NO PATENTS ON SEEDS!

PATENTS CAUSE MONOPOLIZATION IN CONVENTIONAL PLANT BREEDING

ALARMING TREND IN THE NUMBER OF INTERNATIONAL PATENT APPLICATIONS FILED FOR NATIVE GENE VARIANTS

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Authors
Anne-Charlotte Moy, Andreas Bauer-Panskus (research), Johanna Eckhardt and Christoph Then

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Summary

According to statements made by the European Patent Office (EPO), industrial representatives and politicians, conventional plants cannot be patented. However, ongoing research conducted by *No Patents on Seeds!* has revealed the opposite to be the case. Our research shows a continuing and alarming trend towards the monopolization of naturally occurring gene variants. Standard gene sequencing methods enable the identification of genes crucial to plant breeding in existing plant populations – this includes traits for improved disease and stress resistance. The naturally occurring genes are however frequently being claimed as technical inventions, and the patent claims even extend the respective plants, regardless of whether they are in fact obtained from crossing and selection. Other methods used in this context include random mutagenesis and new genetic engineering (NGTs).

According to our research, around 40 international patent applications filed in 2025 explicitly target conventionally-bred food plants. Most claim naturally occurring gene variants as technical inventions, with a large majority targeting improved resistance to pathogens causing fungal or viral diseases.

A recently published report shows that current European Patent Office (EPO) practice is allowing these kinds of patent applications to be filed and subsequently granted. Recently granted patents claim, e.g. maize, lettuce, spinach and tomatoes - all of which were obtained through the use of patented gene variants and subsequent crossing.

¾ of patent applications claim naturally occurring gene variants.

⅔ of applications target pathogen resistance.

16 important food plants are claimed in patents as inventions, including broccoli, tomatoes and maize.

Such developments can significantly hinder or block access to biodiversity that is essential for breeding disease-resistant or climate-change adapted varieties. It means that small and medium-sized breeding companies will be negatively impacted by costs and new dependencies, even if they do not intend to use any form of genetic engineering.

Besides less choice in agriculture and vegetable production, seed and food prices could also be affected. More importantly, it is also putting our food security at risk.

NGT applications are one of the factors driving an increasing number of seed patents. The European Parliament now has a chance to end the ongoing monopolization of seeds when they vote on the future of NGT regulation in June 2026. If the new regulation cannot solve these problems, it should be rejected.

Background

A recent report[1] shows that the European Patent Office is continuing to grant patents claiming conventionally bred plants by circumventing legal prohibitions. This current practice can be understood as an intentional misinterpretation of current legislation. Naturally occurring gene variants identified in existing plant populations are being claimed as technical inventions, the patent claims extend to the plants obtained from the selection process with these genes and cover any subsequent crossings.

The *No Patents on Seeds*! research shows that Rule 28 (2) of the Implementing Regulations of the European Patent Convention (EPC) does not effectively prevent patents from being granted on conventionally bred plants. The rule was introduced into the EPC in 2017 on the initiative of the EU. However, regardless of the express intent of the EU, patents on conventionally bred plants and the use of naturally occurring gene variants are still being granted.

6 recently granted patents claim naturally occurring gene variants and plants selected with their help. The patents claim maize, tomatoes, lettuce and spinach.

In fact, the EPO recently granted patents on maize, lettuce, spinach and tomatoes, most of which had improved resistance to pests and pathogens; they were all obtained from the selection of naturally occurring gene variants and further crossings.

