Intellectual Property Office

BL O/0541/25

17 June 2025

PATENTS ACT 1977

BETWEEN

Okipa Ltd and John Russell Clearwater	Claimants
and	
Aaron Tindall	Defendant

PROCEEDINGS

Reference under section 12 in respect of
international patent application PCT/IB2021/054892
and related applications

HEARING OFFICER J E Porter

For the Claimants: Mr Kevin Cordina (Simmons & Simmons)
For the Defendant: Mr Henry Edwards of counsel (instructed by F R Kelly)

Hearing date: 11 September 2024

DECISION

I. Introduction

1 This decision concerns entitlement to New Zealand patent application NZ 765147, international patent application PCT/IB2021/054892 (published on 9 December 2021 as WO/2021/245607 A1), European patent application EP21816776.5 (published as EP 4161260 A1), US patent application US18/000,251 (published as US 2023/0189809 A1), and any other applications derived from the international application ("the applications"). It is common ground that the matter in dispute applies equally to all the applications.

2 The applications are in the name of Aaron Tindall and concern a composition for eliminating or reducing undesired plant growth. According to claim 1 as filed, the composition comprises a liquid carrier, at least one artificial sweetener or sugar alcohol or an agriculturally acceptable salt thereof, and a penetrant.

3 On 15 August 2023 the claimants launched proceedings seeking that Okipa Ltd ("Okipa") be added as joint applicant for the applications or, if it were found that the inventive concept had not been assigned to Okipa, that John Russell Clearwater be added as joint applicant.

4 As defendant, Mr Tindall maintains that the applications should continue in his name alone.

5 Following evidence rounds and a case management conference, the matter came before me at a hearing held virtually on 11 September 2024. I am grateful to the parties, representatives, and witnesses for making this arrangement work smoothly, despite it involving cross-examination between participants in the UK and New Zealand, and despite a short loss of connection to the transcript writer at one point during the hearing.

II. Background to the dispute

6 The events relevant to these proceedings involve work carried out by Mr Tindall and Dr Clearwater, and also Mr Tindall's father, Dennis McCarthy, in relation to the development of herbicides. These events span a period going back to 2002, and many of the details are disputed. However, the following is common ground.

7 In around 2002, Dr Clearwater worked with a company investigating benign materials for fungicides and also did some work investigating herbicides.

8 In 2015 or 2016, Dr Clearwater and Mr Tindall first met. Dr Clearwater and Mr McCarthy were previously known to each other, and the three of them started to collaborate.

9 During the Autumn of 2016, Dr Clearwater shared with Mr Tindall a sample of a powdered product labelled "6957/17". Whilst it is common ground that this sample was related to their work, some details of what took place are disputed.

10 Various trials of herbicides were carried out between 2016 and 2020. Some related to hot foam herbicides, and some to cold water compositions. Certain facts are disputed but, by late 2019 or early 2020, trials had been carried out on cold water herbicides involving saccharin[1] solution and a penetrant or adjuvant[2].

11 A company called McCarthy Clearwater Ltd ("MCL") was established and incorporated on 11 February 2019.

12 A Collaboration Agreement was signed on 27 February 2019 by Dr Clearwater and Mr Tindall.

13 The New Zealand patent application was filed on 4 June 2020 with Mr Tindall as the named applicant. Dr Clearwater's evidence is that he was aware in 2020 that this application had been filed.

14 The international patent application was filed in Mr Tindall's name on 4 June 2021.

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[1] Both "saccharin" and "saccharine" appear in the applications, pleadings and evidence. The parties make no distinction between the terms. Other than in certain direct quotes, I use "saccharin" throughout.

[2] I deal later with the question of whether the two terms are synonymous.

15 Finally, I note that on 3 May 2024 the hearing officer issued his decision[3] in separate proceedings before the Comptroller involving Dr Clearwater and Mr McCarthy. Those proceedings involved a company called Bionome Technology Ltd and related to a different family of patent applications arising from the collaboration. My understanding is that the decision has been appealed.

16 I will refer to those earlier proceedings as "the Bionome proceedings" and the applications in those proceedings as "the Bionome applications". Whilst the present proceedings involve a different defendant and a different family of patent applications, there are certain points where I will need to consider their relevance.

III. Brief outline of the claimants' case

17 The claimants' case is that Dr Clearwater is the original inventor of at least part of the inventive concept of the applications, having first developed it in around 2002. They submit that he is the inventor of the use of sodium saccharin as a natural herbicide, and specifically the combination of sodium saccharin with an adjuvant. They say that he shared technical details of the invention with Mr Tindall for further development, and that Dr Clearwater instructed Mr Tindall regarding trials involving saccharin and an adjuvant.

18 They therefore submit that Dr Clearwater is a joint inventor. They further submit that Dr Clearwater retained his rights arising from joint inventorship up until 22 February 2022, at which point he assigned his rights to Okipa.

19 The claimants therefore say that Okipa should be recorded as co-applicant for the applications. In the event that any assignment from Dr Clearwater to Okipa is found not to be valid, the claimants submit that Dr Clearwater should be recorded as co-applicant.

IV. Brief outline of the defendant's case

20 The defendant's case is that he was entirely responsible for devising the invention in December 2018, when he independently conducted trials of an aqueous solution of saccharin and an organosilicone penetrant. He says that the results led him to the realisation that the combination would serve as a viable weed control solution that did not need to be applied in a hot foam composition.

21 The defendant argues that, although claim 1 refers to any penetrant, an important aspect of the inventive concept is that it is preferable to use an organosilicone penetrant.

22 The defendant therefore says that he is the sole devisor of the inventive concept. It follows that the defendant resists the addition of either Okipa or Dr Clearwater as co-applicant.

V. Witnesses and evidence

23 The claimants' evidence comprises three witness statements from Dr Clearwater along with a number of exhibits. The defendant's evidence comprises two witness

[3] *Okipa Ltd and John Russell Clearwater v Bionome Technology Ltd* (BL O/0410/24)

statements from Mr Tindall, also with a number of exhibits. For completeness, I should note that his second statement is entitled "Second Counter Statement". It is however in the form of a witness statement, and I agreed with the parties that it should be treated as such.

24 Both Dr Clearwater and Mr Tindall gave oral evidence at the hearing and were cross-examined.

25 Dr Clearwater could occasionally be defensive, and his memory seemed to let him down occasionally (for example in relation to an incorrect recollection of something happening during Covid isolation, when it was actually clearly a few years' earlier – albeit it was said that he was ill for other reasons at the material time). But he seemed to me to answer the questions truthfully and to the best of his ability.

26 Mr Tindall would sometimes give answers which were slightly disjointed, stopping mid-sentence and reformulating his answer, and at times seemed to struggle to answer questions regarding the patent application and the process that had produced it, referring to his patent attorney being the expert rather than himself. But this did not in my view detract from his honesty and openness.

27 Overall both witnesses appeared to me to be truthful, thinking carefully about the questions they were asked and doing their best to recollect events.

VI. The law

28 Section 12 provides for the Comptroller to decide entitlement to a patent application made in a country other than the UK, or made under a treaty or international convention. In particular, section 12(1) states:

> *(1) At any time before a patent is granted for an invention in pursuance of an application made under the law of any country other than the United Kingdom or under any treaty or international convention (whether or not that application has been made) —*
>
> > *(a) any person may refer to the comptroller the question whether he is entitled to be granted (alone or with any other persons) any such patent for that invention or has or would have any right in or under any such patent or an application for such a patent; or*
> >
> > *(b) any of two or more co-proprietors of an application for such a patent for that invention may so refer the question whether any right in or under the application should be transferred or granted to any other person;*
>
> *and the comptroller shall determine the question so far as he is able to and may make such order as he thinks fit to give effect to the determination.*

29 In terms of the parties' view of the applicable law, there was no disagreement that I should take the usual UK approach to the determination of entitlement which is followed under section 8 (that being the equivalent provision to section 12 but for UK patent applications). Therefore, just as for cases under section 8, the starting point for determining entitlement under section 12 centres around an enquiry concerning inventorship.

30 I note at this point that section 12 does not extend to giving the Comptroller the power to order a change in the inventor(s) mentioned on a foreign or international patent application. That power exists only for UK patent applications by virtue of section 13. That does not, of course, stop me from making findings of fact in relation to inventorship as part of determining the entitlement question that is before me under section 12.

31 In considering inventorship I was reminded by Mr Edwards, with reference to the House of Lords judgment in *Yeda*[4], that my first task is to identify the nature of the inventive concept and my second is to identify who contributed to it. In paragraph 20 of *Yeda*, Lord Hoffman says this:

> *The inventor is defined in s.7(3) as "the actual deviser of the invention". The word "actual" denotes a contrast with a deemed or pretended deviser of the invention; it means, as Laddie J. said in* University of Southampton's Applications *[2005] R.P.C. 11, [39], the natural person who "came up with the inventive concept." It is not enough that someone contributed to the claims, because they may include non-patentable integers derived from prior art: see* Henry Brothers (Magherafelt) Ltd v Ministry of Defence *[1997] R.P.C. 693, 706; [1999] R.P.C. 442. As Laddie J. said in the University of Southampton case, the "contribution must be to the formulation of the inventive concept". Deciding upon inventorship will therefore involve assessing the evidence adduced by the parties as to the nature of the inventive concept and who contributed to it. In some cases this may be quite complex because the inventive concept is a relationship of discontinuity between the claimed invention and the prior art. Inventors themselves will often not know exactly where it lies.*

32 As the *Yeda* judgment makes clear, the underlying basis for the determination comes from section 7, which says this:

> *7(1) Any person may make an application for a patent either alone or jointly with another.*
>
> *(2) A patent for an invention may be granted -*
>
> > *(a) primarily to the inventor or joint inventors;*
> >
> > *(b) in preference to the foregoing, to any person or persons who, by virtue of any enactment or rule of law, or any foreign law or treaty or international convention, or by virtue of an enforceable term of any agreement entered into with the inventor before the making of the invention, was or were at the time of the making of the invention entitled to the whole of the property in it (other than equitable interests) in the United Kingdom;*
> >
> > *(c) in any event, to the successor or successors in title of any person or persons mentioned in paragraph (a) or (b) above or any person so mentioned and the successor or successors in title of another person so mentioned;*
>
> *and to no other person.*

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[4] *Yeda Research and Development Co Ltd v Rhone-Poulenc Rorer International Holdings Inc* [2007] UKHL 43; [2008] RPC 1

> *(3) In this Act "inventor" in relation to an invention means the actual deviser of the invention and "joint inventor" shall be construed accordingly.*
>
> *(4) Except so far as the contrary is established, a person who makes an application for a patent shall be taken to be the person who is entitled under subsection (2) above to be granted a patent and two or more persons who make such an application jointly shall be taken to be the persons so entitled.*

33 Noting section 7(4), Mr Edwards reminded me that the burden of proof rests on the claimants to establish that Dr Clearwater contributed to the inventive concept.

34 In terms of identifying the inventive concept, Mr Edwards pointed to paragraph 43 of *IDA*[5] where Jacob LJ said:

> *Next I should expand a little on the "inventive concept" for the purposes of entitlement disputes. Markem has already pointed out that one is not bound by the form of the claims, if any. I think there is a great danger in being over-elaborate about this, about dividing the information in a patent into a myriad of sub-concepts, each of which is considered separately. One must proceed more like a hedgehog than a fox. And after all there is supposed to be only one inventive concept in a patent, see s.14(5)(d).*

35 He also pointed me to paragraphs 100 and 101 of *Markem*[6] in which Jacob LJ highlighted the reasons why, for these purposes, it is necessary to look at information in the specification rather than simply the form of the claims. In paragraph 101, Jacob LJ concluded that:

> *It would be handy if one could go by the claims, but one cannot. Section 8 calls for identification of information and rights in it. Who contributed what and what rights if any they had in it lies at the heart of the inquiry, not what monopolies were actually claimed.*

36 I note that Jacob LJ went on in paragraph 102 to say that:

> *It is not possible to be very specific about how this is to be done. But as a general rule one will start with the specific disclosure of the patent and ask whether that involves the use of information which is really that of the applicant, wholly or in part or as joint owner.*

37 Mr Edwards also submitted that, although the authorities suggest that an individual may make an inventive contribution to an invention simply by expressing or communicating an idea, that idea must feature all the elements of the inventive concept, and a vague prompt towards the invention that falls short of this will not count as a contribution towards the inventive concept. He referred to paragraph 14 of *Stanelco*[7] in support of this, and paragraph 73 of *Markem* where Jacob LJ said:

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[5] *IDA Ltd v The University of Southampton* [2006] EWCA Civ 145; [2006] RPC 21

[6] *Markem Corporation v Zipher Ltd* [2005] EWCA Civ 267; [2005] RPC 31

[7] *Stanelco Fibre Optics Ltd v Bioprogress Technology Ltd* [2004] EWHC 2263 (Pat)

> *At least one way of carrying the antecedent disclosure into effect must I think be ascertainable by the skilled man from the antecedent relied upon.*

38 Finally, Mr Edwards submitted that, in inventions which consist of a combination of different elements, the inventor is typically the person who devises the combination. He argued that it is not right to divide the invention up into discrete elements and attribute inventorship to any person who may have prompted the inclusion of a discrete element in the final combination. His support for this point was *Henry Brothers*[8] in which Jacob J (as he then was) states on page 706:

> *I do not think it is right to divide up the claim for an invention which consists of a combination of elements and then to seek to identify who contributed which element. I think the inquiry is more fundamental than that. One must seek to identify who in substance made the combination. Who was responsible for the inventive concept, namely the combination? That was solely Mr. Z. It was his idea which turned a useless collection of elements into something which would work. The patent, as I have said already, is really about the joint. The remainder of the elements of the claim, although necessary, are peripheral.*

39 On this final point, I note that it is nevertheless entirely possible that an invention can arise from contributions made by more than one inventor. Section 7(2)(a) and 7(3) acknowledges explicitly the concept of joint inventorship. In the situation where the inventive concept consists of a combination of elements, it is possible that multiple inventors are jointly responsible for inventing that combination of elements.

