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**Datasheet for the decision  
of 17 January 2018**

**Case Number:** T 1957/14 - 3.3.04

**Application Number:** 08701583.0

**Publication Number:** 2121982

**IPC:** C12Q1/68, C12N15/82

**Language of the proceedings:** EN

**Title of invention:**

Maize plants characterised by quantitative trait loci (QTL)

**Applicant:**

Syngenta Participations AG

**Headword:**

Quantitative trait loci/ SYNGENTA

**Relevant legal provisions:**

EPC Art. 84, 114(2), 112(1) (a)

RPBA Art. 13(1), 13(3)

**Keyword:**

Main request, auxiliary requests 1 to 3 - clarity (no)

Late-filed auxiliary requests 4 and 5 - admitted (no)

Referral to the Enlarged Board of Appeal - (no)

**Decisions cited:**

G 0002/88, G 0001/04, T 0068/85, T 0301/87, T 0109/91,  
T 0890/02, T 2239/08, T 0915/10, T 0967/10, T 1988/12

**Catchword:**



**Beschwerdekammern**  
**Boards of Appeal**  
**Chambres de recours**

Boards of Appeal of the  
European Patent Office  
Richard-Reitzner-Allee 8  
85540 Haar  
GERMANY  
Tel. +49 (0)89 2399-0  
Fax +49 (0)89 2399-4465

Case Number: T 1957/14 - 3.3.04

**D E C I S I O N**  
**of Technical Board of Appeal 3.3.04**  
**of 17 January 2018**

**Appellant:** Syngenta Participations AG  
(Applicant) Schwarzwaldallee 215  
4058 Basel (CH)

**Representative:** Syngenta International AG  
WRO B8-Z1-30  
Schwarzwaldallee 215  
4058 Basel (CH)

**Decision under appeal:** **Decision of the Examining Division of the  
European Patent Office posted on 23 April 2014  
refusing European patent application No.  
08701583.0 pursuant to Article 97(2) EPC.**

**Composition of the Board:**

**Chair** G. Alt  
**Members:** R. Morawetz  
M. Blasi

## Summary of Facts and Submissions

- I. The appeal of the applicant (hereinafter "appellant") lies from the decision of the examining division refusing European patent application No. 08 701 583.0. The application was filed as an international patent application (hereinafter "application as filed" or "application") which was published as WO 2008/087208. It has the title "*Maize plants characterised by quantitative trait loci (QTL)*".
- II. The examining division held *inter alia* that claim 1 of the main request filed with letter dated 28 January 2013 and claim 1 of auxiliary request 1, filed with letter dated 27 September 2013 lacked clarity (Article 84 EPC). It considered that the terms "*favorable alleles*", "*QTL*", "*contribute to the phenotypic trait of grain yield*", "*genetically linked*" and "*grain yield*" were unclear and that it was impossible for the skilled person to determine which plants fell within the scope of claim 1 (see decision under appeal, Reasons, points 3.2 to 3.11).
- III. With its statement of grounds of appeal the appellant re-submitted sets of claims of the main request and of the auxiliary request which were identical to the sets of claims underlying the decision under appeal and argued that the claims of these requests met the requirements of Article 84 EPC.
- IV. With letter dated 18 August 2017 the appellant requested that several questions be referred to the Enlarged Board of Appeal to "*clarify if or under which circumstances [...] Rule 28(2) EPC [in force since 1 July 2017] and its process of introduction is consistent with the EPC*".

V. The appellant was informed, in a communication pursuant to Article 15(1) RPBA accompanying the summons to oral proceedings, *inter alia* of the board's preliminary opinion as regards the clarity of claim 1 of the claim requests on file.

VI. The appellant replied with the letter dated 6 December 2017 and also filed sets of claims of a new main request and auxiliary requests 1 to 3. Auxiliary request 1 corresponded to the former main request and auxiliary request 2 corresponded to the former auxiliary request 1. Auxiliary request 3 corresponded to the new main request except that instead of a correction of an obvious error in relation to one marker pair associated with QTL 11 only the second marker pair was employed for describing the QTL.

