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**Datasheet for the decision  
of 25 February 2010**

**Case Number:** T 0699/07 - 3.3.01

**Application Number:** 98965689.7

**Publication Number:** 1032267

**IPC:** A01N 57/20

**Language of the proceedings:** EN

**Title of invention:**

Method of controlling weeds in transgenic crops

**Patentee:**

Bayer CropScience S.A.

**Opponent:**

BASF SE

**Headword:**

Glyphosate HPPD inhibiting herbicide/BAYER

**Relevant legal provisions:**

EPC Art. 56

RPBA Art. 13(1)(3)

**Relevant legal provisions (EPC 1973):**

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**Keyword:**

"Admission of documents and request alleged to be late filed  
(yes)"

"Oral submission of accompanying person (no)"

"All requests: inventive step (no) - obvious alternatives"

**Decisions cited:**

G 0004/95

**Catchword:**

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Case Number: T 0699/07 - 3.3.01

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.01  
of 25 February 2010

**Appellant:**  
(Patent Proprietor)

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**Decision under appeal:**

Decision of the Opposition Division of the  
European Patent Office posted 1 March 2007  
revoking European patent No. 1032267 pursuant  
to Article 102(1) EPC 1973.

**Composition of the Board:**

**Chairman:** P. Ranguis  
**Members:** G. Seufert  
R. Menapace

## Summary of Facts and Submissions

I. The Appellant lodged an appeal on 27 April 2007 against the decision of the Opposition Division dated 1 March 2007 revoking European patent No. 1 032 267, and filed a written statement on 2 July 2007 setting out the grounds of appeal.

II. The Patent was granted on the basis of 24 claims, independent claim 1 reading as follows:

1. A method for the control of weeds at a crop locus, said method comprising the application post-emergence of the crop of an effective amount of:

- a) a glyphosate herbicide or derivative thereof; and
- b) at least one HPPD-inhibiting herbicide

wherein the crop locus comprises a crop tolerant to said glyphosate herbicide.

III. In this decision the following numbering will be used to refer to the documents:

- (1) WO-A-98/20144
- (2) WO-A-98/02562
- (3) S. E. Curvey, G. Kapusta, Research Report North Cent. Weed Sci. Soc., V.53, pages 438-440
- (7b) Roundup® Ultra, Supplemental labelling, 28 March 1997
- (8) The Herbicide Glyphosate, Butterworths, London, 1985, pages 231-240, 360
- (13) US-A-5,094,945
- (14) WO-A-97/22253

- (15) The Pesticide Manual, 10th edition, Crop Protection Publication, 1994, pages 577-8
- (16) WO-A-97/37539
- (18) Declaration of Dr. E. Hacker dated 29 March 2005
- (19) B. T. Kang et al., Fertilizer Research 1, 1980, pages 87-93
- (20) E. C. Spurrier, PANS, vol. 19, no. 4, 1973, pages 607-612
- (21) Agrochemicals, Wiley-VHC, Weinheim, 2000, pages 687-9
- (22) Unkrautbekämpfung im Integrierten Pflanzenschutz, 5th edition, DLG-Verlag Frankfurt/Main, 1993, pages 15-17
- (23) Bayer CropScience Patent Data EP 1 032 267, submitted by the Respondent during oral proceedings before the Board

IV. Two oppositions were filed requesting revocation of the patent in its entirety on the grounds of lack of novelty and inventive step (Article 100(a) EPC) and insufficiency of disclosure (Article 100(b) EPC). During the proceedings before the Opposition Division Opponent 1 withdrew its opposition with letter of 5 April 2006.

V. The decision under appeal was based on the main and auxiliary requests filed during the oral proceedings before the Opposition Division. The main request consisted of two sets of claims, one set for all the designated states except Cyprus ('CY') and one set for CY as designated state, the latter corresponding to the set of claims as granted.

Independent claim 1 of the main request for all designated states except CY reads as follows:

1. A method for the control of weeds at a crop locus, said method comprising the application post-emergence of the crop of an effective amount of:

- a) a glyphosate herbicide or derivative thereof; and
- b) at least one HPPD-inhibiting herbicide

wherein the crop locus comprises a crop tolerant to said glyphosate herbicide, with the proviso that said method is not a method wherein the crop is a tobacco crop genetically modified to be tolerant to both glyphosate and HPPD-inhibiting herbicides and wherein the HPPD-inhibiting herbicide is isoxaflutole, and wherein isoxaflutole and glyphosate are respectively applied at doses of 200 and 800 g/ha or 400 and 1200 g/ha.

- VI. The Opposition Division held that the subject-matter of the main request for all designated states except CY complied with the requirements of Article 123(2),(3) EPC, but was not novel over the disclosure of document (2). The auxiliary request for all designated states except CY and the main request for CY as designated state were considered to meet the requirements of Articles 123(2),(3), 84 and 54 EPC, but their subject-matter was not inventive in view of document (13), describing weed control of glyphosate resistant plants with glyphosate alone or in combination with additional herbicides, and the documents (14), (15) or (16), indicating the suitability of HPPD-inhibiting herbicides in post-emergence application. Concerning

insufficiency of disclosure the Opposition Division held the invention to have been sufficiently disclosed to be carried out by a person skilled in the art.