40 Mr Cordina did not make substantive submissions on the law, but I do not understand him to take issue with the various principles set out above. I will therefore adopt those principles – first considering the parties' submissions on the inventive concept, and then moving on to the relevant events in order to determine who contributed to the inventive concept.

VII. The inventive concept

41 In his skeleton argument, Mr Cordina took the view that the defendant had, in his first witness statement, characterised the invention in its broadest form as "a composition … comprising: a liquid carrier, at least one artificial sweetener or sugar alcohol or an agriculturally acceptable salt thereof, and a penetrant". Mr Cordina said that the claimants accepted this definition.

42 However, what the defendant said in his first witness statement was that the invention relates to (emphasis mine):

> *a composition for eliminating or reducing undesired plant growth comprising: a liquid carrier, at least one artificial sweetener or sugar alcohol or an agriculturally acceptable salt thereof, and a penetrant (<u>preferably an organosilicone compound</u>).*

43 Mr Edwards argued that a significant aspect of the teaching of the applications is that the most effective, and therefore preferable, penetrants for this purpose are organosilicone compounds. He pointed to the experimental data in the PCT application in support of this view, the majority of which was said to involve using

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[8] *Henry Brothers (Magherafelt) Ltd v The Ministry of Defence and the Northen Ireland Office* [1997] RPC 693

one of two organosilicone penetrants. He also pointed to the disclosure in the PCT application that "the compositions comprising an organosilicon[e] penetrant were found to be the most effective, acting quickly and killing the plants completely".

44 In light of that, I do not think I can simply accept at face value Mr Cordina's characterisation of the defendant's view, his statement that the claimants agreed with it, and thus regard the matter as concluded.

45 Conversely, Mr Edwards also said in his skeleton argument that Dr Clearwater had in the past contended that the inventive concept was "just the use of a saccharin solution as a herbicide". Mr Edwards put forward a number of arguments as to why this could not be the inventive concept, arguing in particular that the applications teach that a solution of pure saccharin is ineffective, and so use of saccharin alone is not an "invention with any real-world applicability" at least on the strength of the data in the applications. He argued that this view was consistent with Mr Tindall's evidence on pure saccharin solutions, and that the data in the applications focussed on "the efficacy of different combinations of artificial sweeteners and penetrants in solution as herbicides".

46 Mr Edward's view of Dr Clearwater's position was based in particular on an email exchange between Dr Clearwater and Mr Tindall in April 2020, in which Dr Clearwater said "You will recall that I disclosed my discovery that saccharine was an effective herbicide…".

47 It is not wholly clear to me that Dr Clearwater's statement was, at the time, a considered view of the inventive concept within the applications now in suit. But even if it was, I do not see how that email exchange demonstrates that the claimants are advancing that view of the inventive concept now. Mr Cordina has been entirely clear about how the claimants see the inventive concept. I also note Dr Clearwater's statement on page 1 of his first witness statement that "In around 2002 I made a discovery that sodium saccharin with an adjuvant was an effective broad-spectrum herbicide". Therefore I do not think Mr Edward's point based on the April 2020 email exchange assists me.

48 The debate over the inventive concept relates particularly to claim 1 and part of claim 5 of the PCT application as originally filed. These claims state:

> *1. A composition for eliminating or reducing undesired plant growth comprising: a liquid carrier, at least one artificial sweetener or sugar alcohol or an agriculturally acceptable salt thereof, and a penetrant.*
>
> *5. The composition of any one of claims 1-4 wherein the penetrant comprises an alkoxylated alcohol, a saponin and/or an organosilicone compound*.

49 Simply put, the view of the inventive concept which Mr Cordina says the claimants accept is essentially the invention as defined in claim 1 of the PCT application.

50 Mr Cordina says that cross-examination of Mr Tindall reinforced the claimants' view, contending that Mr Tindall "accepted the point that [the organosilicone embodiment] was a specific example that fell within the inventive concept of the application and the general inventive concept is the combination of the three classes of compound".

51 In the early part of his cross-examination, Mr Tindall seemed to agree with Mr Cordina's position on the inventive concept. For example:

> *Q: If we can now turn to the invention and I think it is common ground (I think) between the parties that the invention or the inventive concept we are discussing is a combination of a liquid carrier, an artificial sugar and a penetrant. Do we all agree on that?*
>
> *A: Yes.*
>
> *[…]*
>
> *Q: So the inventive concept, just to be clear, is represented by the general claim and then these other claims represent specific embodiments that fall within the scope of that.*
>
> *A: Right.*

52 However, later exchanges showed a degree of confusion from Mr Tindall on this matter. At one point he clearly contends that only the organosilicone penetrant falls within the inventive concept, because it is the one which works best. He also refers to the advice of his patent attorney in terms of the patent not being limited to the organosilicone penetrant, and how the invention "that I would like to have, to be granted a patent for, it would be the organosilicone as the best penetrant".

53 The cross-examination on this question concludes with Mr Tindall agreeing that claim 1 encompasses all of the example penetrants set out in the application, and that the invention of claim 1 is not limited to an organosilicone penetrant.

54 These exchanges show that Mr Tindall believes that an organosilicone penetrant yields the best results, and accepts (quite correctly) that claim 1 is not limited to an organosilicone penetrant, but encompasses a wider range of penetrants. It is however also clear to me that he is not a patent expert and so was somewhat confused in relation to the specific question of whether the inventive concept is properly defined by claim 1, or by something else.

55 Mr Edwards set out the defendant's position. As I have noted, he says that the preferable use of an organosilicone compound is a part of the inventive concept.

56 To support this view, Mr Edwards pointed back to *Markem* and said that I must consider the information disclosed in the application, and not what monopolies are actually claimed. He reminded me that claims in patent applications may be far broader than individual embodiments and may generalise certain features. He submitted that the focus for determining entitlement should be on how the application came into being, what embodiments were devised, and how they were later translated into the disclosure and specification.

57 He cautioned against "adopting a completely unreal perspective" and concerning myself with "ideas or projects which had no causative impact on the patent being filed". In particular, he said it was wrong to take the approach that "if the individuals tried something that was aborted and that never led to a patent filing and full

commercialisation, but that abortive idea just about fits within the claims on their broadest interpretation, that can be regarded as a contribution to the patent".

58 Having read the patent specification carefully, I note that on page 4 it is said that "In some embodiments the penetrant comprises an alkoxylated alcohol, a saponin, and/or an organosilicone compound". It then mentions possible types of suitable alkoxylated alcohol or organosilicone compounds.

59 Section 4.2 on pages 8-11 then discusses penetrants as part of the invention and lists a number of examples of commercially available organosilicone penetrants, a number of commercially available complex alcohol penetrants, and examples of other (mostly oil-based) penetrants.

60 When it comes to example data provided, Examples 1 to 5 all use Yates Pulse® as a penetrant. I shall refer to this as "Pulse" from now on. The specification is clear that it is an organosilicone penetrant. Example 6 covers the use of 13 different penetrants, and (according to the specification) only 1 of these is an organosilicone penetrant. The other 12 penetrants used in Example 6 are shown in the specification either in the list of complex alcohol penetrants or in the list of "other" penetrants. The data provided shows that all of the compositions in Example 6 (except the control compositions) met with a degree of success, and the specification confirms on page 17 that "all of the compositions of the invention were effective herbicides", while going on to confirm that "the compositions comprising an organosilicon[e] penetrant were found to be the most effective".

61 Taking the disclosed information as a whole, I do not find that the patent specification points to an organosilicone penetrant as being a feature of the inventive concept in its broadest form. As Mr Edwards said, the focus should be on how the application came into being, what embodiments were devised, and how they were later translated into the disclosure and specification – and it is entirely clear from the disclosure and the various embodiments discussed that a number of workable embodiments were devised and tested as part of the inventive concept, by no means all of which involved an organosilicone penetrant.

62 The fact that the specification makes clear that an organosilicone penetrant is the best option of the ones tested does not mean that the inventive concept as a whole is limited by that information. This is not a situation of the type Mr Edwards cautioned me against, where the inventive concept somehow includes ideas which did not work, or abortive concepts which just about read onto the claims.

63 *Markem* is clear that I cannot rely on the claims alone to determine the inventive concept, and I have not done so. Based on my assessment of the information disclosed in the specification as a whole I find that, in this case, claim 1 does provide the right definition of the inventive concept in the applications. I conclude that the inventive concept is a composition for eliminating or reducing undesired plant growth comprising a liquid carrier, at least one artificial sweetener or sugar alcohol or an agriculturally acceptable salt thereof, and a penetrant.

VIII. Penetrant v Adjuvant

64 I have used the word “penetrant” as part of the definition of the inventive concept, based on the disclosure in the applications and the consistent use of that term in the claims, Examples, and lists of various commercially available penetrants.

65 There appeared to be some difference between the parties on the use of the terms “penetrant” and “adjuvant”, and on the question of whether those terms are synonymous. There is no doubt significant overlap of terminology; two of the many commercially available penetrants listed in the applications have “adjuvant” as part of their name (“In-bound Spray Adjuvant®” and “Nexus Spray Adjuvant®”), and one other (“Agnique”) is described as “an ethoxylated soybean oil adjuvant”.

66 Section 4.2 of the PCT application describes a penetrant as “an agent that carries or transfers a compound into the interior of a living cell and/or permits, facilitates or increases uptake of a compound into the interior of a living cell”. It goes on to explain that “Agricultural penetrants dissolve or penetrate the waxy surface layers of a leaf, allowing other chemicals to contact cells and to enter the spaces between them”. Hence, it explains, “Many penetrants also demonstrate surfactant properties and so may also be classed as surfactants. A surfactant is an agent that modifies the surface properties of other materials it is in contact with”. It goes on to note that “a surfactant may act as a penetrant (a surfactant penetrant), but not all surfactants enhance penetration”.

67 Under cross examination, Dr Clearwater said there were many ways to describe a penetrant’s action, but he agreed that the description in the applications was an accurate working description of a penetrant, and agreed with the statement that a penetrant may be a surfactant but not all surfactants are penetrants.

68 In the Statement of Grounds, the claimants use the term “adjuvant/penetrant”. In the accompanying first witness statement, Dr Clearwater refers to his work with “5ml adjuvant per litre of water”. This prompted the defendant to say, in their Counter Statement, that there is “no definition or evidence submitted into these proceedings that the adjuvant [to which Dr Clearwater refers] is a penetrant as claimed”.

69 In response, Dr Clearwater said in his second witness statement that he preferred the term “adjuvant” but he considered Mr Tindall’s use of “penetrant” to have the same meaning. However, during cross-examination Dr Clearwater acknowledged that “adjuvant” was “an inclusive term” (as he put it), going wider than “penetrant”. As Mr Edwards put it, an adjuvant is basically anything that enhances the efficacy of the active ingredient.

70 The position is therefore this: the inventive concept concerns a penetrant, which acts as the applications describe. It is a type of adjuvant, but the term “adjuvant” is a wider one than “penetrant”.

IX. Who contributed to the inventive concept

IX.1 Chronology of events

71 I will now consider the relevant events in chronological sequence, in particular in relation to the development of the inventive concept I have identified above. Although I have set out above a brief chronology of agreed events, it is helpful to set out the relevant events in slightly more detail here, and to include some key claims made by the parties.

- 2002-2003 – Dr Clearwater claims he developed the inventive concept whilst investigating benign materials for fungicides.
- 2015/2016 – Dr Clearwater, Mr Tindall and Mr McCarthy start working together on hot foam herbicides.
- Autumn 2016 – One or more meetings take place between Dr Clearwater and Mr Tindall during which Dr Clearwater suggests specific trials involving a product “6957/17,” which was sodium saccharin crystals. Dr Clearwater claims he did not reveal the nature of the substance. It is disputed as to whether Dr Clearwater also instructed Mr Tindall to use an adjuvant or penetrant.
- 2016-2019 – Trials are conducted of hot foam herbicides involving “6957/17”. It is disputed whether these trials involved an adjuvant or penetrant. It is also contested whether further trials are conducted using (cold) saccharin solution and Pulse during this time.
- 4 December 2018 – Dr Clearwater claims to reveal to Mr Tindall, in a meeting with Clive Elliot QC, that “6957/17” is sodium saccharin crystals.
- December 2018/January 2019 – Mr Tindall claims to have independently trialled a saccharin solution with a penetrant, and achieved unexpected results. This is Mr Tindall’s basis for being the sole inventor.
- February 2019 – MCL is established and incorporated, and the Collaboration Agreement is signed by Dr Clearwater and Mr Tindall.
- 2019-2020 – Further discussions and trials take place. Discussions also take place with the patent attorney, followed by the filing of the New Zealand patent application on 4 June 2020.

