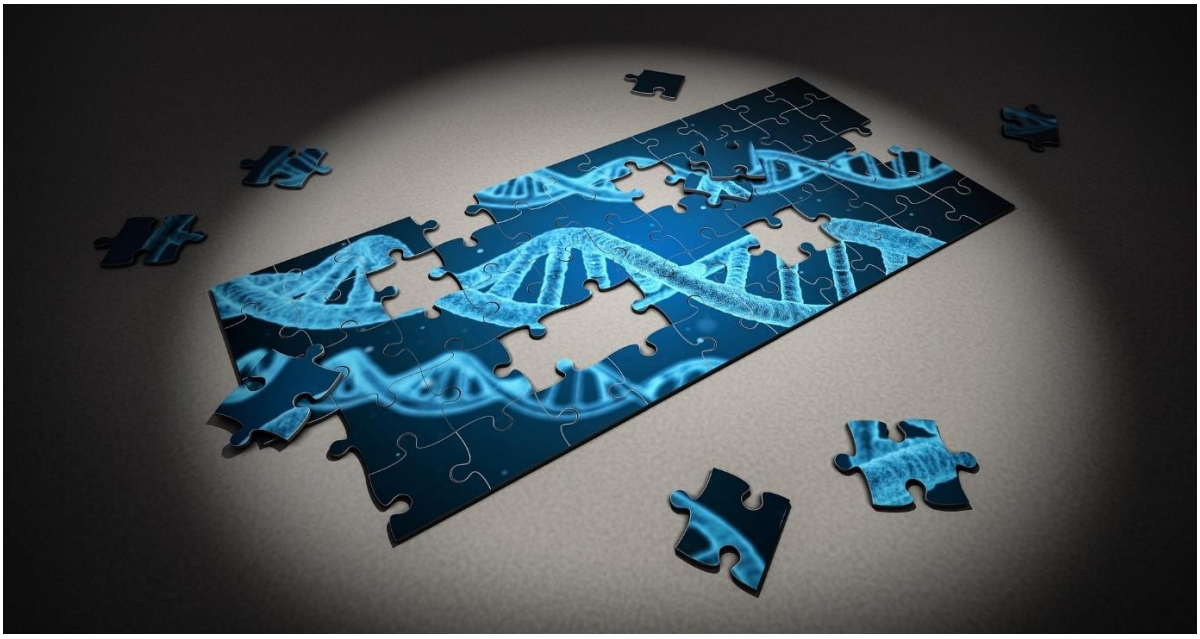
Fact Sheet New Genetic Engineering 2023



Content

In the following texts, each of which provides a brief overview of linked references, various terms and abbreviations are used for genetic engineering:

NGT: New genetic engineering

GMO (genetically modified organism)

GMO (German): genetically modified organism

Legal framework

The legal framework for the use of agro-genetic engineering is set at EU level. The relevant legal bases are the EU Release Directive - implemented in Germany by the Genetic Engineering Act - and the EU regulations on genetically modified food and feed and on the traceability and labelling of GMOs.

What is the current status?

The EU Commission will present a proposal for a new regulation on 7.6. 2023. In order to be able to prepare a proposal for a new regulation, the EU Commission must follow a number of steps. These include, among others, impact assessments (inception impact assessment) as well as public and targeted consultations. The impact assessment as well as the two public consultations have already taken place, the second one ended on 22 July 2022. In parallel, a targeted consultation of stakeholders (affected companies and organisations) as well as Member States started. This has now also ended. Currently, the EU Commission is preparing to submit a proposal for a regulation.

What happens next?

This proposal of the EU Commission is then sent to the Parliament and the Council of Ministers in a next step and discussed (trilogue). EU member states must take a position on the EU Commission's regulatory proposal for new genetic engineering in agriculture with a qualified majority.

On the official website of the EU Commission, a roadmap shows how far the process has progressed.
https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13119-Legislation-for-plants-produced-by-certain-new-genomic-techniques_en

Lobby Narrative "Naturalness

In 2018, the EU Court of Justice clarified that products of new genetic engineering processes are also not generally exempt from European genetic engineering regulation. The industry's argument that the new processes are not genetic engineering because they do not use foreign genetic material is clearly refuted in the opinion. The EU Court of Justice and other experts confirm that new genetic engineering techniques (NGT) fall under current genetic engineering law because they are genetic engineering. Furthermore, the EU Court of Justice explicitly points out the risk of unintended effects (see below) and emphasises the need for close monitoring.
https://backend.dnr.de/sites/default/files/Positionen/ua2018-10-themen-dege.pdf

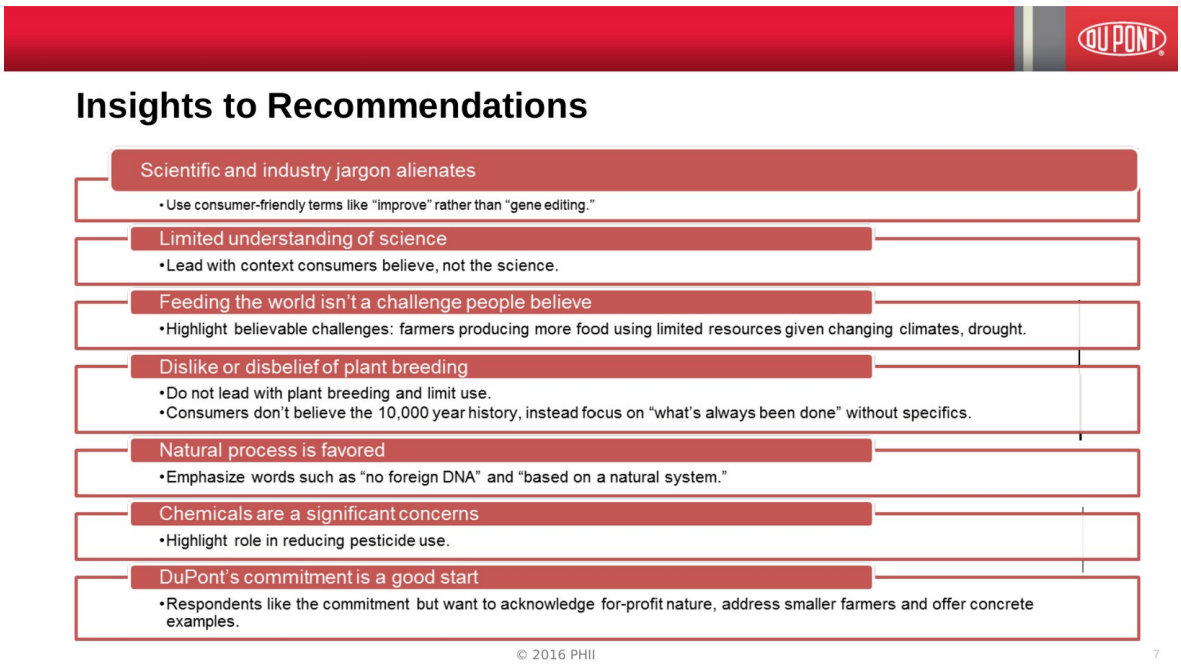
The criteria of the EU Genetic Engineering Directive are fulfilled, according to Professor Dr. Tade Matthias Spranger from the Faculty of Law at the University of Bonn and Professor Dr. Ludwig Krämer, an expert in environmental law.
Professor Dr. Dr. Tade Matthias Spranger (2015): "Legal analysis of the applicability of Directive 2001/18/EC on genome editing technologies", comissioned bz the German Federal Agency for Nature Conservation.
https://www.bfn.de/suche?k=genome+editing+technologies

Professor Dr Ludwig Krämer (2015): "Legal question concerning new methods for changing the genetic conditions in plants", Legal analysis commissioned by AbL, BUND, BÖLW, Gen-ethisches Netzwerk, Greenpeace, IG Saatgut, Testbiotech and Zukunftsstiftung Landwirtschaft. http://www.testbiotech.org/sites/default/files/Kraemer_Legal%20questions_new%20methods_0.pdf

An alliance of European scientists described the reaction to the one-sided attacks by industry associations and biotechnology companies and the biased media coverage of the ruling as backward-looking, unscientific or anti-progress as an exposing pretentious and unenlightened understanding of science, democracy and law.

Yet biotech corporations tout NGT as natural processes that are undetectable, but the growing number of patent applications to protect these technical innovations reveals the strategy behind them. The big biotech companies argue that new genetically engineered plants should be exempt from the European Union's safety controls and labelling requirements for GM foods because, in their view, they are equivalent to natural plants and mimic naturally occurring processes. In the patent applications, the same biotech corporations argue that their processes are innovative technologies.

To this end, a global seed lobby group, the International Seed Federation (ISF), has produced an internal communication toolkit that gives seed companies detailed instructions and PR tricks for communicating about New GM Techniques. Their core message should be: New technologies like CRISPR-Cas9 are just a simple continuation of classical plant breeding, "*which mankind has been doing for thousands of years*". "*What we're doing is basically supporting Mother Nature to some degree, just in a more efficient way,*" Adrian Percy, head of agricultural research at Bayer, told the Wall Street Journal. When the toolkit was launched at the 2017 ISF Congress in Budapest, it was put into practice with a personalised training session for 50 general secretaries of national and regional seed associations. The four seed industry lobby groups then started social media campaigns to spread the common messages of the Toolkit.



https://corporateeurope.org/en/food-and-agriculture/2018/05/embracingnature

Article 2019 - New genetic engineering is not "natural": gene editing makes the entire genome accessible for modification - unlike naturally occurring genetic modifications.
https://www.frontiersin.org/articles/10.3389/fpls.2019.00525/full

On- and off-target effects

In a document published in 2022, EFSA gives the impression that the unintended genetic modifications caused by NGT procedures would not need to be taken into account in most cases**.** As a result, EFSA's proposals would lead to a far-reaching lowering of current standards for risk assessment. EFSA's assumptions appear to be driven to a large extent by insufficient data: In connection with its previous reports, the authority had repeatedly pointed out that it had no mandate to evaluate all relevant scientific publications. For example, it recently admitted: *"Furthermore, the GMO Panel was not mandated to provide a comprehensive literature review on SDN-based technology and its unintended effects.* https://ensser.org/wp-content/uploads/2021/04/Greens-EFA-GMO-Study-1.pdf
https://www.dw.com/de/ern%C3%BCchterung-crispr-cas9-verursacht-viele-mutationen/a-44723007

Literature review of unintended effects (no guarantee of completeness)
In 2015, molecular biologist Ricarda Steinbrecher from the non-commercial research organisation Econexus explains that the new techniques have their own set of risks and uncertainties. So does the Norwegian institute *GenØk*. Whether the modified organism will react in the same way and become

The biotechnologists cannot predict how a natural organism will develop, whether it will have unwanted side effects or develop differently.

2017 - The gene scissors not only repaired the previously targeted mutation in mice - but also triggered hundreds of other changes. The explosive aspect of this: common algorithms that researchers use to predict such possible side effects had not predicted the unplanned mutations. https://www.scinexx.de/news/medizin/genschere-verursacht-doch-ungewollte-mutationen/

2019 - The main problem with CRISPR is its tendency to cause off-target DNA damage. However, there is another problem with CRISPR, namely the unintended effects of on-target edits. These unintended effects result from the cell's DNA repair process after CRISPR has performed its "editing" function. The genetic engineers have no control over them.
https://gmwatch.org/en/106-news/latest-news/19039

2019 - Researchers find that genetic manipulation to create virus-resistant cassava plants has the opposite effect.
https://www.gmwatch.org/en/106-news/latest-news/18909

2020 - Genes that were switched off by the Crispr/Cas gene scissors can nevertheless continue to do their work. This is the result of a study by scientists from Heidelberg.
https://gmwatch.org/en/106-news/latest-news/19280

2020 - Unwanted duplications, inaccurate tests: study by researchers from Münster fuels doubts about the "gene scissors" CRISPR/Cas9.
https://idw-online.de/de/news739647

2020 - The Journal of Biological Chemistry published a study in 2020 revealing that CRISPR editing tools are not as precise as claimed. The tool in question is the genetic engineering tool known as CRISPR-Cas12a or Cpf1. This tool was considered a better choice than other Cas genetic engineering tools because it is considered more precise and less prone to off-target DNA cutting. It has now been found that Cpf1 is very prone to single-strand cuts or so-called "nicks" in off-target cuts. The results showed that the Cpf1 tool
"nicks" were produced at sites on the DNA that contained up to four mismatches of the DNA base units compared to the intended target sequence. This means that a large number of sites significantly distant from the target site and clearly mismatched were damaged.
https://gmwatch.org/en/106-news/latest-news/19368
https://www.keine-gentechnik.de/nachricht/33993/

Study 2020: In the first experiment, there were unintended side effects in about one fifth of the interventions: For example, besides the defective DNA, much more was cut away than intended or certain sections shifted. In a second study, the entire DNA strand was sometimes lost, and not just the targeted section. And in the third trial, too, the entire DNA strand was often affected by the changes. https://www.deutschlandfunknova.de/nachrichten/gentechnik-crispr-cas-warnung-vor-risiken

A British researcher and an Australian researcher published a scientific statement in 2020 highlighting the wide range of unintended outcomes of New Genetic Engineering, both at the site designated for editing and elsewhere in the genome. This contradicts the ever-vaunted "precision" of New Genetic Engineering. In addition to the medical field, the publication also mentions the uncertainties and risks of the technology on agricultural applications in plants and animals. GMWatch has also published an article on this.

