



6 July 2022

Opposition - Decision Issued

FPA Patent Attorneys Pty Ltd
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80 Collins Street
Melbourne VIC 3000
Australia

Your reference	M53055640
Application number	2017261483
Applicant name	Corteva Agriscience LLC
Opponent	Nufarm Australia Limited

Dear Sir/Madam,

Please find attached a copy of a Decision of a Delegate of the Commissioner of Patents.

This decision may be appealed to the Federal Court. You can obtain more information from the website – www.fedcourt.gov.au.

Yours sincerely,

Linda Tobes
Oppositions and Hearings
Phone: 02 6283 2455

IP AUSTRALIA

AUSTRALIAN PATENT OFFICE

Nufarm Australia Limited v Corteva Agriscience [2022] APO 46

Patent Application: 2017261483

Title: Compounds derived from herbicidal carboxylic acids and tetraalkylammonium or (arylalkyl) trialkylammonium hydroxides

Patent Applicant: Corteva Agriscience LLC

Opponent: Nufarm Australia Limited

Delegate: K. Wagg

Decision Date: 6 July 2022

Hearing Date: 19 May 2021

Catchwords: **PATENTS** – section 59 opposition to the grant of a patent – opposition successful on ground of novelty and inventive step – use of choline hydroxide in D2 – costs awarded against the Applicant.

Representation: Counsel for the Applicant: Craig Smith
Patent attorney for the Applicant: FPA Patent Attorneys
Counsel for the Opponent: Benjamin Fitzpatrick
Patent attorneys for the Opponent: Arcadia Intellectual Property



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Patent Application: 2017261483

Title: Compounds derived from herbicidal carboxylic acids and tetraalkylammonium or (arylalkyl) trialkylammonium hydroxides

Patent Applicant: Corteva Agriscience LLC

Date of Decision: 6 July 2022

DECISION

The Opposition is successful on the ground of novelty and inventive step. All other grounds fail.

Costs awarded against the Applicant.

Subject to appeal, the Applicant is provided 2 months to file suitable amendments.

REASONS FOR DECISION

Background

1. Patent application number 2017261483 (the **Opposed application** or the **Specification**) was filed on 14 November 2017 by Dow AgroSciences LLC who recorded a change of name to Corteva Agriscience LLC on 20 November 2021 (**the applicant**). The application is a divisional application that ultimately claims a priority date of 26 February 2007. The Parent is 2016202508, the grand parent is 2015200368; the great grandparent is 2013203406 and the great great grandparent is 2008219657. The great great grandparent, 2008219657, was withdrawn and the parent, 2016202508, was the subject of a hearing along with sibling case 2016203677, see *Nufarm Australia Limited v Dow Agrosciences, LLC* [2020] APO 10 (the **parent opposition**).
2. As a result of the filing date and subsequent later request for examination, the substantive amendments of the *Patents Act 1990* brought about by the *Intellectual Property Laws Amendment (Raising the Bar) Act 2012* (**Raising the Bar**) apply to the present application. This includes the amendment to subsection 60 (3A) that allows the Commissioner to refuse a patent application if satisfied on the balance of probabilities that a ground of opposition exists. Any subsequent references to sections of the Patents Act relate to the *Patents Act 1990* as amended by the Raising the Bar Act. A similar qualification applies to references to the *Patents Regulations 1991*.

3. The application was examined and advertised as accepted by the Commissioner on 25 July 2019. Nufarm Australia Limited (the **opponent**) filed a notice of opposition to grant on 25 October 2019 under section 59 of the *Act*. This decision concerns the opposition to grant under section 59 (this **opposition**).

The Grounds of Opposition

4. The Amended Statement of Grounds and Particulars filed on 21 January 2021 identified all of the available grounds of opposition. At hearing the following grounds were pressed:
- That the application does not comply with s 40(2) and s 40(3), including a lack of clarity, a lack of a clear enough and complete enough disclosure and a lack of support.
 - Lack of Utility
 - Lack of Novelty
 - Lack of Inventive Step
5. I note that the ground of clarity was not pressed in the parent opposition.

Onus and Standard of Proof

6. The onus lies with the opponent to satisfy me that a ground of opposition exists on the balance of probabilities.¹ If I am satisfied, then I may refuse the Opposed Application.²

Evidence

7. The evidence in support comprises the following declarations:

Declarant	Date	Reference	Exhibits
Phillip Maxwell Hay	20 April 2020	Hay #1	PMH-1 to PMH-12

8. The evidence in answer comprises the following declarations:

Declarant	Date	Reference	Exhibits
Mr David Ouse	24 July 2020	Ouse	DGO-1 to DGO- 6
Dr Terry R. Wright	27 July 2020	Wright	TRW-1 to TRW-14
Dr Norman Pearson	24 July 2020	Pearson	NRP-1 to NRP-4
Dr Mei Li	24 July 2020	Li	ML-1 to ML-3

¹ Section 60(3A).

² Ibid.

9. . The evidence in reply comprises the following declarations:

Declarant	Date	Reference	Exhibits
Phillip Maxwell Hay	25 September 2020	Hay #2	PMH-13 to PMH-28

10. Prior to the hearing the Opponent sought to bring in material under r 5.23. This material included evidence from the corresponding European opposition on EP 2124577. At the oral hearing this material was not discussed. I have briefly reviewed the material and do not consider it likely if not certain to affect my decision.³ Consequently, I will not consult that material.

The Specification

11. Before commencing to construe the specification, I note what Middleton J said about approaching patent specifications in *Eli Lilly v Apotex Pty Ltd*:

"It is well settled that the court should, from the outset, approach the task of patent construction with a generous measure of common sense. The court must place itself in the position of a person skilled in the relevant art, being the patent's subject matter. From this perspective, the patent is to be read as a whole, in the context of the specification and in light of the prevailing common general knowledge and state of the relevant art at the priority date."⁴

12. To properly construe the specification, it is essential to obtain an idea of the technology the invention relates to and obtain a picture of the person skilled in the art. I will therefore review the background.

Background

13. The Application begins by stating that it is a divisional of 2016202508 and incorporates the disclosure of that application by reference. The key difference between the current application and the parent is in the claims, in that the parent included an isolation step whereas the current claims do not. The Application states:

"Acid herbicides such as 2,4-dichlorophenoxyacetic acid (2,4-D) have long been used to control unwanted vegetation. 2,4-D is normally converted into liquid formulations by conversion to water soluble salts or emulsified esters. The ester formulations have been found to be more effective than the salts on an acid equivalent basis in the control of noxious vegetation but have the unwanted characteristic of migrating to adjacent desirable vegetation because of the volatility thereof, resulting in unacceptable damage to sensitive plants.

Efforts to solve the volatility problem, including preparation of water soluble salts such as the dimethylamine salt of 2,4-D, have not been totally satisfactory because, upon volatilization of the amine, the herbicide reverts back to its initial acid form, which, in itself under certain unfavorable conditions, has sufficient volatility to cause damage to sensitive crops. 2,4-D ester or 2,4-D dimethylamine formulations

³ See, e.g. *Merial Limited v Bayer Intellectual Property GmbH* [2015] APO 16.

⁴ *Eli Lilly and Company Limited v Apotex Pty Ltd* [2013] FCA 214, 100 IPR 451 at [139].

applied during the warm summer months can lead to vapor drift from the evaporation of the herbicide from sprayed surfaces and subsequent damage to highly susceptible crops such as tomatoes, cotton, soybeans, sunflowers and grapes. This may occur within hours after the herbicide application.”⁵

14. This background discusses both the known herbicide, 2,4-D, as well as purported issues with the ester and dimethylamine formulations. With this in mind I will consider the aim of the invention.

Aim of the invention

15. The aim of the specification can be gleaned from the desire outlined below:

“Thus it would be desirable to have an herbicidal carboxylic acid derivative that is at least as active as the commercially used carboxylic acid herbicide salts, but which is less volatile so that its use would not damage nearby sensitive crops.”⁶

16. I note that the use of the term *desirable* here to achieve a herbicide that is “at least” as active and less volatile so that its use would not damage nearby sensitive crops. I will discuss the problem later as well as the promise under inventive step and utility but note that less volatile is qualified to mean that it would not damage nearby sensitive crops. With this background I will move onto the person skilled in the art.

The Person Skilled in the Art (PSA)

17. The concept of the person skilled in the art (**PSA**) has long been considered by the courts when construing patent specifications. Finkelstein J described the PSA with the following words:

“He is the person to whom the patent is addressed and who must construe it. He is the person whose knowledge will determine whether a patent is novel. He is the person who will judge whether a patent is obvious.”⁷

18. The PSA is not a real person, but an artificial construct used as a tool of analysis by the court, and in this case, the Commissioner. This concept was articulated in *AstraZeneca*⁸:

“The notional person is not an avatar for expert witnesses whose testimony is accepted by the court. It is a pale shadow of a real person – a tool of analysis which guides the court in determining, by reference to expert and other evidence, whether an invention as claimed does not involve an inventive step.”⁹

19. Lord Diplock stated that the PSA is likely to have a practical interest in the subject matter:

⁵ Page 1 lines 8-21.

⁶ Page 2 lines 1-4.

⁷ *Root Quality Pty Ltd v Root Control Technologies Pty Ltd* [2000] FCA 980; 49 IPR 225 at [70].

⁸ *AstraZeneca AB v Apotex Pty Ltd* [2015] HCA 30.

⁹ *AstraZeneca AB v Apotex Pty Ltd* [2015] HCA 30 at [23].

“My Lords, a patent specification is a unilateral statement by the patentee, in words of his own choosing, addressed to those likely to have a practical interest in the subject matter of his invention (i.e. ‘skilled in the art’)”¹⁰

20. In Australia, the Full Federal Court approved this approach with Heerey, Emmett and Dowsett JJ stating:

“The uninventive but skilled worker is likely to have a practical interest in the subject matter of the claimed invention.”¹¹

21. The field of the invention relates to the reaction product of a herbicidal carboxylic acid and a tetraalkylammonium hydroxide and use thereof as a herbicide. Accordingly, the skilled person, or team, would be expected to have a practical interest in the field of herbicides, including the development, manufacture and use of herbicidal agents. The key declarants in this matter are Mr Hay for Nufarm and Mr Ouse, Dr Pearson, Dr Wright and Dr Mei Li for Dow. With the exception of Dr Mei Li, these are the same declarants as those in the parent opposition.