VII. In its statement of grounds of appeal the Appellant maintained the main and auxiliary requests underlying the decision under appeal and filed document (18).

VIII. With letter of 1 February 2010 the Appellant filed a new set of claims replacing the claims of the main request for the designated states other than CY and maintained the two sets of claims underlying the main request of the decision under appeal as the new first auxiliary request.

Independent claim 1 of the new main request for all contracting states except CY reads as follows:

1. A method for the control of weeds at a crop locus **comprising grass weeds, broad-leaf weeds or sedges**, said method comprising the application post-emergence of the crop of an effective amount of:

- a) a glyphosate herbicide or derivative thereof; and
- b) at least one HPPD-inhibiting herbicide

wherein the crop locus comprises a crop tolerant to said glyphosate herbicide.

In said letter the Appellant also requested that Mr. Pallett be given permission to address the Board of Appeal during the oral proceedings on the interpretation of experimental data.

- IX. In response to the newly filed main request the Respondent filed, on 22 February 2010, documents (19) to (22).
- X. Oral proceedings were held before the Board on 25 February 2010. At the beginning of the oral proceedings the parties were informed that the Board considered it both reasonable and appropriate to admit documents (18) and (19) - (22) as well as the new main request for all designated states except CY into the procedure. Invited to present their arguments concerning this issue, the parties, in particular the Respondent, who had objected to the admissibility of document (18) and the new main request, did not submit additional arguments and referred to their written submissions.

Concerning inventive step the discussion focused on the issue whether or not unexpected effects were present as alleged by the Appellant. In this context the experimental data in Tables 1-4 of the patent in suit, in particular Tables 1 and 3, were discussed. During the discussion of the main request for CY, the Appellant declared explicitly that for this request he no longer relied on the presence of an unexpected synergistic effect.

After having been informed of the Board's conclusion that the main request for CY did not involve an inventive step and after having been given an indication that this conclusion would also appear to apply to the other requests on file, the Appellant, without providing further comments on these other requests, although invited to do so by the Board, filed

auxiliary requests II and III for all designated states (including CY).

Independent claim 1 of auxiliary request II is based on the main request for all contracting states except CY. It differs from that main request in that the "at least one HPPD-inhibiting herbicide" has been further defined as being a 4-benzoylisoxazole herbicide, a 2-benzoylcyclohexane-1,3-dione derivative or a 2-cyano-1,3-dione herbicide having the structural formulae (I), (II) and (III) according to dependent claims 11, 17 and 21 of that main request.

Independent claim 1 of auxiliary request III differs from auxiliary request II in that the "at least one HPPD-inhibiting herbicide" is further limited to a single compound, namely 2-(2'-nitro-4-methylsulfonylbenzoyl)cyclohexane-1,3-dione.

- XI. The arguments submitted by the Appellant in the written procedure and during oral proceedings, to the extent that they are relevant for this decision, can be summarised as follows:

*Main requests and auxiliary request I*

Document (13) represented the closest prior art, the distinguishing feature being the use of HPPD-inhibiting herbicides as a second herbicide in combination with glyphosate. The technical problem to be solved in view of document (13) was to provide a combination of glyphosate and a herbicide having residual activity to be applied post-emergence of the crops tolerant to glyphosate, against a broad spectrum of weeds without



impairment of the glyphosate activity, i.e. without generating unacceptable antagonism.

The risks of combining glyphosate with other herbicides and the occurrence of antagonism or impairment of the glyphosate activity in such combinations, in particular in combinations with residual herbicides such as those mentioned in document (13), were known from document (8). The absence of impairment of glyphosate when using HPPD-inhibiting herbicides in the method according to the present invention, which could be deduced from the tables of the patent in suit and which should not be confused with antagonism established according to the Colby method, was therefore highly unexpected. The residual activity was also apparent from the experimental data presented in the patent in suit.

In view of the warnings in document (8) and the absence of any information in respect of what would happen if HPPD-inhibiting herbicides were used as a second component in mixtures with glyphosate, the skilled person had no motivation to apply such a mixture.

#### *Auxiliary requests II and III*

It was apparent from the available experimental data that the claimed method not only led to an unexpected absence of impairment of the glyphosate activity, but also a synergistic activity of the applied mixture against some of the "commercially important" weed species. Since the method according to the invention was directed to the application at a crop locus and since such a crop locus, as could be seen in document (3), usually contained several weed species, the farmer

would always benefit when applying the mixture, even if synergism could not be found against each and every weed species.

Concerning the subject-matter of auxiliary request III, the experimental data submitted with document (18) clearly showed an unexpected and consistent synergistic activity of the claimed mixture against all the weed species that had been tested.

