‘Patchwork’ of global gene editing regulations will harm seed production, group warns

Failing to harmonize international regulations around the use of gene editing in agricultural production will hurt seed production globally, the International Seed Federation has cautioned.

The Federation wants governments and agricultural sector players to make conscious efforts to treat gene editing technology in a way that avoids the “mistakes” that have overshadowed the use of genetically modified organisms (GMOs).

Otherwise, the innovations possible through gene editing may be restricted to a few high-value crops and pursued only by the wealthiest seed companies, the group warned.

Dr. Petra Jorasch recently published a research paper on behalf of the Federation in which she observed that countries currently have different systems to evaluate and regulate products like GMOs that are entering their markets.

This creates a patchwork of national regulations, with some countries regulating specific technologies and others regulating the characteristics of the final product or both, she wrote. Furthermore, definitions for GMO, biotechnology, genetic engineering and bioengineering are not consistent across countries.

“If different national regulations are applied to products developed through the latest plant breeding methods, such as gene editing, there may be different requirements for pre-market assessments and labelling, for example,” Jorash wrote.

“This will limit the capacity of the industry to innovate; reduce the diversity of genetic resources; negatively affect research collaborations; and hinder the movement of seed globally. In addition, commodity trade disruption will occur and agricultural development and food security will be impeded. Enforcement issues are likely to increase because seeds and commodities developed with the aid of some of the latest plant breeding methods are indistinguishable from those derived from traditional plant breeding methods or naturally occurring genetic variation.”

The research paper warned that when it comes to gene editing, there is the “risk is to create another system of patchwork regulations and asynchronous decisions repeating some of the mistakes of GMO regulation.”

“This would create an environment in which only the largest seed companies will have the financial capability to manage the costs related to regulation,” Jorasch cautioned. “Also, only a limited number of crops and traits would benefit from breeding innovations and the accessibility of these tools to the academic community and agricultural research centers will be restricted. The global economic activity in the seed and grain trade will decrease and research cooperation and germplasm exchange for global breeding will become more challenging.”

Her study also observed that “the higher the regulatory burden, the more likely that investments in

research and development will decrease or be moved to more favorable regulatory environments," which would have profound impacts on scientific activities and the development of new commercial varieties.

What is gene editing?

Gene editing is a genetic engineering tool in which DNA is inserted, deleted, modified or replaced in the genome of a living organism. It's gaining greater use because it's more precise than earlier techniques.

While no gene edited crop has yet hit the market in Africa, the United States has released gene-edited soybeans with a high oleic oil content and non-browning mushrooms. Internationally, research is under way on a number of other edited crops, including , disease-resistant banana and cocoa plants that can withstand warmer conditions. In livestock, research is also being done to breed hornless dairy cows, cattle that can withstand higher temperatures and disease-resistant pigs and chickens.

The US Department of Agriculture has announced it will regulate gene edited crops like conventionally bred ones, but the European Union intends to regulate them like GMOs, prompting European researchers to demand a science-based policy on gene editing.

The International Seed Federation, which represents national seed associations and companies in 75 countries, said that "consistent criteria for a balanced regulatory oversight worldwide are a prerequisite to facilitate opportunities" that gene edited crops can create.

"An underlying principle for determining these consistent criteria is that plant varieties developed through the latest plant breeding methods should not be differentially regulated if they are similar or indistinguishable from varieties that could have been produced through earlier plant breeding methods," the federation said in a 2018 position paper on the debate.

Gene editing in Africa

America and Europe have made their stance on gene editing technologies clear, but in places like Africa, where they are needed to address food security challenges, the dust is yet to settle on the debate.

Scientists in Ghana recently called on anti-GMO groups to embrace gene edited crops and not fight them as they have done with GMO crops.

Nigeria's parliament recently initiated processes to amend the country's biosafety laws to include emerging technologies such as gene editing, gene drives and synthetic biology.

Dr. Rose Gidado, deputy director of Nigeria's National Biotechnology Development Agency, said these new tools will help the country deal with food security issues more efficiently.

"For food production to match the escalating population in Africa, new approaches such as the gene editing technology will be required to improve crop production while reducing the need for chemical fertilizers and other chemical sprays that enhance the release of greenhouse gases," she told the Alliance

for Science.

“Gene editing is quicker and easier to use with fewer intellectual property restrictions,” she added. “This efficient gene editing system will reduce many of the opinion gaps that have contributed to the opposition of the genetic modification technology. Because of the simplicity involved in the use of the technology, it would be easier to get the buy-in of policy makers in Africa to adopt.”

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