

Expert warns about strict regulation of new plant breeding methods in the EU

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New technologies in plant breeding, especially gene editing technologies such as nobel-prize winning CRISPR, enable the targeted and precise modification of the genetic material of plants. In 2018, the European

Court of Justice (ECJ) decided in a landmark case that these technologies are subject to the same legal regulations as genetically modified organisms (GMOs). In the journal "Applied Economic Perspectives and Policy," Prof. Dr. Kai Purnhagen from the University of Bayreuth and Prof. Dr. Justus Wesseler from the University of Wageningen analyze the consequences of this legal situation. In the long term, it will have a negative impact on Europe and a positive impact on China.

Mutagenesis, a conventional genetic engineering process, is used to trigger random changes in the genetic material of plants, for example by chemical agents or atomic radiation. With gene editing, individual plant characteristics can be changed in a targeted manner. This procedure involves using so-called "gene scissors" (CRISPR) – developed by Emmanuelle Charpentier and Jennifer A. Doudna, who today were awarded the 2020 Nobel Prize in Chemistry for their research work on editing genomes.

"Compared to mutagenesis, gene editing is considerably more precise and produces far less uncontrollable side effects. It is considered perfectly safe by international experts, and a promising way to provide a growing world population with sufficient food. Nevertheless, its use is regulated much more strictly in EU law than conventional mutagenesis. In practice, this means that genetically modified plants may only be produced within the EU and put on the market if they have successfully undergone an expensive and time-consuming approval procedure. They may not be used at all in certified organic products. Farmers in EU member states therefore have little chance of using new genetic engineering techniques to produce food and thus to remain competitive on the world market," says Prof. Dr. Kai Purnhagen. "It displays a failure of our EU legal system that cannot provide a legal environment where nobel-prize winning techniques can be used for the benefit of the EU citizen," Purnhagen explains. Since October he has been Professor

of Food Law at the new Faculty of Life Sciences: Food, Nutrition & Health at the Kulmbach campus of the University of Bayreuth.

Based on economic studies, the new publication shows that the import of genetically modified plants and food into the EU is also made considerably more difficult. This applies in particular to imports from countries that are among the EU's main trading partners, such as the U.S.. U.S. companies that produce new plants by means of genetic modification and are excluded from the EU's internal market could even be held liable if they thereby impair the export opportunities of other U.S. companies. If the current legal situation in the EU remains as it is, the People's Republic of China, in particular, is likely to benefit from genetic engineering advances in the field of [plant breeding](#)—as will African countries that are increasingly trading with China. These countries could possibly secure food supply in their populations through imports from China, without having to rely on trade with the EU. And biotech companies in the UK are also likely to see new potential in world trade as a result of Brexit.

Purnhagen points out that the EU, with its rigorous regulation of new genetic technologies, is even doing harm to its own ecology. "An EU bio-economy that relies on sustainable rather than fossil raw materials in all sectors of the economy can only be made a reality if a sufficient amount of high-quality biomass is available. To achieve this, however, it is essential to improve the relevant [plants](#), using modern genetic engineering. Moreover, many bioreactors today already depend on genetically modified enzymes in order to work efficiently," says Purnhagen.

The Bayreuth scientist estimates that the chances of fundamentally changing the legal situation created by the European Court of Justice in 2018 are slim. In his view, in recent years, the political majority in the EU member states has shifted in favor of the strict regulation of new

technologies in plant breeding. This constellation is likely to become even more entrenched after the UK, which has traditionally favored rather liberal legislation in this area, leaves the EU. "The widespread willingness in the EU to regulate new plant breeding methods in a particularly restrictive manner is essentially based on an interpretation of the precautionary principle that most countries outside the EU do not follow. This principle requires politicians and the courts to carefully examine dangers and to specifically exclude irresponsible risks. Unfortunately, however, this has translated into a tendency in the EU to place an important branch of biotechnology—despite its great economic and ecological potential—under blanket suspicion," says Purnhagen.

More information: Kai Purnhagen et al. EU Regulation of New Plant Breeding Technologies and Their Possible Economic Implications for the EU and Beyond, *Applied Economic Perspectives and Policy* (2020). DOI: [10.1002/aepp.13084](https://doi.org/10.1002/aepp.13084)

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