- XII. The arguments submitted by the Respondent in the written procedure and during oral proceedings, to the extent that they are relevant for this decision, can be summarised as follows:

*Main requests and auxiliary request I*

The closest prior art, document (13), already suggested the post-emergence application of combinations of glyphosate with a second herbicide, for example residual herbicides like atrazine. HPPD-inhibiting herbicides were not mentioned, but they are known residual herbicides, which had long been applied pre-emergence as taught by document (3). In view of document (13) the skilled person would have considered the use of other herbicides, for example those of document (14), in combination with glyphosate. The experimental data in the patent in suit or those in document (18) were not suitable to demonstrate the existence of an unexpected effect, such as absence of antagonism or presence of synergism. The alleged effects were not consistently present and depended decisively on the location, the amount of herbicides in the mixture and the weed species, as could be seen by

comparing the observed phytotoxicity values and the values calculated according to Colby in the tables of the patent in suit. The Appellant's comparison of the herbicide mixture with only one of the herbicide components of the mixture was not correct, as both components have to be considered.

Document (8) did not deter the skilled person from combining residual herbicides with glyphosate in that according to this document the advantages of such a combination outweigh any possible disadvantages. Furthermore, Table 15.6 of document (8) also indicated that the glyphosate activity was not necessarily impaired by the presence of a second herbicide, even a residual herbicide.

*Auxiliary requests II and III*

The introduction of the feature "grass weed, broad-leaf weeds and sedges" did not result in an essential difference of the claimed subject-matter as these are three main classes of weeds usually found at a crop locus. Synergism was present against some of the tested weed species, but not over the whole scope of the claimed subject-matter, which included synergistic mixtures as well as antagonistic mixtures. Furthermore, synergism could be found in Idaho (Table 1), but not in South Dakota (Table 3).

It was not contested that the tables in document (18) demonstrated a synergistic effect. However, this effect was merely linked to specific weed species and specific amounts of herbicides. Claim 1 of auxiliary request III was limited neither to particular weed species nor to

particular amounts of herbicides in the mixture. The claim did not even refer to synergistic mixtures.

- XIII. The Appellant requested that the decision under appeal be set aside and that the patent be maintained on the basis of the set of claims filed with letter of 1 February 2010 for all designated states except CY and the set of claims as granted for CY (main request), or the two sets of claims according to the main request underlying the decision under appeal (1st auxiliary request), or the two sets of claims filed during oral proceedings (2nd and 3rd auxiliary requests).

The Respondent requested that the appeal be dismissed.

- XIV. At the end of the oral proceedings the decision of the Board was announced.

### **Reasons for the Decision**

1. The appeal is admissible.
2. *Late filed documents and requests*
  - 2.1 The Respondent requested the rejection of document (18) as late filed, arguing that this document containing additional experimental data bears the date 29 March 2005 and could therefore have been provided already during the procedure before the first instance, particularly taking into account that the substantive issues have not changed in the appeal proceedings. The Respondent also objected to the admissibility of the new main request for all states except CY submitted by

the Appellant on 1 February 2010, i.e. about three weeks before oral proceedings, as well as auxiliary requests II and III filed during the oral proceedings before the Board.

2.1.1 Document (18) was submitted by the Appellant in response to the decision of the Opposition Division. In particular, it addresses an issue which was discussed in the contested decision in the context of an objection under Article 100(b) EPC raised initially by Opponent 1. With regard to insufficiency of disclosure the Opposition Division decided in the Appellant's favour, but also indicated that parts of the arguments brought forward by the Opponents, namely whether the results shown in the experimental part using a specific HPPD inhibiting herbicide can be extended to other HPPD inhibiting herbicides, might be related to the question of inventive step. Furthermore, document (18) was filed with the statement of grounds of appeal and therefore forms part of the basis of the appeal proceedings pursuant to Article 12(4) of the Rules of Procedure of the Boards of Appeal ("RPBA"). Hence, there is no reason to exclude document (18) from the appeal proceedings.

2.1.2 The main request for all states except CY was filed by the Appellant in an attempt to overcome an objection under Article 54(3) EPC raised by the Respondent in view of document (2). To this extent a definition of the weeds at the crop locus was introduced into claim 1 of that request. A clear basis for the amendment was provided. Although the request was filed at a late stage in the procedure, its filing did not raise additional complex technical or legal issues that could

not be properly dealt with during the oral proceedings by the Board or the Respondent. Hence, in exercising its discretion under Article 13(1) and (3) RPBA, the Board decided to admit the Appellant's new main request into the procedure.

