

Sustainable Agriculture with Biotech

How the EU could #UnshackleInnovation by 2025



Serious about climate & biodiversity?

Biotechnology, including genetic modification of crops, has a proven record of increasing farmers' incomes whilst reducing CO2 emissions, the need for farmer inputs, and the pressure of agriculture on biodiversity, amongst many other benefits. Unfortunately, the complexity of communicating the science, combined with misinformation, has created misunderstandings and worries about this widely beneficial technology, especially in Europe.

Despite having contributed to the invention of the first genetically modified (GM) crops in the 1990s, EU has practically prevented their cultivation within its borders, whilst remaining heavily reliant

on imported GM crops. Following a July 2018 Court Ruling, the same contradictory policy now applies to plants improved with other modern biotechnologies, even if they are no different from conventionally bred plants. Our plea to European decision makers is simple:

Please prioritise trust in science!

Over more than 20 years of commercialization, GM crops have proven to be as safe as conventional crops, as confirmed by leading scientific institutions, including in Europe. It is time for EU decision makers to stand up for innovation and against misinformation. Biotech can be part of the solution to the many challenges facing agriculture today.

Our Call to Action

1. Base decisions on science

- The Commission should propose a science-based approach to non-transgenic crops developed using **genome editing**. Such crops should not be classified or regulated as GMOs.
- Member States and MEPs should support the **approval of safety assessed GMOs**.
- EFSA and the Commission should ensure **efficient and transparent risk assessment** for GM crops, in recognition that GMOs have been used safely for decades.
- The Commission should remove scientifically unjustified regulatory requirements for GM crops, especially when they contradict the EU's policy to **reduce animal testing**.

2. Build Trust

- The Commission and other authorities should deliver and implement a robust 'general plan for **risk communication**' on food safety.
- Legislators and authorities should publicly push back against **misinformation about GMOs** and communicate more about benefits and the process that guarantees a solid safety assessment and safe foods.

3. Protect Intellectual Property

- The Commission should maintain the **biotech patents directive** in its current form, which is already fit for purpose.
- Legislators and EFSA should continue to protect **confidential business information**, also in regulatory systems.

4. Promote Science and Innovation

- Legislators and authorities should promote the **innovation principle** and stop misusing the precautionary principle to hinder or delay the approval of safe products.
- Legislators should ensure an appropriate level of funding for the development of biotech solutions under **Horizon Europe**.
- The Commission should develop a new EU **life sciences and biotechnology strategy** to prioritise these key enabling technologies for the future.

“ There is compelling evidence that GM crops can contribute to sustainable development goals with benefits to farmers, consumers, the environment and the economy”

European Academies of Science¹⁵

How much do you know about GMOs and sustainability?

Genetic changes are everywhere

1. All our food has changed genes.

Most of the plants and animals we eat do not exist in nature and could hardly survive without us. They have been domesticated and bred over centuries, changing their genes to fit our needs and preferences. In fact, mutations happen daily in each of us as part of evolution. 145 of our 20,000 genes come from bacteria, fungi and algae¹.

2. Most of us already use (imported) GMOs.

Most Europeans wear clothes made with genetically modified (GM) cotton and eat food made from biotech-improved ingredients each day. The GM soya beans we import each year to feed European livestock weigh as much as all EU citizens combined and allow for the EU's production of high-quality meats, eggs, and dairy products. "Banning GM imports means doing away with our capability of producing food" – V. Andriukaitis, EU Health Commissioner (2014-19)².

3. GM crops are not new.

The first GMOs developed by introducing new genes into plants were created more than 30 years ago. GM crops are now being grown on 13% of the world's fields, totaling six times the land area of Italy.

4. Genome editing is different.

In contrast to GMOs that have been developed using transgenesis (insertion of 'foreign' genes), genome editing is a recent breeding method that can allow for precise genomic changes to a plant without the insertion of foreign genes. In these instances, the resulting modification can be indistinguishable from conventionally bred plants or from plants with a natural mutation.