72 Much of the details surrounding these events are disputed, and I will consider each of them in turn.

IX.2 Dr Clearwater’s activities in 2002-2003

73 Dr Clearwater’s case is that, since around 2002, he has worked as an independent research scientist on projects relating to the development of weed control products, and in particular natural herbicides. He says that he first developed the disputed technology in 2002.

74 According to his evidence he was investigating benign materials for fungicides, trialling a range of materials in an abandoned apple orchard in Oratia, New Zealand. This work was carried out in conjunction with a company called BioDiscovery New Zealand Limited under an agreement dated 14 February 2002. According to Dr Clearwater, during that work he discovered that some of the materials had a strong herbicidal effect, unrelated to any fungicidal effect.

75 He claims that "In around 2002 I made a discovery that sodium saccharin with an adjuvant was an effective broad-spectrum herbicide. Since 2002 I have continued to research and develop the use of sugar substitutes and sugars as herbicides". After his agreement with BioDiscovery expired, Dr Clearwater says that he continued to investigate the effect of sodium saccharin and adjuvants on weed control.

76 His recollection is that he experimented with different quantities of various materials, with and without adjuvants, and that one of the mixtures tested included a powder identified as "6957/17" (which he knew was sodium saccharin), an adjuvant, and tap water. He recalls that this combination had a much stronger herbicidal effect than other combinations tested, but the fungicidal effect was not notable. According to his recollection the mixture was 170g/litre of sodium saccharin with 5ml of adjuvant.

77 In his counter-statement, Mr Tindall denies that, since around 2002, Dr Clearwater worked independently on projects relating to the disputed technology. He refers to the Collaboration Agreement in support of this point, and also that Dr Clearwater "has expertise in the field of entomology and it was in an association with me and Dennis Tindall/McCarthy that John Russell Clearwater was involved in biological control methods of weed and pest control".

78 Mr Tindall further contends that the evidence surrounding Dr Clearwater's investigations in collaboration with BioDiscovery, namely the agreement provided as Exhibit 5 to Dr Clearwater's second witness statement, "addresses confidential discussions relating to a range of proprietary fungicidal formulations" but "makes no mention" of the compositions of any formulation, including any composition according to the inventive concept. More generally, Mr Tindall says that no evidence of experimental protocols, results or the compositions themselves (including the adjuvant) has been provided. He disputes that the adjuvant said by Dr Clearwater to be used in the trials in around 2002 was a penetrant, arguing that there is no evidence in the proceedings to support this.

79 Mr Edwards drew attention to an email from Dr Clearwater dated 16 September 2020. Mr Edward's contention was that this was at a point where the patent application was filed and the dispute over inventorship had started, and it was the first document where Dr Clearwater claimed to have used an adjuvant back in 2002. In the email, Dr Clearwater states, in relation to his activity in the abandoned orchard:

> *"I began my project of investigating fungicidal activity in a disused orchard in Oratia. I was provided with a series of plastic bags with powder or crystalline material. I bought a group of 1 litre hand sprayers and was given a bottle of adjuvant. Because of the large number of test materials and large number of replicates, I was provided with a pro-pipette that dispensed 5ml of adjuvant with two presses of the top button. The adjuvant was standard for all materials and all received exactly the same dose.*

> *One test produced a dramatic effect, completely killing the apple branchlet. All replicates of this material showed complete mortality. I met my client, who identified the material as saccharin, and we agreed to drop the loading form* [sic] *170gm/litre to 17gm. No mortality now occurred. I completed my experiment, wrote my report and was paid."*

80 Mr Edwards questioned Dr Clearwater's recollection of events in 2002 given the time that had elapsed and the lack of contemporaneous documents. He highlighted that the testing was done 20 years before the email and suggested that Dr Clearwater could not have had a good memory of it.

81 Dr Clearwater said that his memory was very clear as to what he saw in his trials in the disused orchard in 2002-3, and that he would not have noticed the unexpected result if the adjuvant had not been included. He said: "I know what I saw and I know what I produced and it was produced in 2002 independently of any other person", and described it as the time "when the original successful experiment occurred", saying that he had not met Mr Tindall at that point. He referred several times to the dramatic and unexpected result he saw on the apple trees, and that he had "recognised here was something very different and very unusual".

82 Mr Edwards also pointed out that there is no indication in the 2020 email as to what the adjuvant was; it could have been an excipient of a different kind. Mr Edwards said that the evidence had shown that Dr Clearwater was not told what the adjuvant was, but was given an unmarked bottle and told to add 5ml to the composition.

83 Dr Clearwater confirmed during cross-examination that he did not test different adjuvants at this time. Furthermore he said this:

> *A: If Pulse was one of the most common ones that would be a possibility. The person I was looking for fungicides for did not tell me what the adjuvant was. He told me it was an adjuvant and he told me that it was important to use it and he provided me with a ProPipette so that I would be able to put particularly measured doses on all of my experimental trial.*
>
> *Q: That suggests to me he did not know what the adjuvant was in 2002. It could have been a surfactant. It could have been a spreader sticker.*
>
> *A: It could have been.*

84 Mr Cordina in closing did recognise that Dr Clearwater had acknowledged during cross examination that he did not know the identity of the penetrant at that stage, but also argued that there was no evidence to support Mr Tindall's denial that Dr Clearwater's discovery had happened – just Mr Tindall's "bland assertion" that it did not.

85 As Mr Edwards said, these events are a long time ago and, as I have noted, at one point during cross-examination Dr Clearwater briefly muddled the date of a particular (much later) event. However, it seems to me that Dr Clearwater's written and oral evidence concerning the 2002-3 trials shows consistency and detail regarding what he did and what he saw, and his recollection during cross-examination of those trials and the related events was clear.

86 Furthermore, I do not see how – as the defendant contends – the existence of the Collaboration Agreement or the fact that Dr Clearwater had expertise as an entomologist undermines Dr Clearwater's evidence. The defendant's point was that the Collaboration Agreement acknowledges the "long association" between the defendant, Dr Clearwater and Mr McCarthy in terms of weed control, but there is certainly no suggestion from Mr Tindall that he was himself involved in some way during the 2002-3 trials. I also fail to see how the defendant's point that the Collaboration Agreement acknowledges Dr Clearwater's expertise in entomology convincingly suggests that the 2002-3 trials did not take place in the way Dr Clearwater explains.

87 The defendant also says that the agreement regarding the trials between Dr Clearwater's company and BioDiscovery is related only to fungicides, but I do not see how that undermines Dr Clearwater's evidence either, in which he explains very clearly how certain trials showed him that a herbicidal effect was taking place which was unrelated to the fungicidal effect he had been investigating. Dr Clearwater said several times how unexpected this herbicidal effect was, and so it seems entirely unsurprising that the BioDiscovery agreement, concerning the fungicidal trials, did not foreshadow or envisage the herbicidal effect.

88 I do not see that any of these points, alone or collectively, provide a basis for rejecting Dr Clearwater's evidence regarding the 2002-3 trials. Based on the evidence before me, I conclude that – on the balance of probabilities – Dr Clearwater did conduct some trials in an apple orchard in 2002-3, as part of wider work involving fungicides, and that he did trial (amongst other products) a product which involved a mixture of water, sodium saccharin and an adjuvant, which had an unexpected and significant herbicidal effect.

89 Whilst in his closing speech Mr Edwards certainly did not go that far, he accepted that "it does seem likely" the product 6957/17 (sodium saccharin) was tested back in 2002. However, he did go on to say that it was deeply unclear how it was tested, and what excipients or adjuvants were used.

90 On that point, as the defendant has said, there is no contemporaneous evidence of trial notes or other documents which shed any light on the nature of adjuvant used. Dr Clearwater's evidence was clear that the adjuvant was given to him along with instructions to use a particular dose, and that he was not told what the adjuvant was, beyond it being an adjuvant in general terms. There is no evidence to suggest that he knew or understood the adjuvant to be a penetrant, rather than some other form of adjuvant. He agreed under cross examination that it may have been an adjuvant in the form of a surfactant or spreader sticker. At most, he said that Pulse was "a possibility".

91 The burden of proof is on the claimants. The evidence does not, in my view, get close to demonstrating on the balance of probabilities that the adjuvant was a penetrant, let alone that Dr Clearwater was aware that the adjuvant was a penetrant. The use of a penetrant is central to the inventive concept, as is clear from my analysis of that concept based on the disclosure of the applications. Therefore I conclude that, on the balance of probabilities, Dr Clearwater did not devise the inventive concept during the 2002-3 trials.

IX.3 Dr Clearwater, Mr Tindall and Mr McCarthy start working together

92 Dr Clearwater's evidence is that in 2015 or 2016 he met Mr Tindall "in relation to work I was performing with his father…relating to mealy bug control". He says that he was carrying out tests of a "steam weeder product" at a vineyard. Under cross examination he confirmed that the collaboration between the three of them first involved the hot foam composition which was water and a compound known as APG.

93 Mr Tindall's evidence is that he was involved in the development and commercialisation of herbicidal compositions since 2014. Mr Tindall says that he assisted his father, Mr McCarthy, in exploring commercial opportunities for herbicidal foam compositions, which his father had developed. These compositions comprised hot water and alkyl polyglycoside (his evidence referred to this as "AGP" but he confirmed under cross examination that it was APG).

94 Mr Tindall says that he and his father developed the foam composition as a safe and economical way to control weeds and pests (mealy bug) in vineyards, and that his father engaged Dr Clearwater in 2015 "to advise as an (retired) entomologist on pest (mealy bug) control".

95 While not entirely in agreement, the parties' evidence shows that there is considerable common ground on this point. Dr Clearwater and Mr McCarthy appear to have known each other previously but what matters for these purposes is that it is clear that in 2015 (or possibly 2016 – nothing turns on it) Mr McCarthy, Dr Clearwater and Mr Tindall first worked together, and their collaboration at that point focussed on the hot foam composition, which comprised hot water and APG.

96 Inevitably, there is however much less agreement about what happened next. Both Dr Clearwater and Mr Tindall agree that Dr Clearwater provided some sodium saccharin, but the circumstances around this provision are in dispute.

IX.4 The Autumn 2016 meeting(s)

97 Significant parts of the evidence focussed on one or more meetings in Autumn 2016 at which Dr Clearwater discussed the substance known as "6957/17" with Mr Tindall. It is not in dispute that the meeting(s) took place at that time, and that the substance was sodium saccharin.

98 Dr Clearwater's first witness statement states simply that he "suggested the use of crystalline sodium saccharin (and related or similar compounds) for use as a herbicide based on my previous work". His second witness statement gives more detail. He says that he shared the sodium saccharin with Mr Tindall "along with instructions to mix it with water and an adjuvant", but he says he did not disclose what the product was.

99 Mr Tindall says in his first witness statement that Dr Clearwater provided the product "for use as a potential "soft/liquid pruner" for the purposes of chemical control of vine shoot growth", but that field trials "yielded no significant and inconsistent results". Mr Tindall says that Dr Clearwater made no disclosure that saccharin was, or had the potential to be, an effective herbicide. In his second witness statement, Mr Tindall

denies that Dr Clearwater shared the product along with instructions to mix it with water and an adjuvant.

100 Pages from both Dr Clearwater's and Mr Tindall's notebooks were provided in evidence, Dr Clearwater's dated 13 October and Mr Tindall's undated but immediately following a page dated 13 September. There seems to be no disagreement between the parties that the respective notebook pages relate either to the same or closely related meetings, and nothing turns on any discrepancy between dates.

101 Dr Clearwater's notebook page comprises a very brief note which, other than saying "1pm Aaron", states: "200 gm Product 6957/17 ex BioDisc 170, 17 gm".

102 Mr Tindall's notebook page includes more information and refers to the same product "6957/17," describing it as "food grade," and also specifying a "dilution note" and the figures "170g per l" and "17 per l". Mr Tindall's page also lists what appears to be a number of trials, which are referred to as: "1 Hot foam; 2 Hot foam + 170 p/l; 3 Hot foam + 17 p/l; 4 Water; 5 Cold Water 17 p/l; 5 [*sic*] Cold water". The final note on the page refers to "4m^2 – spaced".

103 Under cross examination, Dr Clearwater agreed that Mr Tindall's notebook entry refers to two concentrations of the 6957/17 product, and he agreed that the concentration figures were the same as those in his own notebook, and said that "those figures came from me". He also agreed that Mr Tindall's note referred to various trials, involving hot foam, water and/or cold water, and some of which appear to be control tests with none of the substance included. And he agreed that the final "4m2 – spaced" figure was the area of application of the composition.

104 Mr Tindall agrees that the notes concern the hot foam trials with various controls. However, his contention is that neither Dr Clearwater's note nor his own provides evidence of an instruction from Dr Clearwater to mix the product with an adjuvant, let alone specifically a penetrant.

105 Dr Clearwater agreed during cross examination that Mr Tindall's note did not contain any reference to a penetrant. When it was put to him that the note was fairly precise in other ways and that, if penetrant had been discussed at the time, then "you would have expected Mr Tindall to note down the penetrant he should use", Dr Clearwater agreed but said that he was not responsible for Mr Tindall's notes, and he reiterated that part of the information that he passed on to Mr Tindall was "to use 5ml of adjuvant".