Claim 1 of the main request reads:

"1. A maize plant characterized by a set of at least 14 QTLs each of which contributes to the phenotypic trait of grain yield as measured by quintals per hectare, wherein each of said QTLs is characterized by the presence of an allele of that QTL that contributes in a positive way to the phenotypic trait of grain yield, wherein each QTL is genetically linked to at least one marker locus selected from the group of loci characterized by at least one pair of linked markers each of which can be identified by a pair of PCR oligonucleotide primers consisting of a forward primer and a reverse primer exhibiting a nucleotide sequence as given in

(1) SEQ ID NO: 59/60 with an amplification product in a PCR reaction having a molecular weight of 120 bp and SEQ ID NO: 77/78 with an amplification product in a PCR

reaction having a molecular weight of 85 bp, respectively, identifying a marker pair linked to QTL1, wherein QTL1 is located on chromosome 1 at a supposed position at 115.6 cM and is obtained from inbred line M3047/2 (NCIMB 41460);

(...)

(11) SEQ ID NO: 49/50 with an amplification product in a PCR reaction having a molecular weight of 120 bp and SEQ ID NO: 61/62 with an amplification product in a PCR reaction having a molecular weight of 160 bp, respectively, identifying a marker pair linked to QTL11, wherein QTL11 is located on chromosome 5 at a supposed position at 54.4 cM and is obtained from inbred line M3047/1 (NCIMB 41459);

(...)

(14) SEQ ID NO: 29 and 30 with an amplification product in a PCR reaction having a molecular weight of 225 bp identifying a marker linked to QTL14, wherein QTL14 is located on chromosome 7 at a supposed position at 137.3 cM and is obtained from inbred line M3047/1 (NCIMB 41459)."

Claim 1 of auxiliary request 1 reads:

"1. A maize plant characterized by a set of favourable alleles at a corresponding set of at least 14 QTLs each of which contribute to the phenotypic trait of grain yield, wherein

1. each QTL is genetically linked to at least one marker locus selected from the group of loci characterized by at least one pair of linked markers

each of which can be identified by a pair of PCR oligonucleotide primers consisting of a forward primer and a reverse primer exhibiting a nucleotide sequence as given in SEQ ID NO: 59/60 and 77/78, respectively, identifying a marker pair linked to QTL1;

(...)

SEQ ID NO: 29 and 30 identifying a marker linked to QTL14; and

2. each allele at the corresponding QTL is defined by a PCR amplification product, which is identical to the corresponding amplification product of the favorable allele as indicated in Table A obtainable from inbred lines M3047/1 (NCIMB 41459) and M3047/2 (NCIMB 41460) in a PCR reaction using the primer pairs as identified in a)."

Claim 1 of auxiliary request 2 reads:

"1. A maize plant characterized by a set of at least 14 QTLs each of which contributes to the phenotypic trait of grain yield, wherein each of said QTLs is characterized by the presence of an allele of that QTL that contributes in a positive way to the phenotypic trait of grain yield, wherein

1. each QTL is genetically linked to at least one marker locus selected from the group of loci characterized by at least one pair of linked markers each of which can be identified by a pair of PCR oligonucleotide primers consisting of a forward primer and a reverse primer exhibiting a nucleotide sequence as given in

SEQ ID NO: 59/60 and 77/78, respectively, identifying a marker pair linked to QTL1, wherein QTL1 is located on chromosome 1 at a supposed position at 115.6 cM;

(...)

SEQ ID NO: 29 and 30 identifying a marker linked to QTL14, wherein QTL14 is located on chromosome 7 at a supposed position at 137.3 cM; and

2. each allele at the corresponding QTL is defined by a PCR amplification product, which is identical to the corresponding amplification product of the favorable allele as indicated in Table A obtainable from inbred lines M3047/1 (NCIMB 41459) and M3047/2 (NCIMB 41460) in a PCR reaction using the primer pairs as identified in a)."

Claim 1 of auxiliary request 3 differs from claim 1 of the main request in that only one marker pair, SEQ ID NO: 61/62, is employed for describing QTL 11.

VII. Oral proceedings before the board took place as scheduled.

At the outset of the oral proceedings, the chair summarised the board's preliminary view on the clarity of claim 1 of the newly filed main request. She indicated *inter alia* that the essential characterising feature of the claimed maize plant appeared to be the alleles present in the QTLs, that these alleles were defined by reference to a functional feature ("*contributes in a positive way to the phenotypic trait of grain yield*") and by their presence within a QTL, but that both these definitions did not clearly define the alleles.



During the oral proceedings the appellant submitted sets of claims as auxiliary requests 4 and 5, respectively, and requested the referral of a question to the Enlarged Board of Appeal (auxiliary request 6).