Table 1: Overview of patents granted on food plants under Rule 28 (2) Implementing Regulations, claiming plants from crossing and selection

Number Company Date of grant	Content of the patent
EP3560330 **KWS** **15.06.2022**	Maize with improved digestibility that was obtained through crossing and selection from existing breeding populations. Natural gene variants were used as a tool to select plants (‘marker genes’).
EP3911147 **Enza Zaden** **16.07.2025**	Tomatoes with resistance to a plant virus (TBRFV). The plants are obtained from crossing and selection with a wild tomato species.
EP3975697 **Bejo Zaden** **24.09.2025**	Spinach with resistance to downy mildew. The plants are obtained from crossing and selection with a wild spinach species.
EP3797582 **Seminis** **17.12.2025**	Lettuce with resistance to aphids. The plants are obtained from crossing and selection with a related species.
EP3720272 **Rijk Zwaan** **11.02.2026**	Tomatoes with resistance to a plant virus (TBRFV). The plants are obtained from crossing and selection with a wild tomato species.
EP3797582 **Enza Zaden** **18.02.2026**	Lettuce with resistance to downy mildew. The plants are obtained from crossing and selection with a related species.

[1] *No Patents on Seeds!* (May 2026); *European Patent Office versus the EU Despite prohibitions: Patents continue to be granted on natural genes and plants selected for breeding*, https://www.no-patents-on-seeds.org/en/report-2026

The European Parliament will have a chance to end the ongoing monopolization of seeds in their vote on the future of NGT regulation. NGT applications are one of the factors behind an increasing number of patents on seeds. Many of these patents include the use of NGTs to simply replicate the natural occurring gene variants. If these patents are granted, they claim both genetically engineered and traditionally-bred plants.

In 2024, the European Parliament called for these kinds of patents to be banned. In a vote scheduled for June 2026, the EU is supposed to make a final decision on a draft regulation, which in its current form does not restrict patent on seeds at all. However, several amendments have been tabled which may help to solve the problem. Another option is to reject the whole proposal.

If the EU allows patents which block access to plant genetic resources, it runs the risk of adopting legislation which could potentially pose a serious threat to the future of food production rather than desired innovations in plant breeding.

Outcome of the research

In 2025, our research identified around 40 EU-relevant newly filed international patent applications that explicitly cover conventionally bred plants. It revealed an alarming trend towards the monopolization of naturally occurring gene variants, as most of the patent applications contained standard processes in gene sequencing to identify natural gene variants for possible plant disease resistance (Fig. 1; Annex). As shown in a recent report, it is highly likely that the European Patent Office will in fact grant these patents.[2]

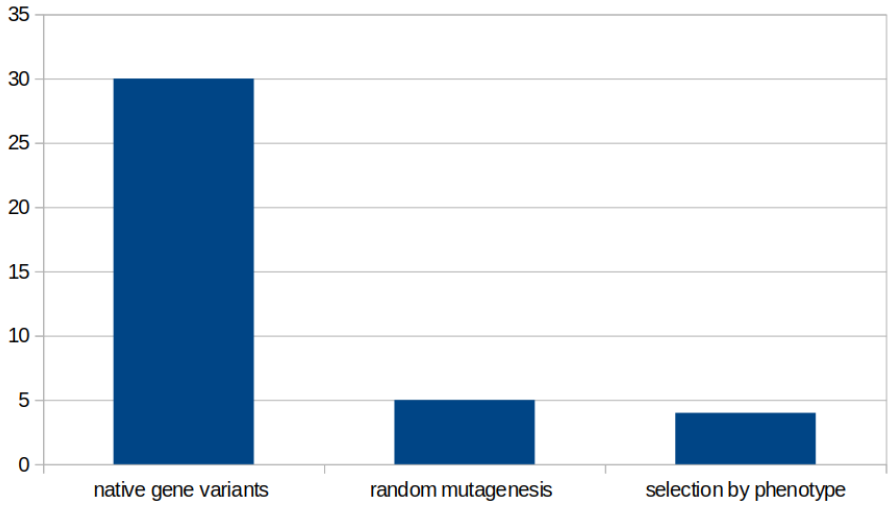

Figure 1: International patent applications claiming conventionally bred food plants (2025). Most of these patents claim naturally occurring gene variants.

