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KWS: patents to control « native traits »

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Since 2022, the German seed company KWS has been developing a range of patent licences covering "*native traits*". Presented as a means of "*promoting innovation in plant breeding*", this strategy illustrates how patents can be used to control the use of these "*native traits*", even though they are already present in biodiversity. This approach by the German seed company, which is also known for its aggressive policy of defending its intellectual property, also highlights the current limitations of European patent law.

This article serves as an illustration of the Inf'OGM *article entitled "Patents and "*native traits*": circumventing the limits of European law". It is therefore recommended that it be read in conjunction with that article, which provides the necessary theoretical framework and background information.*

The strategy developed since 2022 by the German seed company KWS is a clear illustration of the patent strategies relating to "*native traits*" (or *"native characteristics*") discussed in a previous *Inf'OGM* article[1]. By offering patent licences based on technical elements associated with these traits, the company demonstrates how patents enable private control over the use of characteristics already present in biodiversity, whilst remaining within the European legal framework.

TraitWay: a showcase for a deliberate strategy

In 2022, KWS launched its TraitWay catalogue online[2], which offers patent licences covering *"native traits*" – that is, characteristics already present in plant biodiversity, such as disease

resistance, cold tolerance or tolerance to various stresses. More specifically, the German seed company "*offers its native trait related patent applications and patents for licensing to all interested parties via a standard commercial license agreement*". KWS therefore does not claim patent rights over the native traits themselves, which are not patentable.

The company presents the *TraitWay* platform as a means of promoting plant variety innovation by giving breeders access to certain traits that it controls through intellectual property rights. According to KWS, this approach "*is key to meet the challenges agriculture is facing across the globe*" including climate change, food security and regulatory developments.

Its communication regarding *TraitWay* is based on two aspects. On the one hand, it must take into account the fact that, in recent years, the European Union (EU) and the European Patent Office (EPO) have sought to clarify the rules allowing for the rejection of new patents on non-technical "*inventions*", notably by prohibiting the patentability of products obtained by essentially biological processes (Decision G3/19 of the EPO's Enlarged Board of Appeal in May 2020)[3]. At the same time, KWS is promoting a portfolio of *"native traits*", available under licence, presented as a means of enabling *"any interested party*" to access "*inventions*" purported to solve climate and food security problems.

A particular approach to patent law

This dual stance – acknowledging the limits imposed by European law whilst commercially exploiting patents relating to *"native traits*" – strikes a delicate balance that KWS appears to embrace fully. And there is, in fact, nothing paradoxical about the opportunism of this position.

Indeed, the seed company, which welcomed decision G3/19 of May 2020, emphasises the distinction between traits *"developed or produced by technical means*" (patentable) and those *"incorporated into new varieties using essentially biological processes*" (non-patentable)[4], even when these traits are described as identical or equivalent[5].

The recent decision by the European legislator to deregulate GMOs obtained through new genetic modification techniques (NGTs) has reignited the debate, given the risk highlighted by many stakeholders that patents may be granted for traits already present in native biodiversity once they are introduced by technical means. KWS's entire strategy is based on this distinction between the natural trait itself and the technical means used to highlight or introduce it.

Technical claims to control *"native traits*"

Certain families of patents in the KWS catalogue (see box below) were filed following amendments to the implementing regulations of the European Patent Convention (EPC) which came into force on July 1st, 2017. It should be noted that these provisions prohibit the patentability of products obtained by essentially biological processes (EPO Decision G3/19).

KWS refrains from directly claiming these products – native plants or the traits they express. Instead, the German seed company bases its patents on claims covering technical elements related to the traits in question, such as molecular markers, nucleic acid sequences, methods of detection or identification, processes utilising these markers, or specific chromosomal regions[6]. Although marker-assisted selection is not patentable as such[7], these claims enable indirect control to be maintained over, in particular, the identification of the traits in question and over the plants that express them.

Patents have been granted on such specific molecular markers, which may be located on either side of a gene expressing a given trait, or cover large genomic regions. These patents may thus prevent third parties from using these markers, in particular by restricting certain breeders' access to the genetic resources in question. As the sequences of such markers are highly conserved within the genome, it is difficult for these third parties to circumvent these patents by using other sequences or by employing other methods to identify the presence of these sequences.

All patent applications filed by KWS after July 1st, 2017, most of which are still in force, relate to specific molecular markers and to the methods employing these markers. This enables KWS to claim control over plants expressing *"native traits*", without needing to rely specifically on patents relating to NGT1, provided that these plants contain sequences detected by the same molecular markers.

A *"breeder's*" licence programme restricting market access

With regard to the exploitation of its patent rights, KWS offers licensing agreements. An analysis of its breeders licences[8] sheds light on the seed company's strategy. This *"Standard Breeders' Licence (Native Traits)*"[9] grants breeders a royalty-free, non-exclusive and "*non-transferable*" licence to use plant material containing the trait in question and the associated molecular markers in their breeding activities. The agreement permits cross-breeding, breeding work and the use of markers necessary for identifying the trait in question. The licence remains, however, highly restrictive and is limited solely to the explicitly defined use, excluding any genetic modification, broader use of biological material or commercial exploitation.

Unsurprisingly, this standard licence prohibits any commercial activity. Furthermore, it defines this activity in particularly broad terms, since commercialisation begins as soon as an application is made for a plant breeders' right (PBR), entry into the official catalogue or registration of a variety containing the trait in question. Thus, a breeder may spend several years developing a new variety incorporating the trait covered by the patent, but as soon as that variety becomes economically viable and needs to be registered or protected, the breeding licence is no longer sufficient. Another licence, this time subject to a fee, then becomes necessary, as highlighted by Laurent Guerreiro, president of the French breeding company RAGT, in February 2023[10]. In short, after carrying out the breeding work leading to a marketable product, the licensee must still comply with the conditions set by KWS.