Short summary of the statement:
Genome editing offers powerful applications in research, healthcare and agriculture. However, the range of potential molecular events that can result has been underestimated and the technology remains unpredictable - on-target and off-target. This has significant implications for providing a safe approach to therapeutic genome editing, agriculture and other applications. This opinion discusses how these editing events can be predicted and detected through a combination of methods to detect all possible genomic alterations. It also discusses strategies to prevent adverse effects, which are critical to assessing the benefits or risks associated with the use of the technology. Anticipation and verification of the outcome of genome editing are critical to the success of all applications. The key to success lies in the combination of methods for assessing the sequence changes at the target site and quantifying the number of copies of segments deleted/inserted throughout the genome. In all applications, a thorough evaluation of these results is essential to identify any collateral damage from nuclease activity and to realistically assess the benefits and risks associated with the use of this technology.
https://www.sciencedirect.com/science/article/pii/S016895252030247X

2020 - Strange surprise in the genetic material. Gene scissors were considered precise - now they reveal their quirks.
https://www.zeit.de/2020/11/genschere-crispr-gentechnik-erbgut-mutation

2020 - Laboratory studies can only reflect reality to a limited extent. This is because the environment can influence the cultivated plant and, via epigenetics, its gene activities - even in subsequent generations. In this way, new characteristics can appear in the offspring of genetically modified organisms that were not observed in the parent generation.
https://enveurope.springeropen.com/articles/10.1186/s12302-020-00301-0

https://fachstelle-gentechnik-umwelt.de/detection-of-crispr-mediated-genome-modifications-through-altered-methylation-patterns-of-cpg-islands/

2020 - The study provides an overview of the risks associated with New Genetic Engineering of plants and animals. The study shows that there is a broad spectrum of unintended changes in genetic material that are triggered by the process of genetic engineering. But not only that: also the intended traits that can be created by New Genetic Engineering

are associated with risks.
https://link.springer.com/article/10.1186/s12302-020-00361-2

2021 The possible applications of the CRISPR/Cas gene scissors are very diverse and take place in a multi-stage process. Different molecular biology techniques are combined, each with specific risks. When CRISPR/Cas is introduced into cells and the cell nucleus, unwanted changes to the genetic material, RNA or proteins can take place at the cellular level.
https://fachstelle-gentechnik-umwelt.de/wp-content/uploads/FGU_CRISPR_Risiken2.pdf

2021 Chinese scientists have developed a new method to examine the genetic material after an intervention with Crispr/Cas9. They found far more undesirable changes than previously known.
https://www.keine-gentechnik.de/nachricht/34293/

2021 - Whole chromosome loss and genomic instability in mouse embryos after CRISPR-Cas9 genome modification
https://www.nature.com/articles/s41467-021-26097-y

2021 - Unintended changes not under control
With the new genetic engineering methods, the hope is raised that plants can be modified in a short time to make them more resistant to heat, drought, salts in the soil and pathogens. However, such properties are regulated by a multitude of processes in the plants and their cells and are sometimes not yet fully understood.
https://kritischer-agrarbericht.de/fileadmin/Daten-KAB/KAB-2021/KAB_2021_300_305_Kawall.pdf

2021 - The Federal Agency for Nature Conservation (BfN) emphasises that even the smallest deviations in the genome can have serious effects: "*Even single deletions or insertions, i.e. the insertion or removal of individual letters of DNA, can greatly alter organisms.*"
https://www.bfn.de/sites/default/files/2021-04/17-07-13_Background_paper_New_Technologies_end_online_accessible_01%20%281%29.pdf

2021 - New research by Chinese scientists in 2021 shows that CRISPR/Cas9 gene editing causes massive damage to the genome. This would have been missed by most of the analysis tools used so far. The researchers describe a new computer program that allowed them to analyse the data in greater depth than was previously possible.
previous programmes had allowed. They found what they call "enormously harmful DSB [double-strand break] repair by-products of CRISPR/Cas9 editing".
https://gmwatch.org/en/106-news/latest-news/19732

2022 - Researchers at Georgia State University wanted to use a gene modification to create small hamsters that are particularly friendly and sociable. However, the intervention had the opposite effect. The small rodents became extremely aggressive and belligerent.
https://1e9.community/t/us-forscher-haben-versehentlich-fiese-wut-hamster-erschaffen/17215

2022 - Gene shearing study from Sweden warns of unforeseen mutations.
https://www.fr.de/wissen/mutationen-durch-die-genschere-91347806.html

2022 - A publication in the scientific journal Nature 2022 shows that mutations in the genome of plants do not occur purely at random and that their frequency in populations does not depend solely on selection. According to the study, there are natural mechanisms in the genome that protect certain regions from frequent changes. The results now available shed new light on evolutionary biology and also raise questions about the consequences of genetic modifications to plants. As a result, plants resulting from new genetic engineering techniques show profound genetic changes and often new genetic combinations even if no additional genes have been inserted. In terms of their biological properties, they can differ significantly from plants derived from conventional breeding. https://www.testbiotech.org/aktuelles/neue-erkenntnisse-evolution-bei-pflanzen
https://www.nature.com/articles/s41586-021-04269-6

Further reports on unintended effects

Horizon Scanning FGU
https://fachstelle-gentechnik-umwelt.de/horizon-scanning/

Unintended genomic outcomes in current and future genetic technologies: a systematic review 2022
https://pubmed.ncbi.nlm.nih.gov/36365450/

A third of gene knockouts via CRISPR are not knockouts at all - and there are serious consequences for gene-edited food crops. The study, published in Nature, reveals another significant unintended effect of the CRISPR-Cas9 gene-editing tool. This effect can have serious implications for the food safety of genetically modified crops. The study found that CRISPR Cas9 modifications, which are designed to switch off the function of a gene, do not do so.
Instead, the damaged genes are still used to produce proteins, many of which are still functional. The result could be the production of gene-edited plants that are toxic or allergenic.

Link to the article from GMWatch (English)

Link to the study (English)

In generating six different knockout mouse models, it was discovered that frequently (sometimes exclusively) homology-guided repair and/or non-homologous end joining mechanisms caused multiple unwanted insertions of donor DNA. Worryingly, conventional PCR analysis failed to identify these multiple integration events in most cases, resulting in a high rate of alleles falsely reported as precisely edited.
Boris V. Skryabin et al: Pervasive head-to-tail insertions of DNA templates mask desired CRISPR-Cas9-mediated genome editing events (Science Advances, 12.02.2020)

USA: Bacterial genes accidentally introduced into genetically modified cattle
https://www.bauernzeitung.ch/artikel/pflanzen/usa-bakteriengene-versehentlich-in-gentech-rind-introduced-361740
https://www.biorxiv.org/content/10.1101/715482v1.full

2019 study purporting to prove CRISPR safe shows otherwise
https://www.gmwatch.org/en/106-news/latest-news/18731

https://www.gmwatch.org/en/106-news/latest-news/18885

Tsai, S. Q. et al. GUIDE-seq enables genome-wide profiling of off-target cleavage by CRISPR-Cas nucleases. Nature Biotechnology 33, 187-198 (2015).

Cho, S. W. et al. Analysis of off-target effects of CRISPR/Cas-derived RNA-guided endonucleases and nickases. Genome Research 24, 132-141 (2014).

Fu, Y. et al. High-frequency off-target mutagenesis induced by CRISPR-Cas nucleases in human cells. Nature Biotechnology 31, 822-826 (2013).

Hsu, P. D. et al. DNA targeting specificity of RNA-guided Cas9 nucleases. Nature Biotechnology 31, 827-832 (2013).

Pattanayak, V. et al. High-throughput profiling of off-target DNA cleavage reveals RNA-programmed Cas9 nuclease specificity. Nature Biotechnology 31, 839-843 (2013).

Patenting intentions debunk the "naturalness" claim

IF new organisms created with CRISPR/CAS & Co were completely equivalent to those found in nature and undetectable, how do their creators justify the patentability of these "products"? After all, according to the European Patent Convention, patents may not be granted on plants and animals "obtained by essentially biological breeding processes". The EU Patent Directive (Dir. 98/44) states: "A process for the production of plants or animals is essentially biological if it is based entirely on natural phenomena such as crossing or selection.
https://www.epo.org/law-practice/legal-texts/html/guidelines/d/g_ii_5_2.htm

2022 - The agricultural company Corteva (formerly Dow, DuPont and Pioneer) has applied for around 1,430 patents worldwide on plants produced using new genetic engineering methods. Bayer is in second place with 119 patents.
https://www.keine-gentechnik.de/nachricht/34686?cHash=d74a257740cfa411b0283963abba5c75

Two companies are currently in the lead in the race for patents and are deciding between themselves who will be in the forefront in the future. We are talking about the two industry giants Bayer from Germany and its US counterpart Corteva. Licensing in the field of agricultural biotechnology is a lucrative and growing business. Corteva (formerly Dow, DuPont and Pioneer) and Bayer (owner of Monsanto) already control 40 percent of the global industrial seed market. Globally, Corteva has applied for some 1,430 patents on NGT crops, Bayer/Monsanto 119. Both corporations also have extensive licensing agreements with the research institutes that developed the technologies. Corteva not only dominates the patent landscape for NGT plants, but is also the first company with an NGT plant in the EU approval process. In this patented maize, which is resistant to a specific herbicide, the NGT method CRISPR/Cas was used in the process in addition to old genetic engineering. Patents can be applied for in the EU on products and/or processes. Biotech corporations, for example, apply for patents with which they can obtain the respective

genetic engineering processes and the specific genetic characteristics developed by these processes. For example, Corteva holds patent EP 2893023 for a method of modifying the genome of a cell (including by NGT application) and claims intellectual property rights over all cells, seeds and plants containing the same "invention", whether in broccoli, maize, soybean, rice, wheat, cotton, barley or Sunflowers ("product-by-process claims").

In the case of new genetic engineering, it is almost impossible to know exactly what has been patented, as the
applications are often deliberately broadly defined in order to obtain broader "protection". Seed companies deliberately blur distinctions between conventional breeding, random mutagenesis and both old and new genetic engineering. Since information about what is included in the patents is hardly accessible, it is difficult to find out which plants or traits are patented. Breeders, farmers and producers face considerable legal uncertainty about what they are allowed to do with the plants they work with every day, what they would have to pay royalties for and what could potentially lead to a lawsuit. Monsanto, now merged with Bayer, brought 144 patent infringement lawsuits against farmers in the USA between 1997 and 2011.
https://www.global2000.at/sites/global/files/Medienbriefing_Patent-Report_DE.pdf

https://corporateeurope.org/en/food-and-agriculture/2018/05/embracingnature

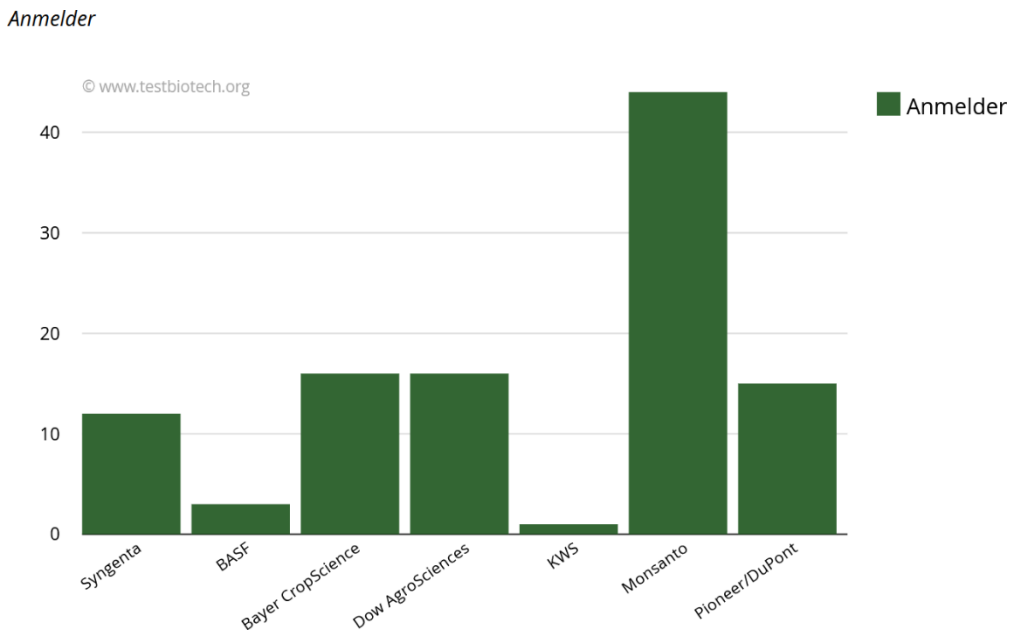
According to a 2022 report, the world's four largest agrochemical companies are exerting increasing influence over an agricultural system in which the concentration of power and wealth threatens health, the environment and access to food. The report, by Philip H. Howard, Ph.D., updates previous work by Howard on these trends over the past decades and focuses on the most recent developments (2018-2022).