Environmental efficiency matters

1. GMOs allow efficient land use that helps biodiversity

Land use is the main culprit for biodiversity loss³, and, as the global population grows, so will the demand for food and land used to produce it. "Because arable land is limited, most of this additional production will have to come from sustainable agricultural intensification." – FAO⁴. GM crops have helped farmers to increase their yields on the same land by over 20%⁵. Without these higher yields, over 220,000 square kilometres more land – nearly two thirds the size of Germany⁶ – would have already been needed to feed the world. Producing even just the same amount using solely organic farming would require the use of substantially more arable land, due to lower yields⁷.

2. GMOs reduce pesticide application

Compared to farmers growing conventional crops, farmers using GM crops require fewer pesticide applications and experience higher profits, by over 65%⁸. Insect resistant GM maize makes up one third of maize in Spain and has reduced insecticide applications by 37%⁹.

3. Fewer CO2 emissions

GMO adoption has enabled savings of CO2 emissions equivalent to taking 16.7 million cars off the road for a year. That's enough cars to form a line that extends one and a half times around the globe. The savings come mainly from reduced ploughing (through no-till farming) and fewer tractor trips, which also preserves our soils and reduces erosion¹⁰.

More facts on GMOs

1. Small farmers and businesses benefit – but not enough

Of the 18 million farmers who grow GMOs, the vast majority are smallholders in developing countries. Nonetheless, due to the heavy regulatory burdens and high costs associated with the development of GM crops, the benefits for small farmers are greatly underrealized. European SMEs and public researchers are unable to afford the investments^{11, 12}, and meet the stringent requirements needed to bring new, innovative products to the market, leading to a high concentration of large multi-nationals in the ag biotech sector. Treating genome edited crops like GMOs will hurt farmers, as well as the SMEs and public researchers, who today develop the majority of genome edited products in other regions with more proportionate legislation.

2. GMOs are as safe as conventional crops

Over 3 trillion GMO meals have been safely eaten. The scientific consensus is that GMOs are as safe as conventionally bred crops, as confirmed by 280+ scientific institutions including academies of science¹³, and the technology is supported by over 140 Nobel laureates¹⁴.

3. Consumer benefits

GM crops with direct consumer benefits are available in innovation-friendly countries and more are expected soon. In addition to lowering prices, they produce healthier oils, improve food safety by lowering the risk for presence of mycotoxins and acrylamide, and reduce food waste (e.g. through non-browning apples). Once available, biofortified foods, like Golden Rice, can also save children from blindness and even death.

¹ <https://www.economist.com/science-and-technology/2015/03/12/genetically-modified-people>

² https://ec.europa.eu/commission/commissioners/2014-2019/andriukaitis/announcements/commissioner-andriukaitis-addressing-extraordinary-meeting-parliaments-committee-environment-public_en

³ Global Assessment Report on Biodiversity and Ecosystem Services.

⁴ FAO <http://www.fao.org/policy-support/policy-themes/sustainable-intensification-agriculture/en/>

⁵ <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0111629>

⁶ Source: <https://www.tandfonline.com/doi/full/10.1080/21645698.2018.1464866> (220,000 square km = 55.4 million acres.)

⁷ Source: <https://www.nature.com/articles/nature11069>

⁸ <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0111629>

⁹ https://www.tandfonline.com/doi/full/10.1080/21645698.2019.1614393?mc_cid=b05299e0356mc_eid=1b28d3af12

¹⁰ <https://www.tandfonline.com/doi/full/10.1080/21645698.2018.1476792>

¹¹ <https://croplife.org/wp-content/uploads/2014/04/Fact-Sheet-Getting-a-Biotech-Crop-to-Market.pdf>

¹² <https://www.europabio.org/agricultural-biotech/publications/pricing-innovation-out-eu>

¹³ Overviews available here: <https://www.isaaa.org/resources/publications/pocketk/56/default.asp> and here <https://geneticliteracyproject.org/2017/06/19/gmo-20-year-safety-endorsement-280-science-institutions-more-3000-studies/>

¹⁴ http://supportprecisionagriculture.org/nobel-laureate-gmo-letter_rjr.html

¹⁵ <http://www.easac.eu/home/reports-and-statements/detail-view/article/planting-the.html>