According to the EU Patent Directive 98/44/EC, patents granted on genes also extend to the plants that inherit these genes.[3] Originally this was only meant to allow patents claiming genetically engineered plants, but it has now been extended to the realm of conventional breeding. These kinds of patents completely ignore the position of the EU, which has tried several times to clarify that such patents should not be granted.

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2 See footnote 1

3 Article 9 of the EU Patent Directive 98/44/EC

Most of the patents claim gene variants that can improve plant resistance to serious plant diseases such as fungal pathogens or viruses. Currently, 24 out of 39 filed applications target genes of interest detected in wild species or in existing plant varieties (see Annex). Without free access to these natural gene resources, our future food security is at risk, as these gene variants are crucial for breeding future varieties adapted to ongoing climate change and with greater resistance to plant diseases.

The patents are targeted at a broad range of food plants, including broccoli, carrots, celery, cucumber, garlic, lettuce, maize, melons, peanuts, peas, pepper, sorghum, soybeans, spinach, squash and tomatoes. In many cases, the filed patent applications also extend to the harvest (fruits, kernels, leaves) and their usage in food and feed.

19 different patent companies are continuing to file these patents, including large corporations, such as Bayer, Corteva, Syngenta, BASF, KWS, Vilmorin and Rijk Zwaan.

Conclusions

This research shows an alarming trend towards the monopolization of plant genetic resources. Many international patent applications published in 2025 claim naturally occurring gene variants as technical inventions. Most of them concern resistance to fungal or viral diseases in plants. At present, European Patent Office (EPO) practice still allows these patents to be granted.

Furthermore, this practice continues to hinder or even block access to biological diversity, which is essential for plant breeding as well as producing varieties that are disease-resistant and/or adapted to climate change. Small and medium-sized breeding companies will also be negatively impacted, even if they do not use genetic engineering. It will result in farmers and vegetable producers having less choice in the varieties they can buy, and an increase in food prices due to licence fees. More importantly, it puts food security at risk.

Right now, the European Parliament has a chance to end the ongoing monopolization of seeds when they vote on the future NGT regulation. The vote is scheduled to take place in June. If the current text is adopted, then NGTs will become one of the main drivers of a rapid increase in the number of seed patents. They will cover both genetically engineered plants and traditional breeding. The new regulation should be rejected if it does not help to solve these problems.

Annex: Overview of international patent applications filed for conventionally bred food plants, published in 2025.

	Application number company	Content (as provided in the examples of the patent)	Claims
1.	WO2025006548 Seminis / Bayer	Purple colored broccoli. The plants were selected from existing plant populations and then used for further crossings.	Process for the selection of the plants, the relevant gene variants and the plants inheriting these genes.
2.	WO2025003305 Vilmorin	Pepper with resistance to nematodes. The plants were selected from existing plant populations and then used for further crossings.	Process for the selection of the plants, and the relevant gene variants and the plants inheriting these genes.
3.	WO2025016551 Enza Zaden	Improved shelf-life in cucumber. Plants were obtained from random mutagenesis (NGTs as an option).	Selection of the plants and further crossings.
4.	WO2025012157 Syngenta	Tomatoes with resistance to ToBRFV (virus disease). The plants were selected from existing plant populations and then used for further crossings.	Process for the selection of the plants, the relevant gene variants, and the plants inheriting these genes.
5.	WO2025021893 Vilmorin	Sugar melons with resistance to CYSDV (virus disease). The plants were selected from existing plant populations and then used for further crossings. Random mutagenesis is mentioned as additional option.	Process for the selection of the plants, the relevant gene variants and the plants inheriting these genes.
6.	WO2025032593 Equi Nom	Peas with high protein and low-fat content. The gene variants are selected by using specific computer programs.	Computer programs for selection of relevant gene variants and the plants inheriting these genes.
7.	WO2025031573 KWS	Spinach plants with resistance to downy mildew. Plants were obtained by crossing and selection with another spinach species. CRISPR/Cas and random mutagenesis are mentioned as additional options.	Process for the selection of the plants, the relevant gene variants and the plants inheriting these genes.
8.	WO2025034481 Hudsonalpha [US] and Instituto Nacional de Technologica Agropecuaria [AR]	Peanuts with resistance to peanut smut (fungal disease). The plants were selected from existing plant populations and then used for further crossings.	Process for the selection of the plants, the relevant gene variants and the plants inheriting these genes.
9.	WO2025032083 Syngenta	Squash plants with resistance to PRSV (virus disease). Plants were obtained by crossing and selection with another squash species.	Process for the selection of the plants, the relevant gene variants and the plants inheriting these genes.
10.	WO2025061297 Bejo Zaden	White carrots selected just by phenotype.	Process for the selection of the plants by phenotype and the plants inheriting undetermined gene variants.
11.	WO2025069034 State of Israel	Squash with higher number of flowers. The plants are obtained from crossing with plants that inherit a spontaneous genetic deletion.	Process for the selection of the plants and the plants inheriting the specific gene variants.
12.	WO2025098596 Enza Zaden	Lettuce with improved resistance to aphids. The plants were selected from existing plant populations.	Process for the selection of the plants, the relevant gene variants and the plants inheriting these genes.