22. As noted in the parent opposition,¹² Mr Hay is a long-term employee of Nufarm with experience in formulating new agricultural chemicals. Mr Hay’s work involved development of formulations including 2,4-dichlorophenoxyacetic acid (**2,4-D**), and in 2005 and 2006 he was, on behalf of Nufarm, involved in the APVMA’s assessment of the risks associated with all forms of 2,4-D, and between 2006 and 2013 coordinated Nufarm’s technical response to the APVMA 2006 Preliminary Review Findings requiring the suspension of high volatile esters of 2,4-D.¹³

23. Mr Ouse and Dr Pearson are both named inventors of the application and the parent¹⁴ with Mr Ouse being a research biologist at Dow with research experience in agronomy and herbicide science¹⁵. Dr Pearson also worked as a chemist in research in early stage formulation innovation and synthesis of novel agrochemical active ingredients at various Dow companies and as a patent liaison at Dow AgroSciences.¹⁶ Dr Wright has research experience in agronomy, pesticide science and plant biotechnology, including field testing herbicides from discovery to commercial product development and launch, and discovery of new herbicides, he has worked at Dow and now at Corteva.¹⁷ Dr Mei Li currently works at Corteva Agriscience, her background includes working in emulsion polymerization, colloidal stable emulsions, functional nanomaterials and polycoatings for antimicrobiological control.¹⁸ Dr Li has experience in herbicide formulation including in the development of ArylexTM.¹⁹

24. Each of the declarants is either a current or former employee of the parties in this opposition. Furthermore, with the exception of Dr Mei Li, each of the declarants provided evidence in the parent opposition. Noting the decision on the parent I am satisfied that the declarants on that case understand the specification and can provide evidence as to what a person skilled in the art knew or would have done at the relevant date. However, it does follow that none of declarants are

¹⁰ *Catinc Industries Inc. v Hill & Smith Limited* [1982] RPC 183 at 243.

¹¹ *Minnesota Mining & Manufacturing Co v Tyco Electronics Pty Ltd* [2002] FCAFC 315; 56 IPR 248 at [39], 257.

¹² *Nufarm Australia Limited v Dow Agrosciences, LLC* [2020] APO 10 at [14].

¹³ Hay #1 at [5], [14], [22], Annexure PHM-1.

¹⁴ *Nufarm Australia Limited v Dow Agrosciences, LLC* [2020] APO 10 at [15].

¹⁵ Ouse 1 at [1], [3].

¹⁶ Pearson at 1 at [1]-[13].

¹⁷ Wright #1 [1]-[19].

¹⁸ Li #1 [1]-[12].

¹⁹ ML-1.

capable of being naïve to the invention when providing evidence on common general knowledge and inventive step.

25. The Opponent submitted that Dr Li's experience in the field is contemporaneous with the date of the declaration rather than the priority date and caution should be taken when considering her evidence on the meaning of choline in D2. The Applicant responded to this stating that choline is used in chemistry more broadly and that Dr Li started working for Dow in 2006. Dr Li does state in her declaration that she was employed as a senior formulation chemist from 2006-2008 at Dow AgroSciences.²⁰ I therefore consider that Dr Li, despite having experience outside of the field, can provide evidence on the current case.
26. At the hearing the Opponent noted that Dr Wright's evidence in relation to the definition of choline had changed from his declaration on the great great grandparent.²¹ My Hay made the comment that this was why that application was subsequently withdrawn.²² In Dr Wright's declaration he refers to choline as a quaternary ammonium salt with a counter ion where the counter ion can be chloride, hydroxide or tartrate.²³ I will consider choline in relation to D2 for novelty, but I do not consider this to be any change in position or any reason to disregard Dr Wright's evidence. Ordinarily if there is conflicting evidence between declarants then the Commissioner will weigh the evidence accordingly.

The Invention Described in the Specification

27. The specification is almost identical to that of the parent application. It states that:
- “It has now been found that compounds formed by combining a carboxylic acid herbicide with either a tetraalkylammonium or an (arylalkyl)trialkylammonium hydroxide have herbicidal activity on an acid equivalent basis at least comparable to the commercially used carboxylic acid herbicide salts, but with reduced volatility. Furthermore, the compounds can be more conveniently formulated as aqueous concentrates or emulsified liquids. The present invention concerns herbicidal compounds comprising the reaction product of an herbicidal carboxylic acid and an *N*-((C₁-C₁₆) alkyl or arylalkyl)tri((C₁-C₁₆) alkyl)ammonium hydroxide, where the alkyl groups can be the same or different.”²⁴
28. I note that the above paragraph discusses the compound formed are said to be “at least comparable” to the commercially used carboxylic acid herbicide. At the Opposition, the Opponent submitted that this does not mean it can be less active, it must be at least as active as the carboxylic acid herbicide. I will discuss this later but note that in the Opposition to the parent it was found that at least as active need only be comparable.²⁵ The specification then describes herbicidal carboxylic acids which include the well-known compound, 2,4-D (also known as 2,4-dichlorophenoxyacetic acid).²⁶

29. As with the parent application the ammonium hydroxide is defined as the following:

²⁰ Li #1 at [12].

²¹ PMH-13.

²² Hay #2 at [8].

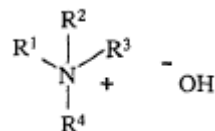
²³ PMH-13 at [188].

²⁴ Page 2, lines 5-13.

²⁵ *Nufarm Australia Limited v Dow Agrosciences, LLC* [2020] APO 10 at [202].

²⁶ Page 3, lines 5-20.

“*N*-((C₁-C₁₆) Alkyl or arylalkyl) tri((C₁-C₁₆) alkyl)ammonium hydroxide refers to compounds of the formula



wherein R¹, R² and R³ independently represents (C₁-C₁₆) alkyl or any two of R¹, R² and R³ represent -(CH₂)_n- where n is an integer from 3-5 and R⁴ represents ((C₁-C₁₆) alkyl or arylalkyl). Preferred *N*-((C₁-C₁₆) alkyl or arylalkyl) tri((C₁-C₁₆) alkyl)ammonium hydroxides are those in which R¹, R², R³ and R⁴ are the same or where R¹, R² and R³ are CH₃ and R⁴ is (C₂-C₁₆) alkyl or arylalkyl.”²⁷

30. The specification indicates that the compounds can be prepared by reaction of the herbicidal carboxylic acid with an appropriate *N*-((C₁-C₁₆) alkyl or arylalkyl)tri((C₁-C₁₆) alkyl)ammonium hydroxide:

“The herbicidal carboxylic acid is mixed with the *N*-((C₁-C₁₆) alkyl or arylalkyl) tri((C₁-C₁₆) alkyl)ammonium hydroxide in a solvent like methanol followed by removal of the solvent and any water generated or present in the *N*-((C₁-C₁₆) alkyl or arylalkyl) tri((C₁-C₁₆) alkyl)ammonium hydroxide reactant under vacuum.”²⁸

31. Appropriate use of the compounds of the invention and suitable formulations thereof are also described.²⁹

32. The following general preparative example is given, with my emphasis:

“The carboxylic acid herbicide and the *N*-((C₁-C₁₆) alkyl or arylalkyl) tri((C₁-C₁₆) alkyl)ammonium hydroxide are combined in equimolar amounts in methanol at room temperature to give a solution of the ammonium salt of the carboxylic acid. The product is then isolated by evaporative removal of the methanol (and any water present) at room temperature to 50°C. The products may be purified by methods known in the art to provide the compounds of the present invention as liquids or solids. *Alternatively, the products of the invention may be prepared in water solvent and used as obtained.* Table I below lists the compounds prepared in this manner with their physical state and MP where applicable.

Alternatively, the samples may be prepared by combining equimolar amounts of the carboxylic acid herbicide, an *N*-((C₁-C₁₆) alkyl or arylalkyl) tri((C₁-C₁₆) alkyl)ammonium halide (such as chloride or bromide) and a metal hydroxide (such as sodium or potassium hydroxide) in a solvent such as methanol. The product is then isolated by evaporative removal of the methanol (and any water present) at room temperature to 50°C and removing the metal halide salt by selective dissolution in water, to provide the compounds of the present invention as liquids or solids.”³⁰

²⁷ Page 3, line 21 – page 4, line 5.

²⁸ Page 4, lines 8-12.

²⁹ Pages 5-8.

³⁰ Page 9, lines 2-15.

33. In the above procedures the product may be prepared in water and used as obtained.
34. Table I, reproduced below,³¹ indicates the ammonium hydroxides in the amine and the herbicidal carboxylic acid in the acid column. The physical properties of the product are then given. I note that the reaction product of 2,4-D and choline hydroxide is provided as 1e.

TABLE I

Compound	Amine	Acid	Physical State	Melting Range (°C)
1a	tetramethylammonium hydroxide	2,4-D	solid	213-216 dec
1b	tetraethylammonium hydroxide	2,4-D	liquid	95-105
1c	tetrapropyl ammonium hydroxide	2,4-D	liquid	NA
1d	tetrabutyl ammonium hydroxide	2,4-D	solid	53-58
1e	choline hydroxide	2,4-D	solid	105-120
1f	N-benzyltrimethylammonium hydroxide	2,4-D	solid	84-86
1g	N-hexadecyltrimethylammonium hydroxide	2,4-D	solid	65-72
2a	tetramethylammonium hydroxide	triclopyr	solid	>170 dec
2b	tetraethylammonium hydroxide	triclopyr	solid	79-86
2c	tetrapropyl ammonium hydroxide	triclopyr	liquid	NA
2d	tetrabutyl ammonium hydroxide	triclopyr	solid	88-93
2e	choline hydroxide	triclopyr	solid	>160 dec
2f	N-benzyltrimethylammonium hydroxide	triclopyr	solid	166-171 dec
2g	N-hexadecyltrimethylammonium hydroxide	triclopyr	solid	73-77
3a	tetramethylammonium hydroxide	cyhalofop	solid	144-155
3b	tetrabutyl ammonium hydroxide	cyhalofop	liquid	NA
3c	N-benzyltrimethylammonium hydroxide	cyhalofop	solid	162-166
3d	N-hexadecyltrimethylammonium hydroxide	cyhalofop	liquid	NA
4a	tetramethylammonium hydroxide	dicamba	solid	175-181 dec

35. There are examples directed to both herbicidal efficacy and the volatility of the compounds of the invention.³²
36. The specification ends with 15 claims. Claims 1, 3 and 7 are independent claims. A key difference between the current claims and those of the parent is that the current claims do not contain an isolation step.

The Claims and Clarity

37. The approach to the construction of claims was discussed by Bennett J in *H Lundbeck A/S v Alphapharm Pty Ltd*:

“the words in a claim should be read through the eyes of the skilled addressee in the context in which they appear ... while the claims define the monopoly claimed in the words of the patentee's choosing, the specification should be read as a whole ... it is not permissible to read into a claim an additional integer or limitation to vary or qualify the claim by reference to the body of the specification ... terms in the claim

³¹ Page 10.