- 2.1.3 Auxiliary requests II and III were filed in an attempt to address the issues which were discussed in the oral proceedings before the Board. They were not based on new subject-matter which could either surprise the Respondent or raise new issues requiring the postponement of oral proceedings. This was even accepted by the Respondent. In auxiliary request II the HPPD-inhibiting herbicides were simply limited to those mentioned in dependent claims 11, 17 and 21 of the patent as granted and in auxiliary request III to a single compound selected from those mentioned in dependent claim 20 as granted. Furthermore, the weeds at the crop locus were defined. The essential issues for the assessment of patentability remained the same and the Respondent could reasonably be expected to deal with any request which in essence limits the subject-matter to specific HPPD-inhibiting herbicides already present in the dependent claims of the contested patent.

For the reasons set out above, the Board decided to admit auxiliary requests II and III into the procedure (Article 13(1) and (3) RPBA).

- 2.2 Documents (19) to (22) were filed by the Respondent in reaction to the Appellant's new main request, in particular to highlight that the newly introduced feature in the Respondent's opinion was not sufficient to establish novelty over document (2). As the Board

had decided to admit the Appellant's new main request, it was appropriate and in accordance with proper procedure also to admit this new evidence.

- 2.3 During oral proceedings before the Board the Respondent filed a coloured copy of a table summarising the experimental results of Tables 1-4 of the patent in suit (document (23)). The Appellant requested the Board not to admit this very late filed document.

This document is nothing more than a summary of results already present in the contested patent and was merely submitted for enhanced comprehensibility of the Respondent's arguments. It did not confront the Appellant with new facts or new evidence. Merely representing a summary of the data of the patent in suit, it can not be considered either as an attempt to surprise the Appellant or the Board. Furthermore, a black and white copy of this table had already been filed in the procedure before the first instance in support of the Respondent's arguments concerning inventive step, and in its reply to the grounds of appeal the Respondent explicitly referred to its submissions before the first instance. Hence, the Board decided to admit this document into the procedure (Article 13(1) and 13(3) RPBA).

3. *Requests for oral submissions by an accompanying person*

- 3.1 During oral proceedings in the context of opposition appeal proceedings, a person accompanying the professional representative of a party may be allowed to make oral submissions on specific technical or legal issues, in addition to the complete presentation of the

party's case by the professional representative, only with the permission of and at the discretion of the EPO. The professional representative should file a corresponding request stating the name and the qualification of the accompanying person and the subject-matter of the proposed oral submission (G 4/95, OJ EPO 1996, 412).

- 3.2 During the oral proceedings the Appellant was accompanied by Dr. Pallett as a technical expert. Dr. Pallett's presence had been announced by the Appellant's representative and a statement of his qualifications had been provided by letter of 1 February 2010, in which it was requested that Dr. Pallett *"be given the permission to address the Board of Appeal, if appropriate, on the interpretation of the experimental data and any technical question arising from the data in the prior art"*.

The request to hear the technical expert was repeated during the oral proceedings in the context of the discussion of the experimental evidence provided in Tables 1-4 of the patent in suit.

- 3.3 The Board decided to consider the Appellant's request after it had heard the complete presentation of each party's case by its professional representative, but only in the event that further clarification on specific issues was needed or the Board had questions which it wished to pose. This turned out not to be the case.



*Main request for CY (patent as granted)*

4. *Novelty and sufficiency of disclosure*

4.1 The contested decision acknowledged the novelty of the request for CY over the disclosure of documents (1) and (2), which both qualify as state of the art within the meaning of Article 54(3) EPC for all designated states except CY. This finding of the Opposition Division was not contested by the Respondent and the Board sees no reason to raise on its own any objection in this respect.

4.2 Insufficiency of disclosure was not under dispute during the appeal proceedings and the Board does not see any reason to take a different view from that of the Opposition Division.

5. *Inventive step*

5.1 The patent in suit is directed to a method of weed control at a crop locus wherein a glyphosate herbicide or a derivative thereof and at least one HPPD-inhibiting herbicide are applied post-emergence of the crop and wherein the crop locus comprises a crop tolerant to said glyphosate herbicide.

5.2 A similar method of weed control is already described in document (13). This document refers to a method for obtaining a gene expressing a product providing glyphosate resistance. This gene can be introduced into crop plant cells and as a consequence glyphosate can be used as a herbicide on the genetically modified crops to substantially remove weeds, while leaving the crops

unaffected. Document (13) discloses in column 7, lines 17-34 that by providing glyphosate resistant plants a wide variety of formulations using glyphosate either alone or in combination formulations can be employed in post-emergence control of weeds. Certain herbicides, which could be used in the combination formulations, are mentioned, for example atrazine, cyanazine, alachlor, metalachlor, or broad-leaf herbicides of the 2,4-D type, such as bromoxynil. HPPD-inhibiting herbicides are not mentioned.

The Board, in accordance with the Opposition Division and both parties, considers document (13) as the closest state of the art and, hence, takes it as the starting point for the assessment of an inventive step.

- 5.3 In the light of document (13) the Appellant considered the problem to be solved as the provision of a method for protecting crops tolerant to glyphosate post-emergence to the crops involving a combination of glyphosate and a herbicide having a residual activity against a wide spectrum of weeds without impairment of the glyphosate activity, i.e. without generating unacceptable antagonism.