Claim 1 of auxiliary request 4 reads:

"1. Maize plant, wherein said maize plant is obtainable by a method comprising the steps of

a) crossing two or more parent maize plants wherein the cross is made between two parent plants, which have a genetic background as represented by maize inbred lines M3047/1 (NCIMB 41459) and M3047/2 (NCIMB 41460);

b) screening the progeny of the cross made in a) for a plant which has in its genome the entire set of alleles at the corresponding set of QTLs that contribute in a positive way to the phenotypic trait of grain yield from at least one of the parent plants; by

i. obtaining plant material from a progeny plant and extracting DNA from said material;

ii. analyzing the DNA sample obtained in step i) to determine the allelic variants present at the marker loci genetically linked to the corresponding QTLs by using a set of markers in a PCR amplification reaction, wherein said set of markers is the set of markers comprising a pair of PCR oligonucleotide primers consisting of a forward primer and a reverse primer capable of identifying a marker linked to a QTL contributing to grain yield, which primers exhibit a nucleotide sequence as given in:

(1) SEQ ID NO: 59/60 with an amplification product in a PCR reaction having a molecular weight of 120 bp and SEQ ID NO: 77/78 with an amplification product in a PCR reaction having a molecular weight of 85 bp, respectively, identifying a marker pair linked to QTL1, wherein QTL1 is located on chromosome 1 at a supposed

position at 115.6 cM and is obtained from inbred line M3047/2 (NCIMB 41460);

(...)

(14) SEQ ID NO: 29 and 30 with an amplification product in a PCR reaction having a molecular weight of 225 bp identifying a marker linked to QTL14, wherein QTL14 is located on chromosome 7 at a supposed position at 137.3 cM and is obtained from inbred line M3047/1 (NCIMB 41459).

c) comparing the molecular weights and/or the nucleotide sequences of the PCR amplification products determined according to step iii) with the molecular weights and/or the nucleotide sequences of the corresponding PCR amplification products obtained from inbred lines M3047/1 (NCIMB 41459) and M3047/2 (NCIMB 41460) in a PCR reaction with the identical set of primer pairs used in step ii) and identifying those PCR products with identical molecular weights and/or nucleotide sequences;

d) identifying and selecting a plant or plants with the desired profile using the data of the marker analysis" (emphasis added by the board).

Claim 1 of auxiliary request 5 differs from claim 1 of the main request in that the feature "*wherein each of said QTLs is characterized by the presence of an allele of that QTL that contributes in a positive way to the phenotypic trait of grain yield*" (see lines 4 to 7) has been deleted.

Auxiliary request 6 reads as follows:

"Question proposed for the Enlarged Board of Appeal:

There are currently two ways to describe genetic elements: (1) by sequence information or (2) by a deposit under the Budapest Treaty in some cases linked to a molecular or phenotypical marker.

If a description of a genetic element - like for example a QTL - by a combination of a deposit and a specific molecular marker linked to the genetic element is not in general considered to meet the requirements of Article 84 EPC but a full disclosure of the sequence of the genetic element is also not required what is the correct standard to fulfill the requirements of Article 84 EPC?"

At the end of the oral proceedings the chair announced the board's decision.

VIII. The appellant's arguments, in writing and at the oral proceedings, can be summarised as follows:

*Main request*

*Clarity (Article 84 EPC) - claim 1*

The subject-matter of claim 1 was directed to a plant characterised by the presence of specifically defined alleles "*that contribute[d] in a positive way to the phenotypic trait of grain yield*" (hereinafter referred to sometimes as "favourable alleles") at 14 quantitative trait loci (QTLs). Said QTLs were defined as being linked to at least one marker locus which in turn was defined by at least one pair of linked

markers. Incorporation of a reference to deposited plant inbred lines as the material source of each of the favourable allele and of the specific molecular weight of the PCR product associated with each of the PCR markers improved the clarity of claim 1.

The specific terms "*QTL*" and, "*genetically linked*" (to a marker locus) and the expression "*an allele that contributed in a positive way to the phenotypic trait of grain yield*" were clear for a person skilled in the art of plant breeding and genetics in the light of their general technical knowledge and the description.

The subject-matter of the claim, including the terminology used, reflected what was the day-to-day business of the plant breeders' work, *i.e.* following and transferring traits from one plant (generation) to another with the help of genetic information about the QTLs/marker loci which were causative for the trait.