106 A specific further point arose from the reference in Mr Tindall's note to "food grade". Mr Edwards noted from Dr Clearwater's evidence that the adjuvant or penetrant in question was Pulse. He took Dr Clearwater to the safety sheet for Pulse which says that it is harmful if swallowed or if it comes into contact with the skin, suggesting that Mr Tindall would not have characterised this as a food grade composition if Pulse had been included.

107 On this specific point first, I note that, in an email to Caine Thompson dated 12 January 2019, Mr Tindall referred to the "latest testing of the food grade product" with the "addition of a penetrant". This suggests that Mr Tindall may have regarded

the product as “food grade” with the penetrant, although it is not entirely clear. It is therefore difficult to give a great deal of weight to the “food grade” note in Mr Tindall’s notebook as being evidence of the absence of penetrant.

108 More widely, I note that the meeting(s) in question took place some eight to nine years ago, and recollections of what happened by both Dr Clearwater and Mr Tindall may not be entirely clear. However, it is entirely clear that neither notebook extract makes any mention at all of using any adjuvant, let alone a penetrant.

109 In my view, based on the details Mr Tindall did write in his notebook, I consider it more likely than not that he would have made a note to use an adjuvant (and probably the amount) if he had received clear instruction from Dr Clearwater to do so.

110 Moreover, even if Dr Clearwater did give clear instructions to use an adjuvant (which Mr Tindall for some reason did not note down, and neither did Dr Clearwater) there is nothing to suggest that he instructed that the adjuvant should specifically be a penetrant. Dr Clearwater’s evidence was that his instructions were based on his 2002 work – but I have already found on the evidence that Dr Clearwater was given an adjuvant as part of that work, was not told what the adjuvant was, and there is no evidence to suggest at that time that he knew or understood the adjuvant to be a penetrant, rather than some other form of adjuvant.

111 Dr Clearwater’s evidence is that he generally uses Pulse as his adjuvant. But no evidence has been provided to demonstrate that, between 2002 and 2016, Dr Clearwater’s understanding of the specific nature of the adjuvant provided to him in 2002 had developed to the extent that he would, at the 2016 meeting(s), have advised Mr Tindall specifically to use a penetrant rather than any other form of adjuvant. There is no evidence that any such specific insight was communicated to Mr Tindall (or others involved).

112 I conclude that, on the balance of probabilities, it is more likely that Dr Clearwater did not give clear instructions to Mr Tindall at the 2016 meeting(s) to use an adjuvant in the trials listed in Mr Tindall’s notebook. If I am wrong, and Dr Clearwater did give such instructions, then on the evidence provided I consider it more likely that Dr Clearwater did not give clear instructions that the adjuvant had to be a penetrant.

IX.5 The hot foam trials of 2016-2018

113 I will now turn to the trials mentioned in the evidence and which were conducted at various times, starting with the 2016-2018 trials of hot foam herbicides.

114 Mr Tindall refers to field trials of the herbicidal foam composition which he says took place in 2016/2017 at a New Zealand winery. His evidence is that these trials concerned the hot foam composition of hot water and APG which he and his father had been developing since 2014, and he says that the composition was “ultimately deemed not economically viable”.

115 Mr Tindall provided in evidence a series of emails entitled “Thermal weed control trial” in which he and others discuss trials to be conducted at the Villa Maria

vineyard. He said that these trials related to adding saccharin to the herbicidal foam compositions comprising hot water and APG.

116 Dr Clearwater agreed that he discussed with Mr Tindall and Mr McCarthy trialling a hot foam product with saccharin, APG and water. He confirmed that APG was a foaming agent and, as a foam, the product had both gas and liquid phases.

117 With regard to the Villa Maria hot foam trials, Dr Clearwater agreed under cross examination was that there were lots of disadvantages to this approach, not least the cost of fuel to heat the foam to a high temperature, the need for lots of water, and the need for specific spraying equipment which was more complex than a usual cold-water sprayer. He agreed that the hot foam product was not commercially viable.

118 Both parties therefore agree that hot foam trials were conducted at Villa Maria, that the foam comprised hot water and APG as a foaming agent, and that saccharin was added. Both parties agree that the conclusion was that the hot foam product was not commercially viable.

119 A point on which the parties differ is whether the hot foam composition of the Villa Maria trials amounted to a composition within the meaning of the inventive concept, and whether it led to the devising of the inventive concept.

IX.6 The hot foam composition and the inventive concept

120 Mr Cordina submitted in his skeleton argument that APGs are well known penetrants in the agricultural field, particularly for weed control. He noted Mr Tindall's evidence in his first witness statement stating that Dr Clearwater had "postulated that adding saccharin to the herbicidal foam compositions comprising hot water and AGP [*sic*] might enhance its effectiveness".

121 Therefore, argued Mr Cordina, when Dr Clearwater proposed using saccharin in the hot foam herbicide, he was proposing a composition consisting of water, saccharin and a penetrant (APG), in accordance with the inventive concept. Mr Cordina submitted that, on Mr Tindall's own evidence, Dr Clearwater was the first to propose at least one embodiment of the invention and his contribution was "at the heart of all further development in the collaboration".

122 Shortly after receiving the claimants' skeleton, and before the hearing, the defendant raised an objection to this as a new line of argument. Hence it was necessary to deal with it as a preliminary point at the beginning of the hearing.

123 Mr Edwards argued that Mr Cordina's point had not previously been pleaded. He submitted that the basic principle is that a party needs to plead any point they plan to rely on, so that other parties in the case have a fair opportunity to respond to it in evidence.

124 Mr Edwards submitted that Mr Tindall's evidence is that the hot foam composition was something discussed between himself, Mr McCarthy and Dr Clearwater, but it was never commercialised, and that his evidence shows that the inventive concept was arrived at by a different route. Moreover, Mr Edwards argued, an APG-based product is not mentioned in any part of the applications. He also argued that Mr

Tindall's evidence makes only "stray reference" to the hot foam and, if the point raised issues upon which Mr Tindall should have had an opportunity to provide evidence, then it is not open to the claimants to run the point now.

125 Mr Cordina submitted that this point is not a change or a new point but was in the proceedings from the very outset, which concerned an inventive concept involving a combination of saccharin (or other sugar alcohol) and a penetrant. He said that the claims do not make any reference to specific types of penetrants, and the applications define "penetrant" extremely broadly and clearly encompass a wide range of materials. Nor, he said, are the applications limited to cold liquids.

126 Mr Cordina said that the use of saccharin in the foam system under discussion has been in evidence from the start, pointing to a statement in Dr Clearwater's first witness statement in which he states that the starting point of his relationship with Mr Tindall was the trials of the foam herbicide, and that he suggested the use of crystalline sodium saccharin. In reply, Mr Edwards pointed out that the statement did not refer to APG and, in any case, there was no suggestion that this was being characterised to be the invention, nor that APG was important to the entitlement issue.

127 At the hearing, I noted that it was unfortunate that the specific line of attack did not materialise at an earlier stage, in particular by way of an amended counterstatement.

128 However, I noted Mr Cordina's points about the wider factual matrix already presented before me and the discussion that is already in play about the contribution made in the hot foam work and the role of APG in that work. I said that I had, in any case, expected that I may hear further evidence from the witnesses on APG or penetrants more generally, and certainly on the inventive concept. Whilst I had some sympathy with Mr Edward's points about the need for further evidence, my expectation was that at least some of these points may well be explored at the hearing as part of the wider factual exploration.

129 Mindful of the wide discretion I have to resolve entitlement disputes, and the judgment in *Yeda* in that respect, and also mindful that it is helpful to a court on any appeal to have made the fullest reasonable exploration of the facts before me, I allowed the point to run. However, mindful of Mr Edward's point about evidence, I was clear that the weight I give to the point may well be affected by the lack of evidence that could have been provided had the point been run at a much earlier stage.

130 Turning to the substance of the point, a key question is the role of APG in the hot foam composition.

131 Mr Tindall's evidence was that Dr Clearwater had speculated that "the sugar chemistry of the AGP [*sic*] in the herbicidal foam compositions might contribute to its effectiveness in killing plants", had based that hypothesis on the blackened appearance of the vegetation that had been treated with the foam, and its similarity to sugar-related damage caused by fire blight disease, and had postulated that adding saccharin to the hot foam might enhance its effectiveness. When Dr Clearwater was taken to that evidence during cross examination, he said he did not

recollect the conversation and he regarded the relevant paragraph as “completely garbled”.

132 The specific point does not assist me much. Whether Dr Clearwater made a link between APG and sugar-related effects or not does not help resolve the question of whether APG is in fact a penetrant, even if it was not necessarily included in the hot foam herbicide for that purpose.

133 As part of the cross examination bundle, and to support his contention that APGs are well-known penetrants, Mr Cordina provided extracts from a textbook published in 1996 entitled “Alkyl Polyglycosides: Technology, Properties and Applications”. He submitted that the extract describes APGs as having “excellent wetting and penetrating properties”, confirming that those substances are known for, and generally have, that functionality.

134 Mr Edwards did not accept that it is obvious and widely understood that APG can act as a penetrant, and argued in any case that the point needed to be properly evidenced – it not being a point that is so notorious I could take judicial notice of it. He submitted that expert evidence would likely be needed, for example, on the common general knowledge understanding of the technical term.

135 He further submitted that there are all sorts of APG products available for purchase which tend to be a mixture of different APG molecules and will tend to have different properties. He referenced the textbook extract which shows six different APG products with different characteristics – some being good wetting agents but not so good as foaming agents, and vice versa. Mr Edwards’ point was that there was no evidence as to which APG was used in the hot foam composition.

136 In response to this point, Mr Cordina referred to section 4 of the book extract which states that all bar one of the APGs being discussed at that point are “strong wetting agents”, and he pointed to a short discussion in the extract discussing how even the one exception would perform well as a spreading agent and penetrator. He confirmed that wetting and penetrating are separate properties, but said that the point being made by section 4 of the extract was that the one APG which was a bad wetting agent was nevertheless still a good penetrator.

137 Mr Edwards pointed out that this discussion was limited to particular APGs under the trade name “Agrimul® PG” and not APGs in general – on which there was no evidence. He reminded me that the defendant had not had a fair opportunity to adduce evidence on the full range of APGs and their different properties, nor on the type of product being used in the hot foam compositions and whether they had good penetrating properties or were just good foaming agents.

138 Mr Cordina also highlighted that the defendant’s skeleton argument refers to APG as a penetrant on page 8, which he submitted appears to be a general statement that penetrants include APG. Mr Cordina submitted that, given the broad definition of penetrant in the applications as a material that helps penetrate plant matter, there should be no dispute that APG falls within this broad functional definition.

139 Mr Edwards’ answer was that all he was doing in that part of his skeleton argument was setting out what was said in the Bionome applications. The footnote relied on

by Mr Cordina simply described the penetrants mentioned in the Bionome applications. Since, Mr Edwards said, the point that APG being a penetrant and the hot foam composition being relevant to the inventive concept was not clearly flagged earlier, it can hardly be suggested that he had somehow admitted the point in his skeleton.

140 With regard to what was said in the Bionome applications, Mr Edwards submitted that, just because a technical claim is made in a patent, it does not mean that it is correct or reflects the consensus in the field. In other words, the Bionome applications may not be right to characterise APG as a penetrant. He pointed to Table 4 of the Bionome PCT application, submitting that the trial results showed a very strong herbicidal effect for a certain penetrant ("Validate"®) but only low herbicidal effects when APG is used. That, Mr Edwards submitted, is consistent with APG having no effect or an inconclusive effect as a penetrant, and is certainly not conclusive evidence that APG is necessarily a penetrant.

141 Mr Cordina's reply on this point was that it is undeniable that the numbers provided in Table 4 for APG examples are lower than some of the other examples, but they are not zero, showing that it has some effect. In his view, Table 4 was certainly not sufficient evidence to argue that APG is not a penetrant.

142 Mr Tindall was cross-examined on some of these points. Mr Cordina took Mr Tindall to the statement in the Bionome applications that "Other penetrants beside Validate® may be used, such as alkyl polyglucoside (APG)" and asked if Mr Tindall accepted that APG was a penetrant. Mr Tindall said that he would not call APG a penetrant and went on to say that, while he was "not an expert in the industry as such", his understanding was that APG "was used like a surfactant, as a soap" to create the hot foam with water. While agreeing that it was his opinion and not from a trained technical view point, he reiterated his view under further questioning, saying that his only exposure to APG was where "we went from the hot water and added the APG as the foaming and I just know it ticked the bill in terms of environmental aspects and it had good foaming qualities and it was safe".

143 Mr Tindall was also taken to the textbook extract. He agreed that he had no reason to disagree with statements in the extract that APGs had "excellent wetting and penetrating properties".

144 In his submissions, Mr Cordina noted Mr Tindall's understanding that APG was the foaming agent, and accepted that foaming is one function of APG, but pointed out that "Mr Tindall also very fairly accepted that it could well have had other functions". Although at one point Mr Tindall speculated that the high temperatures could have had some effect on the functionality of the APG in the hot foam, Mr Cordina pointed out there was no evidence either way on this. In any case Mr Tindall had accepted that APG was added to the saccharin mixture before heating which would, Mr Cordina argued, still fall within the scope of the claim.

