



To the Chairs
Genetic Technology (Precision Breeding) Bill Committee
By email to: scrutiny@parliament.uk

30th June 2022

Re: Genetic Technology (Precision Breeding) Bill 2022.

I am writing on behalf of Organic Farmers & Growers C.I.C to raise our concerns and provide written evidence in respect of the above titled Bill that HM government have placed before Parliament.

Summary

1. Principle of best practice
 - 1.1. Co-existence
2. Safety and evaluation
 - 2.1. Transparency and monitoring
 - 2.2.
3. Business case
 - 3.1. Farm business & Customer choice

The stability and long-term security of our food system is particularly being held under the spotlight currently as we face a dramatic rise in supply chain disruption through political difficulties, military conflict, extreme weather events and natural catastrophes. It is critical therefore that the cost of allowing the introduction of GMO/GE into the supply chain with the additional testing and storage requirements for the food sector are minimised by ensuring the necessary visibility of this material in the supply chain.

It is clearly of enormous importance that we maintain and properly implement a consistent approach to regulatory frameworks. The necessary co-existence requirements must therefore include monitoring and evaluation of crops and animals, risk assessment procedures, and traceability and labelling requirements.

For the UK agricultural sector generally and the non-GMO and organic sectors, it is crucial to ensure genetic technologies come within a comprehensive and statutory co-existence regime.

This is essential to maintain the high standards producers and the market have all come to expect and have built their business models upon.

Co-existence measures for varying cropping regimes are widely adopted around the world. Approaches to coexistence need to be developed in a transparent way, based on a full understanding of the scientific evidence and in cooperation with all concerned.

Such transparency must ensure an equitable balance between the interests of farmers of all production types and the interests of all practitioners in food supply chains from seed to shelf.

The global organic movement recognises that the use of genetic technologies, such as those employing CRISPR-Cas tools, carries the potential for significant errors and grave damage. We thereby have deep socioeconomic, ethical and environmental concerns.

OF&G supports a practical approach that protects the choice of farmers and of shoppers, and one that ensures supply chain integrity. This provides surety on issues such as food safety as well as economic and environmental protection.



Co-existence measures must be clear and well-structured and implemented with mutually between the practitioners of different production systems and all along the supply chain.

The risk of adulteration to the non-GMO/GE food supply chains, and a subsequent threat to the economic well-being of farmers and producers who have secured markets for non-GMO/GE produce cannot be ignored.

There is a strong commercial case for adequate measures to be maintained with a precautionary approach.

The urgent requirement to protect our food systems, improve human health and the environment has never been more valuable.

It is of very grave concern that, as the Regulatory Policy Committee has pointed out, Defra has repeatedly not properly identified the business sector impacted.

This statement within the RPC report is most disturbing -
<https://www.gov.uk/government/publications/the-genetic-technologies-precision-breeding-techniques-bill-rpc-opinion> –

Furthermore, much of the evidence regarding risk discussed in the IA, is drawn from interested parties, or based on scientific trials, that do not replicate real-world conditions (including farmers' behaviour). Such a narrative could, in turn, impede research, development and evaluation of an important new technology. The Department should have considered independent evaluations of the safety and environmental impact of using CRISPR technology in agriculture and food.

We do not accept that this is at all satisfactory when the Bill would enable changes that could have significant impact to businesses, some would possibly be forced to make dramatic changes at potentially great cost which for some may mean they would no longer be economically viable.

Organic Farmers & Growers CIC has more than forty years of experience in food and farming. We were founded in the seventies as a marketing cooperative for organic farmers. In 1992 OF&G became the first body to be approved by the Government to run an organic inspection and certification scheme in the UK and today OF&G is the largest certifier of UK organic land and certifies around a third of the overall UK organic supply chain.

The need for this Bill is not clear to us and we do not accept a justification based on time – and the relative speed of development.

If this new technology is to be adopted, then any legislation must ensure that the production and use of genetically modified/genetically edited organisms (be they plant or animal) must take place in an ethically justifiable way and provide a positive social outcome without adverse effects on health and the environment. To achieve this there must be independent peer reviewed assessments of the proposed new releases to ensure that any risk is fully mitigated against.

There are numerous examples over the last seventy years of the release of agents into the natural environment that were subsequently found to have significant negative impacts on eco-systems. These range from DDT in the early 1980's (although it was withdrawn in the US nearly a decade earlier) to more recently neonicotinoids.