The QTLs of claim 1 were, *inter alia*, described by reference to a deposit, which provided a material source of the alleles of the invention. The Boards of Appeal, in the context of Article 83 EPC, have considered a reference to deposited material as a surrogate for the description of a sequence, *i.e.* as an alternative to structural information (see decision T 109/91, Reasons, point 2.9).

In the deposited material, the markers were linked to the QTLs. The skilled person, a plant breeder, could access the deposited material. This allowed them to identify and transfer the allele contributing to a trait by using the markers without undue burden into any target maize germplasm.

The skilled person would have had no difficulty determining whether any given plant fell within the scope of claim 1. By using the primer sequences recited in claim 1, they could determine whether a certain marker was present in a given plant. The presence of that marker was characteristic of the presence of a marker locus which in turn was characteristic of the presence of the respective allele of a certain QTL.

*Auxiliary requests 1 to 3*

*Clarity (Article 84 EPC) - claim 1*

The plant breeder did not need to know the sequence of the favourable allele to make the plant. The present case was comparable to the case underlying decision T 915/10. Also there the claimed plant was characterised by reference to a deposit and was considered clear, while decisions T 967/10 and T 1988/12 related to different factual situations.

*Auxiliary request 4*

*Admission (Article 114(2) EPC; Article 13(1) RPBA)*

This claim request had not been filed sooner because the pending claim requests were considered to overcome the clarity concerns of the board.

*Auxiliary request 5*

*Admission (Article 114(2) EPC; Article 13(1) RPBA)*

Claim 1 was based on claim 1 of the main request with the reference to the presence of alleles within the QTLs contributing to the trait deleted for

simplification. The skilled person knew that an allele was behind the QTL. Claim 1 was less complex than claim 1 of auxiliary request 4.

#### *Auxiliary request 6*

As there were two ways of defining a genetic element the question arose what the correct standard was for the definition to fulfil the requirements of Article 84 EPC.

- IX. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the claims of the main request, or alternatively, of auxiliary requests 1 to 3, all filed with the letter dated 6 December 2017, or further alternatively, on the basis of the claims of auxiliary requests 4 or 5 filed during the oral proceedings before the board. In the context of these requests the referral of questions to the Enlarged Board concerning Article 84 EPC was requested.

### **Reasons for the Decision**

#### *Introduction and explanation of terms*

1. The present invention relates to a maize plant "*with a genome comprising a unique allele profile associated with the corresponding QTLs [quantitative trait loci] contributing to the expression of a variety of phenotypic traits of economic interest selected from the group of grain yield (...)*" (see application, page 1, first paragraph). "*The term "quantitative trait" has been used to describe a phenotype that exhibits continuous variability in expression and is*

*the net result of multiple genetic loci presumably interacting with each other and/or the environment" (see application, page 1, fourth paragraph). The term "quantitative trait locus" (QTL) refers "to an association between a genetic marker and a chromosomal region and/or gene that affects the phenotype of a trait of interest" (see application, page 4, first full paragraph). A "genetic marker" is a "feature of an individual's genome (e.g., a nucleotide or a polynucleotide sequence that is present in an individual's genome) that is associated with one or more loci of interest" (see application page 4, lines 24 to 26). An "allele is understood, within the scope of the invention, to refer to alternative forms of various genetic units associated with different forms of a gene or of any kind of identifiable genetic element" and "an allele associated with a quantitative trait may comprise a single gene or multiple genes or even a gene encoding a genetic factor contributing to the phenotype represented by said QTL" (see application, page 2, fifth and sixth paragraph).*

*Main request*

*Clarity (Article 84 EPC) - claim 1*

2. Article 84 EPC provides that the claims shall define the matter for which protection is sought and that they shall be clear and concise and be supported by the description. Rule 43(1) EPC further requires that the claims shall define the matter for which protection is sought in terms of the technical features of the invention.

The technical features of the invention are the physical features which are essential to it. The

technical features of a claim to a physical entity are the physical parameters of the entity. In appropriate cases technical features may be defined functionally (see G 2/88, OJ EPO 1990, 93, Reasons, point 2.5).

The meaning of the technical features essential to the invention ("essential features") should be clear for the person skilled in the art from the wording of the claim alone (see decision G 1/04, OJ EPO 2006, 334, Reasons, point 6.2).

3. Claim 1 is directed to a maize plant (see section VI for the complete wording of the claim). The plant is characterised by *"a set of at least 14 QTLs"* and each QTL is characterised by *"the presence of an allele of that QTL that contributes in a positive way to the phenotypic trait of grain yield"*.