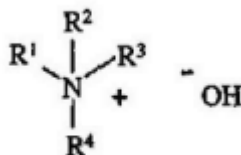
³² See page 11 and 12.

which are unclear may be defined or clarified by reference to the body of the specification”³³

38. This approach of reading the specification as whole through the PSA's eyes with the CGK in mind provides context and the intention behind what is meant³⁴ and is commonly referred to as a purposive construction.³⁵
39. It is a requirement of subsection 40(3) of the *Act* that the claims must be clear. This requirement is understood to be satisfied if a person could ascertain "whether or not what he proposes to do falls within the ambit of the claim".³⁶ The lack of a precise definition in claims may not be fatal to validity so long as they provide a workable standard suitable to the intended use.³⁷ However, if the monopoly defined by the claims cannot be determined, then the claims must fail for want of clarity.
40. Claim 1 of the Application is set out below:

A herbicidal compound comprising the reaction product produced by the process of combination

2,4-dichlorophenoxyacetic acid
a (tetraalkyl)ammonium hydroxid;
in which the (tetraalkyl)ammonium hydroxide is a compound of the formula



wherein R¹, R² and R³ are methyl, R⁴ is not methyl.

41. The claim is near identical to that of the parent application, however, notably the parent included the step of isolating the reaction product, thereby producing the herbicidal compound as a separated product.
42. Claim 3 reads:

A herbicidal compound comprising the reaction product produced by the process of:

³³ [2009] FCAFC 70, 81 IPR228 at [118]–[120].

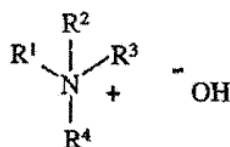
³⁴ *Catnic Components Ltd v Hill & Smith Ltd* [1982] RPC 183 (HC).

³⁵ *Technip France S.A.'s Patent* [2004] RPC 46.

³⁶ *Monsanto Co v Commissioner of Patents* (1974) 48 ALJR 59.

³⁷ *Minnesota Mining and Manufacturing Co. v Beiersdorf (Australia) Ltd.* (1980) 144 CLR 253 at (46).

- combining 2,4-dichlorophenoxyacetic acid and a (tetraalkyl) ammonium hydroxide; in which the (tetraalkyl)ammonium hydroxide is a compound of the formula

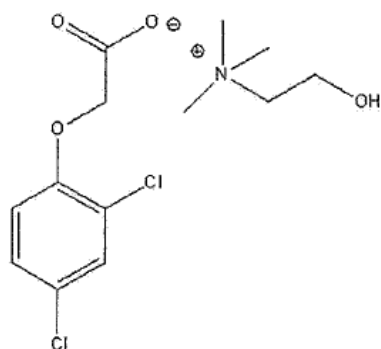


wherein R¹, R² and R³ independently represents (C₁-C₁₆) alkyl or any two of R¹, R² and R³ represent -(CH₂)_n- where n is an integer from 3-5 and R⁴ represents ((C₂-C₁₆) alkyl or arylalkyl).

43. Claim 7 reads:

A herbicidal compound comprising the reaction product produced by the process of:

- combining 2,4-dichlorophenoxyacetic acid and choline hydroxide, said herbicidal compound having the formula:



44. When Hay reviewed the Opposed Application he noted that product can either be purified, which he referred to as “isolated” by (i) evaporating the methanol reaction solvent and by (ii) washing the mixture obtained with water to remove soluble sodium chloride.³⁸ He then noted that this was different to when the “product of the invention” was “used as obtained”.³⁹
45. I note that the claim refers to a (tetraalkyl)ammonium hydroxide and then provides the formula with a central nitrogen atom with four R groups attached. These R groups are clearly alkyl groups, with R¹, R² and R³ being defined in claim 1 as a methyl, the simplest alkyl group: -CH₃. The Opponent submitted that the open-ended definition of alkyl was unclear.
46. In the decision on the parent the delegate considered the specification’s definition of alkyl.⁴⁰ It is worth repeating that here:

“Unless specifically limited otherwise, the term ‘alkyl’, as well as derivative terms such as ‘arylalkyl’, as used herein, include within their scope straight chain, branched chain and cyclic moieties. Unless specifically stated otherwise, each may be unsubstituted or substituted with one or more substituents selected from but not limited to halogen, hydroxy, alkoxy or alkylthio, provided that the substituents are

³⁸ Hay #1 at [85] reading lines 13-20 of page 9.

³⁹ Ibid.

⁴⁰ *Nufarm Australia Limited v Dow Agrosciences, LLC* [2020] APO 10 at [43].

sterically compatible and the rules of chemical bonding and strain energy are satisfied. The term 'aryl' refers to a phenyl, indanyl or naphthyl group. The aryl group may be substituted or unsubstituted with one or more substituents selected from halogen, hydroxy, C₁-C₆ alkyl or C₁-C₆ alkoxy, provided that the substituents are sterically compatible and the rules of chemical bonding and strain energy are satisfied. The term 'arylalkyl' refers to C₁-C₄ alkyl groups substituted with an aryl group.”⁴¹

47. I note from my own experience that alkyl means a fully saturated hydrocarbon radical. In the present case the radical being where it attaches to the nitrogen and then a carbon chain begins, in that chain each carbon has hydrogens attached so that each carbon is said to be “saturated” and there are no double bonds or triple bonds. Examples include methyl (-CH₃), ethyl (-CH₂CH₃), propyl (-CH₂CH₂CH₃). Branched would include isopropyl (-CH(CH₃)₂). The above definition includes straight chain, branched chain and cyclic moieties. I consider this would be within the common meaning. However, this definition then says “unless specifically stated otherwise, each may be unsubstituted or substituted with one or more substituents selected from but not limited to halogen, hydroxy, alkoxy etc.
48. The Opponent also submitted that the structure of claim 1 and 3 extends beyond the limitations of a definition on page 3 lines 21-page 4 line 5. This was based on a comment made by Hay⁴². The definition on page 3 refers to a *N*-((C₁-C₁₆)Alkyl or arylalkyl)tri((C₁-C₁₆)alkyl)ammonium hydroxide, which is different to what is in claims. In my view, the claims are clear as they stand, it is not appropriate to make them unclear recourse to the specification. I do not consider this to be a lack of clarity.
49. The Opponent also made the following submissions:

“Claims 1 and 3 are unclear to the extent that it refers to two distinct alternatives:

a) the reaction product formed by the specific method of manufacture consisting of combining 2,4-dichlorophenoxyacetic acid with a (tetraalkyl)ammonium hydroxide and possibly isolating the reaction product, and not by any alternative method of manufacture, or

b) a reaction product defined as the chemical reaction of combining 2,4-dichlorophenoxyacetic acid with a (tetraalkyl)ammonium hydroxide and possibility isolating the reaction product but which could be manufactured by any of the first, second or third methods provided at page 9 of the Opposed 483 Application.

Mr Ouse, whilst referring to all three methods, considers that at least the first method described on page 9, lines 2 to 8 of the Opposed 483 Application would result in a compound according to claim 1 (the first method includes an isolation step). However, Dr Pearson notes that the third method is not relevant to the claims. Furthermore, the Opposed 483 Application does not suggest that one method should be preferred over another.”⁴³ (citations omitted).

⁴¹ page 2, line 21 – page 3, line 4.

⁴² Hay #1 at [242].

⁴³ Opponent's submissions at [318]-[319].

50. I do not consider the presence of a methods in the specification that are not within the scope of the claims give rise to a lack of clarity.
51. The ground of clarity has not been established.

Section 40(2)(a)

52. The amendments brought about by Raising the Bar introduced the following piece of legislation under s 40 (2):

“A complete specification must:

(a) disclose the invention in a manner which is clear enough and complete enough for the invention to be performed by a person skilled in the relevant art;”

53. In *Merck Sharp & Dohme Corporation v Wyeth LLC (No 3)*⁴⁴ (**MSD**), Burley J considered the law of support⁴⁵ and also considered s 40(2)(a). His honour consulted the explanatory memorandum, which discussed how the change brought about by Raising the Bar was intended to align the Australian disclosure requirements with those overseas.⁴⁶ His honour then considered s 40(2)(a) in comparison to the EPC and UK Act. He noted that s 40(2)(a) is expressed in terms that are virtually the same as in s 14(3) of the UK Act⁴⁷ but notes that the highest courts of the UK have emphasised the influential effect of the EPO Technical Board. I note that his approach is consistent with the approach taken by this office in *CSR Building Products Limited v United States Gypsum Company*⁴⁸ (**CSR**) which involves the following three steps:

- (1) Construe the claims to determine the scope of the invention as claimed,
- (2) construe the description to determine what it discloses to the person skilled in the art, and
- (3) decide whether the specification provides an enabling disclosure of all the things that fall within the scope of the claims.⁴⁹

54. When deciding the third question the delegate in *Evolva*⁵⁰ included the following two questions:

- (4) Is it plausible that the invention can be worked across the full scope of the invention?
- (5) Can the invention be performed across the full scope of the claims without undue experimentation?

55. In *Cytec Industries Inc. v Nalco Company*⁵¹ Burley J cited the above office decisions and confirmed that this was the correct approach.

⁴⁴ [2020] FCA 1477.

⁴⁵ Ibid at [502]

⁴⁶ Ibid at [513]

⁴⁷ Ibid at [521]

⁴⁸ [2015] APO 72.

⁴⁹ Ibid at [89].

⁵⁰ *Evolva SA* [2017] APO 57.

⁵¹ [2021] FCA 970 at [145]-[146].

56. The Opponent's submitted that claim 1 encompasses an indefinite number of herbicidal compounds because of the possible substituents on the R⁴ group of the (tetraalkyl)ammonium hydroxide by the definition of alkyl. They submitted that no data is given in Table III⁵² for a herbicidal composition where R⁴ is substituted such as for the choline hydroxide/2,4-D product, instead, data is only produced for the tetraethylammonium salt (1b) and it is not possible to make any conclusions, in particular concerning whether other members of the class would share reduced volatility, from this single data point.
57. Mr Hay was of the view that the experimental results did not show any difference between the compounds of the invention and the tetramethylammonium salt of 2,4-D and the triclopyr salt of 2,4-D which do not fall within the scope of the claims in terms of both their herbicidal effect and volatility.⁵³ Hay went on to identify that several of the examples in table II showed better herbicidal activity than the choline salt of 2,4-D.⁵⁴
58. I do not consider this evidence to be persuasive that tetraalkyl ammonium salts of 2,4-D with alkyl substituents are less volatility and have reduced herbicidal activity. The examples provide an enablement and are at least comparable in activity to the known salts. That is, I do not consider this evidence to support an allegation that it is not plausible to work the invention across the scope of the claims.
59. The Opponent did not argue an undue burden would be faced by the PSA in carrying out the invention.
60. I am not satisfied this ground of opposition has been made out.

