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EU legislation must safeguard precision plant breeding technologies

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Opinion Plus

European plant scientists are hindered by an outdated regulatory framework that is at odds with recent scientific evidence, writes Dirk Inzé.

Photo credit: **Dirk Inzé**

Agriculture feeds the world. With that in mind, the risk of the breakdown of food systems by climate change is one of the biggest threats we are facing.

Breeding crops that are more tolerant to rapidly-changing and harsher environments, such as the recent period of extreme drought in parts of Europe, will be crucial for the success of tomorrow's food production approaches.

Crop improvement has been carried out for centuries by means of conventional plant-breeding techniques, all leading to genetic changes in the plant.

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Today, precision breeding techniques, based on genome editing, represent the next step in plant breeding. These methods allow us to make the desired genetic changes efficiently and precisely, thereby speeding up innovation in crop breeding.

Precision breeding can contribute to meeting the challenges of climate change, by tailoring crops to a specific area, considering the environmental factors of a certain region.

Moreover, precision breeding is also used to generate crops with an improved nutritional composition, improved digestibility, lower content of anti-nutritional components, reduced allergenicity or requiring less input in the form of crop protection products or fertilisers, which has direct benefits for our environment.

The vast majority of the European R&D sector has embraced this breeding technology and uses it to accelerate basic research and develop crops with valuable novel traits.

The ease of use and relatively low cost of these methods make them accessible for all sizes of companies and institutes worldwide. Moreover, the techniques are applicable in a wide range of crops, from large scale row crops to small and local crops, such as many vegetable and fruit crops.

A recent ruling of the European Court of Justice is now bringing these innovative breeding techniques in jeopardy.

The ruling implies that crops obtained through precision breeding must comply with the strict GMO directive, which in practice boils down to a de facto ban of these methods.

> "Precision breeding can contribute to meeting the challenges of climate change, by tailoring crops to a specific area, considering the environmental factors of a certain region"

At VIB, we have taken the initiative for a position paper urgently calling on European policy makers to safeguard precision breeding technology, in order to secure innovation in plant science and agriculture.

Today, this statement is endorsed by leading scientists representing more than 90 European plant and life sciences research centres and institutes, with new signatories adding their names to the list every day.

We believe that a very restrictive regulation of innovative plant breeding methods will have unacceptable consequences. European agricultural innovation based on precision breeding will come to a halt because of the high threshold that this EU legislation presents.

This will hinder progress in sustainable agriculture and will put plant breeding industries in Europe at a competitive disadvantage.

The impacts on our society will be significant. European farmers will be deprived of a new generation of more climate resilient and more nutritious crop varieties that are urgently needed to respond to current ecological and societal challenges.

The ECJ ruling implies that in Europe, bringing genome-edited crops to the market is only financially feasible for large (multinational) companies and for application in large, broad-acre crops such as maize and soy.

If our regulatory framework were instead adjusted to become more science-based, our universities, government institutions and small companies could lead the precision-breeding revolution, and certain small crops, fruits and vegetables could benefit enormously from its applications.

> "We believe that a very restrictive regulation of innovative plant breeding methods will have unacceptable consequences"

The current strict legislation will also have serious economic impacts in the long term. After all, Europe is in a leading position in terms of innovative agricultural research. This has led to the formation of dynamic biotech clusters consisting of numerous innovative start-ups and corporate partnerships.

Many of these (small) European seed-breeding companies embrace the new technologies, as they can be implemented relatively cheaply and quickly, and because they can democratize the research and development of new agricultural products.

However, the ECJ ruling forces companies to go through a very long and expensive regulatory process. For entrepreneurs engaged in start-up projects involving precision breeding and their potential investors, this regulatory burden creates a low probability of market admission for products developed through precision breeding.

Due to this significant uncertainty and additional risk, smaller biotech companies will seek refuge elsewhere. SMEs and investors may consider it too great a risk to develop activities in this hostile environment, ultimately leading to job losses in the sector.

Additionally, we risk a brain drain effect when plant researchers leave Europe for better job opportunities abroad.

To support innovation in agriculture in Europe, and genome editing in particular, we ask for an adjustment of the regulatory framework to make it more science-based, proportionate and internationally aligned.

Together with the countless statements of European research institutes that appeared online over the last months, the strong support for our position paper is proof of a solid consensus among the academic life science research community that we need to act to safeguard the future of genome editing in Europe for a more sustainable agriculture and food production.

About the author

Dirk Inzé is a plant molecular biologist and professor at Ghent University in Belgium and is scientific director of the VIB Centre for Plant Systems Biology

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