

EXPOSED

How biotech giants use
patents and new GMOs to
control the future of food

MEDIA BRIEFING



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SUMMARY

The use of patents for new genetically modified organisms (GMOs) such as CRISPR/Cas has resulted in a small group of corporations controlling key aspects of the food system, with the biotech giant, Corteva Agriscience in pole position. Patents pose a threat to farmers and food producers, with patent applications already affecting dozens of plant varieties, giving corporations control over crops and seeds, limiting access to genetic diversity and threatening future food security.

In some cases, the big biotech corporations are blurring the distinction between GMOs and conventional breeding techniques by patenting traits that can occur both natu-

rally or as a result of genetic engineering - claiming all plants with those traits as their "invention". Yet the same corporations argue that new GMOs should be excluded from the European Union's safety checks and labelling requirements for genetically modified food because, they claim, they are the same as natural plants.

This briefing warns that the patent rules are being abused and the consequences of exempting new GMOs from GM regulations could be dire for climate resilience and the future of our food.

INTRODUCING PATENTS ON NATURE

Almost [4000 European patents](#) were granted for plant-related processes and products between 1999 and 2020. Patents control how the resulting plant varieties can be used, restricting the rights to the process used to create them, or the rights to specific traits in the product. While a single plant or animal variety cannot be patented under European rules, patents can be sought for an invention that can be applied to more than one variety, or for a specific genetic sequence or trait. Patents have also been granted for traits that occur naturally or result from conventional plant breeding techniques. Such traits should not be patentable according to the laws, but have been granted because of loopholes in the legislation ([Directive 98/44](#)).

Patents related to plants and animals have always been contentious, raising ethical questions about the appropriation of nature, as well as critical questions about food sovereignty, farmers rights and access to seeds. Patents were designed to protect product innovations and provide intellectual property rights for new inventions. But patents on life differ from patents on machines as the licensing restrictions can also extend to the next generations, with one patent potentially covering hundreds of plant varieties or other living organisms.

Patents on plants were introduced in Europe following extensive [lobbying](#) by biotech and pharmaceutical corporations to allow patents on biotechnological inventions. As a result, most of the European applications for patents on plants since the 1990s have been for techniques and applications related to genetic modification. Most of these patents are held by the giant biotech corporations, Corteva Agriscience (formerly Dow, Dupont and Pioneer) and Bayer (owner of Monsanto).

The dominance of these corporations, and the gradual accumulation of patent applications which already cover dozens of plant varieties, flags critical concerns about who owns our food. Patents increase the corporate control of seeds and restrict the rights of farmers, who could be forced to pay royalties or be sued for using crops grown from protected seeds (as has already happened in the United States). They also threaten to hinder innovation in plant technology – with access to the patented new techniques potentially blocked, or limited to those who have paid for a licence, where these are available. This restricted access would limit the diversity available, restricting opportunities to develop climate resilient crops, and would damage the viability of Europe's plant breeding industry, which is largely made-up of small and medium sized companies.

At the same time, these companies are lobbying to deregulate these patented new GMOs in the European Union, arguing that they mimic processes found in nature. The European Commission is preparing to exclude new GMOs from labelling and safety checks arguing they are as safe as conventional plants. Yet the patent applications made by these corporations argue that these processes are innovative techniques. With the Commission now on the path to develop a proposal for deregulation, biotech companies are gearing up to make new applications for patents, with far reaching consequences.

1 Corporate control

While patent rights for many of the biotech techniques are held by university research departments or researchers, the patent rights for their applications in plants are primarily held by the two biotech giants, Corteva and Bayer. Despite claims that the CRISPR/Cas GM technology is available for all to use, Corteva and Bayer have licensing agreements which limit who can use the technology and how.

As a result, securing these licences is highly competitive, with companies able to potentially control key areas of crop development. Over time, this could mean that Corteva and Bayer could control which crops farmers are able to grow.

Licensing in the agricultural biotech sector is already big business, with the technology and trait licensing segment worth [193 million USD](#) in 2020. Globally, Corteva has applied for some 1430 patents on new GMOs, while Bayer/Monsanto have applications for 119. Both corporations also have licence agreements with the institutes that developed the technologies, which hold the majority of the patents. Many agrifood sectors are now so “top heavy” they are controlled by just [four to six dominant firms](#), enabling these companies to wield enormous influence over markets, agricultural research and policy-development. Corteva and Bayer control 40% of the global seed market.