This *"Standard Breeders' Licence"* is therefore a tool used by KWS to control market access. Whilst it paves the way for the breeding of new varieties, KWS regains control once these varieties acquire commercial potential. However, breeders in the EU already benefit from an exemption allowing them to use patented material for breeding purposes (Article 27(c) of the Agreement on a Unified Patent Court). This exemption does not, however, allow them to commercialise the result of their breeding work when it contains the patented trait. For those familiar with it, the KWS licence is ultimately nothing more than a strict application of European law. Its main objective appears to be to organise the transition to the commercial phase through a contractual arrangement, allowing competing breeders to carry out their breeding work, and then requiring them to pay royalties when they develop a variety of commercial interest. Through this type of licence, KWS could also impose obligations on licensees that they would not have to fulfil if they did not take out a licence and relied solely on European law for their breeding activities.

The example of KWS thus shows that the distinction between the non-appropriable *"native trait*" and the technical subject-matter eligible for patenting can, in practice, be circumvented through strategies of contractual protection and commercialisation. The new NGT regulation and its

provisions on patents could reinforce these dynamics of appropriation.

Traitway: a revealing patent portfolio

An examination of KWS's patent portfolio relating to *Traitway* shows that, despite the diversity of the traits claimed (resistance to viruses, fungi and nematodes, cold tolerance, restoration of fertility or improved digestibility), the claims are based very largely on nucleic acid sequences, molecular markers, identification methods or associated technical processes. This uniformity illustrates the intellectual property strategy developed by KWS.

Claimed *"trait"*	Date of filing of the patent application	Status	Main subject matter claimed
Virus resistance – *Beta vulgaris* I	17 June 2013	Patent granted, upheld following opposition proceedings	Nucleic acids (DNA, RNA) conferring resistance to a pathogen (the fungus *Cercospora*), molecular markers, identification methods, cells, seeds, etc.
Resistance to fungi – Maize I	4 September 2013	Patentability examination in progress	Marker-assisted plant, cells, seed, method for producing the plant
Cold tolerance – Maize	27 November 2015	Patent granted, subject to opposition proceedings (appeal)	Maize plant with cold tolerance conferred by a specific chromosomal region, molecular markers, methods for selecting such a plant using markers
Cytoplasmic male sterility (CMS) restorer – Cereals	21 December 2015	Patentability examination in progress	Plant with a chromosomal segment comprising various possible specific sequences encoding the restoration of pollen, organ or seed fertility; methods for detecting such a plant using various markers
Male sterility – *Beta vulgaris*	12 April 2016	Patent granted, opposition period open (deadline mid-July 2026)	Beetroot plant (*Beta vulgaris*) with mutation(s) to reduce or prevent the expression of a functional P450 oxidase; method for producing the plant; cell; DNA encoding various RNAs (including interfering RNAs); markers for identifying the plant and organs, tissues, seeds, etc. containing the mutation(s)

Claimed *"trait"*	Date of filing of the patent application	Status	Main subject matter claimed
Virus resistance – *Beta vulgaris* II	10 August 2016	Patent granted, no opposition	Plants resistant to BNYVV (beet necrotic yellow vein virus) with mutation(s) in the endogenous resistance gene Rz1; a method for identifying and producing these plants; nucleic acids expressing resistance; molecular markers; and cells and seeds modified by said nucleic acids
	Post 1 July 2017		?
Digestibility – Maize	24 April 2018	Patent granted, subject to opposition proceedings	Maize plant comprising a QTL (quantitative trait locus) allele associated with improved digestibility, method for producing such a plant, silage and feed produced thereby, method for identifying such a plant with preferential use of specific sequence markers
Nematode resistance – *Beta vulgaris*	9 May 2018	Patent granted, subject to opposition proceedings	Nucleic acid molecules (DNA, RNA) encoding increased resistance to nematodes in *Beta vulgaris* (beetroot), a method for producing *Beta vulgaris* comprising these nucleic acids, seeds and cells comprising said nucleic acid molecules, and a method for producing *Beta vulgaris* using molecular markers
Fungal resistance – *Beta vulgaris*	18 February 2019	Patentability examination in progress	Nucleic acid molecules (DNA, RNA) encoding increased resistance to nematodes in *Beta vulgaris* (beetroot), a method for producing *Beta vulgaris* comprising these nucleic acids, seeds and cells comprising said nucleic acid molecules, a method for identifying said *Beta vulgaris* using molecular markers, oligonucleotides as molecular markers
Fungal resistance – Maize II	20 December 2019	Patentability examination in progress	Methods for identifying a maize plant comprising screening for the presence of a QTL allele using various markers; a method for producing a maize plant comprising, in particular, the QTL allele
Fungal resistance in plants	17 August 2020	Patentability examination in progress	Methods for identifying a plant resistant or tolerant to *Cercospora* using various molecular markers

Claimed *"trait "*	Date of filing of the patent application	Status	Main subject matter claimed
Fungal resistance – *Brassica napus*	27 October 2020	Abandoned	
Cytoplasmic male sterility (CMS) restorer – Maize	22 December 2020	Patentability examination in progress	Method for identifying a sterility restoration locus with the possible use of molecular markers, molecular marker sequences

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- + *Ibid.*
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