennifer Doudna, one of CRISPR's inventors, called the technology "a democratizing tool"⁷ because it is cheaper and easier to use and so could, in theory, be made accessible to researchers and small and medium-sized enterprises (SMEs). In reality, all of these technologies and the plants produced using them are patented.

To explore use or benefit from CRISPR technology, researchers and other companies must apply for a license. And it is the licenses to bring the product to market that comes with high fees attached.⁸ In other words, the patent owners are happy for researchers and SMEs to do the legwork of inventing new innovations - but to profit from the discoveries, the SME usually ends up partnering or being bought up by the larger company.

In the long-term, this business model not only puts access to GMO technology out of reach of many smaller organisations, it also funnels the market into one completely dominated by a few major corporations.

The patenting of genetic engineering techniques usually refers not just to the technology itself but also to the seeds and often also products using that technology, as well as all following generations that are derived from it. This translates into several risks for smallholder farmers.

Firstly, the market control of GMO seeds means that corporations are able to hike the prices up higher and higher, and farmers struggle to compete with the higher costs for fewer returns.^{9,10} In the EU alone, five large companies controlled 95% of the vegetable seed market in 2013.¹¹

Secondly, the narrowing of available seed varieties and available sellers reduces genetic diversity in crops, with dangerous implications for resilience against climate change. Gene diversity is fundamental to food production that can withstand unstable weather conditions and varied environments. However, by 2014, only 9 plant species accounted for 66% of production.¹²

The Food and Agriculture Organization of the United Nations (FAO) attributes this directly to the narrowing market. "There is a broad consensus that, overall, the shift from traditional production systems using farmers' varieties/breeds of land to "modern" production systems relying on officially released varieties is leading to genetic erosion".¹³

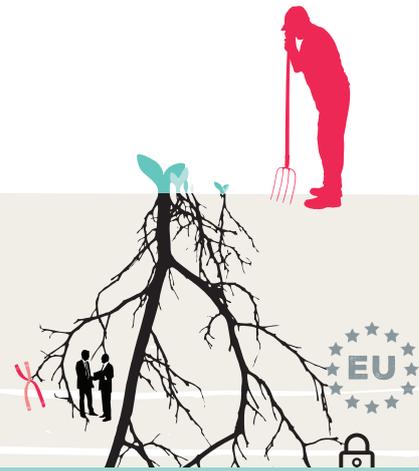
Thirdly, if the GMO industry is successful in lobbying the European Union to deregulate new GMOs, farmers risk losing access to their non-GMO seeds¹⁴ and are faced with GMO contamination in conventional and organic seeds as well as less diverse plant varieties.¹⁵

Finally, patents on seeds are not a common practice in the European Union.¹⁶ Up until now, plant varieties have had their own intellectual property right systems via plant variety protections tools, with breeders holding certain rights to access the different varieties, and farmers holding certain rights to save their own seeds. If patents on seeds are introduced in the EU, the power over these seeds would shift to the handful of corporations controlling them. This would be an attack on farmers' rights and have wide economical impacts on conventional breeders and their access to plant materials.¹⁷

Footnotes:

- 7 Montenegro de Wit, Maywa; Democratizing CRISPR? Stories, practices, and politics of science and governance on the agricultural gene editing frontier. *Elementa: Science of the Anthropocene* 1 January 2020; 8 9. doi: <https://doi.org/10.1525/elementa.405>
- 8 McDougall, P. 2011. The cost and time involved in the discovery, development and authorisation of a new plant biotechnology derived trait. <https://croplife.org/wp-content/uploads/2014/04/Getting-a-Biotech-Crop-to-Market-Phillips-McDougall-Study.pdf>
- 9 Roseboro, K. 2013. GE Seed Monopoly, PCC Markets, 2013. https://www.pccmarkets.com/sound-consumer/2013-09/ge_seed_monopoly/
- 10 M Torshizi, J Clapp, 2021. Price effects of common ownership in the seed sector. *The Antitrust Bulletin* 66 (1), 39-67. https://scholar.archive.org/work/adkkm2pplff2hhnyrfcpm7z4/access/wayback/https://s3-eu-west-1.amazonaws.com/pstorage-sage-1076303800/26154901/sjpdf1abx10.1177_0003603X20985783.pdf

