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Breeding controls

Scientists must help to inform regulators wrestling with how to handle the next generation of genetically engineered crops.

On 6 April, activists gathered in Paris to protest against an emerging class of genetically altered crops. Regulators often classify these as the product of 'new breeding techniques' (NBTs) that are sometimes distinct from classical — and historically controversial — genetically modified (GM) varieties. But some protesters, such as those who joined the Friends of the Earth demonstration in Paris last week, are unconvinced by that argument. They call the new plants 'hidden GMOs'.

Around the world, regulators are struggling to decide how to adapt the existing rules for transgenic technology to plant varieties that have been engineered using cutting-edge methods (see page 158). Many have found that their classical regulatory triggers rely on definitions of 'transgenic' or 'genetically modified organism' (GMO) that no longer apply. And they are questioning whether some NBT crops need to be regulated at all.

It is a complex problem, and one that demands steady input from researchers who are familiar with the science behind the technology.

Both terms — NBTs and hidden GMOs — attempt to hold an umbrella over a wide range of methods. Some of them are neither new technologies nor breeding techniques; many do diverge significantly from classical GM technology. The terms often apply to crops engineered using enzymes called nucleases that can be targeted to alter a specific DNA sequence, creating mutations or inserting new sequences into the genome. The wildly popular CRISPR–Cas9 gene-editing technique, for example, falls into this class. But the term NBT also refers to methods for silencing genes using RNA interference, for creating mutations without using nucleases, and even for grafting a non-GM plant onto a GM rootstock.

Public and regulatory discussions sometimes lump these techniques together, but the plants they yield can differ widely. Some mutations that are edited into the genome already exist in wild plant relatives in nature. Should such crops be regulated as stringently as crops in which CRISPR–Cas9 has been used to insert a fresh sequence into the genome? What if the insertion were 2 DNA letters, or 200?

It is clearly a challenge to gather all of this under a coherent regulatory framework that does not over- or under-regulate NBT crops. There will be a push for simplification. Researchers should seize every opportunity to inform the process, and to ensure that the simplification does not distort oversight.

The approach to oversight of GM crops at the US Department of Agriculture shows how a regulatory system can stray from science. GM crop regulations at that agency depend on its authority to control plant pests and noxious weeds. It is a system that had some relevance to the first generation of such crops, many of which were designed using genetic elements from plant pathogens.

It is rapidly losing relevance in the face of NBTs. In more than two dozen cases, the agency has determined that a particular NBT plant variety does not fall under its purview for regulation because it does not entail the use of a plant pest and is unlikely to yield a noxious weed. These might have been scientifically sound decisions, but they were not made for scientifically sound reasons.

The agency is currently revisiting that regulatory structure. There is ample opportunity for scientists to participate: it has released a draft statement listing some of the regulatory possibilities, and the public can comment until 21 April (see go.nature.com/oftgcw). The US National Academies of Sciences, Engineering, and Medicine has convened a committee to evaluate future developments in biotechnology products, including engineered crops, and to examine how those developments could affect regulations. The report is likely to be influential, and scientists should take part in the discussions as much as possible.

"There is room for a healthy debate as to how these crops are regulated."

Such opportunities are not limited to the United States: participation in other regions may not be as direct but could still be influential. Rather than wait on a long-delayed report from the European Commission to guide regulators, the European Plant Science Organisation in Brussels, for example, has already issued statements and put together educational material regarding NBTs (see go.nature.com/vcedfo).

There is room for a healthy debate as to how these crops are regulated: some may advocate for more oversight, others may want to loosen the reins. But for that debate to be fruitful, it must be well informed. Scientists with an interest in this field have a duty to ensure that it is. ■

Under appeal

Don't get too excited about that successful appeal against a grant rejection.

Since last week, *Nature* has been running an informal poll on its website, with striking results. Almost half of the thousand or so scientists who responded did not realize that it can be possible to appeal when they have a grant application rejected.

The poll was prompted by the remarkable story of a UK lab that successfully challenged such a rejection, and was subsequently awarded a €5-million (US$5.7-million) grant. As we report on page 159, computer scientist Peter Coveney at University College London convinced the European Commission that it had made a mistake in turning down his bid to create a hub to apply computer models to biomedical data.

"If your research is in jeopardy as a part of poor decisions, then people should be prepared to challenge them," Coveney said, in a