	Application number company	Content (as provided in the examples of the patent)	Claims
13.	WO2025088031 Terra Seeds	Tomatoes with resistance to TCSV (virus disease). The plants were selected from existing plant populations and then used for further crossings.	Process for the selection of the plants, the relevant gene variants and the plants inheriting these genes.
14.	WO2025132866 KWS	Maize plants with improved resistance to a fungal disease. The plants were obtained from crossings with a Mexican regional variety. Random mutagenesis and CRISPR/Cas are mentioned as alternatives.	Process for the selection of the plants, the relevant gene variants and the plants inheriting these genes.
15.	WO2025133323 Rijk Zwaan	Spinach plants with resistance to downy mildew. The plants were selected from existing plant populations and then used for further crossings.	Process for the selection of the plants, the relevant gene variants and the plants inheriting these genes.
16.	WO2025133299 Rijk Zwaan	Broccoli with resistance to downy mildew. The plants were selected from existing plant populations and then used for further crossings.	Process for the selection of the plants, the relevant gene variants and the plants inheriting these genes.
17.	WO2025133238 Rijk Zwaan	Spinach plants with resistance to downy mildew. The plants were selected from existing plant populations and then used for further crossings.	Process for the selection of the plants, the relevant gene variants and the plants inheriting these genes.
18.	WO2025144792 Seminis /Bayer	Lettuce with resistance to downy mildew. Plants were obtained by crossing and selection with relative species.	Process for the selection of the plants, the relevant gene variants and the plants inheriting these genes.
19.	WO2025140780 Bejo Zaden	Spinach plants with resistance to downy mildew. The plants were selected from existing plant populations and then used for further crossings. CRISPR/Cas was used to confirm the gene function.	Method for providing the plants, selection of the plants, the relevant gene variants and the plants inheriting these genes.
20.	WO2025153582 KWS	Maize plants with improved resistance to a fungal disease. The plants were obtained from crossing with a Mexican regional variety. Random mutagenesis and CRISPR/Cas are mentioned as alternatives.	Process for the selection of the plants and the relevant gene variants. Also plants obtained from random mutagenesis.
21.	WO2025153541 Nunhems /BASF	Cucumber with higher sugar content. Plants were obtained by crossing and selection with wild relatives.	Process for the selection of the plants, the relevant gene variants and the plants inheriting these genes.
22.	WO2025147574 Olam Americas	Garlic with higher concentration of several substances. Plants can be obtained from phenotypical selection.	Plants with the changed concentration of certain compounds, and method of production.
23.	WO2025149369 Rijk Zwaan	Spinach plants with resistance to downy mildew. The plants were selected from existing plant populations and then used for further crossings.	Plants and methods of production. Gene variants and selection methods.
24.	WO2025172110 Nunhems /BASF	Cucumber plants with changes in growing habit. Plants were obtained from random mutagenesis.	Plants and production methods.
25.	WO2025186284 Vilmorin	Cucumber plants with enhanced yield. Plants were obtained from random mutagenesis (potentially CRISPR/Cas).	Plants and production methods. Gene variants and selection methods.