Thus, the technical features essential for the invention are the alleles present in the QTLs because they are ultimately responsible for the phenotypic trait of grain yield.

4. As set out above (see point 1), an allele, in the context of the present invention, *"may comprise a single gene or multiple genes or even a gene encoding a genetic factor contributing to the phenotype represented by said QTL"*. Thus, an allele is a *"genetic unit"* (see application, page 2, line 30). A genetic unit or a gene is characterised by it being a stretch of nucleotides which have a certain order (*"nucleotide sequence"*), thus defining the informational content of that unit. Hence, the physical parameter of the allele - which is the essential technical feature of the claimed plant - and by which it could certainly be unambiguously characterised is its primary structure,



*i.e.* its nucleotide sequence.

- 4.1 In claim 1 the alleles are defined (i) by a functional feature, *i.e.* their positive contribution to the phenotypic trait of grain yield and (ii) by a structural feature, *i.e.* their presence within a QTL.
- 4.2 In turn, the QTLs, in addition to the presence of an allele, are further characterised (i) in that they are genetically linked to at least one marker locus, (ii) by the chromosome on which they are found and the supposed position on that chromosome and (iii) by the inbred line they can be obtained from.
- 4.3 The marker locus to which the QTL is genetically linked is characterised (i) by the presence of at least one pair of linked markers, each of which can be identified by a pair of PCR oligonucleotide primers, the sequences of which are identified in the claim by SEQ ID numbers, and (ii) the size of the amplification product in a PCR reaction.
- 4.4 The inbred line is defined by its internal designation and its deposit number.
5. It is therefore to be decided whether this definition (see points 4.1 to 4.4) provides an unambiguous characterisation of the physical parameters of the alleles and thus of the essential feature of the claimed maize plants.
6. The appellant argues that, in the light of his general technical knowledge and the description, the person skilled in the art of plant breeding was familiar with the terms used in claim 1, in particular with the terms "QTL" or "genetically linked" (to a marker locus) and

also understood what was meant by an allele contributing in a positive way to a phenotypic trait. In fact, the subject-matter of the claim, including the terminology used, reflected what was the day-to-day business of the plant breeders' work, *i.e.* to follow and transfer plant traits with the help of genetic information about the QTLs/marker loci which were causative for the trait.

- 6.1 In the board's view, the skilled person may well understand the terms used in the claim and how to use the technology related to these terms in practice. Yet this understanding and these practical skills do not, in the present case, convey to the skilled person the structural features necessary to unambiguously characterise the alleles referred to in the claim.
7. The appellant further argues that the alleles were clearly defined in claim 1 by reference to the QTLs in which they were present for the following two reasons (see below points 8 and 9).
8. The QTLs were described by reference to a deposited material. The Boards of Appeal, in the context of Article 83 EPC, had considered a reference to deposited material as a surrogate for the description of a sequence, *i.e.* as an alternative to structural information. An example of this case law was decision T 109/91.
- 8.1 As to decision T 109/91 of 15 January 1992, the sole question dealt with was the novelty of the claimed subject-matter (see Reasons, point 2.1). At issue was whether the claimed plasmid, pHM1519, was the same as plasmid pCG1, disclosed in a document (1), and made available by reference to the deposition number. The

appellants had carried out an analysis of the restriction sites and the length of the respective restriction fragments of the deposited plasmid and the claimed plasmid, respectively.

In that context, the board held that "*Rule 28 [EPC 1973] states the requirement of a sufficient disclosure within the meaning of Article 83 EPC [1973] as far as microorganisms are concerned which cannot be described in words such that the invention can be carried out by a skilled person.*

*A such disclosed plasmid, as is the case here, can be used by a skilled person without the necessity of the knowledge of the molecular structure of this plasmid. A connection of the requirements of a deposition of living material to the implicit knowledge of the molecular structure for the purposes of the judgment of novelty is not self-evident" (ibid., point 2.9).*

The board concluded that the evidence provided by the appellants that plasmid pCG1 was the same as the claimed plasmid pHM1519 was convincing and that there was no necessity for the appellants to go further in its analysis of the complete DNA-molecules of both plasmids (*ibid.*, point 2.12).