Section 40(3)

61. The amendments brought about by Raising the Bar introduced the following piece of legislation under s 40 (3):
- “The claim or claims must be...supported by matter disclosed in the specification.”
62. Burley J discussed the law of support in MSD. His honour accepted the rationale outlined in the CSR decision.⁵⁵
63. In CSR the delegate provided a three-step approach:
- (1) construe the claims to determine the scope of the invention as claimed,
 - (2) construe the description to determine the technical contribution to the art, and
 - (3) decide whether the claims are supported by the technical contribution to the art.⁵⁶
64. The technical contribution may be a general principle:

⁵² Page 13.

⁵³ Hay #1 at [224].

⁵⁴ Hay #1 at [225]-[226].

⁵⁵ [2020] FCA 1477 at [546].

⁵⁶ [2015] APO 72 at [110].

“if [the patentee] has disclosed a beneficial property which is common to the class, [the patentee] will be entitled to a patent for all products of that class (assuming them to be new) even though [the patentee] has not himself made more than one or two of them.”⁵⁷

65. I have construed the claims and description above. The Opponent alleged a lack of support for the discrepancy between the references to (tetraalkyl)ammonium hydroxide in claim 1 and *N*-((C₁-C₁₆)Alkyl or arylalkyl)tri((C₁-C₁₆)alkyl)ammonium hydroxide in the description bridging page 3 and 4. This was a similar submission to that made for clarity. I do not consider this definition on page 3-4 to be limiting on the scope of the claims or lead to a serious inconsistency between the claims and the description. I do not consider this to give rise to a lack of support.
66. The Opponent also submitted that claims 12 and 15, which relate to a method of controlling undesirable vegetation using either an effective amount of the herbicidal compound or composition comprising an effective amount of the compound are not supported because table II showed that the choline salt of 2,4-D appear to be less effective compared to the commercial dimethylamine salt.⁵⁸ The Opponent argued that claims do not define the operating conditions for this method to give product that is “at least” as active as the commercial product but less volatile. The Opponent went on to argue that the Opposed specification does not teach a general principle of application that can support the breadth of the claim. The Applicant responded to this by pointing out how the invention works, 2,4-D is the active herbicide and the function of the quaternary amine is to reduce volatility by being permanently charged.⁵⁹
67. The Opponent’s construction of the “at least as active” appears to ignore the issue of drift and volatility and the function of the quaternary amine, and the context of application being directed to broad spectrum herbicides. I do not consider there is no contribution here when the issue of drift and volatility is considered. Consequently, I do not consider there to be a lack of support.
68. This ground of opposition has not been made out.

Utility

69. It is a requirement of paragraph 18(1)(c) of the *Act* that the invention, so far as claimed in any claim, must be useful:

Subject to subsection (2), an invention is a patentable invention for the purposes of a standard patent if the invention, so far as claimed in any claim: ...
(c) is useful.

70. The issue of utility was considered by the Full Court of the Federal Court in *H Lundbeck A/S v Alphapharm Pty Ltd*.⁶⁰ Emmett J stated:

“A claim is bad if it covers means that will not produce the desired result, even if a skilled person would know which means to avoid. That is to say, everything that is

⁵⁷ *Biogen* [1997] RPC 1 at 49 per Lord Hoffman.

⁵⁸ *Hay #1* at [235].

⁵⁹ *Wright #1* at [68]; *Pearson #1* at [38].

⁶⁰ [2009] FCAFC 70, 81 IPR228.

within the scope of a claim must be useful, otherwise the claim will fail for inutility.”⁶¹

71. In *Apotex Pty Ltd v AstraZeneca AB (No 4)*,⁶² Jagot J pointed out that lack of utility requires evidence, not just speculation:

“Ultimately, an asserted lack of utility must be established by appropriate evidence, not by mere speculation that the invention will not work or meet the promise set out in the specification.”⁶³

72. An overview of utility, including areas for consideration, is provided by Nicholas J in *Apotex Pty Ltd v Warner-Lambert Company LLC (No 2)*⁶⁴. The applicant noted his honour’s statement:

“...much depends upon the proper construction of the claim. Claims are not to be read through the eyes of a skilled addressee purposefully seeking to perform the claimed invention in a manner that would not provide a useful result: see *Washex Machinery Corporation v Roy Burton & Co Pty Ltd* (1975) 49 ALJR 12 at 19. Nor should claims be construed in a manner that the skilled addressee would appreciate would lead to unworkability if there is another construction that is equally open that avoids that result: *Electric & Musical Industries Ltd v Lissen Ltd* (1938) 56 RPC 23 at 39; *Rehm Pty Ltd v Websters Security Systems (International) Pty Ltd* (1988) 81 ALR 79 at 99.”⁶⁵

73. Furthermore, his honour stated:

“A claim may have utility even if a promised advantage cannot be achieved in all cases or with the same degree of success: *Rescare Ltd v Anaesthetic Supplies Pty Ltd* (1992) 25 IPR 119 at 142-143 (Gummow J) and *Sanofi-Aventis Australia Pty Ltd v Apotex Pty Ltd (No 3)* (2011) 92 IPR 320 at [245], point 8 (Jagot J). Thus, if a claimed method of treatment for nausea was effective in a substantial proportion of patients experiencing nausea, the claim would not be invalid merely because a small proportion of patients experiencing nausea did not respond to the treatment. This is because the skilled addressee reading the specification would not expect (assuming he or she is not told otherwise) that the claimed treatment will be an effective treatment for every patient suffering nausea resulting from every conceivable condition.”⁶⁶

74. In *Esco Corporation v Ronneby Road Pty Ltd*⁶⁷ the Full Federal Court accepted that the starting point is to recognise that the utility depends upon whether, by following the teaching of the patent, the result claimed is produced and that process requires following the teaching of the complete specification to isolate the promise of the invention and whether that results in the promise being produced.⁶⁸

⁶¹ Ibid at [81]; [247].

⁶² [2013] FCA 162; (2013) 100 IPR 285.

⁶³ Ibid at [352].

⁶⁴ (2016) 122 IPR 17 at [164] *et seq.*

⁶⁵ Ibid at [168].

⁶⁶ Ibid at [170].

⁶⁷ [2018] FCAFC 46

⁶⁸ Ibid at [233] and [279].

75. The Opponent has put forward a similar case for lack of utility as that run in the parent and again focused on the use of language such as “at least as active” and “at least comparable”.⁶⁹ In the parent, the delegate considered the use of the phrase “it would be desirable” before the herbicide is said to be “at least as active”. There the delegate was not satisfied that the examples in table II, as again argued by the opponent, demonstrated a failure of the compounds to achieve the promise. No further evidence has compelled me to come to a different conclusion in this case. 2,4-D is the herbicidal part of the reaction product and still appears to be carrying out that function.
76. Furthermore, the evidence establishes the fact that a quaternary amine is permanently charged, and it is logical that the permanent charge contributes to it being less volatile⁷⁰ and the reduction in volatility is also part of the promise. What is meant by less volatile is qualified by stating that it would not damage nearby sensitive crops.⁷¹
77. I do not see any reason to depart from the conclusions drawn by the delegate in the opposition on the parent. This ground is unsuccessful.

Novelty

78. It is a requirement of subsection 18(1) of the *Act* that the invention, so far as claimed in any claim, is novel. Subsection 7(1) states that an invention is considered novel unless it is not novel compared to prior art information. The *Act* then states that prior art information can be information made publicly available in a single document.⁷²
79. The prior art base under Subsection 7(1) includes information contained in a published specification filed in respect of a complete application where: the information is, or were to be, the subject of a claim of the specification, the claim has, or would have, a priority date earlier than that of the claim under consideration; and the specification was published after the priority date of the claim under consideration; and the information was contained in the specification on its filing date and when it was published. This is referred to in parlance as a “whole of contents” citation. In addition, in order to raise a “whole of contents” citation, there is an onus on the opponent to draft a notional claim.⁷³ However, the test for novelty remains the same and the level of disclosure in the citation is same. The Opposed application claims a priority date of 30 September 2014. The claimed priority date was not in dispute.
80. The well-established test for lack of novelty is the reverse infringement test. The classic formulation of this test is that given by Aickin J in *Meyers Taylor Pty Ltd v Vicarr Industries Ltd*:

"The basic test for anticipation or want of novelty is the same as that for infringement and generally one can properly ask oneself whether the alleged anticipation would, if the patent were valid, constitute an infringement".⁷⁴

⁶⁹ See *Nufarm Australia Limited v Dow Agrosciences, LLC* [2020] APO 10 at [197]-[203].

⁷⁰ Wright #1 at [68]; Pearson #1 at [38].

⁷¹ Page 2 lines 1-4.

⁷² ss 7(1)(a).

⁷³ *Danisco A/S v Novozymes A/S (No 2)* [2011] FCA 282; (2011) 91 IPR 209 at [178]; this approach was not rejected on appeal *Novozymes A/S v Danisco A/S* [2013] FCAFC at [205].

⁷⁴ [1977] HCA 19; 137 CLR 228 at 235.

81. This test is satisfied if the alleged anticipation discloses all the essential features of the invention as claimed.⁷⁵ In reviewing a citation one must look at the citation to determine what it tells the skilled reader to do. Determining what is taught or disclosed can require some treatment.
82. Australian courts have often cited with approval the words of the UK Court of Appeal in the *General Tire*⁷⁶ case which provides guidance on assessing a disclosure for novelty. It is useful to look at that discussion in full from pages 485-486:

“If the prior inventor's publication contains a clear description of, or clear instructions to do or make, something that would infringe the patentee's claim if carried out after the grant of the patentee's patent, the patentee's claim will have been shown to lack the necessary novelty, that is to say, it will have been anticipated. The prior inventor, however, and the patentee may have approached the same device from different starting points and may for this reason, or it may be for other reasons, have so described their devices that it cannot be immediately discerned from a reading of the language which they have respectively used that they have discovered in truth the same device; but if carrying out the directions contained in the prior inventor's publication will inevitably result in something being made or done which, if the patentee's patent were valid, would constitute an infringement of the patentee's claim, this circumstance demonstrates that the patentee's claim has in fact been anticipated.