2 Restricting farmers

Patents on seeds are a problem for farmers as they restrict what the farmer can grow, leading to more costly royalty fees than are currently paid for plant breeders rights. They also block the right to save, use, exchange and sell farm-saved seed or propagating material, recognised by the [UN Declaration of Peasant Rights and People Living in Rural Areas](#). This threat to farmers is recognised by farming lobby group Copa-Cogeca, who officially opposes patents on crops.

Farmers may also face the risk of legal action for patent infringement, as seen in the United States where Monsanto, now merged with Bayer, filed [144 patent-infringement lawsuits](#) against farmers between 1997 and 2010 for alleged failure to pay royalties on patented GM seeds. Farmers can be liable for patent infringements even where their crops have been accidentally contaminated with the patented genetic material. Given that some of these traits can also occur naturally or as a result of conventional breeding, farmers may not even be aware that the seeds they are using have a patented genetic trait.

3 Impacts on the food system

The use of patents to restrict and control which seeds are grown could have profound impacts on our food system, not only limiting the diversity of plants and seeds available, but also how the resulting crops are used for food. Patent rights often extend to the harvested product and the food processed, affecting bakers, brewers and other food manufacturers. Indeed, Carlsberg and Heineken have [patented the barley](#) used in the production of their beer, with the patent covering the plants, the harvest, the process for brewing, malt and wort and all drinks produced with the patented barley, restricting the rights of other companies to use them.

The increasing monopolisation of food production, controlled largely by giant corporations, is likely to result in increased costs for farmers, less variety and diversity in the plants available, leading to impacts on diets globally. Combined with the vulnerability of food systems to climate impacts, energy supply and other supply chain issues, the growth of patents will pose a threat to future food security and might increase food prices.

4 Hindering the transition to sustainable food systems

Plant breeding is essentially a succession of crossing and selection between plants of interest, with plant breeders working from existing varieties to refine characteristics. For example, some breeding techniques include exposing the plant to “challenges” such as UV light, to create new or adapted traits.

Biotech companies are taking out patents that cover genetic techniques, and the specific genetic traits developed through those processes. These traits are then protected by the patent in future generations – and cannot be used without a licence. This control over genetic material has far-reaching consequences for the future of our food.

For example, Corteva holds the patent for a process modifying the genome of a cell using also the Crispr technique and claims the intellectual property rights to any cells, seeds and plants that include the same invention, whether in broccoli, maize, soy, rice, wheat, cotton, barley or sunflower. Corteva is also the only company with a product currently in the EU authorisation pipeline for which the CRISPR technology was used, as well as old gene modifying techniques. The patented [maize](#) is herbicide-tolerant.

The control over access to genetic diversity limits the availability and diversity of seeds that often relies on classical breeding and diverse food systems. Yet the climate crisis means there is an urgent need to shift to climate resilient cropping systems, with a need for more varieties with high diversity, not less.

The growth in the number of patents creates a legal and administrative burden and increases costs for plant breeders, but it could also lead to fewer and fewer non-patented, non-GMO plant varieties for breeders to work with.

Commenting, Mute Schimpf, food campaigner at Friends of the Earth Europe, said:

“Patenting techniques used for plant breeding gives yet more power over our fields and food to big biotech. They will be lining their pockets from farmers and plant breeders, who in turn will have a restricted access to what they can grow and work with. Biotech corporations are even trying to sell their patent applications by claiming these new genetically modified crops are natural, an oxymoron in itself, when actually their only goal is to secure greater control over the market.”

DEMANDS

Biotech companies are promoting new GMO technologies as natural processes, but the growing number of patent applications to protect these technical innovations reveals the true intention. Companies including Corteva and

Bayer want access to the EU market for their new GMO plants and seeds, gaining greater control over farmers, plant breeders and the food system as a whole.

The organisations publishing this briefing demand:

- The use of all GMOs must be properly regulated with premarket authorisation, labelling and safety checks to protect human health and the environment.
- But regulators must also act to protect our genetic diversity and stop the current abuse of the European patenting regulations. Patents should not and must not be granted for conventional seeds and plants.
- Plant breeders need access to genetic material to develop climate resilient crops, and small farmers need access to seeds. There is an urgent need for real innovation in plant breeding, but this should be done in the interests of sustainable food production, not corporate gain.