

Science setback? What's next now that European court rules gene-edited crops are GMOs?

With the European court ruling that CRISPR crops and other gene-edited foods must be treated as classic transgenic GMOs, scientists worry that Europe and the developing world stand to miss out on a new generation of sustainable agriculture.

The ruling by the European Court of Justice (ECJ) is “the death blow for plant biotech in Europe,” said Sarah Schmidt of the Heinrich Heine University of Düsseldorf in Germany in a [statement](#) to the Science Media Centre. One of the great advantages to gene editing is that because research and development is so relatively inexpensive as compared to traditional transgenics it's adoption could democratize research and the development of new agricultural products.

But this ruling will force gene-edited plants to go through a regulatory process that typically costs about \$35 million, she said, meaning only large companies will be able to afford to walk the regulatory gauntlet, effectively pricing out universities, nonprofits and small companies which are poised in other countries to lead the gene editing revolution. That then tees up the new technology for attacks from European advocacy groups which will undoubtedly then claim that gene editing is yet another new product of “Big Ag.”

The ruling once again puts the EU at sharp odds with the United States over the future of crop biotechnology. US regulators have taken the position that gene-edited crops [don't pose a problem](#) because they involve no “foreign” genes, and are essentially genetically identical to crops developed through traditional cross-breeding. Gene-edited mushrooms may be available soon, while soybeans, flax, wheat and [other crops](#) will enter the US market in coming years.

Last January, Europe appeared set to follow in the footsteps of the US when Michel Bobek, an advisor to ECJ, [recommended](#) that gene-edited crops should not face the same stiff regulations as GMOs—as long as they don't contain foreign DNA. The opinion was hailed by most scientists and farmers. But the ECJ is a political body and not a scientific one, and the full court ignored that 15,000-word opinion to side with advocacy groups and rule that gene-edited crops should face restrictions applied to GMOs in 2001.

“This proves how stupid the European system is for regulating GMOs,” Stefan Jansson, professor of plant physiology at Sweden's Umea University told [Wired](#). “Many of us have tried to change things in last 10 years with meager success. When it comes to things like this, people listen to organizations like Greenpeace more than they listen to scientists.”

The ruling will all but shut down the possibility of a new generation of biotech crops in Europe, but the impact of the ruling will echo more harshly elsewhere, particularly in Africa.

“There's a need in Africa for smaller farmers to secure their food supply and that means creating better crops,” [said](#) Nigel Taylor from the Donald Danforth Plant Science Center in St. Louis to Wired. He runs gene-editing cassava breeding projects in Kenya and Uganda to contain brown streak disease. “With

climate change and urbanization, it's important that agriculture can adapt. Gene editing was going to be a powerful tool to achieve that and it's faced a setback," Taylor said.

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Gene-edited crops are not 'GMOs'

Gene editing describes a [variety of techniques](#) researchers have developed in recent years to add or delete genes from an organism's genome. They differ from [transgenesis](#) in that gene editing techniques typically don't involve transferring foreign DNA into an organism's genome. The plants altered with these new techniques are often called "[cisgenic](#)" as a result.

This seemingly minor but significant difference between gene-edited crops and GMOs has been a major point of contention between the vast majority of scientists and European politicians who have passed numerous restrictive laws over the years. When anti-GMO European activists [convinced the majority](#) of the EU to ban the cultivation of GMOs, they warned that inserting DNA from distant species into food crops could introduce all sorts of new toxins and allergens into the food supply.

These warnings from anti-GMO groups were [always far fetched](#). But now that scientists have discovered new ways to edit specific genes without using transgenic techniques, the anti-GMO movement has switched tactics. The problem now, they say, is not just the presence of foreign DNA in our food, but genetically modifying food crops in any way.

The activist group GM Watch [calls](#) gene-edited crops "GMO 2.0" and celebrated the ECJ's decision in an editorial published on its website, quoting Mute Schimpf, food and farming campaigner at Friends of the Earth Europe:

These new 'GMO 2.0' genetic engineering techniques must be fully tested before they are let...into our food. We welcome this landmark ruling which defeats the biotech industry's latest attempt to push unwanted genetically-modified products onto our fields and plates.

Washington D.C.-based Friends of the Earth also applauded the ruling. "All products made with genetic

engineering, including ones made with gene-editing tools like CRISPR, should be regulated, assessed for health and environmental impacts, and labeled,” [said](#) Dana Perls, the organization’s food and agriculture campaigner. The organization’s affiliate in France was part of a coalition of groups that brought the case.

The court was apparently swayed by the arguments made by European anti-GMO groups, [stating](#), “the risks linked to the use of those new techniques/methods of mutagenesis might prove to be similar to those which result from the production and release of a GMO through transgenesis.”

But experts say otherwise. Professor Wendy Harwood, a researcher in the Department of Crop Genetics at the John Innes Centre, [told](#) the Science Media Centre there is a flaw in the court’s reasoning.

Older mutagenesis techniques that have a long safety record are exempt from [Europe’s GMO regulations]. The same outcomes can be achieved using newer, faster and more precise mutagenesis methods as using the older techniques. Treating the plants derived in different ways is not a logical approach based on the scientific evidence.

Dr Nicola Patron, head of synthetic biology at the Earlham Institute, [added to](#) Harwood’s criticism:

Humans have used different technologies to induce mutations in plants to increase genetic diversity and improve the agronomic qualities of crops for almost a century; the same outcomes can now be achieved using faster, more efficient and precise mutagenesis methods. In most cases, it will not be possible to determine which technique was used to induce the mutation.

Nick Talbot, deputy vice chancellor, and professor of molecular genetics at the University of Exeter [said](#):

Many modern crop varieties were generated over the last several decades by random mutagenesis in which there was no control on secondary effects. Precise modern gene editing technologies allow accurate, predictable changes to be made in a genome. To classify gene edited crops as GMOs and equivalent to transgenic crops is completely incorrect by any scientific definition.

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Missed opportunities for Europe, developing world

Gene editing already has yielded a variety of scientific and economic benefits. Researchers have used [CRISPR-Cas9](#), for example, to boost yields, fight common plant diseases and engineer crops that can withstand the withering effects of climate change. In fact, the technology is developing so quickly that scientists may soon be able to produce [customized seeds](#) for farmers based on the environmental

conditions around their farms. These are significant developments in agriculture, and Europe is now risking missing out on them.

“This is a very disappointing outcome, and one that will hinder European innovation, impact and scientific advance,” [said](#) Johnathan Napier, a scientist at Rothamsted Research in the U.K. “The classification of genome-edited organisms as falling under the GMO Directive could slam the door shut on this revolutionary technology. This is a backward step, not progress.”

It's still unclear how individual countries will react to the ECJ's decision. At least one country, Belgium, [has acknowledged](#) that its scientists are running field trials of gene-edited crops, so opposition to the technology is not universal in Europe. Nonetheless, the public remains generally [critical of all forms of genetic engineering](#) in agriculture. If history offers any guidance, the situation probably won't improve in the short term.

The long-term impact in the most food-insecure countries could be even more devastating. The EU is Africa's largest single trading partner, receiving nearly \$16 billion in agriculture and food imports in 2017 from Africa.

I think it might be the fear of the unknown that is driving the recent law,” [said](#) Bode Okoloku, a Nigerian-born plant scientist at the University of Tennessee, to Wired. “There are hundreds of millions of small farmers who could have gained from that technology and that is now less likely,”

Cameron J. English is the GLP's senior agricultural genetics and special projects editor. He is a science writer and podcast host. [BIO](#). Follow him on Twitter [@camjenglish](#)