As the solution to this problem the patent in suit proposes a method wherein a glyphosate herbicide or derivative thereof and at least one HPPD-inhibiting herbicide are applied.

- 5.4 To demonstrate that this problem has been successfully solved the Appellant relied on Tables 1-4 of the patent in suit, in particular on Tables 1 and 3. The Appellant argued that Tables 1 and 3 which refer to the "first

planting", i.e. the situation where the plants and weeds have been sown together and have already emerged at the time of the treatment with the herbicides, reflect the influence of the HPPD-inhibiting herbicide on the activity of glyphosate and can thus be used to establish whether or not the activity of glyphosate is impaired. On the other hand, Tables 2 and 4 which refer to the "second planting", i.e. the situation where the weeds have been sown just prior to the application of the herbicides, reflect the residual activity of the applied mixture.

Evidence that the glyphosate activity was not impaired can be found by comparing in Tables 1 and 3 of the patent in suit the value representing the percentage of phytotoxicity in the row headed "glyphosate" with the value in the row headed "glyphosate+isoxazole". The Appellant argued that this comparison clearly shows that with the exception of a single example, namely the weed "Amaranthus retroflexus" (see Table 3, column headed AMARE), the values for the mixture are always higher than the values of the glyphosate alone. Thus, it can be concluded that the activity of glyphosate is not impaired. The Appellant also particularly stressed that the existence of impairment or antagonism of glyphosate activity should be looked at from the perspective of the glyphosate component alone and should not be equated with the notion "antagonism" according to the method of Colby.

- 5.5 The higher phytotoxicity values of the mixture compared to those of glyphosate alone are not disputed. The Board, however, cannot follow the conclusion which the Appellant has drawn from this fact. The method

according to the patent in suit refers, in addition to the application of glyphosate, always to the application of a second component. This component has a herbicidal activity of its own (Tables 1 and 3 of the patent in suit, the rows headed "isoxazole") and is therefore able to contribute to the herbicidal activity of the mixture. Thus, a higher value of phytotoxicity in the mixture comprising glyphosate and an additional amount of a second herbicide with its own individual contribution as compared to the value for glyphosate alone is not evidence that the activity of glyphosate is not impaired. To establish antagonism/impairment **in a mixture** it is not sufficient to consider only one component of a mixture. Rather, what is relevant is whether or not the mixture shows the phytotoxicity values which the person skilled in the art would expect from the combination of the two individual herbicides.

- 5.6 Relevant information can be found in the patent in suit itself. In Tables 1-4 the **observed** response of weed control for the mixture of glyphosate and the HPPD-inhibiting herbicide and its **expected** response, which has been calculated according to the Colby formula (see page 7, paragraph [0054] of the patent in suit) is shown. As pointed out by the Board during the oral proceedings, according to Colby, a herbicide combination is considered synergistic if the observed response is greater than expected, and antagonistic (i.e. impaired) if it is less. If the observed and expected values are the same, the combination is additive. These facts were not contested by either party.

Taking this into account, an examination of the results in Tables 1 and 3 of the patent in suit leads to a rather inconsistent overall picture. In Table 1 the observed response of the mixture is in general identical to or above the expected response. Therefore, it could be concluded that no antagonism/impairment exists. However, in Table 3 antagonism is observed for the mixture of glyphosate and isoxazole in varying degrees for most of the tested weeds (AMARE, AMATA, CHEAL, IPOSS, SEFTA, SETGL), the difference between observed and calculated values ranging from -3 to -18, with differences of -1 not even being taken into account. The Board notes that the effects apparently also depend on the location (cf. Iowa in Table 1 and South Dakota in Table 3) and on the amount of the HPPD-inhibiting herbicides (see values for AMATA in Table 3 of the patent in suit).

Similar results, namely the existence of synergism, antagonism or additive effects depending on the location, the type of weed and the amount of the second herbicide, can be found in Tables 2 and 4 of the patent in suit, reflecting the residual activity of the HPPD-inhibiting herbicide.

- 5.7 It follows from the above that the claimed absence of impairment or antagonism of glyphosate in a glyphosate/HPPD-inhibiting herbicide mixture has not been convincingly established. Furthermore, the Board observes that the herbicides atrazine, cyanazine, alachlor and metalachlor mentioned in document (13) are known as residual herbicides (see for example document (8)). Therefore, the residual control of weeds is also not a new and unexpected effect. The fact that HPPD-

inhibiting herbicides are known as residual herbicides was not contested and can also be seen from document (3), which refers to the pre-emergence use of RPA 201772, i.e. 5-cyclopropyl-4-(2-methylsulphonyl-4-trifluoromethyl)benzoylisoxazole cited in the patent in suit as one of the compounds of formula (I) of particular interest.

