

Gene edited crops are GMOs—initial thoughts on the recent court ruling

July 27 2018, by Kostas Vavitsas

Yesterday (25 July), the Court of Justice of the European Union made a ruling that surprised many: organisms obtained by targeted mutagenesis techniques are considered in all aspects GM organisms and are subject to the rigid EU rules. The EU ruling comes in stark contrast with this year's [announcement](#) by the U.S. Department of Agriculture, stating that the Department does not plan to regulate "new plant varieties that are indistinguishable from those developed through traditional breeding methods".

The news had an impact on plant and agriculture researchers throughout the continent. In this post I will write some initial thoughts that occurred to me after reading the decision and some comments from my colleagues. My take is not an expert's opinion (I am not a plant biologist) and many may disagree, so please feel free to argue with or against what I write in the comments or contact me for a post.

Are edited plants GMOs?

Arguably they are. Even if a mutation could have happened in nature or if it is impossible to detect and differentiate the edited plant from a natural variant, there was an intervention that took place to change the genome.

That being said, modern techniques actually allow for better control of the genetic modifications than say irradiation—which is an approved

mutagenesis method. The court ruling would allow the use of targeted editing techniques if they prove safe to use.

The current GM regulations used by the EU were drafted in 2001, and a lot has changed since then. Grouping all genetic modifications together is not the best evidence-based policy, and polarizes the public debate in a heated showdown where stakeholders must take position for or against GMOs. However, pretending that CRISPR-edited plants are not modified is plainly untrue, and it can only result in mistrust.

Impact on health and environment

The recent GMO debate has concentrated on whether GMO crops are safe for the consumers and the environment. Indeed, the [EU directive](#) that regulates GM organisms cites environmental and health concerns.

The most comprehensive analysis so far on the issue was done by the National Academies of Sciences, Engineering, and Medicine, in a [report](#) publishes in 2016. The committee did an extensive assessment of the impact of [genetically engineered crops](#) throughout the last 20 years they are used commercially. Regarding health, they found no negative effect of consuming GM crops, rather than a positive correlation coming from the reduced use of insecticides in insect-resistant plants. They didn't find any adverse environmental effect—especially loss in biodiversity—though they note that there is leakage of the transgenes to other plants and that resistant insect populations appeared. They also conclude that the regulation should focus on the product and not on the technique used to make the plant.

I personally believe that a GM crop is not inherently safer or more hazardous than a variety obtained by traditional breeding or approved mutagenesis techniques. But this doesn't mean that any GM plant is by definition safe. I would wear clothes made using GM cotton, I would

easily eat a vegetable that had a mutation for drought tolerance; however, I may be sceptical in consuming a crop with altered lipid content and I would like to dig a bit further into it. This assessment may or may not be correct, and may be different than someone else's. It is important that consumers have their concerns addressed and have the data available to make informed choices. And in the space of GM crops, that means traceability and maybe labelling. On the other hand, consumer choice means that there are choices to be made; therefore a catholic GM ban would reduce options, and may deprive farmers and consumers of the resources to overcome upcoming challenges.

Effects on innovation

The U.S. Department of Agriculture [announcement](#) states that it does not regulate genetically engineered organisms to facilitate innovation. The Court of Justice's ruling will certainly have an opposite effect, discouraging industrial engagement and even research funding for projects on crop improvement using genetic engineering techniques.

Though genetic manipulations will not disappear from research (invaluable as they are for understanding plant biology), the lack of direct commercial applications may stifle enthusiasm. In particular for plant synthetic biology, which is less developed than other sub-fields, the blow may prove fatal. Again, the grouping of all genetically modified organisms and their applications is short-sighted, as it may not be relevant for future products and applications that may have a modified organism component, but may not fall into the traditional GM crop category.

I think the current EU legal frame, as implemented by the national governments, lacks the necessary flexibility to incorporate new technologies for the benefit of society. It may be more efficient to have an initial, quick assessment of a new product, a decision whether the

product should go through a more rigorous—and costly—assessment or it is deemed safe to go to market.

Beyond the science, the issue is complex

This particular [ruling](#) came due to the action brought by a French agricultural union, contesting the French legislation that exempts mutagenesis from GM regulation. This paints a complex picture, as the union "which defends the interests of small-scale farming" argues that edited organisms carry the "risk of significant harm to the environment and to human and animal health, in the same way as GMOs obtained by transgenesis". The reasons behind this action probably go beyond the actual safety concerns, and may resonate the fears of small-scale farmers on the economic impact of GM crops.

Edited plants will be most likely patented by the companies that developed them. This raises issues of food security and competition to current producers. The negative publicity many of these companies have received, as well as the fact that often concerns of the public are dismissed as unscientific and fear-mongering, do not create the grounds for a healthy debate.

It is worth studying and pondering upon why the public seems not to be convinced by the opinion of most scientists that GMOs are safe and beneficial. It is also worth listening to the concerns with an open mind, finding the core of the problem, pinpointing all the biases, and acting accordingly. And, as most of the research funds come directly or indirectly from the public, we should respect the public opinion and adjust our research accordingly.

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