Howard, a food systems researcher, is a member of the International Panel of Experts on Sustainable Food Systems and a professor at Michigan State University.

https://uncutnews.ch/die-kontrolle-von-4-riesigen-chemieunternehmen-ueber-das-globale-food-system-threatened-health-and-environment/

The European Parliament has long had a clear position on patents, which is widely supported: It is called: No patent on life! Exclusive rights to animals and plants are taboo. However, the practice of granting patents is different. The European Patent Office (EPO) has been patenting even conventional breeding for years. The patent office still acts like a service provider for seed monopolists.

Filings by corporations in the EU



https://www.testbiotech.org/gendatenbank_bilder

What "great" products are on the market?

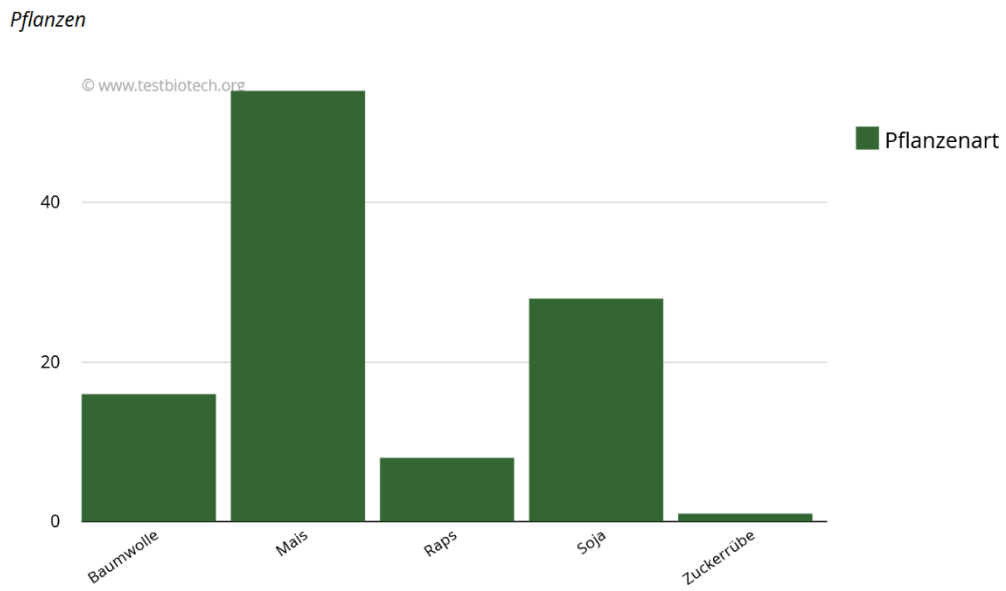
In 2017, genetically modified plants grew on around 190 million hectares worldwide. On 47% of these there were plants that are tolerant to pesticides such as glyphosate and glufosinate. On 12% plants that produced an insecticide themselves and on 41% plants that have both properties. Less than 1% of the area involved plants with other traits. This includes flowers with naturally non-occurring colours. The source for the figures is the International Service for the Acquisition of Agri-biotech Applications (ISAAA), a lobby group for the biotech industry: http://www.isaaa.org/resources/publications/briefs/53/download/isaaabrief-53-2017.pdf, pages 104 and 105.

The first new crop varieties developed using New Genetic Engineering to hit the market in the US by 2019 were herbicide-tolerant canola, non-browning apples and healthier soybean oil. Meanwhile, in the United States and Canada, the first genetically engineered animal, Atlantic salmon, modified to grow faster, has been approved for human consumption.
https://umweltinstitut.org/landwirtschaft/gentechnik-neue-manipulationsmethoden/

As a report by the EU's Joint Research Centre shows, research is being carried out on many possible applications in the field of stress tolerance, altered composition of ingredients and new properties in relation to harvesting and plant growth. But when it comes to applications

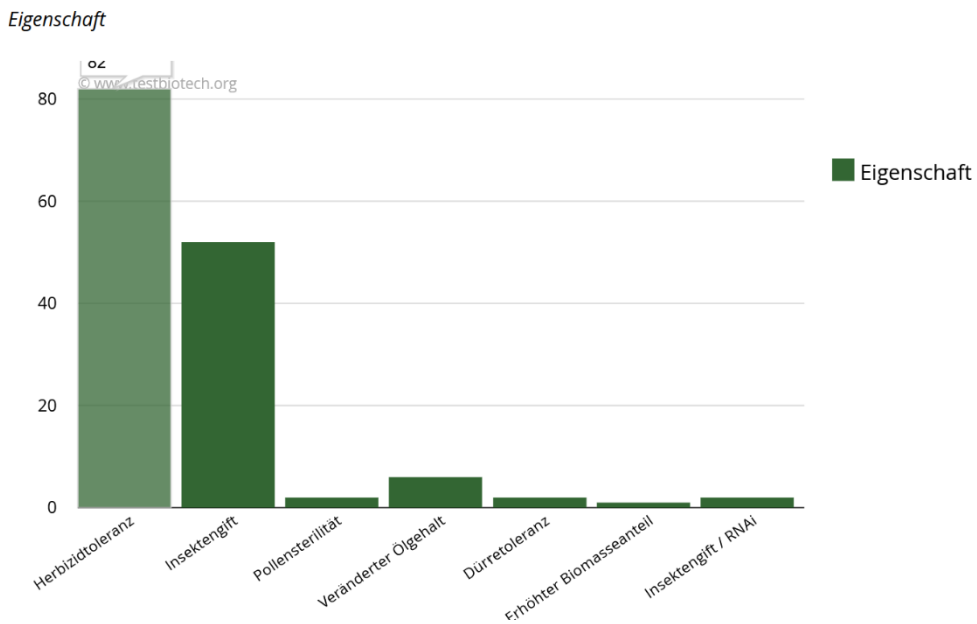
that are on the verge of commercialisation, herbicide resistance remains the most common trait.

Plant applications in the EU



https://www.testbiotech.org/gendatenbank_bilder

Characteristics of the notified GM plants in the EU



Marketing authorisation in the EU

https://webgate.ec.europa.eu/fip/GMO_Registers/GMO_Part_C.php

Worldwide list

Which companies and research institutions are involved? And what is to be developed at all? Answers are provided by an updated report of the Swiss Federal Office for the Environment on the "Commercialisation Pipeline in Plant Breeding" Status 2022
file:///C:/Users/Dr.%20Andrea%20Beste/Downloads/endbericht-semnar-gelinsky.pdf

Produced organisms cannot be identified: Not correct.

Contrary to this claim, many techniques already available allow the unequivocal detection and identification of a wide range of genetically modified sequences, from the smallest - e.g. a point mutation of a single nucleotide (DNA base unit) - to the largest, e.g. the insertion of large genetic sequences. Chromosome rearrangements and multiple copies of gene sequences generated by new genetic techniques can also be detected and identified. Alterations located in several parts of the genome and epigenome can be detected simultaneously (multiplex techniques).

Many of these techniques are already being used by breeders and seed companies. They include:

- Basic observation of the characteristics of the new GMO (e.g. how a herbicide-tolerant GMO reacts to a herbicide).

- Amplification of the genetic targets

- Sequencing of the entire genome.

https://gmwatch.org/en/news/archive/2019/18678-experts-agree-new-gmos-can-be-detected

https://www.keine-gentechnik.de/nachricht/33574/

https://gmwatch.org/en/106-news/latest-news/18910

In general, a distinction must be made between two levels: If the modified sequence is known, it is possible to develop specific detection methods using established test methods. For CIBUS NGT oilseed rape, the applicant has submitted a detection method to the Canadian authorities and several organisations in Europe have developed a specific detection method to identify and quantify CIBUS oilseed rape. This shows that it is possible for the developers of NGT plants to provide a suitable detection method during the approval process. Such a PCR test does not prove which technique was used for genetic modification. The current EU rules do not even require this for legally secure detection of a GMO. It is sufficient that a detection method based on

of certain DNA sequences can unambiguously identify a GMO. Proof of which technique was used can be provided by other means.
https://kritischer-agrarbericht.de/fileadmin/Daten-KAB/KAB-2022/KAB_2022_287_298_Volling.pdf

Excursus: Commission and MS do not care about detectability

From the Release Directive 2001/18:

(5. Member States shall ensure that the competent authority carries out inspections and, where appropriate, other control measures to ensure compliance with this Directive. In the event of an unauthorised release of the GMO(s) or the unauthorised placing on the market of the GMO(s) as or in products, the Member State concerned shall ensure that the necessary measures are taken to terminate the release or placing on the market, to initiate countermeasures if necessary and to inform the public of the Member State concerned, the Commission and the other Member States.

In 2019, Friends of the Earth Europe collected data on whether and how new genetic engineering products imported into Europe are already being tested. Shockingly, many member states would like to test, but complain that the Commission has not yet developed a test protocol with which the import control can take place at all. All in all, it seems that the Commission has not yet made any effort to develop test methods or test protocols.
FoEE communication http://www.foeeurope.org/eu-public-exposed-illegal-gm-imports-lack-tests-190719

2019

The President of the Federal Agency for Nature Conservation, Beate Jessel, expects the agricultural industry to provide the detection methods for genome-edited plants when applying for approval. This is required by law and should also be in the manufacturers' own interest, Jessel said at a hearing in the German Bundestag in 2019, contradicting the argument that new genetic engineering methods cannot be regulated for lack of detectability.
https://www.keine-gentechnik.de/nachricht/33843/

2020
The Gen-ethisches Netzwerk e.V. (GeN) has researched that agricultural corporations regularly deny access to test material and thus prevent research with genetically modified organisms. Between 2013 and 2018, the Federal Agency for Nature Conservation (BfN) or its contractors in the field of risk research with GOVs were denied access to genetically modified seeds for research five times.
https://www.gen-ethisches-netzwerk.de/agrarpolitik/252/freie-und-unabhaengige-forschung-

ensure

The BMEL told taz 2020 that the federal and state governments were "continuously" working on developing detection methods for genetically modified organisms.
https://taz.de/Forschungsfoerderung-fuer-neue-Gentechnik/!5726761/

While the German government has funded research on new genetic engineering methods such as Crispr/Cas & Co with more than 27 million euros, only two million euros are available for detection and risk research.
https://www.keine-gentechnik.de/nachricht/34167/

2021 Experts: Expand databases for genome-edited plants
https://www.keine-gentechnik.de/nachricht/34245/

No result to date:

BLE, Feasibility study on detection and identification methods for genome-edited plants and plant products, start 2020, results should be available by the end of 2022.

http://kgt.zs-intern.de/news-gentechnik/news/de/34063.html

https://www.ble.de/SharedDocs/Downloads/DE/Projektfoerderung/Entscheidungshilfe/Bekanntmachung_02-20-32_Detection-Genome.html

2021
As questions from the European Parliament showed, the Commission neither invests in risk research in the field of new genetic engineering nor in procedures with which the genetic modification can be detected.
https://www.europarl.europa.eu/doceo/document/P-9-2021-004657-ASW_DE.pdf

27. April 2022 Answer from the COM to written question MEP Häusling:

"*Under the next Horizon Europe 2023-2024 work programme, the Commission is addressing issues related to transparency and safe innovation in the food system through traceability strategies and detection methods for products obtained through new genomic techniques.*"
https://martin-haeusling.eu/images/220427_RE_KOM_Research_on_risks_and_detection_methods_en.pdf

Lobby narrative non-hazardousness

Overview 2022 - Ecological Risks of the New Genetic Engineering Methods
https://www.bund.net/fileadmin/user_upload_bund/publikationen/landwirtschaft/Landwirtschaft-Broschuere-Hintergrund-Gentechnik-BUND-2022.pdf