5.8 Consequently, the technical problem as defined by the Appellant needs to be redefined in a less ambitious way. Given the teaching of document (13), it can merely be seen in providing an alternative way of weed control at a crop locus post-emergence involving a combination of glyphosate and a residual herbicide wherein the crop locus comprises a crop tolerant to glyphosate.

5.9 In view of the experimental results summarised in Tables 1-4 of the patent in suit the Board is satisfied that this problem has been solved.

5.10 It then remains to be decided whether or not the proposed solution is obvious in view of the prior art.

5.10.1 The closest prior art, document (13), already teaches that genetically modified crops can be treated post-emergence with combination formulations comprising glyphosate and further herbicides. Specific herbicides are mentioned, but the teaching of document (13) is not limited to those herbicides. The Board is of the opinion that the skilled person looking for an alternative to the herbicides mentioned in document (13) would consider combining glyphosate with herbicides having similar effects, i.e. having residual activity and/or activity on broad-leaf weeds. HPPD-inhibiting

herbicides are a known class of herbicides and the skilled person learns from document (14) that 4-benzoylisoxazoles, which are a particular group of HPPD-inhibiting herbicide identical to those referred to in claim 10 of the contested patent, can be used as an alternative or supplement to bromoxynil, one of the herbicides mentioned in document (13), and that they are effective against broad-leaf weeds, grasses and sedges. He also learns that these herbicides are suitable for post-emergence treatment of crops (for example document (14), page 1, line 24 - page 2, line 13, examples). The post-emergence treatment of crops against broad-leaf weeds, grasses and sedges with 2-benzoyl-cyclohexane-1,3-dione derivatives, another group of known HPPD-inhibiting herbicides, is also part of the prior art (documents (15) or (16)). Since it has not been convincingly shown that there is a particular effect related to the use of the HPPD-inhibitors, their choice is part of the routine task of the skilled person unless there is information in the prior art that teaches away from that particular choice.

5.10.2 The Appellant's relevant arguments were the following:

The skilled person would not have considered combining glyphosate and HPPD-inhibiting herbicides, as there is a clear teaching in the prior art that the combination of residual herbicides with glyphosate in general reduces the activity of the glyphosate and can be hazardous (D8, page 233, first two lines of the paragraph headed "residual herbicides"; page 235, last paragraph). Antagonism in such mixtures is also clearly obvious from the results in Table 15.6, in particular part (a), of document (8), in which most residual

herbicides including some of those mentioned in document (13) show antagonism. Furthermore, the weed species tested in document (8) are rather limited.

Contrary to the teaching in document (8), the present invention allows the control of a wide variety of weeds post-emergence of the crops without leading to impairment of the glyphosate. This effect was highly unexpected. Furthermore, in view of the warning in document (8) and in view of the fact that the skilled person had no information at all as to what would happen if glyphosate was to be combined with HPPD-inhibiting herbicides, he had no motivation to combine these two herbicides.

Moreover, as can be seen from document (7b), not even the manufacturer of glyphosate mentions HPPD-inhibiting herbicides as a potential herbicide to be combined with glyphosate.

The Appellant also indicated that document (13) does not clearly refer to application post-emergence of the crop, but merely mentions post-emergent control of weeds.

5.10.3 The Board is not convinced by these arguments:

For the reasons set out in points 5.5 - 5.7 above, the Board is not satisfied that an unexpected absence of impairment or antagonism is apparent from the experimental data of the patent in suit.

Furthermore, although it cannot be denied that document (8) refers to possible disadvantages that may occur



when using residual herbicides in combination with glyphosate, it also clearly recommends the use of such mixtures as they often have important practical advantages (extension of the period of control, avoidance of double spraying) which outweigh the disadvantages (document (8), page 233, first paragraph after the table). Therefore, document (8) would not deter the skilled person from using other residual herbicides in such mixtures; on the contrary, it provides a clear incentive for such a combination.

With regard to the Appellant's statement concerning document (7b), the Board observes that a disclosure of HPPD-inhibiting herbicides as a potential component in mixtures with glyphosate would amount to a disclosure anticipating the subject-matter of claim 1, which is not a prerequisite for successfully attacking inventive step.

The Appellant's argument concerning the post-emergence treatment of the crop is not considered convincing either as it is the whole purpose of document (13) to provide genetically modified crops which can tolerate glyphosate and which can therefore be treated with this herbicide to remove the weeds and leave the crop relatively unaffected. Since glyphosate has no soil activity, pre-emergence treatment of the crops would not require crops tolerant to glyphosate.

5.11 In conclusion, the solution of the technical problem defined above would have been obvious to the person skilled in the art in view of document (13) in combination with any of the documents (14), (15) or (16). Hence, the subject-matter of the main request for

CY does not involve an inventive step within the meaning of Article 56 EPC.