145 Having considered Mr Tindall's testimony and his own admissions regarding his expertise, I am not convinced that Mr Tindall has sufficient knowledge or expertise in relation to the properties of APGs and penetrants for me to place any reliance on his evidence on this point. This illustrated a concern Mr Edwards had expressed that trying to elicit evidence from Mr Tindall on this point would be "unsatisfactory" since

Mr Tindall was at the hearing to give evidence on the information in the applications and how the inventions were devised, not on general technical matters, or indeed as an expert witness. Thus I am not assisted by Mr Tindall's acceptance of the book extract statements on APG as penetrants, nor his reference to any possible effect of heating on APG functionality.

146 On the matter of the reference to APG as a penetrant in the Bionome applications, I accept Mr Edwards' point that no concession was being made in his skeleton argument on this point, for the reason he says. I understand his point that reference was simply being made to information as presented in the Bionome applications.

147 In terms of what the Bionome PCT application tells me on this point, there is the statement on page 5 which Mr Cordina drew to Mr Tindall's attention, referring to APG as one of "Other penetrants" that could be used. I note there is also on page 6 the statement that applying the compositions to the plants was "assisted by the use of a penetrant and, in some cases, the use of APG". Contrary to the statement on page 5, this seems to imply that APG is not considered a penetrant, but is assisting in some other way. In addition, the next sentence says that "APG is alkyl polyglucoside, a non-ionic surfactant" (and I recall Dr Clearwater's evidence noted previously where he agreed with the statement that a penetrant may be a surfactant but not all surfactants are penetrants).

148 As both representatives pointed out, Table 4 then shows much lower herbicidal effect when APG was used in comparison to Validate. Mr Edwards essentially said this was at best inconclusive on any APG penetrant effect whereas Mr Cordina said it was not sufficient evidence to dismiss APG as a penetrant.

149 Taking all that into account, it seems to me that the disclosure of the Bionome PCT application on this point is somewhat ambiguous. I also accept Mr Edwards' point that I need to treat technical information in a patent with a degree of caution – and that is certainly the case with an application which has not yet been examined and found in order for grant of a patent. I am also again mindful that this evidence has not been explored in the way that it might have been if the point had been raised earlier in the proceedings. Taking all of these points into consideration, I am not persuaded that the Bionome PCT application disclosure provides a sound basis for me to conclude that APG is a penetrant within the meaning of the applications in question.

150 That leaves the textbook extract. There is the one general statement relied on by Mr Cordina, that APGs have "excellent wetting and penetrating properties". There is then Mr Cordina's point that the discussion in section 4 concludes that, despite a marked difference in wetting, all 6 of the listed APG products are "expected to perform well as spreading agents and penetrators". I accept that point, but Mr Edwards is right to point out that the discussion is limited to 6 APGs under the trade name "Agrimul® PG", and not APGs in general.

151 When considering what weight to give these statements, I remind myself that I have no evidence exploring the range of APGs and their properties, and no evidence on the particular APG product used in the hot foam composition – and its effectiveness as a penetrant as opposed to its effectiveness as a foaming agent.

152 In the absence of such evidence, and bearing in mind the point I have made about the weight I should give to the limited (and less than fully tested) evidence provided, I do not consider either the general brief textbook statement or the limited discussion of 6 Agrimul® PG compositions to provide a sound basis for concluding that the APG which was used in the hot foam composition was, on the balance of probabilities, an effective penetrant.

153 However, there is in any case a wider point here. Mr Edwards submitted that none of the documents suggests that any testing of APG with saccharin could have led to the discovery of the inventive concept of the applications. He said that the issue is not whether APG is technically a penetrant or not, but whether "this abortive discussion about using APG and saccharine" had any link to the actual invention. He said "this idea that if the individuals tried something that was aborted…but that abortive idea just about fits within the claims on their broadest interpretation, that can be regarded as a contribution to the patent" was just wrong. He also argued that APG plays no part in the applications and is not disclosed within them.

154 He argued that the right approach in resolving the question of whether the hot foam work falls within the inventive concept is that I should work from the disclosure of the specifications and the claims, and "essentially the story of how the invention in the patent was devised". Referring to *Markem*, he argued that the focus is how the application came into being, what embodiments were devised, and how these were later translated into the disclosure and specification. He said that it was "very unusual" to argue that the inventive concept had been reached by a composition that is not mentioned in the applications.

155 Mr Cordina preferred to come at this point from the view that the hot foam composition with saccharin and APG had, once Dr Clearwater suggested the addition of saccharin, contained all the features of the inventive concept.

156 Both witnesses seemed entirely clear in their minds that the inventive concept of the applications in suit and the hot foam composition were two separate and distinct inventions. Dr Clearwater said this during cross examination:

> *The hot foam is very much Mr Tindall's. I was the saccharine plus penetrant person.*

157 And later, when Mr Edwards returned to the point and asked Dr Clearwater to confirm that his evidence was that "this patent application this invention has nothing to do with the hot foam products that Mr Tindall and his father Mr McCarthy were working with", Dr Clearwater said "yes".

158 When it was put to Mr Tindall that the hot foam composition with APG and the added saccharin could read onto the inventive concept of the applications in suit, he seemed to struggle with the idea. The transcript captures his confusion:

> *(Pause). Are you trying to link that the APG is the penetrant of hot water? Do not forget, and I am not trying to, you know, you are talking about hot water here, right, you are not talking about cold water, which I am sure is what that APG, I am assuming, right, that is what that is talking about."*

159 A further exchange takes place:

Q: So the person who suggested to you the combination of those three ingredients – water (be it hot or cold), a penetrant and saccharine – was Dr Clearwater?

A: No, not as a penetrant, and I am just disagreeing with you the link between APG as a penetrant to the hot water, and I never - - we were only using the APG as a blanket.

Q: So you were using it as –

A: With the hot water, right. There was a good foam and it trapped the heat on top of the plant, which made the hot water operation, it optimised it and made it quicker, faster and more effective, so that was not a penetrant.

Q: Do you know it was not acting as a penetrant?

A: Do I know? I am pretty sure it was not.

160 Under further questioning from Mr Cordina about how he knew it was not acting as a penetrant, Mr Tindall did concede that he had nothing to show that APG was not acting as a penetrant in the hot foam, and admitted that APG could have been acting as a penetrant but reiterated that he had never heard of it.

161 My view of the point is therefore this. It is clear from their evidence under cross examination that both Mr Tindall and Dr Clearwater held the view that APG was included in the hot foam herbicide because of its properties as a foaming agent. Neither of them gave evidence to the effect that APG was added to the hot foam in order to act as penetrant. There was nothing in the evidence to suggest that it was understood or contemplated during the hot foam work that APG was acting as penetrant.

162 I have already found that Dr Clearwater's contribution was to suggest including saccharin into the hot foam composition to improve its effectiveness, but that he did not at this point specifically suggest that the combination of saccharin with water and a penetrant would make an effective herbicide. It is clear that Mr Tindall did not know or consider that APG may be acting as a penetrant. The witnesses agreed that the hot foam was not considered commercially viable, and they moved on to other work.

163 The evidence is therefore entirely clear: those involved did not arrive at the inventive concept by virtue of the hot foam work, and the applications did not come into being as a result that work. In other words, no discovery was made by either Dr Clearwater or Mr Tindall during the hot foam trials involving APG that a combination of an aqueous solution of saccharin and a penetrant would make an effective herbicide. The evidence does not support the view that the hot foam work had any causal link to the filing of the applications in suit.

164 Therefore, even if my earlier finding is wrong – and APG is, as a matter of fact, a penetrant within the meaning of the inventive concept – that does not lead to a finding for the claimants on the question of whether the hot foam work resulted in the invention. I am satisfied that, on the balance of probabilities, the hot foam work did not lead to the devising of the inventive concept.

165 I note at this point that there was a brief debate about whether the inventive concept actually included the use of foams within its meaning at all. Mr Edwards suggested it did not, since the applications required a liquid carrier in a single liquid phase, made no mention of foams, and even taught away from foams (in that a defoamer is mentioned).

166 Dr Clearwater conceded that foam has liquid and gas phases but I don't think the point was pursued in terms of whether that led to a conclusion that an inventive concept featuring a liquid phase means that a foam (with its additional gas phase) is expressly excluded.

167 I accept that the applications do not expressly refer to the inclusion of foam-based compositions and refer to an anti-foaming agent or defoamer as one of a number of optional additives. But the point has not been fully evidenced and that must leave some doubt as to whether foam-based compositions would necessarily fall outside the inventive concept. However, given the conclusion that I have reached on the facts that the hot foam work did not lead to the devising of the inventive concept, the question falls away.

IX.7 Trials of saccharin solution and Pulse

168 I have already found that (on the balance of probabilities) Dr Clearwater did not give clear instructions at the 2016 meeting(s) to use an adjuvant and, if he did, then it is more likely than not that he did not give clear instructions that the adjuvant had to be a penetrant.

169 However, that is not the end of the matter. Dr Clearwater says that he and Mr Tindall jointly performed various tests which confirmed that his 6957/17 substance mixed (he claims on his instructions) with the adjuvant Pulse was an effective herbicide. As I have already noted, the applications state that Pulse is an organosilicone penetrant. There appears to be no dispute over that point.

170 Dr Clearwater says that he had run out of his supply of adjuvant by this time and that, following his instruction, Mr Tindall obtained a bottle of Pulse and then shared it with him. Dr Clearwater provided photographs of an empty bottle of Pulse which he says was the one provided. Dr Clearwater claims that they "jointly performed various tests which confirmed the mixture I shared was an effective herbicide."

171 Mr Tindall denies all this. He says that, separate to the hot foam/APG trials, he conducted field trials of saccharin solutions (with water) following Dr Clearwater's provision of the saccharin product 6957/17. As noted earlier, Mr Tindall says that the saccharin was provided as a "soft/liquid pruner" for the purposes of chemical control of vine shoot growth. He says that the results showed the product to be unfeasible for that purpose, and that Dr Clearwater "made no disclosure of the, or even any potential, effect of saccharin as a herbicidal composition".

172 Mr Tindall further denies that, at Dr Clearwater's instruction, he obtained and shared any bottle with Dr Clearwater. He says that there is no evidence in the photographs of a date and it is impossible to prove when, or by whom, the empty bottle in the photograph was obtained or shared.

173 He also notes Dr Clearwater's concerns about the value of the saccharin product 6957/17 and his steps to keep the composition confidential at that time, and contrasts that with Dr Clearwater's apparent openness if he did in fact instruct Mr Tindall to obtain Pulse as claimed. Mr Tindall contends that this shows Dr Clearwater did not regard the use of Pulse as valuable information and so "would not have considered [Pulse] to be an essential feature of the invention".

174 Mr Edwards pointed Dr Clearwater to the results contained in the PCT application showing that the inventive concept was a very effective herbicide with a fast reaction, change of colour, wilting and reduction in biomass. Dr Clearwater agreed with this, and agreed when it was put to him that "it would be obvious to someone testing these compositions that they had a very effective herbicide". He agreed it was correct to say that the effects would be seen very quickly without the need for a very big trial.

175 Mr Edwards further took Dr Clearwater to the statement in the PCT application that "the compositions comprising an organosilicon[e] penetrant were found to be the most effective…", and the statement that saccharin on its own does not work. It was put to him that would be "immediately apparent" that a composition comprising saccharin and a penetrant is "a much more efficient and effective solution to the problem of finding an environmentally friendly herbicide than what you and Mr Tindall had been trying previously, which was the hot foam solution". Dr Clearwater agreed.

176 Mr Edwards submitted that, if Mr Tindall was following an instruction from Dr Clearwater to perform tests with saccharin and a penetrant, he would have seen immediate results at the time. But, said Mr Edwards, it is only some considerable time later, in an email on 12 January 2019, that Mr Tindall talks about addition of a penetrant having "a major increase in efficacy" and suggests moving on from the hot foam product (of which, more later).

177 Dr Clearwater's response was to emphasise that, when he had given Mr Tindall the saccharin material he had also given him the adjuvant, and that he himself had done the initial experiments using a penetrant. Dr Clearwater also said that they had concluded "very successful" tests at Villa Maria and that he did experiments in his home garden with an adjuvant. He also at this point referred back to his original 2002-3 work.

178 There was then some slight discrepancy in the testimony. Dr Clearwater said that he and Mr Tindall "exchanged materials", and said that he gave Mr Tindall the saccharin under the code name but that Mr Tindall gave him a partially used Pulse bottle. Dr Clearwater went on to refer to this being done during Covid-19 restrictions when they needed to be "very careful about going out so I was keeping pretty much to my own home". When it was pointed out that the discussion was about whether this had all happened several years earlier, not during Covid lockdowns in 2020, Dr Clearwater recalled that he had had "major operations and several health issues" so that his ability to get out had been limited.

179 Mr Edwards highlighted to Dr Clearwater that the image of the bottle of Yates Zero Pulse that had been put into evidence by the claimant was undated. Dr Clearwater said that the photograph is recent but the bottle dates back from the first contact. Mr Edwards suggested that a possible explanation as to why Dr Clearwater had the

Pulse bottle was because Mr Tindall came to his house to demonstrate the saccharin/penetrant invention during later trials (discussed below) and left the bottle at his house. Dr Clearwater seemed to agree that this could be a possibility, but did certainly agree that it would have been valuable if he had written on the bottle the date at which Mr Tindall had passed it to him.