The Brazilian Ministry of Agricultural Development published an important study in 2017 - titled: "Hazards and uncertainties of transgenic crops: More than 750 studies that have been (and are being) ignored by the genetic engineering regulator." The study examined research on genetic engineering, the dangers to human and animal health, as well as the risks to the environment and agricultural and socio-economic problems. In the section on risks to health, the authors of the study note that the
scientific literature reveals "immunological and allergenic reactions" in animals and humans to the type of Bt toxins that have been introduced into the genetically modified (GM) Bt plants using genetic engineering techniques. The authors warn that, over time, persistent immunological reactions "may eventually lead to allergenic and/or inflammatory reactions".
reactions". In addition, due to synergistic effects and feedback responses, it is likely that "simple immune responses to certain (specific) molecules change to complex allergenic responses to other molecules." In other words, consumption of GM Bt plants could sensitise people to other allergens from food or other allergens found outside food.
https://www.gmwatch.org/en/106-news/latest-news/17483-the-750-studies-that-gmo-regulatory-bodies-often-ignore

Editing cell genomes with CRISPR-Cas9 could increase the risk that the altered cells intended to treat disease will cause cancer, warn two studies published in 2018. In the studies, published in Nature Medicine, scientists found that cells whose genomes have been successfully edited with CRISPR-Cas9 have the potential to trigger tumours in a patient. This could turn some CRISPR-edited cells into ticking time bombs, according to the researchers from Sweden's Karolinska Institute and Novartis.
https://www.scientificamerican.com/article/crispr-edited-cells-linked-to-cancer-risk-in-2-studies/

Genetically engineered potatoes that do not develop brown spots after genetic engineering develop toxins that are harmful to human health, says the former biotechnologist Rommens in his book. This results from the fact that the genetic modification leads to undesirable side effects. These are often hardly detectable in the laboratory, but only become apparent when the GM plants are grown in the field and exposed to the usual stress. In addition, the brown spots on normal potatoes are actually a warning not to eat this part of the tuber. The genetic modification only prevents browning, thus hiding the spoiled spots, so that they are eaten along with the toxins they contain. From his own experience, he pleads

Rommens is in favour of having the safety of GM plants monitored by independent scientists who are trained to find undesirable side effects.

In a reaction to Rommens' book, his former employer "Simplot" tried to discredit him as a scientist, referring to a 2004 paper whose publication he withdrew eight years later because he had made a mistake in it. Rommens countered that he had filed more than 60 patents for Simplot and had developed the genetic engineering products that the company was now marketing. The accusations in the book were not directed at the company, but at himself as a genetic engineering developer, because he had not seen the side effects of the products he was developing. https://www.keine-gentechnik.de/nachricht/33452/#gsc.tab=0

A 2019 study shows the risks to biodiversity associated with new techniques and traits and the importance of prior safety assessment. Fungal resistance, for example, could affect the natural microflora and beneficial mycorrhizal fungi, as well as growth and ageing processes, since resistance genes have more than one effect. Virus resistance could contribute to the emergence of new viruses and an altered fatty acid content could have an effect on defence against insect pests and stress tolerance. https://www.frontiersin.org/articles/10.3389/fbioe.2019.00031/full

Steve Druker comes to the following conclusions in his book 2020:

1. The production of genetically modified food is risky
2. The higher risk is also transferred to the food itself and its consumers
3. The safety of genetically modified food has never been cleanly proven
4. Some genetically engineered foods have already been shown to be dangerous in feeding trials

https://www.hugendubel.de/de/buch_gebunden/steven_m_druker-manipulated_genes_twisted_truth-28141891-product-details.html

Negative health effects

2020 - Identification of a non-approved genetically modified bacterium in food enzymes by whole genome sequencing. https://www.nature.com/articles/s41598-020-63987-5

Study 2009 - Animal toxicity studies with certain GM foods have shown that they can toxically affect several organs and systems. The results of most studies with GM foods indicate that they may have some general toxic effects such as effects on the liver, pancreas, kidneys or reproduction and may alter haematological, biochemical and immunological parameters. For this assessment

but requires years of animal studies and clinical trials.
https://pubmed.ncbi.nlm.nih.gov/18989835/

Feeding studies in laboratory animals and farm animals have shown that some GM crops, including those already marketed, have toxic or allergenic effects. These effects may come from the GM crop itself or from residues of the pesticides used.

Excessive growth of the intestinal mucosa, similar to a precancerous condition
Pusztai A, Bardocz S. GMO in animal nutrition: Potential benefits and risks. In: Mosenthin R, Zentek J, Zebrowska T, eds. Biology of Nutrition in Growing Animals.Vol 4. Elsevier Limited; 2006:513-540.
http://www.sciencedirect.com/science/article/pii/S1877182309701043

Vecchio L, Cisterna B, Malatesta M, Martin TE, Biggiogera M. Ultrastructural analysis of testes from mice fed on genetically modified soybean. Eur J Histochem. 2004;48:448-54

Impaired liver, pancreas and testicular function
Malatesta M, Biggiogera M, Manuali E, Rocchi MBL, Baldelli B, Gazzanelli G. Fine structural analyses of pancreatic acinar cell nuclei from mice fed on genetically modified soybean. Eur J Histochem. 2003;47:385-388.

Malatesta M, Caporaloni C, Gavaudan S, et al. Ultrastructural morphometrical and immunocytochemical analyses of hepatocyte nuclei from mice fed on genetically modified soybean. Cell Struct Funct. 2002;27:173-80.

Ewen SW, Pusztai A. Effect of diets containing genetically modified potatoes expressing Galanthus nivalis lectin on rat small intestine. Lancet. 1999; 354:1353-4.
https://www.sciencedirect.com/science/article/abs/pii/S0140673698058607

Abnormalities of the intestine
Fares NH, El-Sayed AK. Fine structural changes in the ileum of mice fed on delta-endotoxin-treated potatoes and transgenic potatoes. Nat Toxins. 1998; 6(6):219-33
https://gmoresearch.org/gmo_article/fine-structural-changes-in-the-ileum-of-mice-fed-on-delta-endotoxin-treated-potatoes-and-transgenic-potatoes/

More here:
https://www.gmwatch.org/files/10-Questions-about-GM-Foods.pdf

Researchers doing studies with GMOs are developing special "artificial diet systems". The purpose of these new diets, they claim, is to standardise the testing of toxicity effects on non-target organisms from the Bt toxins of GM plants that produce so-called Bt, or cry, toxins. However, a scientific paper published in the journal Toxins in December 2018 suggests a different conclusion. The new diets contain hidden ingredients that can mask the toxicity of Cry toxins, allowing it to go undetected by toxicity tests on beneficial species, such as the lacewing.
https://www.gmwatch.org/en/106-news/latest-news/18736

The US NGO GMO/Toxin Free USA launched "GMOResearch.org" in 2020. It is the first searchable scientific database of its kind with over 2,000 studies and reports on the safety and effects of genetically modified organisms (GMOs) and related agrochemicals. The database is the world's most comprehensive scientific database on these topics, documenting references from around the world on health effects, environmental effects, effects on non-target organisms, resistance of target organisms, pesticide drift, genetic contamination, horizontal gene transfer and other unintended effects, as well as references related to crop yields, social impacts, ethics and economics.
https://gmoresearch.org/de/

While the German Ethics Council and the Max Planck Society support the use of the New vehemently oppose genetic engineering in the human germ line because it could also affect "future generations", the potentially much more complex and severe consequences of use in (agricultural) ecosystems are often ignored or played down. This also shows the effects of a misguided research policy that focuses one-sidedly on laboratories and not on the environment.
https://www.forumue.de/wp-content/uploads/2019/06/1_Neue-Gentechnik-der-wirklich-allerletzte-Cry_of-Mering.pdf

Climate protection through genetic engineering?

Seed Report "New Genetic Engineering: Products & Profiteers - Empty Promises for a Farming World Agriculture and the climate
www.global2000.at/sites/global/files/Neue_Gentechnik-Produkte_und_Profiteure.pdf

Genetically modified plants are not a solution to climate change, because the desired characteristics such as drought resistance are too complex. The Schweitzer Ethics Report concludes that it is much more appropriate for research to focus on mixed cultures and heterogeneous plant populations.

"Even if new genetic engineering methods can significantly shorten the breeding time, the fundamental problem remains that every plant variety in Switzerland must increasingly cope with volatile climatic conditions. This problem cannot be solved, regardless of the breeding method, by equipping plants with drought resistance or specific disease resistance. The volatility of climatic conditions is decisive. In order to ensure food security, other research approaches are working on reducing the risk of major crop failures by adapting the type of farming and relying more on mixed crops that may not produce maximum yields under volatile climatic conditions, but optimise yields by having one crop at least partially compensate for the yield loss of another. The

Commission agrees that the goal of adaptation must therefore be to find or develop the right mixed crops and cultivation methods for Swiss agriculture that can cope with climatic volatility. What climate-relevant projects of the new genetic engineering methods can currently be found is largely at the basic research stage and contrasts with the expectations of the potential of genetic engineering methods, such as those formulated in the EU Green Deal. Whether these projects will prove successful in practice is a matter of controversy within the ECNH. The clear majority is sceptical as to whether new genetic engineering approaches can contribute in a relevant way to the adaptation of agriculture within the required timeframe. The minority considers the chances of these methods contributing to adaptation in a relevant way within the required timeframe to be given. However, it also assumes that they can only be part of the solution. " https://www.ekah.admin.ch/inhalte/dateien/EKAH-Report_Climate change_Agriculture Biotechnology_2022_EN.pdf

https://www.schweizerbauer.ch/politik-wirtschaft/agrarpolitik/ethikkommission-weniger-nutztiere- more-cereals/

South Africa rejects the supposedly drought-tolerant GM maize as useless.
https://www.keine-gentechnik.de/nachricht/33819/

https://acbio.org.za/wp-content/uploads/2022/04/Ministers_final_decision_on_Monsanto_appeal.pdf

Agroecological breeding better
Plant breeding in organic and agro-ecological farming systems is a better way to respond to the challenges of climate change than genetically modified and other intensive farming methods, researchers from Italy show in two new, open-access 2020 scientific reports.
https://www.sciencedirect.com/science/article/pii/S2589004220310129

2022 - "The thinking error of genetic engineering" - Prof Finkh, University of Kassel
My objection to genetic engineering is fundamental - not because there is anything wrong with genetic engineering itself or because it is more "dangerous" than other forms of plant breeding, but because its approach is based on a serious error in thinking: It is based on the mistaken belief that the properties of a plant - how much yield it produces, how well it can resist pathogens and how well it can withstand drought or heavy rainfall - can be influenced solely by changing its genes.
https://www.derpragmaticus.com/r/gentechnik-pestizide/
https://www.keine-gentechnik.de/nachricht/34706?cHash=cd2dd20823a3f9ee58957598890bac44

Genetic engineering against hunger?

As early as 2010, Welthungerhilfe concluded: "*A sustainable increase in income for small farmers in developing countries through green genetic engineering has not yet been achieved.*

be demonstrated, nor any contribution to the fight against hunger."
https://www.welthungerhilfe.de/fileadmin/pictures/publications/de/magazin-welternaehrung/2010-newspaper-world-food-2-2010.pdf

For the FAO in the Future Report on World Food Supply, this is not an issue: time and again, the big seed companies claim that their genetically modified plants are necessary to feed the growing world population. The Food and Agriculture Organisation (FAO) sees things differently. In its 2017 report on the future of food, it devoted only one paragraph to agro-genetic engineering. The report, "The Future of Food and Agriculture", describes 15 trends and ten challenges for global food security. In the FAO's view, the pressure on available natural resources, increasing economic inequality and the effects of climate change jeopardise the goal of ending hunger by 2030. It is true that in the last 30 years, growing food production has succeeded in curbing hunger. But this has been associated with considerable environmental damage.
"*Resource-intensive, high-input farming systems have caused massive forest destruction, water scarcity, soil depletion and high levels of climate-damaging emissions,*" writes the FAO. This type of intensive agriculture is not sustainable. What is needed instead are innovative approaches such as agroecology or agro-forestry systems that protect natural resources while still being productive.
https://www.keine-gentechnik.de/nachricht/32459/

2019 - Bread for the World also does not see genetic engineering as a source of hope.
https://blog.misereor.de/2019/05/07/sind-neue-gentechnische-zuechtungsmethoden-wirklich-hoffnungstraeger/

2021 - Misereor
https://www.misereor.de/fileadmin/publikationen/diskussionsbeitrag-neue-gentechnik-misereor_01.pdf

2021 - Bread for the World
Bread for the World has set up its own thematic website on agro-genetic engineering. The website, entitled "What benefits the agro-industry harms people", describes, among other things, the undesirable side effects and interactions of agro-genetic engineering. Instead of genetic engineering, Bread for the World appeals for "healthy diversity instead of monocultures".
https://www.brot-fuer-die-welt.de/themen/gruene-gentechnik/