- 11 Commission Staff Working Document SWD/2013/0162 <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=SWD:2013:0162:FIN>
- 12 FAO, 2019. The State of the World's Biodiversity for Food and Agriculture. <https://www.fao.org/3/CA3129EN/CA3129EN.pdf>
- 13 Ibid
- 14 Hilbeck, A., Lebrecht, T., Vogel, R. et al. Farmer's choice of seeds in four EU countries under different levels of GM crop adoption. *Environ Sci Eur* 25, 12 (2013). <https://doi.org/10.1186/2190-4715-25-12>
- 15 <https://www.centerforfoodsafety.org/issues/303/seeds/the-role-of-ge-seeds-and-the-patent-system>
- 16 <https://www.europarl.europa.eu/news/en/press-room/20190912IPR60934/no-patents-on-naturally-obtained-plants-and-seeds>
- 17 Zhou, W. The Patent Landscape of Genetically Modified Organisms, 2015. <https://sitn.hms.harvard.edu/flash/2015/the-patent-landscape-of-genetically-modified-organisms/>



THE LOBBY POWER OF AGRIBUSINESS AND BIOTECH

One example is a lobby letter on new GMO, all the signatories of the letter have a tremendous lobby power that they used to influence the EU and defend their vested interests.¹⁸

Indeed, since the beginning of their efforts to deregulate GM, in 2018, they spent at least €36.599.932 lobbying the European Union.¹⁹ And this is just the tip of the iceberg as many organisations failed to declare how much they spent on lobbying for some years during this period. We can only assume the actual number is much higher than this.

This amount of money allowed these groups to hire up to 78 full time equivalents to further their interests.²⁰ That is not counting consultancies, law firms, that work for them on an ad hoc basis.

Moreover, these big lobbyists have had privileged access to the top decision makers in the EU. Since 2018, they have had 182 meetings with European Commissioners, their cabinets and director generals.²¹ That's more than one meeting a week. And the access doesn't stop there.

The result of the GM legislation is a stark example of how much influence big agri and biotech have on our decision making processes.



Footnotes:

18 Cogeca, Cibe, Fediol, Fefac, Croplife (Europe), coceral, EFFAB, European Flour Millers, Europatat, Plants for the Future, FoodDrinkEurope, Fefana, Starch Europe, Euroseeds, Europabio. <https://euroseeds.eu/app/uploads/2021/05/21.0268-Final-VC-letter-to-Council-NGT-Study-21-05-2021.pdf>

19 Source: Transparency register.

<https://ec.europa.eu/transparencyregister/public/consultation/search.do?locale=en&reset=>

20 Ibid.

21 Source: lobbyfact <https://lobbyfacts.eu/>

The push to deregulate new GMOs and its contradictions

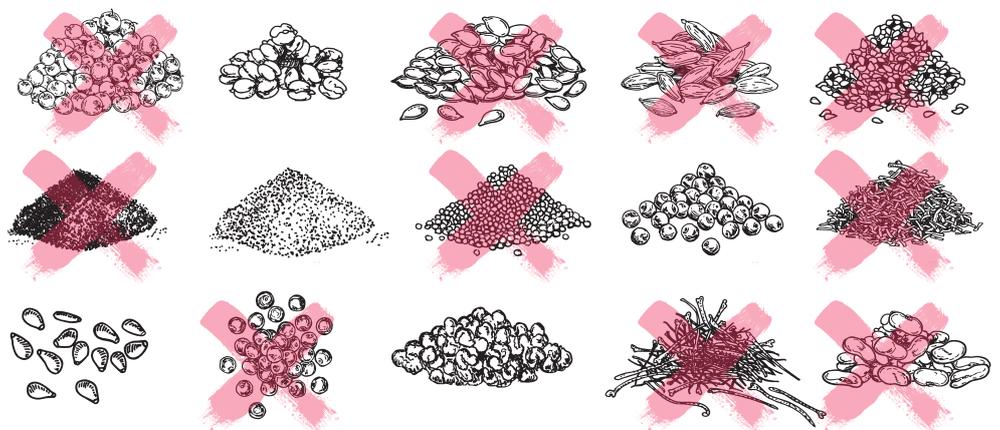
Biotech lobbyists are seeking to expand the rules for patents on plants, animals and organisms so that the scope of patent application covers any plants containing genetic information that could be derived from genetic modification, whether any such engineering is applied or not.²² This expands the scope of patents into completely naturally-derived crops, creating a worrying potential for farmers to pay royalty fees to corporations for plants that did not even use their technology.

Another contradiction emerges as, at the same time as trying to dominate the patent landscape on new GMOs, biotech lobbyists are pushing to even have new GMOs defined as 'natural' by the European Commission.²³ The GMO industry's attempts to blur the definition of natural and unnatural has disturbing implications, where unproven science techniques are released into crops without going through any labelling requirements or safety checks, and then the same industry will, in legal terms, patent nature itself.