Whilst these substances can be withdrawn, that is not the case where traits are ‘hard-baked’ into the DNA of an organism. The ability to withdraw the trait is clearly significantly curtailed (especially if it were to ‘jump’ across into wild populations of closely related organisms). It is even more critical therefore that the necessary risk assessments and the overall justifications for the release of these traits into the natural environment are fully quantified and tested.

And here we would emphasise the fact that careful analysis of the evidence clearly shows current intensification of agricultural practices is resulting in the unsustainable degradation of soils which severely weakens human food security.

It is already possible to breed many times during a single season using cross fertilisation in conjunction with gene sequencing to assess which traits are establishing prominence or not. That is a very well established and successful practice in pre-breeding and is done speedily, safely with the usual checks including assessment of risk.

We are deeply concerned with the stated definition of Precision Bred Organism. The Bill appears to employ a political interpretation of plant breeding science.

We do not agree with Defra’s assertion referring to the consultation as stated in the Bill Explanatory Notes – (the following taken from the Bill Explanatory Notes - 220011en.pdf)

The consultation received no new scientific evidence indicating that PBOs should be regulated as GMOs, and many responses expressed the view that GMOs are demonstrably different to the products of precision breeding.

The CRISPR-Cas system is a powerful tool for genome engineering, and it has been made clear in a great many respected scientific publications that a responsible approach must be employed to ensure caution in delivery and distribution of any subsequent genetically altered products.

Recognised as a human-made, non-natural invention, these techniques use an enzyme generated by bacteria from outside the target organism to effect changes to DNA in the target organism that can be within a predicted range, however, it is on record that this is not always the case in every use of the CRISPR-Cas tool and so changes are made outside of the range predicted at the outset.

Reference - <https://www.sciencedirect.com/science/article/pii/S216225311630049X>

Some of the terminology used in the Bill we believe does not relate to real-world scenarios. Scientists use the term ‘precise’ which in laboratory conditions has a meaning that those working in agriculture would not call ‘precise’ at all. Such terminology when applied from scientific lexicon to general food systems changes the meaning and becomes wholly inaccurate. We would add that the use of marker assisted technology, that is non-invasive, can be very precise and deliver predictable results. It is a missed opportunity to not have raised this during the collation of material for this Bill.

Also of great importance is the fact that CRISPR-Cas tools are a patented technology, they are designed to produce results that give rise to patentable (privately owned) genetically engineered (modified) organisms. Consequently they must be regulated as stringently as products of other genetic engineering techniques

The phrase used often in the Bill or supporting documentation, ‘to occur naturally’, is not something we would recognise in any way that would align with the techniques involved in altering genetic material



by the invasive practice such as is used by the CRISPR tool in what is often referred to as 'genetic editing'.

We describe our concerns on this and other points in detail in our response to the Defra consultation on the regulation of genetic technologies:

<https://ofgorganic.org/news/of-g-response-to-govt-consultation-on-regulation-of-genetic-technologies>

UK regulations should ensure that:

- **All forms of gene editing are subject to robust regulation and risk assessments over and above basic health and environment regulations;**
- **All aspects and stages of gene editing processes and products in the supply chain should be transparent, monitored and clearly labelled;**
- **That the regulatory system should be broad based in goals and structures encompassing citizen involvement, transparency, ethical considerations and societal goods and services.**

Any redefining of genome-editing as non-GMO would also put the renegotiation of the current organic equivalency agreement embedded in the UK/EU TCA by December 2023 in serious doubt due to this significant divergence.

In the context of new traits being 'edited' in livestock it is critical that these traits do not simply mask poor welfare conditions or physiologically and metabolically drive the animal beyond its natural limits. We have already seen instances within the dairy sector where high production animals' breakdown to other physiological and disease stresses simply because they are physiologically living 'on a knife edge' and do not have the reserves or capacity to cope with these additional challenges. We see similar issues within the poultry and pig sectors where disease and physiological stress behaviours are common.

It is critical therefore that we undertake a full root cause analysis around the need or otherwise of unnatural interventions, if as a consequence of improved feed efficiency the animal is exposed to greater physiological and disease pressure then we have question the quality of life we imposing on that animal.

Risk assessments must be in place and checks properly made in all situations with plant breeding especially in the field where escape does pose a significant risk.

Cross-pollination is one of the routes for cross contamination. There is also evidence where escape can occur in transport and storage.