Not less, but more pesticides, superweeds and pests

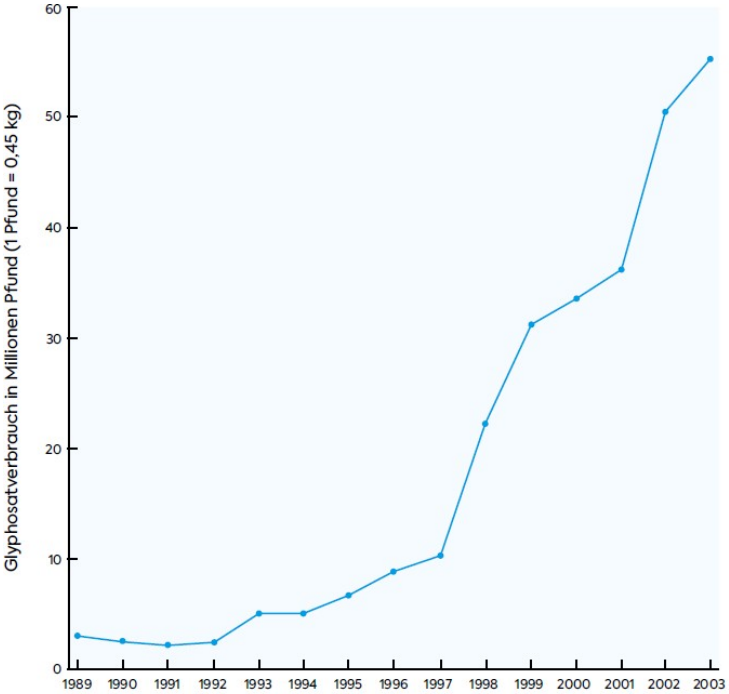
Reducing the use and risk of pesticides by 50% by 2030 is a key objective of the European Union's farm-to-fork and biodiversity strategies, which aim to improve the sustainability of food and farming systems and reverse environmental degradation. The Directorate-General for Health and Consumer Protection of the

European Commission (DG SANTE) states that plants produced using New Genetic Engineering techniques may contribute. But the evidence points in a different direction. Many new GM crops currently in the marketing pipeline are designed to increase herbicide use. A study by the EU's Joint Research Centre (JRC) based on information from GM developers found that the largest trait group (6 out of 16 plants) of new GM crops about to be commercialised is herbicide tolerance. https://publications.jrc.ec.europa.eu/repository/handle/JRC123830

A review based on public sources of New Genetically Engineered crops in the marketing pipeline shows changes in the composition of the crops, such as altered fatty acids, starch and proteins. They are targeted for use in industry and fast food, rather than more environmentally friendly farming systems. Crops include potatoes with improved storage properties and blackberries without seeds. Examples include Corteva's waxy maize (modified starch profile), Cargill's canola with lower saturated fat content to reduce trans fats in hydrogenation, and Calyxt's soybean developed for higher protein content. The potatoes are from Simplot, the blackberries from Pairwise. https://www.global2000.at/sites/global/files/Report_Gentechnik-Pestizide-Teufelskreis_DE.pdf

The use of the total herbicide glyphosate has increased 15-fold worldwide since the introduction of herbicide-resistant GMO crops.

Example USA



Glyphosatverbrauch in neun Staaten des Mittleren Westens von 1989 bis 2003

Die Grafik zeigt die Entwicklung des Glyphosateinsatzes in den agrarisch geprägten Staaten im Mittleren Westen der USA von 1989 bis 2003. Ab 1998 verbreiten sich glyphosatresistente Pflanzen in der Landwirtschaft in den USA. In den fünf Jahren bis 2002 verfünffachte sich der Glyphosateinsatz im mittleren Westen. Die Quelle für die Grafik ist ein Bericht des US Geographical Survey, der zum Innenministerium der USA gehört: https://pubs.usgs.gov/sir/2007/5122/pdf/SIR2007-5122.pdf, im Text auf den Seiten 2 und 3, als Grafik auf Seite 7.

The graph shows the development of glyphosate use in the agrarian Midwestern states from 1989 to 2003. From 1998 onwards, glyphosate-resistant plants spread in agriculture in the USA. In the five years to 2002, glyphosate use in the Midwest increased fivefold. The source for the graph is a report by the US Geographical Survey, part of the US Department of the Interior: https://pubs.usgs.gov/sir/2007/5122/pdf/SIR2007-5122.pdf , in the text on pages 2 and 3, as a graph on page 7.

Not "all" scientists in the world say that genetic engineering prevents pesticides, on the contrary:

ENSSER:
https://ensser.org/wp-content/uploads/2021/04/Greens-EFA-GMO-Study-1.pdf

Charles Benbrook, Organic Center, USA, 2009:
https://www.agrarheute.com/pflanze/studie-gentechnik-erhoeht-pestizidverbrauch-um-145000-tons-491808

Study by the University of Canterbury in New Zealand, 2014:

https://www.sueddeutsche.de/wirtschaft/gentechnik-in-der-landwirtschaft-mehr-gift-weniger-yield-1.1869788

Mertens, 2021:
https://www.gen-ethisches-netzwerk.de/agrobusiness/257/weniger-herbizide-dank-gentechnik

UCS briefing paper, 2013:
https://www.ucsusa.org/resources/rise-superweeds

Mortensen 2012:
https://www.cga.ct.gov/2012/ENVdata/Tmy/2012HB-05117-R000222-The%20Organic%20Center---Analiese%20Paik%204-TMY.PDF

CASAFE, 2012:
http://www.casafe.org/pdf/estadisticas/Informe%20Mercado%20Fitosanitario%202012.pdf

Benbrook 2005:
https://biosafety-info.net/articles/assessment-impacts/ecological/rust-resistance-run-down-soils-and-rising-costs-problems-facing-soybean-producers-in-argentina/

Pengue 2003:
https://gmoresearch.org/es/gmo_article/el-glifosato-y-la-dominacion-del-ambiente/

Figures from the United States Department of Agriculture in 2016 show that herbicide use in soybeans, one of the most important agricultural crops, has increased two-and-a-half-fold over the past two decades, at a time when the acreage of the crop increased by less than a third. Use in maize was already declining before the introduction of GM crops, but then almost doubled from 2002 to 2010 before levelling off. Problems with weed resistance in such crops have driven up overall use.
https://energy.wisc.edu/news/doubts-about-promised-bounty-genetically-modified-crops

Scientists at the University of Koblenz-Landau in 2021 have shown that the pesticides applied in US agriculture are significantly more toxic to plants and insects than they used to be. Contrary to what the agrochemical industry usually argues, this was also true where genetically modified crops were grown, according to the study.
https://www.keine-gentechnik.de/nachricht/34299/

Research in the journal Science 2021 completely refutes the claim that the impact of pesticides is decreasing and that GM crops are contributing to this positive trend. In fact, the new study shows that not only is the toxic impact of pesticides increasing in the US, but that GM crops are no better than conventional non-GM crops in this regard. The study by German researchers, based on US government data, shows that the toxic effects of pesticides used on GM crops are the same as on conventional crops, despite claims that GM crops would reduce the need for pesticides. Threatened species include in particular invertebrates and pollinators.
https://www.science.org/doi/10.1126/science.abe1148

3 June 2022 / In a recent publication, scientists from Argentina and the United States

Brazil, how the cultivation of transgenic soy promotes the spread of certain butterfly caterpillars (Spodoptera cosmioides, black armyworm), which are considered pests. The GM soy 'Intacta', originally developed by Monsanto, is resistant to glyphosate and produces an insecticide. Now it turns out that the combination of these characteristics favours the spread of the caterpillars, which can cause considerable damage to fields.

The cause of this undesirable effect lies in unforeseen interactions: In the fields with transgenic soy, special weeds that have adapted to the herbicide glyphosate are spreading. These weeds are particularly suitable food for the caterpillars. In addition, they also feed on the genetically modified soy, although this produces an insecticide. However, this poison is ineffective against the caterpillars; in fact, it seems to increase their vitality. The authors discuss whether the poison triggers a kind of 'positive stress'. In any case, the larvae examined in the study grew larger than those in the comparison group. The number of offspring of the moths also increased. Both the insect-poisonous soy and the weeds, whose occurrence is promoted by the herbicide-resistant soy, contributed to this development. https://www.testbiotech.org/aktuelles/mehr-schaedlinge-durch-transgene-soja

"Much higher" herbicide residues found in glyphosate-resistant soybeans: "Glyphosate should not be in the food chain". Researchers in Europe are concerned about the increased levels of herbicide residues in harvested crops and food, which they link to the use of glyphosate-resistant soybeans. In particular, genetically modified glyphosate-resistant soybeans are tolerant to the widely used but controversial herbicide glyphosate.

Link to the article (English)

Study on the news (English)

Higher harvests? A myth!

"Super yields" with GM rice: This is how genetic engineering fairy tales are created.
https://www.keine-gentechnik.de/nachricht/34659?cHash=c3e35df529e3fc22a2578e80f7bdfcbc
https://twitter.com/MerKhaiBurch/status/1553072152353689601

"*My re-evaluation of the data clearly shows that the GMO varieties are not as high in yield potential as the*
and are severely impaired in their ability to produce normal tubers" writes Caius Rommens in 2018 to sum up his genetic engineering work. "My book describes the many
hidden problems of GMO potatoes, but GMO potatoes are not the exception. They are the rule."
https://www.independentsciencenews.org/health/hidden-health-dangers-former-agbiotech-insider-gmo-crops/

https://www.keine-gentechnik.de/nachricht/34659?cHash=c3e35df529e3fc22a2578e80f7bdfcbc

Genetic engineering researcher: "But now, 20 years later, I have to say: the benefits never materialised. The disadvantages outweigh the benefits. In addition, I have noticed that the corporations in their dealings with critics
are not squeamish."
https://www.topagrar.com/suedplus/news/ganz-persoenlich-am-anfang-war-ich-sauer-10123807.html?upgrade=true

More poison, less yield
https://www.sueddeutsche.de/wirtschaft/gentechnik-in-der-landwirtschaft-mehr-gift-weniger-yield-1.1869788

South Africa rejects GM maize as useless
https://www.keine-gentechnik.de/nachricht/33819/
https://acbio.org.za/wp-content/uploads/2022/04/Ministers_final_decision_on_Monsanto_appeal.pdf

"Failure to yield - evaluating the performance of genetically engineered crops" (2009), Union of Concerned Scientists.
https://www.ucsusa.org/resources/failure-yield-evaluating-performance-genetically-engineered-crops

Breeding success with higher yield - without genetic engineering

https://www.gmwatch.org/en/high-yield

Outcrossing impairs biodiversity

2022 - In Brazil, traditional maize varieties are contaminated with genetic engineering constructs on a large scale. This has been proven by experts from the Brazilian agricultural research agency Embrapa in a study that has now been published in the journal Plants. According to the study, transgenes were found in one third (34 percent) of around 1,000 samples taken in 2018/19 and 2020/21 in federal states in the east and northeast of the country. Some of the samples came from farmers who only grow their own seeds, some of which are kept in families for generations. In addition, the scientists examined samples from farmers who had exchanged seeds with others or bought them at local markets. The lowest contamination levels were found in samples from farmers who neither exchange nor buy maize seed. The highest GM content (up to 75 percent) was found in purchased seed. The authors detected transgenes for herbicide resistance (glyphosate and glufosinate) as well as various Bt toxins that are toxic to insects.
https://www.testbiotech.org/aktuelles/gentechnik-mais-kontaminiert-traditionelle-sorten-brasilien

2022 - A recent study from Brazil shows that genetically modified fluorescent ornamental fish (zebrafish, Dania rerio) have escaped from breeding facilities in large numbers and spread into regional river systems. The transgenic fish are sold under the trade name GloFish in various countries as ornamental fish for aquariums. The publication was published in the journal Studies on Neotropical Fauna and Environment and

among other things, in the current issue of Science.
https://www.testbiotech.org/aktuelles/transgene-zierfische-brasilien-ausser-kontrolle

Study published in 2020 shows that the cultivation of transgenic plants faces new problems. According to this, the current research results show that teosinte, a weed related to maize, has changed in such a way that further gene exchange with maize is facilitated. A possible hybridisation with genetically modified maize may be the consequence and promote the emergence of new superweeds. Conclusion from the study: The emergence of noxious weeds poses a serious threat to agricultural production. It is therefore of great importance to understand their origin and evolution. The study analyses the fascinating case of teosinte, , which recently emerged as an invasive weed in maize fields in Europe. Patterns of genetic variation showed extensive genetic introgression of temperate-adapted maize into European teosintes. The introgressed genomic regions contained a key flowering time gene and a herbicide resistance gene. The results illustrate how adaptive introgression can drive the evolution of a wild relative of a crop plant into a weed. Hybridisation is an evolutionary force that should not be underestimated when predicting invasiveness risks.
https://www.pnas.org/doi/full/10.1073/pnas.2006633117