	Application number company	Content (as provided in the examples of the patent)	Claims
26.	WO2025184759 Pioneer HiBred / Corteva and University of Huazhong	Maize with resistance to a fungal disease. The plants were selected from existing plant populations and then used for further crossings.	Process for the production and selection of the plants, the relevant gene variants and the plants inheriting these genes.
27.	WO2025207940 United Sorghum (US)	Sorghum plants with enhanced digestibility for producing animal feed. The plants were selected from existing plant populations and then used for further crossings.	Process for the production of the plants, the relevant gene variants and the plants inheriting these genes. Animal feed production method.
28.	WO2025207804 University of Texas	Sorghum plants with enhanced digestibility. Plants were obtained from random mutagenesis (potentially GE).	Plants and production methods.
29.	WO2025201663 Enza Zaden	Sugar melons with resistance to ToLCNDV (virus disease). The plants were selected from and crossed with wild species.	Process for the selection of the plants, the relevant gene variants and the plants inheriting these genes.
30.	WO2025240683 Syngenta	Soybeans with resistance to fungal disease. The plants were selected from existing plant populations and then used for further crossings. Transgenic version is given as an alternative.	Process for the selection of the plants, the relevant gene variants and the plants inheriting these genes. Includes transgenic variants.
31.	WO2025237806 Nunhems /BASF	Lettuce with delayed bolting. Plants were obtained from random mutagenesis (potentially GE).	Plants and production methods.
32.	WO2025238086 Rijk Zwaan	Cucumber with enhanced resistance to downy mildew. The plants were selected from existing plant populations and then used for further crossings. Random mutagenesis is mentioned as an alternative.	Process for the selection of the plants, the relevant gene variants and the plants with 'modified' genes.
33.	WO2025233367 Rijk Zwaan	Cucumber with enhanced resistance to a fungal disease (coryne). The plants were selected from existing plant populations and then used for further crossings. Random mutagenesis is mentioned as an alternative.	Process for the selection of the plants, the relevant gene variants and the plants with 'modified' genes.
34.	WO2025238084 Rijk Zwaan	Cucumber with enhanced resistance to downy mildew. The plants were selected from existing plant populations and then used for further crossings. Random mutagenesis is mentioned as an alternative.	Process for the selection of the plants, the relevant gene variants and the plants with 'modified' genes.
35.	WO2025254825 Syngenta	Maize with resistance to fungal disease. The plants were selected from existing plant populations and then used for further crossings.	Process for the selection of the plants, the relevant gene variants and plants inheriting these genes.
36.	WO2025248527 BreedX	Pepper plants with high yield and stress resistance. The plants were selected from existing plant populations and then used for further crossings. CRISPR/Cas is mentioned as an additional option.	Process for the selection of the plants, the relevant gene variants and the plants inheriting these genes. Includes plants obtained from CRISPR/Cas.

	Application number company	Content (as provided in the examples of the patent)	Claims
37.	WO2025253247 Origene	Watermelon with improved tolerance to reduced water conditions. Plants were obtained by crossing and selection with plants from Zimbabwe which have known drought tolerance. Only phenotypical selection. In addition, plants were made triploid.	Plants and production methods.
38.	WO2025253246 Origene	Watermelon with resistance to SqVYV (virus disease). Plants were obtained by crossing and selection with existing plant populations. Only phenotypical selection. In addition, plants were made triploid.	Plants and production methods.
39.	WO2025248083 Rijk Zwaan	Celery with reduced foliage. The plants were selected from existing plant populations and then used for further crossings.	Process for the selection of the plants, the relevant gene variants and the plants inheriting these genes.