- 8.2 In the present board's view, as can be seen from the above summary, decision T 109/91 is not directly applicable to the present situation. Firstly, it is concerned with novelty of the claimed subject-matter and not its clarity. Secondly, the reference to the deposit is used to define the claimed subject-matter as such, i.e. all of its features and not only an essential one. The board seems to say that the so-defined subject-matter fulfils the requirements of

Article 83 EPC because the plasmid *"can be used by a skilled person without the necessity of the knowledge of the molecular structure of this plasmid"*.

However, the board also says, when considering the disclosure of the structural features of the plasmid, that *"[a] connection of the requirements of a deposition of living material to the implicit knowledge of the molecular structure for the purposes of the judgment of novelty is not self-evident"* (*ibid.*, point 2.9). To this board this means that the board in case T 109/91 was of the view that the molecular structure of the plasmid was not implicitly disclosed by depositing the material and referring to its deposit number. This understanding appears to be in line with the findings of the competent board in e.g. decision T 301/87 (OJ EPO 1990, 335, Reasons, points 6.2 to 6.4).

8.3 The present board is thus not persuaded by appellant's argument that deposited material serves *"as a surrogate for the description of a sequence, i.e. as an alternative to structural information"*.

9. Furthermore, the appellant argues that the deposited material provided a material source of the alleles of the invention. The appellant submits that in the deposited material the markers were linked to the QTLs. The skilled person, a plant breeder, could access the deposited material. This allowed them to identify and transfer the allele contributing to the trait at issue by using the markers without undue burden in to any target maize germplasm.

9.1 However, in the board's opinion, the reliance on deposited inbred line material for the definition of

the essential features of the invention and by requiring it to be analysed in order to identify the relevant alleles is at odds with the principle that, generally, the meaning of a claim, including its essential features, should be clear, for the person skilled in the art, from the wording of the claim alone (see point 2 above).

- 9.2 Furthermore, the fact that the plant breeder can obtain a plant having the favourable alleles by accessing the deposited inbred lines and then transferring those alleles to a progeny plant by crossing and selection using the markers, may be a consideration relevant in the context of sufficiency of disclosure. However, when it comes to clarity, the board fails to see how the fact that the breeder knows how to make a plant that falls within the claim's scope can help the clarity of the definition of the essential features in the claim.
10. The board can also not accept that the definition of the alleles in present claim 1 should be considered as clear because a skilled person can determine whether any given plant falls within the scope of claim 1 - even without knowing the structure of the alleles - by determining whether the markers as defined in the claim are present in that plant.
11. Thus, the appellant's arguments do not convince the board that claim 1 of the main request provides a clear definition of the structural features of the alleles and thus of the essential features characterising the claimed maize plant.
12. The alleles are defined in claim 1 by further features (see also points 4.1 to 4.4 above).

13. Thus, they are defined by the functional feature "*that contributes in a positive way to the phenotypic trait of grain yield*" (see point 4.1).

13.1 It is established case law that for functional features to be considered as clear they must not only put the skilled person in the position to be able to understand the teaching of the claim, but also must he be able to implement them. In other words, they must provide "*instructions which are sufficiently clear for the expert to reduce them to practice without undue burden, if necessary with reasonable experiments*" (see decision T 68/85, OJ EPO 1987, 228, Reasons, point 8.4.3 and decisions cited in section III.A.3.4 of the Case Law of the Boards of Appeal of the European Patent Office, 8th edition 2016). The present board understands this to mean that by reading the functional feature the skilled person, through his common general knowledge, should be aware of structural features corresponding to that functional definition.

13.2 In the light of this case law the board considers that the functional feature "*contributes in a positive way to the phenotypic trait of grain yield*" is not clear since the skilled person does not know to which structural feature or features it corresponds.

The present situation is different from e.g. the situation in which the name of a known herbicide resistance - which would be considered as a functional feature - is used to define a herbicide resistance gene and the skilled person is aware of this structure through his common general knowledge (see e.g. decision T 890/02, OJ EPO 2005, 497, Reasons, points 5 to 9).