2019 - Synthetic biology has been identified by international experts as an emerging environmental issue with global implications and listed as one of five topics in the UN Environment Programme's (UNEP) Frontiers Report, published in 2019. The deliberate or accidental release of genetically modified organisms into the environment could have significant negative impacts on human and environmental health. https://www.unep.org/news-and-stories/story/risks-and-potential-rewards-synthetic-biology https://www.keine-gentechnik.de/nachricht/33609/

https://www.spiegel.de/wissenschaft/natur/uno-warnt-vor-fuenf-unterschaetzten-environmental-problems-a-1256235.html

2017 - GeneWatch UK has published a report on Oxitec's release of genetically modified mosquitoes in the Cayman Islands. The report cites new information about the ineffectiveness and risks, including the project's annual report, which was released following a Freedom of Information request.

https://gmwatch.org/en/106-news/latest-news/17828-new-documents-show-oxitec-s-gm-mosquitoes-ineffective-and-risky

See also Giese/von Gleich et al., 2015
https://link.springer.com/book/10.1007/978-3-319-02783-8

Small farmers do NOT benefit from genetic engineering

GMO cotton: "We conclude that the primary impact on agriculture is more to make farming more capital intensive than to bring long-term agronomic benefits."
https://www.rnd.de/wissen/indien-genmanipulierte-baumwolle-erfolg-oder-fehlschlag-CZ3ZOMF24ZCJZPLRK4HGCOF4UQ.html
https://www.keine-gentechnik.de/nachricht/33966/

Welthungerhilfe concluded as early as 2010: "*A sustainable increase in income for the benefit of small farmers in developing countries through green genetic engineering has not been proven to date, nor has a contribution to combating hunger.*"
https://www.welthungerhilfe.de/fileadmin/pictures/publications/de/magazin-welternaehrung/2010-zeitung-welternaehrung-2-2010.pdf

Bread for the World also does not see genetic engineering as a source of hope.
https://blog.misereor.de/2019/05/07/sind-neue-gentechnische-zuechtungsmethoden-wirklich-hoffnungstraeger/

Genetically modified potatoes developed in Ireland and the Netherlands are to be grown commercially in Rwanda and Uganda. Local environmental groups are fighting this together with the African Centre for Biodiversity. Support comes from smallholder organisations from the Andes, the potato's homeland.
https://www.keine-gentechnik.de/nachricht/33959/

Damning verdict on the "Alliance for a Green Revolution in Africa" founded by the Bill and Melinda Gates Foundation and the Rockefeller Foundation. According to the report, it has not improved the situation of small farmers as announced, but made it worse. The SZ writes about this in 2020: "The alliance has failed to achieve its own goals, and its corporate-driven approach is not working to end hunger, the study concludes." More hungry, hardly more productivity
along with less diversity in food, negative economic consequences for farmers, damage to the environment and less sovereignty in favour of corporations were instead the results of the alliance.
https://www.sueddeutsche.de/wirtschaft/agraralliannz-afrika-gates-stiftung-1.4963169

https://www.rosalux.de/fileadmin/rls_uploads/pdfs/Studien/False_Promises_AGRA_en.pdf

Monogenetics does not help

Manipulating individual genes in the DNA of plants anchors new traits in plants much less stably than conventional breeding, where the plant itself decides how its genetic material reacts to the new combination and the new traits are anchored more broadly genetically. To anchor a trait such as drought resistance in the genetic material, 60 other genes have to be changed. This can have many unintended side effects. Seeds of heterogeneous, seed-resistant varieties are genetically much broader than the currently used high-yielding varieties and the individual plants on the field vary more. This offers great potential for responding to changing environmental conditions and environmental stresses such as plant diseases, pests and weather extremes. Finding old varieties

can also lead to success without breeding: For example, the MASIPAK network's collection of more than 2,000 different rice varieties yielded 12 varieties that survive being flooded for a few days; 18 varieties that cope well with drought; 20 varieties that show tolerance to salt water and 24 that are resistant to certain local pests. Accordingly, it would be more efficient to first look for the varieties with climate-adaptive properties that already exist, rather than releasing new constructs into the world with elaborate risk monitoring.
https://masipag.org/programs/breeding/

Inde Sattler, co-founder of the apfel:gut association and an organic farmer, explains: "Cross-breeding polygenic resistances that have been able to develop in a site-adapted manner takes time and many years of field research." It is therefore important, she says, that the plant interacts with the environment under organic
cultivation conditions in order to develop in a way that is adapted to the location. "Decades of experience in organic breeding research have shown that monogenic resistance does not get us anywhere. What we need is the genetic diversity of robust plants," emphasises Inde Sattler.There is no one trait "drought tolerance" that could be bred for, or even built into plants. Rather, plants have numerous ways of responding to water shortages. They can, for example: root deeper, root more widely, form more fine roots, they can form a stronger wax layer on the leaves or stronger leaf hairs to reduce evaporation. They can also achieve this by closing the stomata of the leaves earlier, or by changing their day-night rhythm, they can also, for example, endure wilting during the day and rebuild turgor (the plump filling of the cells) at night, osmotic adjustment and changes in the viscosity of the cell plasma can also contribute to drought tolerance. Which of these reactions plants are capable of or particularly capable of depends within their species traits on the genetics of the individual plant or variety. Therefore, breeding for drought tolerance can be done in a promising way. Effective breeding procedures for this, such as alternate selection under drought stress and optimal field conditions, have been known for a long time. https://www.dreschflegel-verein.de/_pdf/2018-der-duerresommer-brennende-argumente-der- gentechniklobby.pdf

Overview: Breeding successes without genetic engineering

https://www.gmwatch.org/en/drought-tolerance

https://www.gmwatch.org/en/non-gm-successes-flood-tolerance

https://www.gmwatch.org/en/pest-resistance

https://www.gmwatch.org/en/salt-tolerance

https://www.gmwatch.org/en/disease-resistance

https://www.gmwatch.org/en/high-yield

Complete overview:
https://www.gmwatch.org/en/non-gm-index

Gentec and nature conservation

In the south of the USA, genetically modified rice that is resistant to the herbicide has been cultivated for 20 years. It is therefore not affected by glyphosate. In the meantime, however, the rice has also passed on this property to wild rice, which grows in the rice fields as weeds. As a result, glyphosate is no longer effective against wild rice.
https://www.deutschlandfunknova.de/nachrichten/landwirtschaft-zuchtreis-gibt-glyphosatresistenz-an-unkraut-weiter
https://www.nature.com/articles/s42003-022-03803-0

Rapeseed has been genetically modified primarily for its herbicide resistance and to increase the production of rapeseed oil. Because it forms weedy, feral populations and has been shown to be able to hybridise with its close relatives, it is important to control the cultivation and spread of genetically modified crops, especially oilseed rape. Several studies have reported that the spread of GM oilseed rape in non-GM fields and roadsides is possible due to transport and cultivation practices, and that it can become a weed. This overview summarises the cases of unintentional spread of feral GM oilseed rape on fields and roadsides.
https://www.mdpi.com/2079-7737/10/12/1264

The following is the German and English version of an important position paper of the Federal Agency for Nature Conservation. In it, they position themselves against the use of genetic engineering for nature conservation.

https://www.bfn.de/en/publications/position-paper/genetic-engineering-nature-conservation-and-biological-diversity

https://www.bfn.de/publikationen/positionspapier/gentechnik-naturschutz-und-biologische-vielfalt

Saving the forest from the consequences of climate change with genetic engineering? Genetic engineering expert Christoph Then warns against such interventions in the complex forest ecosystem. This could lead to the spread of new diseases - and make the trees even more susceptible. https://www.deutschlandfunk.de/eingriffe-in-die-natur-forscher-gentechnik-koennte-100.html

Canada: GM canola passes on glyphosate resistance to weeds
https://www.keine-gentechnik.de/nachricht/34681?cHash=79ced293066e4f5ef96f3f34b16b633d

Pesticides in the real world: The consequences of genetically modified, intensive agriculture for native amphibians. https://www.sciencedirect.com/science/article/abs/pii/S0006320719309905

A scientific publication in the journal Environmental Sciences Europe 2020 addresses the specific environmental risks of genetically modified plants that can spread and multiply in the environment. It is the first peer-reviewed publication to focus on the risks posed by the progeny of GM plants. The authors provide an overview of unexpected effects that occur in the hybrid offspring of the plants but have not been observed in the original plants. Associated risks include invasiveness and possible destabilisation of ecosystems. The study concludes that the risk assessment of persistent and multiplying GMOs is complex, both spatially and temporally, and is associated with many uncertainties. For the
Risk assessment, the paper therefore recommends the establishment of "cut-off criteria", which would shall include factual limits of knowledge. These criteria are to be defined within the
Apply risk assessment at the "spatio-temporal controllability" step and use well-defined biological characteristics. This additional step contributes to a more robust risk assessment and can significantly improve the reliability and traceability of the risk assessment and decision-making on potential releases.
https://enveurope.springeropen.com/articles/10.1186/s12302-020-00301-0

Case study gold of pleasure (Camelina sativa), which has already been produced several times with the help of the
gene scissors CRISPR/Cas9 was changed in its fatty acid content. Both unintended effects on metabolic pathways of the genome-edited plants and possible environmental effects of the intended and unintended changes are explained.
https://fachstelle-gentechnik-umwelt.de/wp-content/uploads/CRISPR_Risiken_Umwelt_de3.pdf

When cotton plants are attacked by insect pests, they bring in reinforcements with nectar. This attracts predatory ants, which destroy the insects. As a Mexican study showed in 2021, this survival mechanism is disrupted in genetically modified cotton. Wild cotton into which the genes cross could thus become an invasive species, the scientists warn.
https://www.keine-gentechnik.de/nachricht/34237/

Weed killers associated with GMO crops favour antibiotic-resistant bacteria in soil, a 2021 study shows. The use of weed killers can increase the incidence of antibiotic-resistant bacteria in soil, a new study from the University of York shows. Scientists from China and the UK studied the effects of three widely used herbicides - glyphosate, glufosinate and dicamba - on bacterial communities in soil. All three herbicides are used on genetically modified, herbicide-tolerant crops. Using soil microcosms, the researchers discovered that herbicides increased the relative abundance of bacterial species carrying antibiotic resistance genes.
https://gmwatch.org/en/106-news/latest-news/19712
https://academic.oup.com/mbe/article/38/6/2337/6133234

There is little reason to believe that this novel technology can only target the "bad" insects and not a wide variety of insects that are vital to agriculture, such as pollinators. Bayer and other companies developing RNAi pesticides claim they can target specific insects. Independent researchers warn that thousands of insect species have genetic sequences that match or are so similar that they could be inadvertently altered to kill them.
https://www.gmwatch.org/en/106-news/latest-news/19734-new-pesticides-will-modify-insect-genes-what-could-go-wrong

New RNAi pesticides with suicide gene...