180 As I have already noted, Dr Clearwater says (in his first witness statement) that the obtaining of the Pulse was "at my instruction". He later said under cross examination that "I asked for a bottle of adjuvant. I did not specifically ask for a bottle of Pulse but Pulse was the one that was supplied".

181 Mr Edwards put it to Dr Clearwater that the term "adjuvant" could refer to penetrants but also to other excipients too, and thus the instruction to use an adjuvant was not an instruction to use a penetrant. Dr Clearwater acknowledged that different adjuvants have different efficacies, but he generally used Pulse in his experiments at that time. He said that "adjuvant" is the term he uses, and his recollection is that this is what he told Mr Tindall to obtain (and also told him to use in 5ml doses).

182 The question is whether the evidence supports the claimants' contention that Dr Clearwater and Mr Tindall jointly performed tests which confirmed that the saccharin mixed with Pulse, an organosilicone penetrant, is an effective herbicide. As on other points, the onus is on the claimants to prove their case. Having reviewed the evidence on this point, I am not satisfied that they have done so.

183 First, there is a complete absence of material evidencing these trials directly – such as notes from notebooks, sample details, test result data. Nor are there any email exchanges or other material discussing the outcomes of such trials. The notebook pages which have been provided in this case concern the hot foam/APG product trials and the addition of saccharin. They do not seem to me to concern the trial that Dr Clearwater refers to here, namely that of the saccharin product combined with Pulse.

184 Second, the evidence that has been provided is far from sufficient to discharge the onus which is on the claimants. It is wholly unclear from the evidence exactly when the Pulse bottle came into Dr Clearwater's possession and under what circumstances. Even if the Pulse bottle was obtained by Mr Tindall at Dr Clearwater's instruction (which Mr Tindall denies), Dr Clearwater was himself clear that he asked for an adjuvant in general terms, not specifically a penetrant. So that does not prove that Dr Clearwater devised the inventive concept even if he did make this instruction.

185 Third, I think Mr Edwards point is persuasive. The applications, and the evidence, support the view that the herbicidal effect of the product of the invention was very noticeable and quick when the product was applied. Although Dr Clearwater said there had been "very successful" tests of saccharin with Pulse, he did not specify when those occurred or provide details, and there is no explanation at all as to why none of the people involved appear to have recorded that success – or adapted or stopped what they were doing with hot foam at the time, in light of such success.

186 As already noted, Dr Clearwater provided the saccharin material at the meeting(s) in Autumn 2016, and suggested adding it to the hot foam product comprising hot water

and APG. The evidence supports that this is what was trialled – along with control trials some of which involved cold water. I am not satisfied that, on the balance of probabilities, the evidence also supports the contention that successful trials of saccharin solution mixed with Pulse took place during this time and led to the devising of the inventive concept.

IX.8 The meeting with Clive Elliot QC in December 2018

187 According to Dr Clearwater, he did not disclose the nature of the substance that he had suggested adding to the hot foam composition in the meeting(s) of Autumn 2016. It was not until some two years later, in a meeting with Clive Elliot QC on 4 December 2018, that he says he disclosed that the substance was sodium saccharin crystals.

188 Mr Tindall denied that first disclosure took place at the 4 December meeting. His evidence was that Clive Elliot QC was engaged to advise on legal aspects of the development of the hot foam herbicide. He exhibited a page from his notebook containing brief notes of the meeting, and pointed to the mention of "Swiss Type Claim" to support his contention that Mr Elliot's advice concerned the addition of saccharin to the hot foam and thus a novel use for a known substance.

189 Dr Clearwater provided an email exchange between Mr Elliot and Mr Tindall of the same date, where Mr Elliot refers to "our meeting this morning with you and John". It says "that you will now go away and do further trials and tests on the different aspects of the invention and that we will regroup again in the New Year, probably early February". It briefly refers to a "new company" and taking some steps towards patenting. Mr Tindall points out that there is no mention of the composition in this email exchange.

190 Dr Clearwater also refers to an email he sent on 24 April 2020 to a patent attorney, but addressing Mr Tindall, where he writes "You will recall that I disclosed my discovery that saccharine was an effective herbicide in the presence of Clive Elliot QC" and that "You were clearly surprised" at the disclosure. The email goes on to say that "Clive said it would be appropriate to pursue a claim for a Swiss patent i.e. a novel use for an old material".

191 Under cross examination, Dr Clearwater said that the disclosure of the coded substance as saccharin was "the crucial one because we [that is, himself and Mr Tindall] both knew about the use of Pulse at this stage. There was no question about that, but the missing piece of the jigsaw was saccharine. When Aaron was told it was saccharine, he was astounded, he was amazed".

192 During his cross-examination, Mr Tindall suggested that he did not know the nature of the crystals for some time. When the company MCL was in the process of being formed, Mr Tindall said that "John had said that he owned all the rights to the crystals" and that "At the time I was not sure what the crystals were. I thought that maybe he had even made them, they were his. So when he said just recently about the amazement about it, yes, it was, because I thought it was something more".

193 Mr Edwards submitted that the evidence suggests the meeting was focussed on the discussion of a pure saccharin solution and references to a Swiss type claim in the

evidence support that view, since use of saccharin would be a method of using a known substance, whereas a composition which also included a penetrant would have been a novel composition for which a standard product claim could be used.

194 While it is clear that the email exchange immediately after the meeting does not refer to disclosure of the coded substance, both sides appear to agree – and have evidenced – that some sort of discussion over a Swiss-type claim took place at the meeting. This points strongly to a discussion over the patenting of a new use for a known substance. This is also consistent with the picture given by the email of 24 April 2020. Furthermore, Mr Tindall's testimony under cross examination also appears highly consistent with this picture – he was unaware of the substance's composition at the time when the company was being set up. I note that MCL was formed in early 2019.

195 I therefore consider it more likely than not that Mr Tindall was unaware of the nature of the substance "6957/17" up until late 2018, and that Dr Clearwater disclosed the identity of that substance at the meeting on 4 December 2018.

196 Mr Edwards further argued that the meeting was in fact focussed on the use of saccharin as a "soft pruner", pointing back to Dr Clearwater's 24 April 2020 email where he says (after referring to the disclosure and Swiss claims) that his "first discovery" was the use of the saccharin material as a "soft pruner" because the boundary between the dead tissue and unsprayed living tissue was very sharp.

197 It seems to me, however, that the email is not sent as a record of the meeting but as a summary of some key points that Dr Clearwater felt summed up his contribution in the collaboration overall. In any case, the defendant says in his second witness statement that Clive Elliot QC "was engaged to advise on legal aspects of the development of adding saccharin to the herbicidal foam compositions comprising hot water and AGP [*sic*]". I therefore consider it highly likely that the disclosure of the coded substance as saccharin which took place at the meeting was done so in the context of both the "soft pruner" aspect and the hot foam work.

198 For completeness, I do not consider that there was any disclosure at the meeting specifically of the inventive concept. I did not hear any suggestion that this was the case – the closest the claimants coming to that contention was Dr Clearwater's testimony that his disclosure of the identity of the saccharin was "the missing piece in the jigsaw". There are two points that arise from this.

199 The first point is that the claimants do not plead that Dr Clearwater's entitlement arises solely by contributing saccharin. Their position, and Dr Clearwater's consistent testimony, is that it was him who alighted on the combination of saccharin solution and a penetrant.

200 The second point is that disclosure at the Elliot meeting made clear to all concerned that the hot foam comprised hot water, saccharin and APG. However, for the reasons that I have already set out, I have found that the hot foam work did not lead to the devising of the inventive concept.

201 One final related point is that, during cross examination, Dr Clearwater said that the email of 4 December showed Mr Elliot's perception after the meeting that Dr

Clearwater was the inventor. This is where Mr Elliot says: “Once the necessary trials are completed and the invention is properly documented I recommend that patent novelty and freedom to operate searches are conducted. These should be conducted through the main international online databases. John should start this process and I can then give you recommendations as to whether a professional patent searcher should also be retained”.

202 Mr Edwards said that it may be that he was suggesting that Dr Clearwater perform the tests that provide the disclosure of the patent, such tests coming after the initial discovery of the inventive concept. If so, he said, this was not relevant to the issue of inventorship. Dr Clearwater conceded that point. In any case, even if Mr Elliot did consider that Dr Clearwater was the, or an, inventor of the invention being discussed, it was the hot foam composition that was the subject of the discussion – not the inventive concept of the applications in suit here. Either way, the point clearly gets the claimants no further forward.

IX.9 The December 2018 trials and beyond

203 In his counterstatement, Mr Tindall asserts that in December 2018 he independently conducted field trials with a combination of an aqueous solution of saccharin and an organosilicone penetrant (Devour1020), which was applied to weeds in Sydney, Australia.

204 During cross examination he explained the background slightly further, saying that he had returned to Sydney for Christmas and he had “some of the old saccharine which I know, I have tested before. It did nothing. I thought what am I going to do? I have got this – I had some penetrant, the Devour, let’s just mix it up rather than throw it away, spray it”. In his first witness statement, he says that the results were “extraordinary” and led to his realisation that this was a viable herbicide that did not need to be heated or combined with APG, and which avoided the inconsistent results of the saccharin solution alone.

205 He says that these trials formed the basis of the inventive concept, and that the results were disclosed to Caine Thompson (a collaborator on the hot foam project) in an email of 12 January 2019. In this email Mr Tindall said this:

> *The reason for touching base tomorrow relates to latest testing of the food grade product.*
>
> *The addition of a penetrant has seen a major increase in efficacy across common weed species/varieties found in the road corridor – including grasses.*
>
> *Speed of action was also greatly increased – vegetation was visibly distressed/effected within hours of treatment with certain varieties fully effected within three days of treatment.*
>
> *My thoughts are to leave the thermal technology to concentrate on getting this product patented and commercialised.*

206 Dr Clearwater disagrees with Mr Tindall’s claim to have independently carried out the trials involving the penetrant. He says that experiments were performed in his garden in Auckland, where he instructed Mr Tindall to spray areas of his garden with

"a mixture of sodium saccharin and an adjuvant" and Dr Clearwater recorded the results that later formed part of the applications.

207 In particular, he says that Example 1 was an experiment performed in his garden in the weeks subsequent to 1 November 2019 (he recalled the exact date due to a hospital stay). Dr Clearwater also claims that Example 4 is his work, conducted in his own garden, although he could not remember when these tests were carried out. He says that the tests comprising Example 5 were performed jointly with Mr Tindall including at the Villa Maria vineyard, and that his diary records these as being on 2 January 2020.

208 Mr Tindall denies this. He refers to an email that he sent on 7 October 2019 sending Dr Clearwater (via his wife) some photographs regarding "Vanome"[9]. He says that "I had approx. 50mg left so made up a half litre mix including penetrant. Treatment was done at mum's place". Mr Tindall also points to what he said is a response – sent on 2 January 2020 from Dr Clearwater's wife – which says "John says "that's great!" and says to thank you for the material that you provided. He thinks that there is some very interesting "stuff" there!".

209 Mr Tindall further denies that he was instructed to spray areas of Dr Clearwater's garden, pointing to a further line in the email from Dr Clearwater's wife which says "BTW..he [i.e. Dr Clearwater] is happy for you to use some penetrant on his "garden"..but I'm aware that with time constraints this might not be possible this visit". Mr Tindall says that this shows Dr Clearwater was simply amenable to him conducting tests based on the preliminary testing and results that Mr Tindall had provided earlier.

210 Mr Tindall further denies that Example 4 was the work of Dr Clearwater in his own garden and that Example 5 was joint work including at Villa Maria, pointing to a lack of evidence (including no sight of the diary entry of 2 January 2020 to which Dr Clearwater refers).

211 Dr Clearwater was taken to these emails during cross examination. Mr Edwards suggested that the reference to having "50 mg left so made up a half litre mix including penetrant" seems to distinguish between Vanome itself and the penetrant. Dr Clearwater said that, when he had asked Mr Tindall to spray his garden using a large 10 litre sprayer, Mr Tindall had sprayed the sodium saccharin without the adjuvant. Dr Clearwater said this:

> *I enquired as to why it had been a failure and it turned out that he had never put the adjuvant on. I said all treatments must have the adjuvant. I remember this very distinctly. I was most annoyed with him.*

212 He suggested that when Mr Tindall had said "including penetrant" it was because of that earlier mistake. Dr Clearwater also suggested that was why he was emphasising in the email reply that it must include the penetrant.

213 When Mr Edwards suggested that the emails showed that it was Mr Tindall who was responsible for trialling the saccharin and penetrant combinations, Dr Clearwater

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[9]Dr Clearwater said under cross examination that Vanome was the name he gave to the saccharin and an adjuvant, though not any particular defined adjuvant.

said that they worked together on some occasions and independently on other occasions, showing each other the results they were getting. He did however at another point express the view that Mr Tindall would not have had the precise scientific equipment to measure out the penetrant.