If, on the other hand, the prior publication contains a direction which is capable of being carried out in a manner which would infringe the patentee's claim, but would be at least as likely to be carried out in a way which would not do so, the patentee's claim will not have been anticipated, although it may fail on the ground of obviousness. To anticipate the patentee's claim the prior publication must contain clear and unmistakable directions to do what the patentee claims to have invented. A signpost, however clear, upon the road to the patentee's invention will not suffice. The prior inventor must be clearly shown to have planted his flag at the precise destination before the patentee.”⁷⁷ (citations omitted).

83. In *General Tire*, the requirement for clear and unmistakable directions in the prior publication is well known. However, it also states that if carrying out the directions in the prior art leads inevitably to doing something within the scope of the claim *in suit*, then there will be a lack of novelty. This inevitable consequence of carrying out the directions in the prior art occurred in *Novozymes v Danisco*⁷⁸ with Jessop J providing the following guidance with Yates J and Greenwood J concurring:

“In my view, the *General Tire* approach, if taken at all, may be taken only with respect to the whole of any claim asserted to have been anticipated. The “precise destination” at which the flag must have been planted is one which includes every integer of the claim. The approach cannot, in my view, be taken for some integers only, leaving others to be dealt with by reference to the understanding of the skilled addressee. In the present context, what this means is that, to the extent that the

⁷⁵ *Nicaró Holdings Pty Ltd v Martin Engineering Co* [1990] FCA 40; (1990) 91 ALR 513 at 517.

⁷⁶ *The General Tire & Rubber Company v. The Firestone Tyre and Rubber Company Limited and others* [1972] RPC 457.

⁷⁷ [1972] RPC 457 at 486.

⁷⁸ *Novozymes A/S v Danisco A/S* [2013] FCAFC

appellants' case is based on *General Tire*, it is not sufficient that they be able to point to passages in the Novo patent from which it would appear to the skilled addressee that inactivation was contemplated or intended by the earlier inventors. It is necessary that they show that, if Example 20 were worked as directed, it would inevitably, as a matter of hard fact, have involved inactivation of the enzyme (to the standard set up under Claims 1 and 7 of the patent in suit as identified by the primary Judge) at the baking stage.”⁷⁹

84. With that in mind I will now look at the disclosures of the prior art.

The Opponent cited four documents for the ground of lack of novelty. The first one is listed below:

D2: JP 51-1 06728⁸⁰

85. D2 was published in 1976 and was also cited by the Opponent in the Opposition on the parent application.⁸¹ The title of D2 is “A herbicide containing phenoxy compounds and cholines”. Cholines is used as a plural in the title and again in the first paragraph. 2,4-D, which is the herbicide in the current claim, is a phenoxy compound and mentioned on page 2 of D2 where it is denoted at DCP.

86. There was no dispute that choline hydroxide is within the scope of the (tetraalkyl)ammonium hydroxide and when reacted with 2,4-D the claims would be infringed. Choline is a quaternary amine where R¹, R² and R³ are methyl and R⁴ is -CH₂CH₂OH—this is an alkyl group that has been “substituted” with an hydroxyl group. The dispute here relates only to whether D2 teaches the use of choline *hydroxide*. The “cholines” in D2 are discussed as:

“The cholines of the present invention are choline or choline salts. The choline salts of the present invention are for example salts of choline with organic acids such as oxalic acid and ascorbic acid and the like and salts of choline with inorganic acid such as phosphoric acid and carbonic acid and the like.”⁸²

87. I note that choline hydroxide is a choline salt. D2 also states:

Choline is normally widely present in living things, that is, in the bodies of plants and animals, and is an important substance in lipid metabolism and so forth, and is a very stable substance of very low toxicity in plants and animals.”⁸³

88. With further detail on the ratios to be used provided as:

The molar ratio of phenoxy compounds and cholines in the present invention is 1:1 to 1:1.2 and preferably 1:1 to 1:1.1. If the ratio of cholines to phenoxy compounds is less than 1, there is no significant difference from the use of phenoxy compounds alone. Furthermore, if 1.2 is exceeded, the herbicide becomes highly alkaline and the risk of harm increases.

⁷⁹ *Novozymes A/S v Danisco A/S* [2013] FCAFC at [145].

⁸⁰ Exhibit PMH-9 – translation

⁸¹ *Nufarm Australia Limited v Dow Agrosciences, LLC* [2020] APO 10 at [97] *et seq.*

⁸² D2 page 3.

⁸³ *Ibid.*

89. D2 also describes an example with specified amounts of 2,4-D (referred to as DCP) and “choline”⁸⁴:

DCP	40 parts by weight
Choline	22 parts by weight
Surfactant	3 parts by weight
Water	35 parts by weight

90. The surfactant, *Sorvol 8043*, is used.⁸⁵ The above product is used as “Herbicide of practical embodiment (1)” in further examples on crops (see table 2 and embodiments 1-4). In the Opposition on the parent the delegate discussed choline⁸⁶ the issue being that choline on its own is a cation and so it must have a counter ion of some kind. Whether or not that counter ion would be hydroxide in D2 is ambiguous based on what is disclosed in the translation. The delegate in the Opposition to the parent acknowledged this ambiguity, however, did not need to decide the matter as D2 lacked the isolation step present in the claims of the parent.⁸⁷

91. I have found the various textbook descriptions of choline and choline CAS numbers unhelpful in this case.

92. Mr Hay stated that “it is my view that the reference to choline in D2 means ‘choline hydroxide’” and discussed the same documents referring to choline, choline base and choline hydroxide as in the parent opposition.⁸⁸

93. Mr Hay also checked the mole ratios in the specific embodiments against the preferred ratios discussed in D2.⁸⁹ I have reproduced that below:

Choline “Salt”	MW	Weight in grams	mol	MOLAR RATIO of DCP:choline
choline hydroxide	121.18	22	0.1815	1.0
choline chloride	139.62	22	0.1576	0.9
choline bicarbonate	165.19	22	0.1332	0.7
choline phosphate	182.13	22	0.1208	0.7
choline oxalate	193.197	22	0.1139	0.6
choline salicylate	241.28	22	0.0912	0.5
choline bitartrate	253.25	22	0.0869	0.5
choline dihydrogen citrate	295.29	22	0.0745	0.4
choline gluconate	299.33	22	0.0735	0.4
choline ascorbate	368.31	22	0.0597	0.3

⁸⁴ D2 page 6

⁸⁵ Ibid.

⁸⁶ *Nufarm Australia Limited v Dow Agrosciences, LLC* [2020] APO 10 at [102] *et seq.*

⁸⁷ *Nufarm Australia Limited v Dow Agrosciences, LLC* [2020] APO 10 at [110]

⁸⁸ Hay #1 at [130].

⁸⁹ Hay #1 at [131].

94. Dr Wright carried out his own calculations based on a solution of 45% choline hydroxide and came to a different conclusion. He did this because choline hydroxide would not be used at 100%⁹⁰ and would be used in a solution. I do not consider that the disclosure of using 22 parts by weight of choline in D2 suggests one should include the weight of any solvent or water when determining the mole ratio.

95. Mr Hay also instructed Dr McKerrow to conduct a series of experiments where choline hydroxide, choline chloride and choline bitartrate is reacted with 2,4-D to compare the products. Indeed, if the hydroxide serves the purpose of deprotonating the acid to form the product, then this will be confirmed. What Dr McKerrow's experiments showed was:

“Dr McKerrow's experiments showed that 2,4-D acid reacts with choline hydroxide in equimolar proportions immediately to form a clear aqueous solution, with the evolution of heat, to form a solution of pH 6.9. This is consistent with the behavior reported in D2 for the choline at page 3, line 22 and lines 36 to 39.

Dr McKerrow's experiments show that 2,4-D acid reacts with choline hydroxide in a molar ratio of 1:1.3 to form a clear aqueous solution, with the evolution of heat, to form a solution of pH 12.7. This is consistent with the behavior reported in D2 for the choline (see page 3, line 22, lines 31 to 32 and lines 36 to 39).

Dr McKerrow's experiments show that a 2,4-D acid does not react with a choline salt of an inorganic acid (choline chloride) or a choline salt of an organic acid (choline bitartrate) in either equimolar proportion or in molar ratio 1:1.3. Specifically, 2,4-D acid does not dissolve and there was no evolution of heat.”⁹¹

96. The Applicant responded to these experiments by saying that this was “supplementing” the disclosure of D2, including the reliance on further definitions of choline. They argued that this did not amount to clear and unmistakable directions.

97. In my view, D2 does require some understanding that an acid base reaction is taking place between the phenoxy acid and whatever choline is used. Dr Wright acknowledged this and stated:

“PMH-9 only describes 2,4-D choline compositions prepared using choline salts, including choline chloride and choline acetate, that act as weak bases compared with choline hydroxide. Choline hydroxide, which acts as a strong base, is able to abstract essentially all of the free hydrogen ions associated with 2,4-D acid to form 2,4-D choline. In contrast, the choline salts described in PMH-9 act as a weak base and have a lower capacity to abstract free hydrogen ions from 2,4-D acid. This would result in a greater proportion of 2,4-D acid in the final composition of PMH-9 compared with a composition prepared from the reaction product of 2,4-D acid and choline hydroxide. In turn, the greater proportion of 2,4-D acid would lead to a composition with greater volatility.”⁹²

98. Dr Wright acknowledges the use of the choline salts that are not choline hydroxide would not result in much of a reaction product between the 2,4-D and choline and instead would just give a

⁹⁰ Wright at [123].

⁹¹ Hay #1 at [139]-[141].

⁹² Wright #1 at [106]

mixture of salts. D2 does suggest that the reaction takes place, and the formation of a 2,4-D choline salt is taught with:

It is inferred that choline salts of phenoxy substituted lower aliphatic acids are formed when phenoxy substituted lower aliphatic acids are mixed with choline.⁹³

99. When the person skilled in the art sets out to follow the teachings of D2 they would face the question of what form of “choline” or choline salt is to be used. In my view, molar ratios are part of what a skilled person would understand from the disclosure of D2 and points to the use of choline hydroxide. I also consider that by inferring that choline salts of the phenoxy substituted carboxylic acid are formed D2 itself also points to the use of choline hydroxide.

100. If a different choline salt was used, then it would seem that in order for the product to be water soluble the person skilled in the art would also have to start with a salt of 2,4-D:

As the salts of the phenoxy substituted lower aliphatic acids and of choline are both highly water soluble, the herbicide envisaged by the present invention can be used a water soluble chemical when salts of both components are used.”⁹⁴

101. None of the experts suggested that a salt of 2,4-D was used in the example of D2 which would be required if a non-basic salt of choline is used.