RNAi stands for RNA interference. DNA consists of two strands with a colourful sequence of bases, represented as letters A, G, C and T. The bases of the two strands interlock like the teeth of a zip. When a cell needs to make a protein, it unzips and transcribes only the short part of the DNA it needs to build that one protein. As RNA. This messenger leaves the cell nucleus and the cell machinery produces the desired protein letter by letter according to its blueprint. RNA is found in practically every living being on this planet. The special thing about it: It has only a single strand. RNA is only half a zip. Many viruses have double-stranded RNA as their hereditary substance. This substance does not actually occur in a normal cell, and the cell knows: as soon as I see double-stranded RNA, it must be a virus, and then the cell has proteins that recognise this and chop it up into small snippets and then take these snippets as a template and destroy everything that looks exactly like these snippets. Disease successfully averted - at least if a virus has actually entered the cell. What does this have to do with pesticides? The idea behind it is to direct the defence mechanism, which pests also have, against their own body structures. You basically create an autoimmune disease. If you inject a double-stranded RNA against a gene of a beetle, then the beetle switches off its own gene, so to speak, because it thought: this is a virus. However, it is necessary for the application to find genes or gene segments (sequences) that lead to death as quickly as possible after activation of the RNAi. In addition, the sequence used must be chosen in such a way that it only occurs in the pest, but not in harmless species. https://www.geo.de/natur/rna---schaedlingsbekaempfung-der-zukunft--33074404.html

Resistance to the risky and unsafe cultivation of genetically modified RNAi manioc in Kenya.
https://www.gmwatch.org/en/main-menu/news-menu-title/archive/100-2020/19525-push-back-against-risky-and-unsafe-rnai-gm-cassava-cultivation-in-kenya

Monsanto's Colorado potato RNAi pesticide is part of the so-called BioDirect pipeline, which focuses on the use of RNAi-based sprays for pest, weed and disease control in crops, Genomeweb reports. The danger with these products is that genes could also be silenced or altered in expression in non-target organisms, including consumers of the food crops sprayed with the pesticide.

https://www.gmwatch.org/en/main-menu/news-menu-title/archive/87-2015/15864-monsanto-advances-topical-rnai-pesticide-against-colorado-potato-beetle

Arguments for better regulation

Wickson et al. 2017:

There is a growing demand for the inclusion of social, economic and ethical considerations in the governance of biotechnology. However, there is currently little guidance on understanding what this means or how it should be done. A framework for care-based ethics and policy can capture many of the concerns that perpetuate an ongoing socio-political conflict over biotechnologies Conflict over biotechnologies and offers a new way to incorporate such considerations into regulatory assessment and policy-making. Why do we need a policy of care to govern biotechnology? Agricultural biotechnology has been a source of social and environmental conflict for decades. Existing governance institutions based on traditional scientific risk assessment procedures have failed to address the root causes of the ongoing and highly polarised conflict (Pavone et al. 2011). These include concerns related to the concentration of ownership and power in agricultural and food systems, conflicting visions of a desirable future, and limited trust in regulatory systems and the available science. There is now an urgent need to find new ways of biotechnology governance that adequately address the issues that give rise to this conflict. that give rise to this conflict is now urgent as the field is being transformed by new tools for genome editing, synthetic biology and the digitisation of biological information. In an attempt to better address the causes of conflict, more and more countries are seeking socio-economic
and ethical considerations into their assessment of new biotechnologies (Binimelis and Myhr 2016). The importance of these considerations is also gaining ground at the regional as well as international level. For example, European Directive 2015/412 allows Member States to restrict the cultivation of GM crops based on 'non-scientific' concerns, and the Cartagena Protocol on Biosafety has a framework for conceptual clarity on socio-economic considerations.
https://link.springer.com/article/10.1007/s41055-017-0014-4

President BfN, 2019
https://www.keine-gentechnik.de/nachricht/33843/

Technology Assessment at the dt BT, 2020
https://www.tab-beim-bundestag.de/projekte_gene-drives-technologien-zur-verbreitung-genetic-changes-in-populations.php

"DIE Wissenschaft" advocates deregulation New genetic engineering?

In 2018, the research company VIB falsely claims that individual academic advocates of deregulating New Genetic Engineering represent their institutes as a whole. The large number

"leading scientists" who signed the VIB statement "on behalf of" various research centres and institutes in the field of plant and life sciences allegedly proves that there is "*a solid consensus in the academic life science research community in Europe on the negative consequences of this ruling*". To date, the VIB claims that no less than 127 research institutes "support" the statement.

However, this is false and grossly misleading. The VIB position paper contains 127 signatories with the logos of their research institutes next to them, implying that each institute in its entirety supports the position. However, the signatories are academics and researchers, and occasionally the rector of a university, who have signed in their individual capacity. It cannot be assumed that their views reflect the official positions of the institutions in which they work.
https://www.gmwatch.org/en/106-news/latest-news/19225

The European Network of Scientists for Social and Environmental Responsibility (ENSSER) has already called in 2017 for genetically modified organisms to be "*regulated at least as strictly as products of older genetic technologies*". ENSSER has warned that New Gene Technologies, including gene editing, "*may have unforeseen and unintended effects*" and that their exclusion from GMO regulations "*would pose an unacceptable risk to public health, the environment and trade*".
https://ensser.org/publications/ngmt-statement/

Gelinksky E and Hilbeck A (2018):
https://enveurope.springeropen.com/articles/10.1186/s12302-018-0182-9

2019 - Analysis by scientists from Austria, Germany and the United Kingdom

The products New GMO techniques cannot be assumed safe, but must undergo a risk assessment tailored to the **GMO** in question before being placed on the market, says a new peer-reviewed analysis.

The main points of the analysis are:

* The properties of some genome editing tools, such as the small amount of DNA sequence change or how precisely the editing tool can be targeted to a specific site, cannot be taken as an indication of the safety of New GMOs.

* All New Genetic Techniques can lead to unintended changes of different types and frequencies.

* The existing guidelines for the risk assessment of GMOs established in the EU by the European Food Safety Authority (EFSA) should be reviewed to determine whether they are sufficient and appropriate for certain types of new GMO applications.

* Specific guidelines need to be developed to enable risk assessors to focus their attention and resources on the issues relevant to the various applications

and which provide guidance to evaluators on the use of established and new tools in their evaluations.

* A case-specific pre-marketing risk assessment should be carried out for all new GM plants, including appropriate molecular characterisation to detect unintended modifications and/or confirm that no undesirable transgenic sequences are present.
https://www.gmwatch.org/en/106-news/latest-news/18905

2019 - Scientists support the need to subject genetically modified plants and animals to rigorous safety assessment.
https://www.gmwatch.org/en/106-news/latest-news/19223

2019 - New genetic engineering techniques and their products carry risks that need to be assessed.
https://ensser.org/publications/2019-publications/ensser-statement-new-genetic-modification-techniques-and-their-products-pose-risks-that-need-to-be-assessed/

Eckerstorfer et al (2019). Front Bioeng Biotechnol 7:31.
https://www.frontiersin.org/articles/10.3389/fbioe.2019.00031/full

Kawall et al (2020). Environmental Sciences Europe Volume 32, Article number: 106 (2020) https://enveurope.springeropen.com/articles/10.1186/s12302-020-00361-2

2020 - GMO regulations and their interpretation: How EFSA's guidance on GMO risk assessment is doomed to fail...
https://enveurope.springeropen.com/articles/10.1186/s12302-020-00325-6

2021 - The desire to adjust current regulation is often presented as scientific consensus. However, a study recently published by the Greens in the European Parliament makes it clear that the individual researchers and the lobby groups studied cannot be considered as representing general science. This is because they mainly represent genetics and molecular biology. On the other hand, interdisciplinary expertise is lacking, which is important for assessing the possible negative consequences of new genetic engineering methods in agriculture, according to the study. This includes expertise in ecology, agroecology, socioeconomics, toxicology and public health. Systemic problems such as the hunger and climate crisis or species extinction must be answered with holistic solutions.
https://ensser.org/wp-content/uploads/2021/04/Greens-EFA-GMO-Study-EN-Executive-Summary.pdf

http://extranet.greens-efa-service.eu/public/media/file/1/6954

2021 - Efforts to deregulate new techniques use terms and metaphors such as "like nature", "precise" and "no foreign genes". The language implies familiarity and safety through association with what occurs in nature or through breeding. In a 2021 study, researchers from the University of Canterbury and the Defense Technology Agency, both in New Zealand, show how these terms are misapplied to the new techniques.

https://biosafety-info.net/articles/biosafety-science/emerging-trends-techniques/why-new-genetic-techniques-need-to-be-stringently-regulated/

2022 - The thinking error of genetic engineering
"My objection to genetic engineering is fundamental - not because there is anything wrong with genetic engineering itself or because it is more "dangerous" than other forms of plant breeding, but because its approach is based on a serious error in thinking: It is based on the mistaken belief that the characteristics of a plant - how much yield it produces, how well it can resist pathogens and how well it can survive drought or heavy rainfall - can be influenced simply by changing its genes."
https://www.derpragmaticus.com/r/gentechnik-pestizide/

Even the scientist who invented Crispr/Cas urges caution. Emmanuelle Charpentier, director at the Max Planck Institute for Infection Biology, calls this technology powerful, "and that's why we need strict regulation". Europe could play a pioneering role.
https://www.faz.net/aktuell/wirtschaft/mehr-wirtschaft/eugh-urteilt-zu-gentechniken-wie-crispr-cas-15708217.html

Positioning of associations/trade

2019
https://www.testbiotech.org/sites/default/files/letter%20to%20EU%20Commission%20to%20halt%20GMO%20authorisations_2019.pdf

2021
Discounters and organic food chains have joined forces to oppose looser rules for New Genetic Engineering techniques in food production.
https://www.tagesschau.de/wirtschaft/unternehmen/gentechnik-einzelhandel-kennzeichung-eu-commission-101.html

2021
A broad coalition of 162 organisations has written an open letter to Frans Timmermans, Vice-President of the European Commission. It demands that plants and animals modified with New Genetic Engineering methods continue to be strictly regulated in the future.
https://www.organicseurope.bio/content/uploads/2021/03/High-level-letter-Timmermans_New-GMOs_Layout_20210330.pdf?dd

2021 Misereor
https://www.misereor.de/fileadmin/publikationen/diskussionsbeitrag-neue-gentechnik-misereor_01.pdf

2021 Bread for the World
Bread for the World has set up its own thematic website on agro-genetic engineering. The website entitled "What benefits the agro-industry harms people" describes, among other things, the undesirable side effects and interactions of agro-genetic engineering. Instead of genetic engineering, Bread for the World appeals for "healthy diversity instead of monocultures". https://www.brot-fuer-die-welt.de/themen/gruene-gentechnik/

2021
Co-op becomes first UK supermarket to reject GM crops and animals without rigorous testing. The move comes amid a government review of controversial foods. Ministers are consulting on removing some controls, which could include scrapping mandatory labelling of food containing GM ingredients. The Co-op has thrown its weight behind the #NotInMySupermarket campaign, coordinated by Beyond GM and SlowFood UK groups. https://www.dailymail.co.uk/news/article-9276737/Co-op-British-supermarket-reject-GM-crops- animals-without-strict-assessments.html

2022

https://www.greenpeace.de/biodiversitaet/landwirtschaft/oekologische-landwirtschaft/gentechnik-positions-food-trade

2022 - European Commission considers weakening precautionary principle for new genetic engineering. Expert opinion shows: Gene scissors and other new genetic engineering techniques harbour risks and have not yet been sufficiently researched. vzbv demands strict risk assessment and approval procedures, compulsory labelling and technology assessment. https://www.vzbv.de/meldungen/vorsorgeprinzip-muss-auch-fuer-neue-gentechnik-gelten

2022 - An alliance of 50 organisations has spent six months collecting 420,757 signatures across Europe against relaxing EU GMO law.

https://www.euractiv.de/section/landwirtschaft-und-ernahrung/news/protest-in-bruessel-gegen-possible-genetic-engineering-deregulation/
https://www.ohnegentechnik.org/artikel/420000-unterschriften-fuer-bewahrung-der- GMO-FREE

Regulation in non-European countries

Status 2023

	Russland	GE-Pflanzen sind konventionellen gleichgestellt. (Dekret des Präsidenten, 2019)
Nord- und Südamerika	USA	GE-Pflanzen sind konventionell gezüchteten Pflanzen gleichgesetzt.
	Kanada	GE-Pflanzen sind frei, sofern sie keine neuartigen Merkmale besitzen.
	Brasilien, Argentinien, Chile, Equador, Kolumbien, Paraguay, Honduras, Guatemala	GE-Pflanzen sind von den GVO-Regeln ausgenommen. Fallweise Überprüfung der Voraussetzungen.
Asien	China	Spezifische Regeln für die Zulassung von GE-Pflanzen.
	Indien	GE-Pflanzen sind von GVO-Regeln ausgenommen, wenn nachweislich transgen-frei.
	Philippinen	GE-Pflanzen sind von GVO-Regeln ausgenommen. Produkte werden nach Überprüfung zertifiziert.
	Indonesien	GE-Pflanzen sind von GVO-Regeln ausgenommen, wenn sie keine Fremd-DNA enthalten.
	Japan	GE-Pflanzen der Kategorie SDN-1 sind von GVO-Regeln ausgenommen. Registrierung erforderlich.
	Südkorea	GE-Pflanzen, in die kein Fremd-Gen eingefügt wurden, sind von GVO-Regeln ausgenommen. (vorläufige Regelung, 2021)
Afrika	Nigeria, Kenia	GE-Pflanzen sind von den GVO-Regeln ausgenommen. Fallweise Überprüfung der Voraussetzungen.
Australien	Australien	GE-Pflanzen der Kategorie SDN-1 sind von GVO-Regeln ausgenommen.

https://www.transgen.de/aktuell/2853.genome-editing-pflanzen-regulierung-weltweit.html

Industry influence on politics, audit bodies and media

Influencing politics and the media

2019
EuropaBio buys articles on Euractiv

https://www.euractiv.com/section/agriculture-food/opinion/senselessly-shunning-science-the-eu-parliaments-gmo-dilemma/

Senselessly shunning science: the EU Parliament's GMO dilemma

DISCLAIMER: All opinions in this column reflect the views of the author(s), not of EURACTIV Media network.

