



Enabling genetic technologies for food security

POLICY BRIEFING

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Policy briefing

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Enabling genetic technologies for food security:

Policy briefing

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Summary

Increasing demand for food and feed in the context of a changing climate, accelerating biodiversity loss, declining arable land, and increased spread of agricultural pests and diseases has been described as ‘a perfect storm’¹ that necessitates increased agricultural productivity. Crop genetic improvement is crucial to address this challenge. The last 50 years have seen extraordinary advances in our understanding of plant genes and genomes. These developments underpin a highly productive plant breeding industry and also guide the work of those improving crop traits by both breeding and gene editing. In the context of gene editing, the UK government has recognised the need for regulations to keep pace with technology development by passing the Precision Breeding Act, which creates a path for crops improved with genetic technologies to be brought to public use.

The crop improvement method that has come to be known as genetic modification (GM) can deliver outcomes that other crop breeding technologies cannot. For example, genes for useful immune receptors that confer disease resistance can be identified in wild relatives and brought into the genetic background of a favoured crop variety, without introducing other, potentially deleterious, genes. In recognition of this, and of the extensive evidence that there is nothing risky about the technology *per se* (risk and benefit are instead determined by the purpose for which the method is used), a growing number of countries are using the GM method for crop improvement to help meet their food security needs.

Given the UK’s academic plant science and commercial plant breeding expertise, the country has a great opportunity to use the GM method for the benefit of its citizens, to reduce the environmental and biodiversity impact of agriculture and to enhance international food security. UK plant science innovations are already being commercialised in other countries with more proportionate regulatory regimes. Outside the EU, the UK is no longer bound by an approach to regulation that is based on the scientifically unjustified idea that there are intrinsic risks in using the GM method. Instead, it can take advantage of the experience of 30 years of commercial use of GM crops to ensure its regulatory processes are proportionate to the potential for risks of specific traits in individual organisms, rather than the technology that delivers those traits. Using the GM method has the potential to decrease the land required to meet our food needs and so free up more space for nature, decrease our dependence on food imports and our reliance on agrichemicals, and so decrease the economic and environmental costs of food production.

1 Beddington J. 2009 *Food, Energy, Water and the Climate: A Perfect Storm of Global Events?* Government Office for Science, London.

We recommend the UK Government re-evaluate the content and implementation of the legacy EU regulations that govern crops improved with the GM method and that were incorporated into UK law. These regulations have been implemented in the EU in a manner that prevents publicly funded discoveries from resulting in valuable innovations. Proportionately implemented regulation should be based on hypothesis-driven risk assessment of the specific properties conferred by each introduced trait, the intended use and the receiving environment.

In the immediate future, even without primary legislation, the transposed regulations enable developers of GM traits to make an application for regulatory approval that does not contain all the studies that are routinely required in the EU, if there is a sound case for not including them (a full description of how this approach could work in practice is included in section 3.3). UK regulators should be open to applications that carry such requests, especially where the crop has already been approved by a trusted regulator in another country. In the longer term, the UK government should follow its own policy on regulation as set out by the 2023 Science and Technology Framework and look to adopt an outcomes-based approach that stimulates demand for science and technology while safeguarding citizens.

Proportionately implemented regulation would open up opportunities for new start-up companies to turn the plant science advances of the last 30 years into valuable innovations and products. This would capitalise on the opportunity provided by the greater accessibility of the technology now that many of the patents that previously restricted access have expired. Spurning the use of GM creates a substantial, and avoidable, opportunity cost.