102. Given that the molar ratios by weight suggest the choline hydroxide is used in D2, the fact that the choline hydroxide is basic and can deprotonate the acid group on 2,4-D to form the phenoxy acid salt of choline, which is “inferred” in D2, I am of the view that choline hydroxide is used in the practical embodiments of D2. The clear and unmistakable directions of D2 are to use choline hydroxide in the practical embodiment and react it with 2,4-D. Consequently claims 1-4, 7-8, 10-12 are not novel when compared to D2.

103. D2 only discusses choline salts, does not mention adding a further herbicide and does not mention tolerance or resistance to 2,4-D. Therefore claims 5-6, 9, 14 and 15 are not anticipated by D2.

D3: GB 1339315

104. D3 was cited for novelty in the Opposition on the parent⁹⁵ and the disclosure does relate to improved non-volatile herbicidal composition and the examples use 2,4-D. However, the amines used in the examples are secondary amines including dimethylamine, diethanolamine, diethylamine and the primary amine: monoethanolamine. D3 does state that the salts:

“...are those which after admixture with one or more other salts, possess the property of being liquid when measured at 20°C. ...such salts may individually be liquid at 20°C and may be chosen from the primary amine salts... secondary amine salts... tertiary amine salts... and as well, the quaternary ammonium salts ... Other salts which may be employed include the alkali metal salts and the salts formed by the reaction of other bases such as ammonium hydroxide, with the appropriate acids.”⁹⁶

⁹³ D2 page 3.

⁹⁴ Ibid.

⁹⁵ *Nufarm Australia Limited v Dow Agrosciences, LLC* [2020] APO 10 at [89] *et seq.*

⁹⁶ D3, page 2, lines 87-113.

105. The substituents of the amines/ammonium salts may be alkyl, alkoxy, or hydroxy substituted alkyl.

106. In the Opposition on the parent the delegate acknowledged that the experts all agreed choline could be considered within the scope of that definition of the amine, but stated that that disclosure of quaternary amines forms part of the intellectual content of D3 rather than what is considered for novelty purposes.⁹⁷ The Opponent respectfully submitted that this was wrong and involved a misapplication of that distinction. The Opponent said that there are three possible substituents (i.e. alkyl, alkoxy and hydroxyalkyl) and it would only be a selection of 81 different possible compounds, albeit not taking into account the length of the alkyl chain or the position of the hydroxy group (on hydroxyalkyl). As such, the Opponent submitted that the disclosure in D3 was sufficiently specific to deprive the claims of novelty.

107. The Applicant provided the following quote in relation to broad prior disclosures of chemical compounds by Jacob LJ:⁹⁸

.. An old question and answer runs as follows: "Where does a wise man hide a leaf? In a forest." It is, at least faintly, ridiculous to say that a particular leaf has been made available to you by telling you that it is in Sherwood Forest. Once identified, you can of course see it. But if not identified you know only the generality: that Sherwood Forest has millions of leaves.

108. It would appear that a tetraalkylammonium hydroxide is the leaf and D3 is Sherwood Forest in this scenario. In my view D3 is not quite Sherwood Forest but I consider the disclosure to be more of a mention of the possibility of quaternary ammonium salts and far from clear and unmistakable directions. The worked examples do not use quaternary ammonium salts and there are no further directions on using them or what R groups to choose.

109. I do not consider that the mention of quaternary ammonium salts in the above passage is clear and unmistakable directions to use them. There are worked examples which do not use quaternary ammonium salts and there are no further directions on using them or what R groups to choose.

110. D3 is not prejudicial to the novelty of the Opposed claims.

D28: GB 1,056,235

111. D28 was also cited in the parent opposition⁹⁹ and it relates to the use of benzonitrile, as opposed to phenoxy carboxylic acid, herbicides. The Opponent argued that the evidence in this opposition establishes the D28 does clearly teach the production of a salt of 2,4-D with a tetraalkylammonium hydroxide within the scope of the current claims. D28 does disclose the use of the benzonitrile with a quaternary ammonium bromide or chloride and with a quaternary ammonium hydroxide.¹⁰⁰

112. Other than the benzonitriles, D28 does say that phenoxyalkanoic acids can be used and states:

⁹⁷ *Nufarm Australia Limited v Dow Agrosciences, LLC* [2020] APO 10 at [94]

⁹⁸ *Dr Reddy's Laboratories(UK) Ltd v Eli Lilly and Co Ltd* [2010] RPC 9 at [26]

⁹⁹ *Nufarm Australia Limited v Dow Agrosciences, LLC* [2020] APO 10 at [125] *et seq.*

¹⁰⁰ D28, page 4, lines 3-33.

“[p]referred mixtures of the invention contain quaternary ammonium derivatives of known phenoxyalkanoic acids.”¹⁰¹

113. In the example of this the sodium salt of 2,4-D is reacted with tetramethylammonium chloride.¹⁰² This reaction product is then isolated. I note that it could be argued this reaction product, that does not use the hydroxide, would be within the scope of the claims given that the resulting product would be the same.¹⁰³ However, claim 1 clearly states that R⁴ is not methyl. Consequently, this example is clearly outside of the scope of the current claims.
114. The evidence does not establish that D28 teaches the use of any specific tetraalkylammonium hydroxide within the scope of the claims to be reacted with 2,4-D.
115. D28 is not prejudicial to the novelty of the opposed claims.

D24: US 2,900,411

116. D24 was also cited in the Opposition on the parent¹⁰⁴ and it is directed at reacting amines with a plant hormone carboxylic acid to give a water insoluble herbicide. This is achieved by:

“...reacting an aliphatic amine having at least 6 carbon atoms in an aliphatic radical thereof with a plant hormone carboxylic acid to form the salt of these two substances.”¹⁰⁵

117. The large alkyl (aliphatic) groups are used in D24 so that the product is insoluble. The plant hormone used in D24 includes 2,4-D.
118. The delegate in the parent opposition noted that the examples of D24 are directed to the preparation of salts of 2,4-D and phenoxyacetic acid with primary, secondary and tertiary amines and that there is no exemplification of a salt with a quaternary ammonium.¹⁰⁶ The delegate also noted that D24 only provides a general indication that the salts may be prepared in any suitable manner, and for example, “the two substances may be mixed in a solvent and warmed until a homogeneous solution is obtained and then cooled until precipitation of the desired salt is complete, after which it may be filtered and dried.”¹⁰⁷

119. The aliphatic amines in D24 are described as:

“It will be understood that such aliphatic amines include any straight or branched carbon chain, primary, secondary or tertiary aliphatic amines, as well as the quaternary amines or quaternary ammonium compounds, having the requisite number of carbon atoms in the aliphatic radicals thereof. ... Examples of the amines which may be used are: primary amines, such as dodecylamine, tridecyl-amine, tetradecylamine, pentadecylamine, hexadecylamine, heptadecylamine, and octadecylamine; secondary amines, such as didodecylamine and dioctadecylamine;

¹⁰¹ D28, page 4, lines 88-90.

¹⁰² D28 page 5, lines 72-86.

¹⁰³ Hay #2 at [168]-[169].

¹⁰⁴ *Nufarm Australia Limited v Dow Agrosciences, LLC* [2020] APO 10 at [135] *et seq.*

¹⁰⁵ D24, column 2, lines 3-8.

¹⁰⁶ *Nufarm Australia Limited v Dow Agrosciences, LLC* [2020] APO 10 at [138].

¹⁰⁷ D24, column 2, lines 42-45.

tertiary amines, such as tridodecylamine; and quaternary compounds, such as trimethyloctylammonium hydroxide and trimethyldodecylammonium hydroxide.”¹⁰⁸

120. The delegate was of a similar view of this disclosure as that of D3, in that it was only “intellectual content”¹⁰⁹ and the Opponent made a similar argument. In my view this disclosure is similarly not clear and unmistakable directions to use a quaternary ammonium hydroxide and react it with 2,4-D to arrive at the current claims.

121. D28 is not prejudicial to the novelty of the opposed claims.

Inventive Step

122. It is a requirement of subsection 18(1) of the *Act* that the invention, so far as claimed in any claim, involves an inventive step. Subsection 7(2) states that an invention is taken to involve an inventive step unless it would have been obvious to a person skilled in the art in the light of the common general knowledge, considered alone or together with the prior art (subsection 7(3)).

123. The test for whether an invention is obvious is to ask whether it would have been a matter of routine to proceed to the claimed invention. In *Wellcome Foundation Ltd v V.R. Laboratories (Aust.) Pty Ltd*¹¹⁰ Aickin J stated:

"The test is whether the hypothetical addressee faced with the same problem would have taken as a matter of routine whatever steps might have led from the prior art to the invention, whether they be the steps of the inventor or not."

124. In *Alphapharm*,¹¹¹ the High Court endorsed the use of the reformulated "Cripps question":

“Would the notional research group at the relevant date, in all the circumstances, which include a knowledge of all the relevant prior art and of the facts of the nature and success of [the prior art], directly be led as a matter of course to try [the invention], in the expectation that it might well produce a useful alternative to or better drug than [the prior art] or a body useful for any other purpose?”¹¹²

125. This has been elaborated on in the Full Federal Court’s decision *Generic Health Pty Ltd v Bayer Pharma Aktiengesellschaft*:

“We do not think that the plurality in *Alphapharm* were saying that the reformulated Cripps question was the test to be applied in every case. Rather, it is a formulation of the test which will be of assistance in cases, particularly those of a similar nature to *Alphapharm*. The plurality did not reject as an alternative expression of the test the question whether experiments were of a routine character to be tried as a matter of course (*The Wellcome Foundation Limited v VR Laboratories (Aust) Proprietary Limited* (1981) 148 CLR 262, at 280-281, 286, per Aickin J). We do not think there is a divide here in terms of whether an expectation of success is relevant between a test which refers to

¹⁰⁸ D24, column 2, lines 17-33.

¹⁰⁹ *Nufarm Australia Limited v Dow Agrosciences, LLC* [2020] APO 10 at [142].

¹¹⁰ [1981] HCA 12; 148 CLR 262 at 286.

¹¹¹ *Aktiebolaget Hassle v Alphapharm Pty Ltd* [2002] HCA 59; 212 CLR 411.