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From Twitter

2019

In the 2017-18 financial year, GM crop company Bayer donated $40,600 to Labour in GB and $42,540 to the Coalition. The GM crop and agrochemical lobby group, CropLife, donated $34,271 to Labour and $22,300 to the Coalition. CropLife's chief executive, Matthew Cossey, is also a former senior civil servant and Labour's campaign manager.
https://www.miragenews.com/australian-federal-government-and-the-opposition-sign-off-on-uncontrolled-genetic-experiment

2019 - Federal government spends € 100 million tax money on genetic engineering - only € 9.6 million on organic farming, although it can scientifically prove that it promotes sustainability - in contrast to genetic engineering. 2019 - https://www.weltagrarbericht.de/fileadmin/files/weltagrarbericht/Weltagrarbericht/12Agraroekologie/2019Th%C3%BCnen-Report_65_final.pdf

[and also 2023 - https://syncandshare.lrz.de/getlink/fiWMYsSjm7uGyBzrBFLGpH/Weihenstephaner%20Schriften_16_Study.pdf]

In an answer to a minor question from the Bündnis 90/Die Grünen parliamentary group in 2019, the federal government lists an extensive list of projects for the application, development and/or release of genetically modified plants and animals (http://dip21.bundestag.de/dip21/btd/19/079/1907926.pdf). Testbiotech has researched further funding and funding commitments in addition to this list and thus arrives at the stated sum of more than 100 million euros. The association assumes that the actual sum is much higher (see https://kurzelinks.de/2j35).
https://www.boelw.de/themen/forschung-bildung/forschungspolitik/artikel/forschungspolitik-oeko-breeding-instead-of-genetic-engineering-promoting/

2020
The chemical company wanted to influence the FPA, an organisation of the foreign press, in the USA with five-figure sums.
https://taz.de/Chemieriese-will-Image-verbessern/!5653454/

2020
On 10 February 2020, the EU Commission's DG SANTE conducted a "targeted stakeholder consultation" to discuss the design of this policy study on "New Genomic Techniques". However, only Brussels-based organisations were invited and the list of invitees shows a huge imbalance. Of the 94 organisations invited, more than 70 % represent the interests of the food industry and agriculture, while NGOs are represented by less than 12 %.

2020
Statements by the Intergovernmental Panel on Climate Change (IPCC) on new genetic engineering techniques are misused by various actors to justify not only their use but also extensive deregulation. There is no indication that the IPCC specifically calls for the rapid use of new genetic engineering. An undifferentiated interpretation that limits the report to
the formula 'IPCC calls for genetic engineering/genome editing!', as adopted by individual scientists, but also by influential professional associations, is therefore misleading and untenable in view of the given textual basis. https://www.testbiotech.org/content/gentechnik-fuers-klima

2020 "This industry thrives on whipping up a lot of foam"
https://www.spektrum.de/news/diese-branche-lebt-davon-viel-schaum-zu-schlagen/1752354

2021

https://www.global2000.at/sites/global/files/Gentechnik-EU-Lobby-Report-2021.pdf

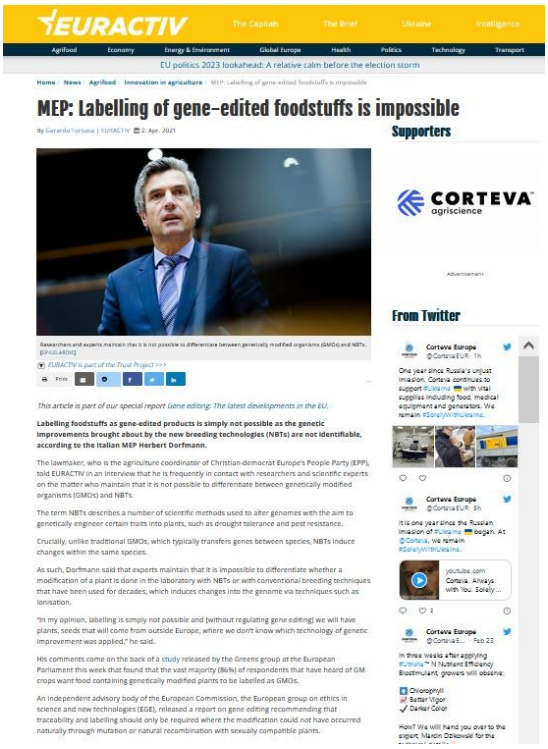
https://food.ec.europa.eu/system/files/2020-04/gmo_mod-bio_stake-cons_sum-rep-stakeholder.pdf

https://www.euractiv.com/section/agriculture-food/opinion/new-gmos-kyriakides-gets-off-on-wrong-foot-with-biased-consultation/

2021
GMO advocates are subject to a logic flaw in using COVID vaccines to promote GMO deregulation. In a new article in EuroChoices, agricultural economist Justus Wesseler and life sciences professor Kai Purnhagen "list the contribution of the
biotechnologies to create a "vaccine" for COVID-19 to argue for a softening of GMO regulations in the EU. They argue that this will allow the "potential" of GMOs, and in particular new genetic technologies, to be realised. But Dr Judy Carman, an epidemiologist, biochemist and director of the Institute for Health and Environmental Research in South Australia, points out fatal flaws in their argument. "*The authors conveniently forget that vaccines were tested on animals for safety, then went through phases I, II and III of human clinical trials to determine safety, and are monitored for safety after vaccination (phase IV), whereas GM crop producers have no intention of subjecting their crops to all this testing.... So if they want to argue that their plants are as safe as these vaccines, they can first test them for safety like these vaccines, publish the evidence in peer-reviewed scientific journals for all of us to see, and then go through the kind of approval process that the vaccines went through.*" https://gmwatch.org/en/106-news/latest-news/19709

2021
CEO report. EU rules on new GMOs are being undermined. CRISPR files reveal lobbying tactics to deregulate new GMOs. Officials from national ministries hand-picked for joint strategy sessions with lobbyists; a think-tank set up a new task force with a big grant from the Gates Foundation to pave the way for GMO deregulation using "climate narratives"; and a lobbying platform based on a signature letter exaggerating its support from research institutes. Through Freedom of Information requests to the European Commission and the Dutch and Belgian governments, Corporate Europe Observatory (CEO) has uncovered new information about recent lobbying tactics,. CEO has provided extensive documents to a number of investigative journalists. Media coverage: Spiegel (DE), EUObserver, Reporterre Part 1 (FR), Reporterre Part 2, La Libre Belgique, apache.be (BE), El Diario (ES), Il Domani (IT), Público (PT), Reporters United (EL). Other reports appeared in De Standaard (BE), Libération (FR), Le Courrier du Soir (FR), Counterpunch (US).
https://corporateeurope.org/en/2021/03/derailing-eu-rules-new-gmos

2021 Euractiv coverage of New Genetic Engineering sponsored by Corteva, which holds the most CRISPR patents and is working hard to undermine EU rules on genetically modified crops. https://www.euractiv.com/section/agriculture-food/news/mep-labelling-of-gene-edited-foodstuffs-is-impossible/



EURACTIV

EU politics 2023 lookahead: A relative calm before the election storm

Home / News / Agrifood / Innovation in agriculture / MEP: Labelling of gene-edited foodstuffs is impossible

MEP: Labelling of gene-edited foodstuffs is impossible

By Gerardo Fortuna | EURACTIV | 2 Apr. 2021

Researchers and experts maintain that it is not possible to differentiate between genetically modified organisms (GMOs) and NBTs. [EPA-EFE/ARCHIVE]

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Print

This article is part of our special report Gene editing: The latest developments in the EU.

Labelling foodstuffs as gene-edited products is simply not possible as the genetic improvements brought about by the new breeding technologies (NBTs) are not identifiable, according to the Italian MEP Herbert Dorfmann.

The lawmaker, who is the agriculture coordinator of Christian-democrat Europe's People Party (EPP), told EURACTIV in an interview that he is frequently in contact with researchers and scientific experts on the matter who maintain that it is not possible to differentiate between genetically modified organisms (GMOs) and NBTs.

The term NBTs describes a number of scientific methods used to alter genomes with the aim to genetically engineer certain traits into plants, such as drought tolerance and pest resistance.

Crucially, unlike traditional GMOs, which typically transfers genes between species, NBTs induce changes within the same species.

As such, Dorfmann said that experts maintain that it is impossible to differentiate whether a modification of a plant is done in the laboratory with NBTs or with conventional breeding techniques that have been used for decades, which induces changes into the genome via techniques such as ionisation.

"In my opinion, labelling is simply not possible and [without regulating gene editing] we will have plants, seeds that will come from outside Europe, where we don't know which technology of genetic improvement was applied," he said.

His comments come on the back of a study released by the Greens group at the European Parliament this week that found that the vast majority (86%) of respondents that have heard of GM crops want food containing genetically modified plants to be labelled as GMOs.

An independent advisory body of the European Commission, the European group on ethics in science and new technologies (EGE), released a report on gene editing recommending that traceability and labelling should only be required where the modification could not have occurred naturally through mutation or natural recombination with sexually compatible plants.

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At least €36,599,932 has been spent on lobbying for the deregulation of GMOs in the EU since it began in 2018. https://www.global2000.at/sites/global/files/211220_bund-GLOBAL2000_Research_NGT_Agricultural_Corporations_Final.pdf.

The U.N. Food Systems Summit focused on biotechnology, although agro-ecological innovations promise more sustainability. https://www.keine-gentechnik.de/nachricht/34255/

2023
An investigation by Friends of the Earth Europe shows the extent to which the European Commission's proposal has been captured by the seed industry. https://friendsoftheearth.eu/publication/how-big-agri-ghost-writes-the-commissions-proposal-on-

new-gmos/
https://www.deutschlandfunkkultur.de/gefaehrdete-welternaehrung-wie-konzerne-die-100.html

Criticism of EFSA's existing assessment and review practice

2020
In the approval of genetically modified plants, legal requirements are interpreted in a very one-sided and industry-friendly way. The test procedure always aims to enable cultivation or approval - at the expense of environmental protection.

https://www.deutschlandfunk.de/gentechnik-pflanzen-zulassungspruefung-sehr-100.html

2020
EFSA opinion underestimates dangers of GM crops. It dangerously underestimates the risks posed by genetically modified crops and paves the way for their deregulation - and holds out the prospect of a future with few, if any, safety controls.
https://www.gmwatch.org/en/106-news/latest-news/19624

2020
In recent years, the EU Parliament has passed around 40 resolutions against further imports of genetically modified (GM) plants. The main criticism is that the risk assessment by the European Food Safety Authority (EFSA) is inadequate. Similar criticism is also voiced by experts from various member states. Nevertheless, the EU Commission approved all applications.
https://www.testbiotech.org/sites/default/files/%C3%9Cberblick%3A%20das%20RAGES-Projekt.pdf

2020
EU - Control of GMOs: defective material
"In 2019, the European Union decided to systematically check the quality of GMO material provided by companies as part of the authorisation procedure. This decision was taken because in 2018, deficiencies were found in part of the GMO material supplied by the company ASOCS, which was used as a positive control for the validation of GMO detection methods.
https://www.infogm.org/6955

2021
The EU Parliament has again spoken out against further import authorisations for genetically modified plants by a large majority. According to the vote, significant gaps in the risk assessment of the European Food Safety Authority (EFSA) were identified. In earlier votes, the EU member states had also spoken out against market authorisations by a large majority. Only 10 member states voted in favour of the approval of the two plants currently under discussion, 13 countries were against and 4 abstained. In the European Parliament, the rejection is even clearer: almost 500 MEPs were against the

Approval, no 190 for it.
https://www.testbiotech.org/aktuelles/risikopruefung-druck-auf-eu-kommission-und-efsa-waechst

2023 - "Taken together, these trends reflect the increasing industrialisation of agriculture and a landscape that some economists would like to call "oligopoly". Control over more parts of the food supply system means more power in setting prices, dictating practices and more."
https://uncutnews.ch/die-kontrolle-von-4-riesigen-chemieunternehmen-ueber-das-globale-food-system-threatened-health-and-environment/

Excursus: Difference between random mutagenesis and CRISPR/Cas

In classical mutagenesis, the genetic material of a living organism is not specifically altered. For this purpose, the organisms to be bred are exposed to mutagenic, i.e. mutagenic, conditions. These range from irradiation (e.g. with UV light) to the use of chemical substances. It is not possible to predict where exactly in the genome a mutation will occur. In the CRISPR/CAS method, mutations are not triggered, but pieces of DNA are specifically introduced and incorporated into the target DNA. *CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats)* refers to DNA segments that repeat in a specific way. They occur in various organisms, e.g. bacteria, which can use them to recognise foreign DNA as an invader and fight it. The CRISPR-Cas technique uses this natural reaction. Cas is an enzyme that can cut the DNA at predetermined points and thus make room for the DNA to be introduced.

..... Finally, something to smile about...

https://www.youtube.com/watch?v=56zVGYobX9M