14. The alleles are moreover defined in claim 1 by further definitions in relation to the QTLs, *i.e.* the QTLs' supposed location on a chromosome, the QTLs' linkage to marker loci which in turn are defined by PCR primers identified by their sequence and the size of the amplification product (see points 4.1 to 4.4).
15. In the board's opinion it is evident that none of these definitions provides the skilled person with any information about the structural features of the alleles themselves. Thus, the sequence of an allele is neither derivable from the QTL's supposed location on the chromosome nor from a characterisation of the markers linked to it, regardless of how extensive that characterisation is.
16. The appellant referred to decisions T 915/10, T 967/10 and T 1988/12, of which, in its view, the circumstances underlying the first one were comparable to the present case, whereas those underlying the two latter decisions were different.
- 16.1 In decision T 967/10 of 22 October 2015, the claim under consideration was for a lettuce plant showing a reduced susceptibility towards infection with *Bremia lactucae*, which plant was obtainable by crossing a susceptible lettuce plant with a lettuce plant grown from the seed of one of several deposited seeds. The board considered that the claimed plant was, at least partly, defined by a process for its production but that it is unknown what the genetic information present in the genome of the claimed plants, and one of the characterising technical features imparted to the claimed plants by the process, actually is. Therefore the process feature as such was considered unclear (see Reasons, points 7 to 10).

In decision T 1988/12 of 10 November 2016, the claim under consideration was to a *Brassica* plant characterised solely by a process by which it was obtainable. As a consequence of the process features, the subject-matter of claim 1 included *Brassica* plants whose phenotype was due to the presence in their genome of genetic information identical to that present in the genome of the deposited seeds. Since the skilled person could not derive from the claim per se the explicit structural or informational nature of this genetic information, the process through which the claimed plant was defined did not impart identifiable and unambiguous technical features to it and in particular, the genetic information present in the genome of the claimed plants was unknown (see Reasons, points 8 to 13).

In contrast to the appellant, the board considers the finding of this board in the present case (see point 18 below) to be in line with the findings of the boards in these two decisions since in these cases and in the present case the claimed subject-matter was considered unclear because, due to the particular definition chosen, the essential features of the claimed plants remained unknown.

- 16.2 Decision T 915/10 of 11 June 2015 concerned soybean plants which had been genetically modified so as to make them tolerant to the herbicide glyphosate and which contained in their genome the particular transgenic insertion event MON89788. Claim 1 was for a soybean plant "the genome thereof containing SEQ ID NO: 9, wherein the plant is obtainable by crossing a plant obtained from soybean seed deposited under ATCC accession number PTA-6708 and another plant" (emphasis



added). This claim was considered to meet the clarity requirement of Article 84 EPC (see Reasons, point 7).

However, SEQ ID NO: 9 represents the entire inserted DNA present in the particular transgenic insertion event MON89788 along with some flanking soybean genomic sequences (see Reasons, point 3). The claimed plant was thus characterised by the nucleotide sequence of the insert and the exact location within the genome, which information is considered in itself a clear characterisation of an event (see also decision T 2239/08 of 10 January 2013, Reasons, point 6 and decision T 967/10, *supra*, Reasons, point 16).

Contrary to the appellant, the board therefore considers that the present case is not comparable to the case underlying decision T 915/10.

17. Hence, the physical parameters of the alleles (see point 4 above), their structures, are not defined by the definitions in the claim. Consequently, the essential features characterising the claimed plant, the alleles (see point 3 above), are also not defined by the claim.

18. For the above reasons, the board concludes that claim 1 lacks clarity.

*Auxiliary requests 1 to 3*

*Clarity (Article 84 EPC) - claim 1*

19. In claim 1 of these claim requests, the alleles, which are the essential technical features of the claimed plant (see point 3 above), are defined by reference to QTLs, marker loci and deposited inbred lines and

considered unclear for the same reasons as indicated above for claim 1 of the main request, *mutatis mutandis*.

*Auxiliary request 4*

*Admission (Article 114(2) EPC and Article 13 RPBA)*

20. Claim 1 of this request is directed to a maize plant which is obtainable by crossing two or more parent maize plants wherein the cross is made between two parent plants, which have a genetic background as represented by maize inbred lines M3047/1 (NCIMB 41459) and M3047/2 (NCIMB 41460), identifying and selecting a plant with the desired profile using the data of the marker analysis.
21. The request was filed during the oral proceedings after the board had given its opinion on the main request and on auxiliary requests 1 to 3.
22. The board, when deciding on the admission of auxiliary request 4, has taken into account criteria developed by the case law in relation to the admission of claim requests submitted for the first time during oral proceedings. For example, a claim request submitted at a late stage might be allowable if its submission can be considered an appropriate reaction to unforeseeable developments in the proceedings or if it would be immediately apparent to the board, with little or no investigative effort on its part, that the new request did not raise new issues and overcame clearly and obviously at least the issues dealt with in relation to the previous requests (see also Case Law of the Boards of Appeal, 8th edition 2016, section IV.E.4.2.6 a)).