GMO techniques and their impact on plants and animals and the environment are still not fully understood and various studies have linked GMO animal feed to poor animal health,²⁴ and the impacts of techniques like CRISPR are often unpredictable.²⁵ For this reason, EU law requires so far the current and new GMOs to undergo several safety checks and labelling.

Deregulation of new GMOs will also take power out of the hands of consumers and retailers, as new GMOs will bypass the same rigorous safety checks and labelling requirements and go straight from the corporation to the plates of consumers.

"There is a broad consensus that, overall, the shift from traditional production systems using farmers' varieties/breeds of land to "modern" production systems relying on officially released varieties is leading to **genetic erosion**".



Footnotes:

- 22 Eurovia, 2020. New GMOs, Patents on Seeds and Peasants' Rights to Seeds in Europe. <https://www.eurovia.org/wp-content/uploads/2020/04/Fact-sheet-EN.pdf>
- 23 Euroseeds, Plant Breeding Innovation Applying the latest Plant Breeding Methods for the benefit of sustainable Agriculture, Consumers and Society, 2018. <https://euroseeds.eu/app/uploads/2019/07/18.1010-Euroseeds-PBI-Position-1.pdf>
- 24 Dona A, Arvanitoyannis IS. Health risks of genetically modified foods. *Crit Rev Food Sci Nutr.* 2009 Feb;49(2):164-75. doi: 10.1080/10408390701855993
- 25 Wolt JD, Wang K, Sashital D, Lawrence-Dill CJ. Achieving Plant CRISPR Targeting that Limits Off-Target Effects. *Plant Genome.* 2016 Nov;9(3). doi: 10.3835/plantgenome2016.05.0047

Conclusion



The story that GMO lobbyists are spinning is a story of contradictions.

The framing of new GMOs as a democratising tool that will fix the agricultural and climate crisis is at odds with the facts. Rather than foster diversity and innovation, corporate capture of technologies like CRISPR has led to a concentration of power in the agricultural sector by a handful of mega-corporations. To adapt to the challenges of an increasingly unstable climate and unpredictable yields, agriculture must develop resilient and diverse crop techniques that can withstand unexpected change - but the current market control sees fewer seeds and less choice for farmers.

Finally, the biotech industry has a track record of building a story about new GMOs that paints them as the key to unlocking the future of sustainable farming.²⁶ But the science isn't even clear on whether new GMOs are helping at all.

A healthy, fair and sustainable agricultural system is within reach. We know that the best way to feed the world's growing population is agroecology.²⁷ Sustainable farming is built on the foundation of working with nature, not against it. It is a system that places diversity, fairness, and balance with nature at its core. This is also partly reflected in the EU Commission's Farm to Fork Strategy.²⁸

While new GMOs promise to prop up the status quo of farming by 'editing' cows to produce less methane and allowing mass production of animal feed, science shows us time and time again that a fair and sustainable food system means moving away from industrial-scale farming and monocultures, towards crop diversification, biodiversity, and more efficient use of land and natural resources.²⁹

Just as cows should not be edited, neither should the facts. Solutions to protect sustainable and fair farming cannot be bought from mega-corporations. Europe must steer clear of false solutions and make sure their time, money and research is invested in proven solutions like agroecology, and not in propping up a patent cartel.

Friends of the Earth Europe is calling for:

- Access to biological diversity needed for further breeding not to be controlled, hampered or blocked by patents. The relevant EU directive must be strictly applied to block patent claims on plants, animals and organisms that are not based on patented GMO technology.
- Regulation of the new generation of GMOs under existing GMO laws to ensure freedom of choice for consumers, farmers and breeders, and for new technologies to go through stringent safety checks and labelling before being marketed.
- Support for real solutions to climate change and nature friendly farming in public policies. Legislation in the areas of agriculture, research and environmental should be geared towards climate-resilient and biodiversity practices like agroecology.