Outside the farm-gate, research has clearly shown that potentially highly damaging contamination has occurred along routes of transportation –

Detection of feral GT73 transgenic oilseed rape (Brassica napus) along railway lines on entry routes to oilseed factories in Switzerland - <https://link.springer.com/article/10.1007/s11356-013-1881-9>



In Switzerland, railway tracks are regularly treated with a glyphosate-containing herbicide by the operating company Swiss Federal Railways SBB. This happens on safety grounds (to avoid destabilization of gravel by plant growth) and is based on a unique permit (The Federal Authorities of the Swiss Confederation 2005). These management conditions, which are also practiced by other countries (e.g., Austria, Germany), may well promote the establishment of glyphosate-resistant GM OSR. Gravel beds create an ideal fallow habitat for GM herbicide-resistant OSR to germinate.

Once emerged, GM OSR plants are positively selected by glyphosate applications (Londo et al. 2010). These circumstances were likely to promote the growth of GT73 OSR plants along Swiss railway tracks. Similarly, Yoshimura et al. (2006) observed a greater frequency of occurrence of glyphosate-resistant OSR in the area of Vancouver where glyphosate is used around grain elevators, as compared to the rural monitoring region of Saskatchewan in which glufosinate is commonly applied.

In the event of an incident such as an escape of genetic material from a deliberate release then it is critical that a suitable monitoring system is in place to record the incident and ensure remedial action is taken and future incidents are mitigated against.

Where the wider environment has been contaminated this could lead to environmental and economic damage. It is under these circumstances that there would be public scrutiny and the potential outcry would result in a loss of confidence in the integrity of the UK supply chain both domestically and internationally.

Intellectual Property Rights are of huge importance in the food system and we would encourage an industry and a public debate on corporate control within our food systems.

Although some CRISPR laboratory work begins in SME's and start-ups the trends we have seen show that larger businesses will partner with these smaller companies, and this often leads to take-overs by larger corporate entities.

Consolidation in the food industry also increases job losses, reduces consumer choice, and as a result global diversity, variety and independence in our food chain are at risk.

Reference:

<https://www.independent.co.uk/news/business/news/uk-food-industry-overseas-firms-takeovers-mergers-sector-a8358516.html>

We would want to see clear protection for farmers and others in the supply chain regarding ownership of Intellectual Property when products that have resulted from Precision Bred Organisms come to market. Some of these products could carry multiple traits that have been made because of using a CRISPR-Cas tool. When outcrossing occurs across field scale commercial cropping some of these traits may transfer to other crops and any farmers and growers affected could possibly and unwittingly become liable for financial penalties.

We would want to ask how such a circumstance would affect our licensees across the UK, also in Wales and Scotland? The Bill states the change would take effect in England as agriculture is a devolved responsibility. However, the organic regulatory framework is not a wholly devolved responsibility. Both the Welsh and Scottish governments have voiced their strong opposition to an agricultural use of plant material altered by use of genetic technologies including those of CRISPR-Cas within their Devolved Administrations.



We firmly believe that this Bill presents a great many challenges that are not entirely covered or fairly represented in the government's supporting documentation.

We would welcome the opportunity to discuss our concerns points in detail whenever convenient. CRISPR-Cas has great potential, but with any very powerful innovation such as this, that has the potential to be effect such dramatic and rapid changes this can come with the potential of very serious harm - <https://stanmed.stanford.edu/2018winter/CRISPR-for-gene-editing-is-revolutionary-but-it-comes-with-risks.html>

Attached separately is supporting information in the document - *OFG evidence to Genetic Tech bill - supporting detail June 2022.pdf*.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'S. Jacobs', written in a cursive style.

Steven Jacobs

Business development manager



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Genetic Technology (Precision Breeding) Bill Committee

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Organic Farmers & Growers CIC information to support evidence in document - *OFG evidence to Genetic Tech bill June 2022.pdf* -

As an Organic Control Body we annually audit end-to-end using physical inspections and detailed inspection of farm & food business records, mass balances and labels: for instance feed labels must carry a non-GM declaration. And we in turn are audited by a Defra approved auditor and must pass that audit to continue to legally operate.

Sales in the UK organic sector are valued at £3 billion and have been increasing year-on-year since 2010.

The sector has around half a million hectares under certification across the UK.

Globally the organic sector is valued at \$100 billion with around 75 million hectares under certification worldwide.