- 22.1 Objectively, the board's opinion as regards lack of clarity of the subject-matter of claim 1 of the main request and of auxiliary requests 1 to 3 should not have come as a surprise to the appellant, as it was set out in the communication issued under Article 15(1) RPBA (see section V).
- 22.2 It was also not immediately apparent to the board that the claim request overcame the clarity objection at issue or raised any new issues because of the various changes made. Thus, the plant according to claim 1 was no longer characterised by a set of at least 14 QTLs but by a process for its production, i.e. that it was obtainable by a method comprising the steps of crossing two or more parent maize plants wherein the cross was made between two parent plants, "*which have a genetic background as represented by maize inbred lines M3047/1 (NCIMB 41459) and M3047/2 (NCIMB 41460)*", screening the progeny of the cross for a plant which has in its genome the entire set of alleles at the corresponding set of QTLs that contribute in a positive way to the phenotypic trait of grain yield from at least one of the parent plants, and identifying and selecting a plant with the desired profile using the data of the marker analysis.
- 22.3 In particular, it was not clear to the board whether the feature "*which have a genetic background as represented by maize inbred lines M3047/1 (NCIMB 41459) and M3047/2 (NCIMB 41460)*" meant that only the cited inbred lines or other - undefined lines - could be used.
- 22.4 In addition, clarity issues that had been resolved in claim 1 of the main request, namely the definition of how grain yield was to be determined, were

reintroduced.

23. Accordingly, the board, exercising its discretion pursuant to Article 114(2) EPC, governed by the principles laid down in Article 13(1) RPBA, decided not to admit auxiliary request 4 into the appeal proceedings.

*Auxiliary request 5*

*Admission (Article 114(2) EPC and Article 13 RPBA)*

24. This request was filed during the oral proceedings after the board had given its opinion on the main request and auxiliary requests 1 to 3 and had further decided not to admit auxiliary requests 4 into the appeal proceedings.
25. Claim 1 of this request was based on claim 1 of the main request and differed from it in that the feature "*wherein each of said QTLs is characterized by the presence of an allele of that QTL that contributes in a positive way to the phenotypic trait of grain yield*" had been deleted.
26. In the board's view, the deletion of the functional definition of the alleles did not resolve the clarity problem of claim 1 as the alleles were still defined by reference to the QTLs which, as explained in relation to the main request, do not provide an unambiguous definition of the alleles.
27. Hence, it was again not immediately apparent to the board that it overcame the clarity objections raised against claim 1 of the main request.

28. Accordingly, the board, exercising its discretion pursuant to Article 114(2) EPC, governed by the principles laid down in Article 13(1) RPBA, decided not to admit auxiliary request 5 into the appeal proceedings.

*Referral to the Enlarged Board of Appeal (Article 112(1) EPC)*

29. The appellant submitted that uniform application of the law required that the board refer the question filed during the oral proceedings (see section VII above) to the Enlarged Board of Appeal.
30. Pursuant to Article 112(1)(a) EPC, the boards of appeal refer questions to the Enlarged Board, either of their own motion or upon request from a party, in order to ensure uniform application of the law or if a point of law of fundamental importance arises, if they consider that a decision is required for the above purposes.
31. The board considers that it does not deviate from decisions T 109/91 or T 915/10. As set out above, decision T 109/91 is not concerned with clarity (see points 8.1 and 8.2) and in the case underlying decision T 915/10 the technical features characterising the claimed event were defined in the claim by reference to a sequence (see point 16.2).
32. Accordingly, the present decision does not deviate from those relied on by the appellant.
33. Moreover, based on the analysis set out above (see points 2 to 18), the board was in a position to decide the case. It therefore did not consider a referral to the Enlarged Board to be required.

34. Accordingly, the appellant's request for a referral to the Enlarged Board of Appeal of the question submitted at the oral proceedings was rejected.
  
35. Appellant's request for a referral to the Enlarged Board of Appeal of several questions to "*clarify if or under which circumstances [...] Rule 28(2) EPC [in force since 1 July 2017] and its process of introduction is consistent with the EPC*" (see section IV) needed not to be dealt with by the board because the appeal is not allowable. In the decision under appeal the examining division had held, *inter alia*, that the claims then on file lacked clarity (Article 84 EPC) and the board decided that the claims of the admissible claim requests also failed to meet the requirements of Article 84 EPC.

**Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:

The Chair:



P. Cremona

G. Alt

Decision electronically authenticated