¹¹² *Alphapharm* at [53].

routine steps to be tried as a matter of course and the reformulated Cripps question. It is difficult to think of a case where an expectation that an experiment might well succeed is not implicit in the characterisation of steps as routine and to be tried as a matter of course.”¹¹³

126. It is clear that this test requires routine steps to be undertaken and that there is an expectation that something or anything useful might come from them. In *Nichia Corporation v Arrow Electronics Australia Pty Ltd*¹¹⁴ (*Nichia*) the Full Federal Court said the expectation does not mean that it is necessary to know or be able to predict that useful result and a useful alternative is one which is useful when compared to the prior art in the field of the invention.¹¹⁵ This was further elaborated on by the Full Federal Court in *Mylan*¹¹⁶:

“The reformulated Cripps question does not require certainty of outcome. It requires that the skilled addressee be directly led as a matter of course to try the claimed invention in the expectation that a particular research path “might well produce” a useful result (*Hässle v Alphapharm* at [53]). It does not require the skilled addressee to know that the steps will produce a useful result.”¹¹⁷

127. I note that more than one thing may be obvious too, and other steps or solutions might be tried first.¹¹⁸

Common general knowledge (CGK)

128. Common general knowledge is the background knowledge and experience available to all those working in the relevant art:

“The notion of common general knowledge itself involves the use of that which is known or used by those in the relevant trade. It forms the background knowledge and experience which is available to all in the trade in considering the making of new products, or the making of improvements in old, and it must be treated as being used by an individual as a general body of knowledge.”¹¹⁹

129. However, it is not enough that information is recorded in a document, even if that document is widely circulated – it is only part of the common general knowledge when it is generally known and accepted:

“... information does not constitute common general knowledge merely because it might be found, for example, in a journal, even if widely read by persons in the art ... Reference in this regard is made to the words of Luxmoore J in *British Acoustic Films* (1936) 53 RPC 221 at 250, cited by Lehane J in *Aktiebolaget Hässle v Alphapharm Pty Ltd* (1999) 44 IPR 593; [1999] FCA 628 at 605 [39]:

¹¹³ [2014] FCAFC 73 at [71].

¹¹⁴ [2019] FCAFC 2

¹¹⁵ *Ibid* at [80]; [89]; [99].

¹¹⁶ *Mylan Health Pty Ltd (formerly BGP Products Pty Ltd) v Sun Pharma ANZ Pty Ltd (formerly Ranbaxy Australia Pty Ltd)* [2020] FCAFC 116.

¹¹⁷ *Ibid* at [502].

¹¹⁸ *Ibid* at [94].

¹¹⁹ *Minnesota Mining & Manufacturing Co v Beiersdorf (Australia) Ltd* [1980] HCA 9; 1 A IPR 231 at 255-256.

In my judgment it is not sufficient to prove common general knowledge that a particular disclosure is made in an article, or series of articles, in a scientific journal, no matter how wide the circulation of that journal may be, in the absence of any evidence that the disclosure is accepted generally by those who are engaged in the art to which the disclosure relates. A piece of particular knowledge as disclosed in a scientific paper does not become common general knowledge merely because it is widely read, and still less because it is widely circulated. Such a piece of knowledge only becomes general knowledge when it is generally known and accepted without question by the bulk of those who are engaged in the particular art; in other words, when it becomes part of their common stock of knowledge relating to the art.”¹²⁰

130. The delegate in the parent opposition determined the following information was CGK:

- 2,4-D was a commonly used herbicide in both cropping and non-cropping situations. Aerial, handheld and ground methods of application were used.
- 2,4-D was initially manufactured as a relatively insoluble free acid, and then converted into a more water miscible form for supply. Two common approaches were used: reaction of the 2,4-D acid with an alcohol to form an ester or formation of a water soluble salt.
- Sprayed herbicides can drift as droplets, vapours and/or particles.
- Ester forms of 2,4-D exhibited volatility problems, and extra care was needed to prevent off-target movement to nearby sensitive plants.
- Amine salts of 2,4-D had reduced volatility relative to esters.
- Volatility of compounds, at least within a class of compounds, tends to reduce with increasing molecular weight.
- It was possible to induce tolerance or resistance to 2,4-D in crops by genetic manipulation or selective breeding.
- Quaternary ammonium salts were readily available and commonly used as disinfectants, surfactants, fabric softeners and anti-static agents. Synthesis and properties of these compounds was well known.¹²¹

131. The Opponent appeared to accept the delegate’s above findings. However, they sought to include a further five points. These, in my interpretation, are essentially an expansion on the delegate’s points above. First, that volatility tends to decrease with increasing molecular weight and that applies to amine series’ such as primary<secondary<tertiary<quaternary.¹²² Hay makes the statement that:

“On the simplest case by case analysis, quaternary ammonium salts ‘unequivocally have higher molecular weights than primary, secondary or even tertiary amine salts.’”¹²³

132. I take Mr Hay to be referring to a series with the same R groups, such as methylamine, dimethylamine, trimethylamine and tetramethylamine and I accept that they do have increasing molecular weight. However, molecular weight can also be increased by increasing the length the

¹²⁰ *Ranbaxy Laboratories Limited v AstraZeneca AB* [2013] FCA 368; 101 IPR 11 at [217].

¹²¹ *Nufarm Australia Limited v Dow Agrosciences, LLC* [2020] APO 10 at [154].

¹²² Hay #2 at [87].

¹²³ Hay #2 at [87].

one R group on a primary amine, such as methylamine, ethylamine, propylamine. I also would note that the four R groups attached to the amines in claim 1 are not identical, R⁴ is not methyl. I consider that quaternary amine salts are known and that molecular weight generally, but not always affects volatility. However, I will consider this evidence further when addressing the routine steps of the PSA when faced with the problem.

133. The Opponent also submitted that quaternary amines themselves were used as herbicides, citing some evidence in reply by Hay.¹²⁴ I do not see how these unrelated herbicides are relevant to the current case as common general knowledge. They are not used in the context of a counter ion and I merely take this as evidence that quaternary ammonium salts on their own were known.

134. I accept the Opponent's submissions that the synthesis of quaternary ammonium hydroxides was known and that they were considered basic.¹²⁵

135. The *Cripps* question begins with the formulation of the problem, and I note that in *AstraZeneca AB v Apotex Pty Ltd*¹²⁶ (*AstraZeneca*) the court held that it is not permissible to incorporate information that is not available to the person skilled in formulating the problem in the art either as common general knowledge or information available under subsection 7(3).

136. It is clear that the problem addressed by both the currently opposed application and the parent is the same. The delegate in the Opposition to the parent found:

“the problem solved by the specification is the production (and use) of herbicidal carboxylic acids, particularly 2,4-D, derivatives with reduced volatility as described and exemplified in the specification.”¹²⁷

137. The Opponent submitted that this characterisation of the problem is clearly incorrect, and that it relates to the solution. The opponent's submissions focused on the meaning of volatility and its context in aqueous agricultural solutions sprayed on plants and soils. They went on to say that the problem is unacceptable damage to sensitive plants which is a consequence of volatility, not the volatility *per se*. They argued that this is a case of cause and effect. I accept that the effect of volatility is vapour drift which damages neighbouring crops, however, I do not see how the cause, which is volatility, is not part of the problem.

138. Notwithstanding the different construction of the problem the current claims are directed towards quaternary ammonium salts and the Opponent argued that a quaternary salt would be an obvious “less” volatile solution. In the Opposition to the parent the delegate found:

“I conclude from the evidence that a skilled person would have understood that amine salts would provide a less volatile form of 2,4-D, and while such a person undertaking an investigation of all amine salts of 2,4-D would not have had any technical reason to actively exclude quaternary ammonium salts, those salts would not have been at the front of the skilled person's mind. While of course a skilled person may be directly led to multiple obvious solutions to a problem, I think it is clear from Mr Hay's evidence that quaternary ammonium salts are not among the solutions to which a person would be directly led. To my mind there is a distinction to be made between those things that would

¹²⁴ Hay #2 at [49] and [100].

¹²⁵ Hay #1 [49].

¹²⁶ [2014] FCAFC 99; 107 IPR 177.

¹²⁷ *Nufarm Australia Limited v Dow Agrosciences, LLC* [2020] APO 10 at [161].

be investigated as a matter of routine, and those that would not be excluded from a research project, which would seem to fall more appropriately under the umbrella of ‘obvious to try’”

139. The Opponent has argued that the delegate did not have proper regard to the authorities that say there can be multiple solutions. The Opponent’s argument included that moving to a quaternary amine increases the molecular weight. I accept that in a series such as methylamine, dimethylamine, trimethylamine and tetramethylamine molecular weight increases, but it is also true of increasing the length the one R group on a primary amine, such as methylamine, ethylamine, propylamine. The current claims, and solution is the use of a quaternary amine and this differs from the prior art in that it is permanently charged. Dr Wright explained:

“I do not consider the general trend of amine volatility decreasing with increasing molecular weight, which may apply to primary, secondary and tertiary amine compounds per se, to be relevant in respect of quaternary ammonium compounds. In the context of volatility, quaternary ammonium compounds represent a different class of compounds to primary, secondary or tertiary amines. Quaternary ammonium compounds have a permanent ionic nature—primary, secondary and tertiary amines do not. In contrast to primary, secondary and tertiary amines, quaternary ammonium compounds are not capable of donating a proton to another compound. Specifically, in respect of 2,4-D, quaternary ammonium compounds are not capable of donating a proton to the 2,4-D anion to form the more volatile 2,4-D acid. The reduced volatility observed with higher molecular weight primary, secondary and tertiary amines was therefore not relevant for quaternary ammonium compounds, such that it would have been clear at the Relevant Date that the volatility of 2,4-D salts could be reduced by using quaternary ammonium compounds. Even if they had a higher molecular weight (which I have shown in the preceding paragraph is not a foregone conclusion either).”¹²⁸

140. I accept Dr Wright’s evidence that the charged nature of quaternary amines would make a salt that is different to that of a primary, secondary or tertiary amine and would require different preparation. Furthermore, in terms of carrying out the steps of increasing molecular weight of the amine Dr Wright points out:

“I note that the secondary and tertiary amines Hay identifies at paragraph 64 that he would have immediately considered using include DEA, TEA and TIPA (with molecular weights of 105 g/mol, 149 g/mol, 191 g/mol, respectively). These amines all have a higher molecular weight than two of the exemplified quaternary ammonium cations from the Patent Application including the tetramethylammonium and choline (molecular weights of 74 g/mol and 104 g/mol, respectively). So, if quaternary ammonium salts do not have higher molecular weights than primary, secondary or even tertiary amine salts, then it could not have been clear at the Relevant Date that the volatility of 2,4-D salts could be reduced by using quaternary ammonium compounds.”¹²⁹

141. Given this, I do not consider the use of quaternary amines is an obvious step that the person skilled in the art would take when solving the problem of volatility (that causes the effect of damage to nearby crops).

¹²⁸ Wright #1 at [68].

¹²⁹ Wright #1 at [67].