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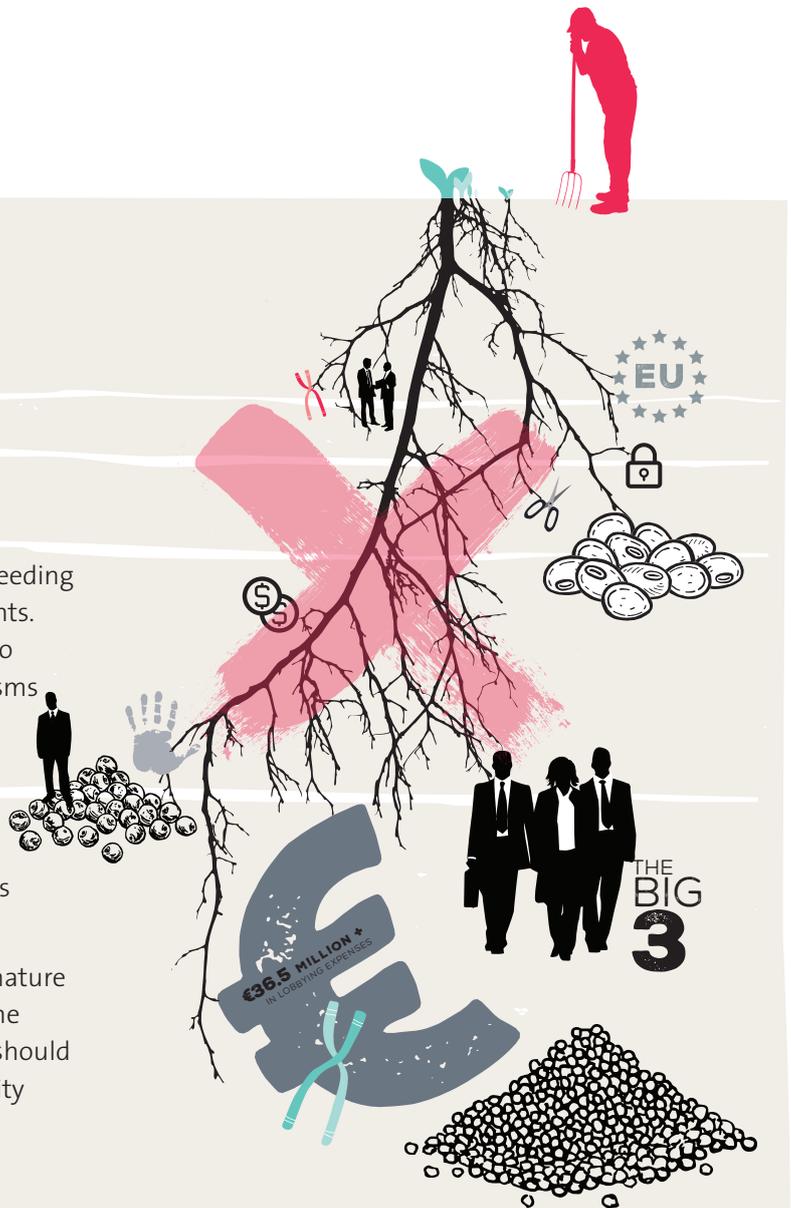
- 26 Montenegro de Wit, Maywa: Democratizing CRISPR? Stories, practices, and politics of science and governance on the agricultural gene editing frontier. *Elementa: Science of the Anthropocene* 1 January 2020; 8 9. doi: <https://doi.org/10.1525/elementa.405>
- 27 United Nations Environment Programme, 2009. *Agriculture at a Crossroads: Synthesis Report*,

- International Assessment of Agricultural Knowledge Science and Technology for Development (IAASTD). <https://wedocs.unep.org/handle/20.500.11822/7880>
- 28 https://eur-lex.europa.eu/resource.html?uri=cellar:ea0f9f73-9ab2-11ea-9d2d-01aa75ed71a1.0001.02/DOC_1&format=PDF
- 29 FAO, 2019. *The State of the World's Biodiversity for Food and Agriculture*. <https://www.fao.org/3/CA3129EN/CA3129EN.pdf>

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Friends of the Earth Europe is the largest grassroots environmental network in Europe, uniting more than 30 national organisations with thousands of local groups. We are the European arm of Friends of the Earth International which unites 74 national member organisations, some 5,000 local activist groups, and over two million supporters around the world. We campaign on today's most urgent environmental and social issues, challenging the current model of economic and corporate globalization, and promoting solutions that will help to create environmentally sustainable and socially just societies. We seek to increase public participation and democratic decision-making. We work towards environmental, social, economic and political justice and equal access to resources and opportunities on the local, national, regional and international levels.

Author: Cass Hebron

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Friends of the Earth Europe
Mundo-B Building, Rue d'Edimbourg 26,
1050 Brussels, Belgium

tel: +32 2 893 1000 fax: +32 2 893 1035
info@foeeurope.org twitter.com/foeeurope
facebook.com/foeeurope