*Main request for all designated states except CY and auxiliary request I*

6. *Amendments*

6.1 The amendment in claim 1 of the main request for all designated states except CY, namely the introduction of the feature "comprising grass weeds, broad-leaf weeds and sedges", is properly supported by the application as filed (see page 4, lines 7-8 of the application as filed) and restricts the scope of the claims. The amendment therefore complies with the requirements of Articles 123(2) and (3) EPC, which has not been contested by the Respondent.

6.2 The set of claims of auxiliary request I for the designated states other than CY was amended before the first instance by the introduction of a disclaimer in an attempt to establish novelty over document (2), which was regarded as prior art according to Article 54(3) EPC. The Board had some doubts concerning the proper drafting of the disclaimer. However, in view of the considerations under point 8 below this issue does not need to be pursued further.

7. *Novelty*

7.1 Novelty of the subject-matter of claim 1 of the main request for all designated states except CY and claim 1 of auxiliary request I for all designated states except CY has been challenged by the Respondent in view of the

disclosure of document (2). It is not contested that this document is state of the art according to Article 54(3) EPC.

7.2 Given the negative outcome concerning inventive step, for which document (2) is of no relevance (point 8 below), a decision on novelty is not necessary. The question whether or not the requirement of the specific weed species at the crop locus (main request for all designated states with the exception of CY) or the disclaimer (auxiliary request for all designated states with the exception of CY) establishes novelty over the disclosure of document (2) has no bearing on the assessment of inventive step.

7.3 The set of claims of auxiliary request I for CY is identical to the main request for CY. Its novelty is undisputed (see point 4.1 above).

## 8. *Inventive step*

8.1 Claim 1 of the main request for all designated states except CY differs from the main request for CY in that the feature "comprising grass weeds, broad-leaf weeds and sedges" has been introduced.

8.2 Document (13) refers to a method of weed control using glyphosate alone or in combination with other herbicides. Specific weeds present at the crop locus are not defined.

Grass weeds, broad-leaf weeds and sedges belong to the main groups of weeds commonly found at a crop locus (see documents (3) or (19)). Moreover, since glyphosate

is a well-known total herbicide and since documents (14), (15) and (16) already disclose the efficacy of the HPPD-inhibiting herbicides against grass weeds, broad-leaf weeds and sedges post-emergence of the crop, this feature cannot contribute to inventive step. Therefore, the considerations concerning the assessment of inventive step set out in points 5.10.1 - 5.10.3, and the conclusion drawn in point 5.11 for the main request for CY apply equally to the subject-matter of claim 1 of the main request for all designated states except CY. No additional arguments beyond those for the main request for CY have been submitted.

8.3 Claim 1 of auxiliary request I for all designated states except CY is distinguished from claim 1 of the main request for CY in that a method wherein two mixtures with specific amounts of glyphosate and isoxaflutole, a particular HPPD-inhibiting 4-benzoylisoxazole herbicide, have been applied to a tobacco crop genetically modified to be tolerant to both glyphosate and HPPD-inhibiting herbicides, is disclaimed.

However, this disclaimer does not change the subject-matter of the invention; it merely excludes the use of two particular mixtures with a single specific HPPD-inhibitor for a particular crop. Other HPPD-inhibitors such as those disclosed in documents (14), (15) and (16) still form part of the subject-matter of claim 1. Thus, for the assessment of an inventive step the same considerations and the same conclusion as those for the main request for CY apply to the auxiliary request I for all designated states except CY (points 5.10.1 - 5.10.3, 5.11 above).

8.4 Auxiliary request I for CY is identical to the main request for CY and therefore does not involve an inventive step for the reasons set out in point 5.

8.5 It follows that the main request for all designated states except CY and auxiliary request I are not allowable for lack of inventive step pursuant to Article 56 EPC either.

*Auxiliary request II*

9. *Amendments and novelty*

In view of the negative outcome with respect to inventive step (see below) the Board can limit itself to the consideration of this requirement.

10. *Inventive step*

10.1 Claim 1 of auxiliary request II differs from the main request for CY, i.e. the patent as granted, in that the crop locus comprises grass weeds, broad-leaf weeds and sedges and in that the "at least one HPPD-inhibiting herbicide" has been further defined as being a 4-benzoylisoxazole herbicide, a 2-benzoylcyclohexane-1,3-dione derivative or a 2-cyano-1,3-dione herbicide of the general formulae (I), (II) and (III).

10.2 The Board, in agreement with both parties, considered that document (13) represented the closest state of the art for the subject-matter of auxiliary request II.

10.3 The Appellant based its arguments in support of inventive step on the synergistic activity observed for a number of mixtures of the patent in suit. It admitted that synergism is not present in all mixtures and against all the weeds, but argued that it should be considered that the claimed method is directed to the treatment of weeds at a crop locus, which usually implies the presence of a variety of weed species, as can be seen for example from document (3). A farmer will never be confronted with the situation of controlling only one weed species. The experimental data in the patent in suit as well as in document (18) demonstrate that at least against some of the commercially important weeds synergism is present for the claimed herbicide combination. Thus, overall, the farmer, when applying the mixture, will always benefit from this synergism.