142. Therefore, the ground of a lack of inventive step in light of the common general knowledge alone has not been established for the Opposed claims.

Inventive Step in light of 7(3) documents

143. At the hearing the Opponent pressed inventive step when the CGK is combined with D2, D3, D28 and D24.

144. D2 has been discussed above for novelty and I have found that claims 1-4, 7-8, 10-12 are not novel when compared to D2. I accept that inventive step is a different test. In the Opposition to the parent the delegate found that:

“In my view, a skilled person seeking a derivative of 2,4-D with reduced volatility would *prima facie* not consider D2 a reasonable starting point given its silence with respect to the volatility of the herbicides disclosed. Further, while Dr Hay indicated that the reported absence of chemical damage to maize and wheat crops “must equate to the composition of D2 having a reduced volatility” [citation omitted] there is no evidence that a person considering this document absent knowledge of the claimed solution would have considered this to be the case or considered D2 a reasonable starting point.”¹³⁰

145. The delegate also noted that Mr Hay had prior knowledge of the invention before giving his evidence on this point.¹³¹ In the current case Mr Hay’s evidence is also tainted as he had already made the declarations on the parent.¹³²

146. In my view D2 is available to the person skilled in the art under s 7(3) and it teaches the reaction of 2,4-D with choline hydroxide to give a herbicide. Neither the currently Opposed application or D2 demonstrate any barrier that needed to be crossed or some difficulty to overcome¹³³ to arrive at the current claim. Instead, it appears that in merely following D2 the PSA would arrive at the current claims 1-4, 7-8, 10-12 as I have found for novelty.¹³⁴ It follows that claims 1-4, 7-8, 10-12 lack an inventive step.

147. Claims 5-6, 9 and 14-15 are directed to different quaternary amines (where R⁴ is defined and does not include choline), additional herbicides and methods of controlling resistance or tolerance. Mr Hay did comment on these claims in his background¹³⁵ but when comparing them to D2 he only stated that the use of two or more herbicides is simply not new and did not go into further detail with regards to obviousness.¹³⁶ In his background Hay did discuss the use of more than one herbicide in formulations including in the product Tillmaster.¹³⁷ However, it appears that this was more common when overcoming resistance¹³⁸ and there is no evidence for it when there are nearby sensitive crops and volatility might be a problem. Therefore it has not been established that claims 5-6, 9 and 14-15 lack an inventive step when compared to D2.

¹³⁰ *Nufarm Australia Limited v Dow Agrosciences, LLC* [2020] APO 10 at [175].

¹³¹ *Ibid* at [176].

¹³² Hay #1 at [2].

¹³³ *R D Werner & Co Inc v Bailey Aluminium Products Pty Ltd* (1989) 25 FCR 565.

¹³⁴ Hay #1 at [131] *et seq.*

¹³⁵ Hay #1 at [82] *et seq.*

¹³⁶ Hay #1 at [176].

¹³⁷ Hay #1 at [99].

¹³⁸ Hay #1 at [100].

148.D3 is directed towards non-volatile salts of 2,4-D, however, as discussed above for novelty, the amines used in the examples are secondary amines including dimethylamine, diethanolamine, diethylamine and the primary amine: monoethanolamine. D3 does state that the salts:

“are those which after admixture with one or more other salts, possess the property of being liquid when measured at 20°C. ...such salts may individually be liquid at 20°C and may be chosen from the primary amine salts... secondary amine salts... tertiary amine salts... and as well, the quaternary ammonium salts ... Other salts which may be employed include the alkali metal salts and the salts formed by the reaction of other bases such as ammonium hydroxide, with the appropriate acids.”¹³⁹

149.In the Opposition to the parent the delegate found:

“While D3 does refer to the volatility problem associated with 2,4-D esters, I agree with Dow that it does not suggest that any derivatives disclosed would have improved volatility relative to 2,4-D amines – while various examples indicate that in the conditions of D3 there was no injury to the crop, there is no indication that this is different from the commercial amine salt control. Given that it appears to have been understood that a salt fixed in ionic form would have very low volatility, it would not be surprising if a person would have made quaternary ammonium salts with an expectation of lower volatility relative to amine salts, but there is no clear evidence to support a conclusion that a person unaware of the present invention would have taken that approach.”¹⁴⁰

150.The Opponent submitted that the delegates reasoning is flawed and that requiring evidence of the precise approach taken is not the test. I accept that evidence in terms that echoes the formula of the Cripps question is not necessary.¹⁴¹ However, in my view, the use of quaternary amines is different to using primary, secondary, or tertiary amines because quaternary amines have a permanent charge. The disclosure in D3 is just a mention of quaternary ammonium salts and there is no evidence from a naïve expert on using them.

151.I am not satisfied that the evidence has established a lack of inventive step when D3 is combined with the CGK.

152.D28 was also cited in the opposition on the parent¹⁴² in that case the delegate found that D28 is directed towards benzonitrile salts that are water soluble and is silent in regards to volatility of 2,4-D derivatives. The Opponent cited passages in D28 that refer to damage, such as:

“the benzonitrile derivative should be applied at a rate such that the crops do not suffer any substantial permanent damage”¹⁴³

153.I consider these passages to be discussing the amount of benzonitrile to be used and to teach nothing about volatility of 2,4-D compounds. Although there is an example in D28 that uses a quaternary amine of 2,4-D this is specifically excluded from the current claims and the overall teaching of D28 does not lead a person to try others. A lack of inventive step has not been established for D28.

¹³⁹ D3, page 2, lines 87-113.

¹⁴⁰ *Nufarm Australia Limited v Dow Agrosciences, LLC* [2020] APO 10 at [185].

¹⁴¹ *AstraZeneca AB v Apotex Pty Ltd* [2014] FCAFC 99 at [543]

¹⁴² *Nufarm Australia Limited v Dow Agrosciences, LLC* [2020] APO 10 at [189] *et seq.*

¹⁴³ D28 page 2 lines 84-86.

154.D24 was not pressed for lack of inventive step in the parent opposition. As discussed above for novelty D24 teaches the production of salts of plant hormone carboxylic acids with aliphatic amines having at least 6 carbons. D24 discloses the aliphatic amine can include:

“quaternary compounds, such as trimethyloctylammonium hydroxide and trimethyldodecylammonium hydroxide.”¹⁴⁴

155.Mr Hay said that this “clearly, at the very least, instructs me to prepare a herbicidal composition by mixing 2,4-D with either trimethyloctylammonium hydroxide or trimethyldocylammonium hydroxide”.¹⁴⁵ The Applicant submitted that D24 is directed towards achieving insoluble herbicidal compounds and that it would not be of assistance in providing non-volatile forms. The Applicant also stated that the Opponent’s approach was affected by hindsight.

156.Dr Pearson responded to Mr Hay’s evidence and disagreed with his conclusion. Dr Pearson pointed out that no quaternary amines are exemplified¹⁴⁶ and asks a series of questions:

“D24 describes the use of routine standard laboratory techniques wherein equimolar amounts of the amine and the acid are reacted in a compatible solvent to precipitate the salt. Column 2, lines 26 to 33 of D24 describes the amines which may be used as including “quaternary compounds, such as trimethyloctylammonium hydroxide and trimethyldodecylammonium hydroxide,” but these 2 quaternary compounds were not used as examples. Why weren’t they exemplified? Did they not work, were they not available? How can one assume anything about these two compounds and draw unfounded conclusions from them?”¹⁴⁷

157.Pearson then raises further questions that could be described as secondary indicia of inventive step:

“Just because two individual chemicals are known it does not mean the result of combining them is obvious or would have a known result. That is an overly simplistic analysis. Moreover, if that had been the case for tetraalkylammonium salts of auxinic acid herbicides I put the question to Hay yet again - why were they not prepared and broadly researched given the huge and longstanding problem of vapor drift for farmers the world over? I can personally attest to the extensive research that we undertook in the laboratory at Dow and the unexpected result that tetraalkylammonium salts of auxinic acid herbicides provided unprecedented levels of very low herbicide volatility. Much better than the previous generation of mono-, di- and trialkyl amine salts such as the highly used 2,4-D DMA salt. The product that was the end result of this research is the Enlist herbicides, for which there was a need because no products on the market had, by the Relevant Date, improved the vapor drift problem to satisfactory levels.”¹⁴⁸

158.Dr Pearson also states that:

¹⁴⁴ D24 column 2 lines 33-34.

¹⁴⁵ Hay #1 at [162].

¹⁴⁶ Pearson #1 at [56].

¹⁴⁷ Pearson #1 at [57].

¹⁴⁸ Pearson #1 at [60]

“D24 fails to describe the volatility of quaternary ammonium compounds, let alone 2,4-D quaternary ammonium compounds.”¹⁴⁹

159. In my view, the evidence of Mr Hay on D24 does not address the problem or why the person skilled in the art would try the quaternary compounds in seeking to solve the problem. Consequently, a lack of inventive step has not been established for D24.

160. Claims 1-4, 7-8, 10-12 lack of inventive step when compared to D2.

Conclusion

161. The opposition has been successful on the ground of novelty and inventive step. All other grounds fail. The Applicant is provided two months to file suitable amendments.

Costs

162. The opposition has been successful on the ground of novelty and inventive step. Ordinarily costs are awarded against the losing party. The Opponent has filed submission in relation to the Applicant's conduct in relation to the family tree of the Opposed application. I note they withdrew the great great grandparent; the opposition on the parent; the amendments filed in this opposition; and that there is a further divisional application under opposition, being 2019253885. The Opponent has therefore requested costs on an indemnity basis.

163. Indeed, costs can be awarded when an Opposition is withdrawn,¹⁵⁰ however, I note that costs were awarded in both the parent opposition¹⁵¹ and awarded and taxed in the great great grandparent. I see no reason to revisit those decisions with further awards because of them. The Commissioner has the power to award costs under Schedule 8 and can make a variation of costs. This Opposition has been successful because the claims have a different scope to that of the parent, the isolation step is not present in the current claims. Given the different outcomes and the previous awards I am not convinced a variation is necessary. Furthermore, the evidence from the parties was largely similar and a lot of the same declarants were used. Given this history, I am not convinced I should vary costs in the current opposition.

164. Costs are awarded against the Applicant under Schedule 8.

K. Wagg
Delegate of the Commissioner of Patents

¹⁴⁹ Pearson #1 at [58].

¹⁵⁰ *Super Internet Site System Pty Ltd v Sensis Pty Ltd* [2006] APO 27

¹⁵¹ *Nufarm Australia Limited v Dow Agrosciences, LLC* [2020] APO 10 at [217] *et seq.*