214 In response to Mr Edward's suggestion that the reply from Dr Clearwater's wife invited Mr Tindall to trial the product in the garden, rather than saying that Dr Clearwater had trialled the combination already and knew it worked, Dr Clearwater replied that it was perfectly reasonable during a collaboration to allow a collaborator to repeat the results he himself had already done.

215 Dr Clearwater agreed that Mr Tindall came around to his house to show him what he was doing, but reiterated his view that Mr Tindall was not independently conducting trials and not producing original results. He also said that he had tested some of Mr Tindall's "products" such as a sweet protein, but these did not produce anything of value.

216 Mr Cordina took Mr Tindall to these emails in order to confirm that they were not a single email chain, and that the email of 2 January 2020 from Dr Clearwater's wife and the reply from Mr Tindall on 3 January were "unrelated" to the email from Mr Tindall in October 2019 reporting the testing he had done. Mr Tindall appeared to agree, resiling from the position in his witness statement that the email of January 2020 was a "response" to his October 2019 email.

217 Mr Tindall confirmed his view during cross examination that the experiments in the patent application were all his, and that Dr Clearwater had made no contribution to the testing. He was taken to Example 1 and confirmed his view that it was done at his own home saying "It was here. I am pointing at it there and I took the photos like I always do, the befores, the afters".

218 On Example 4 Mr Tindall said "I did all of the testing here", although he said it was possible that Dr Clearwater replicated some of the spraying in his own garden. Mr Cordina suggested the testing was done to some degree under Dr Clearwater's instructions, which Mr Tindall denied and then said that "Katherine [the patent attorney] was helping with giving directions" as well as a bit of input from Mr McCarthy. According to Mr Tindall, Dr Clearwater was fixated on "mode of action" (that is to say, the science behind the action of the saccharin on the plant) and not the weed spraying.

219 Mr Cordina put to Mr Tindall an email he had sent to Brett Donaldson at Villa Maria dated 20 February 2020, stating that he would like access to a small section of the vacant land at Villa Maria, and that there were a number of gorse bushes at the site that "we'd like to treat with a non-hazardous compound that we've been working on/developing". Mr Cordina said this sounded like a joint development programme was going on in February 2020. Mr Tindall said that he did not know anything about inventorship or patents at that time, and Dr Clearwater was still a friend at the point, but he himself went and did spraying though Dr Clearwater took some photographs.

220 Mr Cordina further highlighted a 28 June 2019 email from Mr Tindall to Dr Clearwater (via his wife) saying that "we have completed" proof of concept testing, and an email of 9 January 2020 from Mr Tindall to a lawyer referring to "the real value of what

John and [I] had developed". Mr Cordina submitted that the contemporaneous evidence is therefore that they worked jointly on testing the products and therefore both contributed to the inventive concept.

221 Mr Tindall's response was that at the time his understanding was that Dr Clearwater "owns the crystals, the rights" but that he later realised that was not the case. He said this:

> *…I thought he owned the rights at that time. That is what I am saying. Everything changed when we went to AJ Park and Katherine got involved, the patent attorney. Up until then, like I said, I believed him…. he believes it that he owned the rights to that stuff and I was quite happy to go along with it*

222 In summary, there is considerable disagreement between the witnesses as to who directed and carried out the various trials involving a composition comprising a cold-water saccharin solution with a penetrant which appear to have taken place from December 2018 until (at least) early 2020. Dr Clearwater contends that he carried out, or at least directed, the trials, that he and Mr Tindall collaborated and that Mr Tindall may have repeated some of the trials. Conversely, Mr Tindall contends that he conducted these trials independently and without any instruction from Dr Clearwater, though he kept Dr Clearwater informed – who may have replicated some of the trials.

223 Mr Cordina submitted that, whilst there was some discussion as to who did what, and replicating tests, it was clear that both parties contributed to the testing, and it was that testing which went into the patent application as examples of the invention. Mr Edwards considered the 12 January 2019 email to be key to the case, because it is "the first time anyone acknowledges that the invention consists of a combination of penetrant and saccharine as distinct from everything else that was being discussed".

224 It seems to me that the time between Autumn 2018 and early 2020 is likely to have been a key period in terms of the trials that were done to form the basis of the disclosure and Examples of the applications. However, despite the considerable number of trials disclosed in the applications, the evidence provided in relation to this time period and the trials is sparse, and at times conflicting.

225 First, there is the question of what took place in the immediate period leading up to late 2018 and the outcome noted by Mr Tindall in his 12 January 2019 email reporting "the latest testing" and referring explicitly to "the addition of penetrant". The evidence sheds very little further light on this but it appears that the results were so notable that Mr Tindall suggests dropping the hot foam work.

226 Dr Clearwater's response when this email was put to him under cross examination was simply to reiterate that this was his discovery. If he had in mind at this point the work involving saccharin and Pulse, or his work in 2002/3 in the abandoned apple orchard, then I have dealt with the evidence in relation to those events. If he had in mind some other work in the period leading up to December 2018/January 2019 then this was not explained.

227 Regarding this specific period, I note an email from Mr Tindall to a third person dated 10 October 2018 which refers to the potential for commercialising "a unique food

grade compound as an additive to the APG product for a new hot foam additive, and as a stand-alone vegetation control 'spray' product". The email goes on to say that "It's early days but initial trial results are positive". I did not receive specific submissions on the point but the reference to the compound being added to the "APG product" suggests that the compound being referred to at this point is the saccharin substance itself (since it was saccharine that was added to the hot foam product with APG).

228 Mr Cordina noted that the trials referred to in the 12 January 2019 email were said to have been carried out in December 2018, and submitted that it seemed very unlikely that these trials could not have been prompted by Dr Clearwater's disclosure at the 4 December 2018 Elliot meeting.

229 This point appears to me to be somewhat speculative and there is no evidence either way. It is clear that various tests went on with the saccharin substance both before and after Dr Clearwater disclosed the nature of the substance at the Elliot meeting. I do not think there is a sound basis for concluding on the balance of probabilities that Dr Clearwater devised the inventive concept because he disclosed the nature of the substance shortly before Mr Tindall tried the saccharin and Devour combination and reported the results to Caine Thompson in January 2019.

230 Second, there is the question of what took place after January 2019 and until early 2020. The 28 June 2019 email from Mr Tindall to Dr Clearwater which was put to Mr Tindall during cross examination refers to progress regarding proof of concept testing "earlier in the year". But neither this email nor other evidence sheds light on the specifics of what that testing was or who did it. Much of what may have been done during most of 2019 remains unclear. (Mr Cordina pointed out general references in this and other emails to "we" or "John and I", which I deal with below).

231 At certain points Dr Clearwater's evidence referred to specific dates within the period between late 2019 and early 2020 when he said that he worked alone or with Mr Tindall on tests related to Examples 1 and 5 of the applications. But there is no further evidence provided to support the view that Dr Clearwater was either conducting tests himself or giving clear directions which resulted in the devising of the inventive concept at this time.

232 In my view the weight of the evidence goes the other way. It shows Mr Tindall reporting results to Dr Clearwater in the email of 7 October 2019 regarding a trial of 50mg of the saccharin in half a litre of water with penetrant. As I have noted, it became unclear whether a reply from Dr Clearwater's wife on 2 January 2020 (entitled "Re your latest email") was in direct response, or was in response to some other email from Mr Tindall which is not before me. But whether it was in response to Mr Tindall's 7 October 2019 email and photographs or some other results, it is clear that the reply is a brief response to some form of testing which was done by Mr Tindall between late 2019 and early 2020. The reply comprises encouraging remarks, a thank you, and an offer to discuss. None of this evidence supports the view that Dr Clearwater was either testing or directing the testing around this time.

233 The brief offer made in the reply to Mr Tindall to "use some penetrant" on Dr Clearwater's garden does not get the claimants any further. As I have noted, Dr Clearwater's explanation was that Mr Tindall had previously forgotten to use

penetrant when he had been asked to spray Dr Clearwater's garden. There is no evidence provided to show that the earlier spraying (where the penetrant was said to have been forgotten) took place at Dr Clearwater's request or under his instruction. Dr Clearwater's testimony was that – as a result of this event – he remembered distinctly making clear that all treatments must include the adjuvant. Even putting to one side the point that an adjuvant may not necessarily be a penetrant, this evidence falls a long way short of demonstrating on the balance of probabilities that Dr Clearwater devised the inventive concept during that time.

234 In relation to this period, I note a further email of 24 February 2020 in the cross examination bundle for Mr Tindall. In response to an update from Mr Tindall regarding trial work on vacant land at Villa Maria, Dr Clearwater mentions purchase of equipment, asks if Mr Tindall has enough Vanome for 2 applications to 30 gorse bushes, and asks about spraying of "the coconut material". He appears to tell Mr Tindall to spray two patches each 1 m^2 with coconut at "hot" and "ambient" temperatures. I did not hear submissions on this particular email but I could not see a reference to use of a coconut material in the applications, and the testing at high temperature suggests to me that this may have concerned the hot foam work. It is therefore wholly unclear whether this email relates to the inventive concept of the applications at all.

235 I now turn to Mr Cordina's point that some of Mr Tindall's emails from this period refer to "we" or "John and I" in terms of carrying out trials. However, I do not think such references lead to a conclusion that, on the balance of probabilities, either the trials which led to the discovery referred to in the 12 January 2019 email, or the subsequent trials in 2019 and early 2020, were carried out jointly.

236 It is clear from the evidence that Dr Clearwater, Mr Tindall and Mr McCarthy had been working together for some years on possible developments across this field and were still interacting during this period on both the hot foam and cold water products. I do not think Mr Tindall (or the others) had a clear picture at that stage either of patent matters or of what the "inventive concept" of any patent might actually be. Mr Tindall said his understanding was that, since Dr Clearwater had brought the saccharin crystals to the work, it was Dr Clearwater who had some form of rights in relation to those, however used. I am also mindful of Lord Hoffman's point in *Yeda* (see paragraph 29 above) that inventors themselves "will often not know exactly where" the point of discontinuity between the prior art and the inventive concept arises.

237 It seems to me that the most likely explanation for Mr Tindall's references to "we", etc is that they reflected the wider ongoing contact between those involved across the scope of their work, and Mr Tindall's understanding of ownership of the crystals.

238 Looking overall at the evidence concerning this period and the trials, there was clearly interaction between Dr Clearwater and Mr Tindall, and a continued discussion of tests and outcomes. It is not out of the question that tests were replicated and that some work was done individually and unbeknownst to the other person. But there is certainly not sufficient evidence of that taking place to support the claimants' case. And if there were such evidence, it would need to be assessed to determine the extent to which such replications or further tests were done to further

demonstrate the inventive concept (as already devised) or were tests that formed part of the devising of that concept.

239 For all of the above reasons, I am not satisfied that Dr Clearwater contributed during this period to the trials which formed the devising of the inventive concept. On the balance of probabilities, I find that the key trial devising the invention is the one referred to by Mr Tindall in his email to Caine Thompson of 12 January 2019. While the evidence is quite unclear about subsequent trials, there is no doubt that some took place including as part of developing the invention and a possible patent application, and that there were discussions with Dr Clearwater. However, for the reasons I have set out above, the claimants have not proved that, on the balance of probabilities, Dr Clearwater's involvement in those trials amounted to him having a role in devising the inventive concept.

IX.10 The setting up of MCL

240 Dr Clearwater, Mr Tindall and Mr McCarthy set up the company MCL on 11 February 2019. It appears to have been set up to exploit the hot foam product, albeit Mr Tindall seemed to suggest under cross examination that it was a way for them to partner more generally while recognising that Dr Clearwater "owned the right to the crystals".

241 The company appears to have remained largely inactive over the relevant period. A question arose as to the fact that the patent attorney involved in the applications in suit appeared to be representing MCL but nothing, in my view, turns on this. Clearly the applications are not filed in MCL's name, and I consider below the evidence regarding the interactions that both Mr Tindall and Dr Clearwater had with the patent attorney regarding the preparation of the patent applications.

IX.11 The Collaboration Agreement

242 As noted above, Dr Clearwater and Mr Tindall signed a Collaboration Agreement dated 17 February 2019 with Mr McCarthy's involvement too. This Agreement was central to the Bionome proceedings where entitlement to the Bionome applications was in dispute, but there was no inventorship dispute.

243 Mr Cordina submitted that, based on the findings of the Bionome decision that the Agreement did not assign Dr Clearwater's rights, the Agreement could have no effect on Dr Clearwater's right to be named as an inventor in this case, even if the subject matter of the applications in suit falls within the Agreement's scope. Mr Edwards agreed that the Agreement was part of the general factual background to the present proceedings but also agreed that the focus was on who devised the invention as a matter of fact, and that neither side was advancing a claim to entitlement based on the Agreement.

244 I agree that I do not need to consider the Agreement further, and I do not need to make any findings as to its scope or effect in order to reach my decision in these proceedings.

IX.12 Correspondence with the patent attorney

245 Dr Clearwater's evidence is that he worked with Mr Tindall and the patent attorney firm AJ Park to develop "a patent application covering the various compositions we were discussing", and that this "included my original development of sodium saccharin with an adjuvant". He says that, as he was the scientist, it was agreed that he would lead on preparing the draft documents for the application. He goes on to say that he recalled a lot of email exchanges, that there was a dispute over inventorship and that he "strongly disagreed" that Mr Tindall was the sole inventor.