10.4 The Board cannot follow the Appellant's arguments.

It is undisputed that for single weeds synergism exists, depending on the location, the specific mixture and first or second planting (patent in suit Tables 1-4). There is, however, no data available in the disputed patent demonstrating beneficial effects for the farmer in the weed control over the whole crop locus, when applying the mixture. The Appellant's conclusion that, due to the synergistic effect of the mixture for some important weeds, the farmer will always profit, neglects the fact that synergism apparently depends on the location (cf. Tables 1 and 3, Idaho and South Dakota), the amount of each of the herbicides in the mixture (see for example Table 1, column headed ABUTH, or IPOHE) and the fact that there

is also antagonism, as can be seen from the tables in the patent in suit.

10.5 Since an overall benefit for a crop locus has not been demonstrated and synergism has only been observed for some of the particular herbicide combinations against some particular weeds, the technical problem to be solved remains the same as for the main request, namely the provision of an alternative method of weed control (see point 5.8 above).

10.6 Since documents (14), (15) and (16) already disclose derivatives belonging to the specifically claimed groups of HPPD-inhibiting herbicides, which in addition are known to control grass weeds, broad-leaf weeds and sedges, the additional features are not suitable to remove the lack of inventive step of the subject-matter of claim 1 of the main request.

10.7 As a consequence, auxiliary request II is not allowable for lack of inventive step.

### *Auxiliary request III*

#### 11. *Amendments and novelty*

In view of the negative outcome with respect to inventive step (see below) the Board can limit itself to the consideration of this requirement.

#### 12. *Inventive step*

12.1 Claim 1 of auxiliary request III differs from claim 1 of auxiliary request II in that the HPPD-inhibiting

herbicide has been limited to a single component, namely 2-(2'-nitro-4'-methylsulfonylbenzoyl) cyclohexane-1,3-dione (mesotrione).

- 12.2 The Appellant argued that the claimed mixture of glyphosate and mesotrione has a clear synergistic effect and referred to document (18), Tables 1-5, in support of his argument. Such an effect was unexpected and thus supports the presence of an inventive step.
- 12.3 Document (18) is a declaration of Dr. Hacker and describes additional experiments in weed control carried out under the supervision of Dr. Hacker by applying a mixture of glyphosate and HPPD-inhibiting herbicides falling within the scope of formula (II) of the patent in suit. Tables 1-5 of this declaration present the results of these experiments with mesotrione as the HPPD-inhibiting herbicide. In each of the experiments reflected in Tables 1-5, activity against a different weed species has been tested (LOLMU, HORVU, AVESA, CHEAL, AMARE). Mixtures with 50 g/ha of mesotrione have been used in combination with 720 g/ha (Tables 1 and 2) or 360 g/ha (Tables 3-5) glyphosate. The results in all the tables indicate synergism.
- 12.4 The Board observes that in Tables 1 and 5 the scoring day given for the herbicidal action was 7 days and in Table 4, 22 days. In Tables 2 and 3 both values, namely 7 and 22 days, are mentioned. Considering the results in Table 2 and 3, it appears that the synergistic effect may also be time dependent. The order of magnitude of synergism is considerably less after 22 days than after 7 days.



However, even assuming, in favour of the Appellant, that in the experiments reflected in Tables 1-5 of document (18), synergism is always present independent of the time of scoring, the Board agrees with the Respondent that the experimental data merely demonstrate a synergistic effect against a few selected weed species and for specific amounts of each of the herbicides. Taking the experimental data of the patent in suit into consideration, it is apparent that the occurrence of any effect, be it synergism, antagonism or additive effects, also depends on the location or on the amount of the HPPD-inhibiting herbicide in the mixture, which for the same weed can result in different effects (for example Table 1 of the contested patent, column headed ABUTH or IPOHE or Table 3 of the patent, column headed ABUTH or AMARE). Therefore, the additional experimental data are not suitable to demonstrate credibly that a synergistic effect can be achieved by applying any mixture of glyphosate and mesotrione falling within the scope of the claim 1 of auxiliary request III.

- 12.5 Consequently, the problem to be solved by the claimed subject-matter remains the same as the problem mentioned in point 5.8 above, i.e. the provision of an alternative method of weed control at a crop locus wherein the crop locus comprises a crop tolerant to glyphosate.
- 12.6 Since mesotrione belongs to a known group of HPPD-inhibiting herbicide (see document (16)), a fact that has not been under dispute and is even acknowledged in the patent in suit (see paragraph [0002]), and since no particular effect is associated with its use, its

selection is merely an arbitrary choice and requires no inventive skills.

12.7 Following from the above, the Board concludes that the subject-matter of auxiliary request III does not involve an inventive step as required by Article 56 EPC.

## **Order**

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

The appeal is dismissed.

The Registrar:

The Chairman:

B. Atienza-Vivancos

P. Ranguis