Organic farming is proven to stabilise ecosystems and reducing harmful inputs

These include reductions in CO2 equivalent greenhouse gas emissions and increased carbon sequestration annually worth over £100s million in carbon permit trading terms. Reductions in nitrogen surpluses and related losses to water courses potentially saving up to £100 million in water treatment costs. Reductions in application of pesticide active ingredient applications, with an associated 25% increase in biodiversity.

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Main concerns -

- **Transparency** - in order to assure the public and the business community what measures will be in place to guarantee transparency?
 - where organic integrity is ensured through inspection & certification along the entire process and all along the supply chain

- **Evaluation** - How will Defra & the FSA guarantee traceability to assure adequate monitoring and evaluation?
 - What do you require from the Bill in terms of traceability to enable you to maintain organic standards and for other non-GM supply chains to ensure the integrity of their supply chains?



- **Safety** - plant breeders we have spoken to do not agree with the assertion in the Bill that genetic changes brought about by the use of the CRISPR-cas tool could always be determined as the same as those that would occur naturally - therefore commercial benefit and plant variety safety in plant breeding and food systems and in the environment would not be guaranteed
- **Liability and insurance** - in the event of a containment breach - e.g. in transport, what measures would be employed to establish liability? In the event of a dispute who would be the arbiter / adjudicator?
- What would constitute a 'precision breeding' escape or contamination event?
 - - QHPs potentially will contain stacked traits? How many?
 - - At what level of stability?
 - - If a trait were to fail would that compromise the others?
 - - And would that lead to a variety becoming altered to the QHP that was originally recorded?
- As a government regulated control body we would need to see a **Register of events** and audit requirements.
- This would need to be updated in a timely manner and reported to us in a timely manner.

The UK currently has around 500,000 hectares of land certified under the organic regulation. And the UK organic market is worth around £3 billion. The trade implications of any disruption resulting from contamination and/or loss of supply chain integrity could be significant and costly.

Organic is not a devolved responsibility. Agriculture is a devolved responsibility. The organic sector across the UK, including stakeholders and the governments of each Devolved Administration, would need to see proper agreement across the four nations and with the UK government before any activity takes place.

Currently the Devolved Administrations work together through the Common Framework. We understand that there is tension between Defra and their counterparts around the UK which is a cause of very grave concern for us in looking at maintaining organic supply chain integrity.

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[Supporting information with references.](#)

English Organic Forum

An EOF report published in February 2021 identifies key environmental public goods that could be delivered from 1 million hectares of organic land (approximately 10% of England's agricultural land).

These include more than 9.4 million tonnes CO2 equivalent fewer greenhouse gas emissions and increased carbon sequestration annually worth over £188 million in carbon permit trading terms.

A 50,000 tonne reduction in nitrogen surpluses and related losses to water courses potentially saving up to £100 million in water treatment costs.



As well as 1,700 tonne reduction in application of pesticide active ingredient applications, with an associated 25% increase in biodiversity.

<https://ofgorganic.org/news/a-clear-consolidated-and-compelling-case-for-organic>

IFOAM and FiBL

Organic farmland and retail sales continued to show strong growth worldwide, according to data from 190 countries (data as of the end of 2020).

Against the backdrop of the pandemic, the global market for organic food showed its highest growth ever in 2020, exceeding 120 billion euros – a total increase of 14 billion euros.

The United States continued to be the leading market (49.5 billion euros), followed by Germany (15 billion euros) and France (12.7 billion euros). In 2020, many major markets showed extraordinarily strong growth rates; the German market, for example, grew by more than 22 percent. Swiss consumers spent the most on organic food (418 euros per capita in 2020), and Denmark continued to have the highest organic market share, with 13 percent of its total food market.

The global COVID-19 pandemic resulted in a significant increase in demand for organic products in many countries, but there were also challenges: “The effects of the pandemic are visible in retail sales data. As people stayed home and began to cook more often and health, environment and climate change have become big issues, organic retail sales increased rapidly. However, at the same time, in the food service, sales decreased in many countries”, says Helga Willer, who is in charge of the yearbook at FiBL.

Almost 75 million hectares were organically managed at the end of 2020, representing a growth of 4.1 percent or 3 million hectares compared to 2019.

Organic area increased across all continents in 2020. Half of the global organic agricultural land is in Oceania (35.9 million hectares). Europe had the second largest area (17.1 million hectares), followed by Latin America (9.9 million hectares).

<https://www.ifoam.bio/news/global-organic-market-unprecedented-growth-2020>