246 Mr Tindall says that MCL engaged a patent attorney in January 2020, and that both he and Dr Clearwater were "in the process of reviewing and authorising the filing of the patent application" by May 2020. Pointing to a pre-filing email exchange between himself, Dr Clearwater and the patent attorney from 29 May to 4 June 2020, Mr Tindall says that Dr Clearwater authorised the filing of the application in Mr Tindall's name as sole applicant and inventor.

247 Dr Clearwater says that, under pressure from Mr Tindall, he agreed that the application could be filed on the understanding that "inventors could be corrected later", but that the breakdown in relations meant this was not discussed further. On this point, Mr Tindall refers to an email he received from Dr Clearwater in September 2020 saying that Dr Clearwater had agreed to the filing of the application "as a necessary defensive move to protect against [Mr McCarthy's] activities".

248 In his evidence, Dr Clearwater points to a document from Mr Tindall dated 27 April 2020 which includes an excerpt of patent attorney advice from 17 April 2020 saying to Mr Tindall that "…it would be safer to name you [i.e. Mr Tindall] as a co-inventor…". Dr Clearwater says this shows the attorney "clearly believed we should both be inventors". He also says that it was Mr Tindall's comment on the last page of that response, to the effect that inventorship could be resolved during the 12 month period covered by the provisional filing, which led him to approve the filing of the New Zealand application naming only Mr Tindall.

249 Mr Cordina suggested to Mr Tindall during cross examination that his pre-filing email saying "please file under my name for now" and "Any changes to inventorship will be made over the next 12 months if the decision is made to file a final spec" showed there was some doubt at the time as to who the inventors were. Mr Tindall said that this was a provisional filing, no decision had been made on a PCT application, and it was all about "let's just keep this thing moving". He said that, if they were going to progress with it, then "we needed somebody" to make a decision over inventorship.

250 The claimants also point to a draft letter from the patent attorney which was seemingly approved (with one minor edit, not relevant) by Mr Tindall in an email of 5 June 2020. The letter concerns the dispute which had arisen between, on the one hand, Dr Clearwater and Mr Tindall and, on the other, Mr McCarthy. Dr Clearwater's evidence points to the paragraph of the letter which states that Mr McCarthy:

> *will no doubt appreciate that, as inventors of the weed killing invention at issue in this matter (the Invention), Aaron Tindall's and John Clearwater's cooperation and involvement will be required if any valid intellectual property protection around the Invention is to be obtained*.

251 Dr Clearwater says this shows that, in June 2020, Mr Tindall agreed that they were co-inventors.

252 Mr Cordina pointed Mr Tindall to his second witness statement in which he said that the patent attorney had advised that "I should be designated as an inventor", and then took him to the email of 27 April 2020 which contained the quoted advice from the attorney on 17 April ("…safer to name you as a co-inventor…").

253 On the basis that the view on 17 April was that co-inventorship was the correct approach, Mr Cordina asked if the draft application was then amended to remove every contribution of Dr Clearwater before it was filed. Mr Tindall admitted that he did not know, and he would need to ask the patent attorney as he trusted her and had left all those matters to her. Mr Cordina suggested that it was contradictory for Mr Tindall to say that Dr Clearwater was not an inventor while not having checked the application to see if Dr Clearwater's subject matter is in there.

254 Mr Cordina submitted that the evidence showed that the work to prepare the applications was done both Dr Clearwater and Mr Tindall and that, when pressed, Mr Tindall did not really know whether Dr Clearwater's content remained in the applications. He argued that Mr Tindall's evidence diverged with that of the patent attorney who, based on her knowledge, had advised that Mr Tindall and Dr Clearwater should be listed as co-inventors.

255 Mr Tindall's evidence in relation to the work with the patent attorney is that, during the process of defining the invention, the attorney conducted patent searches and identified prior art disclosing the use of sugars as herbicides, and noted the best results related to the trials with saccharin and Devour. Mr Tindall says that the attorney advised that the use of sugars as herbicides would not be patentable, and that he should be an inventor in view of those trial results – to which Dr Clearwater "expressed his displeasure" in April 2020.

256 Under cross examination he said that the hot foam patent application had got "knocked back" in discussions with the patent attorney, but when he mentioned the cold water and penetrant mix the attorney had said "that is different, that is potentially novel, let's look at that". He went on to say that the attorney then looked further into that, which became the basis for the claims, and Dr Clearwater "had no part in that" – although Mr Tindall reiterated that at the time he was of the view that Dr Clearwater "owned the rights to the crystals".

257 Mr Tindall also relies on his email to the patent attorney of 6 April 2020 as showing that it was him alone who was devising the composition and recording the results at different concentrations. He points to the part of the email which says:

> *It does look like there is an effect at 100g per litre - not great but something is happening… Also, I managed to get almost 1kg of Vanome last Friday so have begun testing minimum dilution rate - 10g per litre. After 48 hours, the effect looks comparable to that of the similar compounds at 100g per litre. I'll send through a report this Friday.*

258 Mr Edwards took Dr Clearwater to his email of 24 April 2020 (which I have already looked at in other contexts during my analysis, and concluded that it was a summary of some key points that Dr Clearwater felt summed up his contribution to the

collaboration overall). This is the email where Dr Clearwater says (after referring to the disclosure at the Elliot meeting and Swiss claims) that his "first discovery" was the use of the saccharin material as a "soft pruner" because the boundary between the dead tissue and unsprayed living tissue was very sharp. Mr Edward's point was that Dr Clearwater went on in that email to say that Mr McCarthy's contribution had been to test saccharin "with a number of additives" and to tell Mr Tindall that "your claim to be a co-inventor rests on identical grounds – the testing of a few additives".

259 Mr Edwards contended that Dr Clearwater's view was therefore that the invention was saccharin as an active ingredient in a herbicide, not saccharin plus penetrant. The email did not, he said, say that it was Dr Clearwater's idea to add the additives to the solution. Dr Clearwater reiterated in response that his invention "was always saccharine plus an adjuvant".

260 Focussing on the attorney advice of 17 April 2020, Mr Edwards said that her view was that a significant element of the invention was the addition of the penetrant and he pointed to her advice that "there seems to be a reasonable chance" that it could be the inventive feature, although she says it is hard to say until the application is examined for novelty and inventive step. He contended that the attorney's advice was more consistent with the defendant's case, pointing out that, in the end, there is no claim to saccharin on its own in the applications, even on the basis of Dr Clearwater's theory on its mode of action. That, he said, has the effect of removing Dr Clearwater's alleged contribution.

261 Mr Cordina pointed out in reply that the attorney's advice was conditional ("if you were the one that originally suggested including a penetrant..."). It was not a statement that Mr Tindall was the contributor. But if he was, the advice was that he becomes a co-inventor.

262 More generally, Mr Edwards submitted that it is "not entirely uncommon" to have a lot of evidence from around the time of filing an application where parties dispute who contributed what. His point, with reference to paragraphs 20-22 of *IDA*, was that it is not direct evidence going to the objective question of who actually did what, but is subjective evidence of what their perceptions are as to their rights in the invention. Those perceptions, he submitted, may not be correct and so may shed very little light on who actually made the relevant contributions to the inventive concept.

263 He also said that it was unclear at this stage what would be included in the application and what would survive prosecution. He submitted that it is difficult to get anything on inventorship out of emails sent at a time where "there is no stability in terms of the claims…and the contents of the disclosure of the patent". In particular, he argued that the patent may have been planned to cover both the mode of action of saccharin and the combination of saccharin and penetrant. He contended that people were making claims to different parts of the disclosure against a "shifting background", and when receiving advice at different times about which bits of the patent application may be novel and inventive.

264 As what I understood to be a fallback position, Mr Edwards contended that – if I was going to rely on the evidence concerning patent attorney correspondence – then the initial emails from April 2020 may the most reliable, and earlier documents were

likely to be more reliable as they come before the dispute, or at least at the start, when “people’s memories are necessarily less distorted by the developing dispute”.

265 Significant amounts of material and argument were therefore provided by both sides regarding the discussions and work that went on between the relevant people and the patent attorney, leading up to and around the time of the filing of the first application. Having reviewed all of that material, and the arguments made in relation to it, my view of what happened is as follows.

266 As I have already discussed, in January 2020 Dr Clearwater was responding (via his wife) to contact from Mr Tindall regarding spraying that Mr Tindall had done using the cold water composition. At a certain point, which may have been before or after this date, matters had reached the stage where they engaged the services of a patent attorney, and this was done via MCL.

267 During the period leading up to 17 April 2020, the evidence suggests that Mr Tindall was continuing with some form of trials. His email to the attorney of 6 April 2020 referred to these trials and some further ones underway, “similar compounds that we were looking at including or leaving out” and suggesting “maybe we should include all (natural, alcohols, artificial)”, which appears to be a reference to different sugars or sweeteners. Meanwhile two key events appear to have happened during this period.

268 One is that the patent attorney conducted some searching as part of preparing for an application and/or as a freedom to operate search. Mr Tindall’s response to Dr Clearwater on 27 April 2020, summarising his view of events, says that the two of them and the attorney had last met together on 10 March 2020 and a prior art document was discussed relating to the novelty of “Vanome (on its own)” as opposed to “Vanome plus penetrant”. I heard no challenge to this particular part of the evidence. It therefore seems clear that the attorney, Dr Clearwater and Mr Tindall considered some prior art and its effect on the possibility of patenting the use of saccharin alone.

269 The second event is that Mr McCarthy, to the apparent surprise of both Dr Clearwater and Mr Tindall, filed the first of the Bionome applications, on 25 March 2020.

270 These two events appear to have prompted some urgent thinking as to the scope of the patent application to be made, and as to who would be considered as inventor(s) out of Dr Clearwater, Mr Tindall and Mr McCarthy.

271 As a result, on 17 April 2020 the attorney provided MCL, via Mr Tindall, with some conditional and somewhat caveated advice. This is the advice referred to above that addition of penetrant “appears to be a significant feature” although it was “hard to say” until any application was examined, and that <u>if</u> Mr Tindall was the one to suggest that feature then it would be “safer” to name him as co-inventor.

272 This advice, when relayed to Dr Clearwater, resulted in Dr Clearwater’s response of 24 April 2020 in which he “carefully considered your claim to be a co-inventor” and rejects it, saying that “If all of my discoveries were removed from the patent, nothing of any value would remain”. When Mr Tindall responds on 27 April 2020, he says he

was not making a claim to inventorship but was sharing the advice that MCL had received, and that – regarding the removal of material from the patent and the value of what remained – "This is what we are attempting to verify, but only as it relates to the current draft specification, and using a fact based approach".

273 Regarding Dr Clearwater's comment in his 24 April 2020 email that his work "showed that the product works by an entirely new mechanism", Mr Tindall's reply again refers to the 10 March 2020 meeting with the attorney, advice on the patentability of the mode of action, and comments made in that respect in the draft application at the time.

274 Despite this exchange, the evidence shows that they were able to maintain some form of cooperation. Work moved towards filing of the application with an email on 29 May from Mr Tindall to the attorney saying "I've just caught up with John - there's one minor edit to the spec relating to details…". That email instructed the attorney to file under Mr Tindall's name "for now", and the attorney replied explaining that she would need Dr Clearwater's approval in his capacity as a co-director of MCL (the party who are instructing the attorney). With Dr Clearwater's approval forthcoming, the application was indeed filed on 4 June 2020.

275 Meanwhile on 5 June 2020 the letter was sent to Mr McCarthy from the patent attorney on behalf of MCL, Dr Clearwater and Mr Tindall. This alleged that breach of a non-disclosure agreement had taken place, and was the letter which referred to Mr Tindall and Dr Clearwater as "as inventors of the weed killing invention at issue in this matter".

276 On this specific point, I note that the claimants say that Mr Tindall's approval of this letter shows that, at the time, he considered himself and Dr Clearwater to be co-inventors. When Mr Cordina put that point to Mr Tindall, he agreed that the letter was referring to the invention of saccharin and a penetrant but could not give a clear answer as to whether it was correct. He said that he had been caught out by Mr McCarthy filing a patent application "out of the blue", that the letter was dealing with that and that he had relied on his patent attorney's advice.

277 It is not clear to me how the patent attorney or MCL could have known precisely what invention was contained in the application filed by Mr McCarthy. The letter makes this clear, demanding sight of a copy of the application along with other information. This fact, combined with Mr Tindall's clear lack of expertise concerning patent drafting and related matters – leaving all those issues to his attorney – gives me significant doubt that Mr Tindall's approval of the draft letter amounted to him having a clear view at the time on the inventorship of the saccharin and penetrant composition.

278 More generally, it is very clear from the evidence that the scope of the invention as defined by the patent applications, and the protagonists' understanding of inventorship, was in flux during this period. Dr Clearwater had a view that he, and only he, had contributed anything of value. Mr Tindall, for at least some of the collaboration, thought Dr Clearwater had rights in the saccharin crystals. There seems to have been some discussion of whether Dr Clearwater's work on the mode of action was to be included or not. Dr Clearwater said during his cross examination that the attorney had "felt that the evidence [regarding mode of action] was not

strong enough" and that she and Dr Clearwater agreed to take it out. Meanwhile Mr Tindall's response on 27 April 2020 says that the patent attorney firm "cannot discount the possibility that Dennis [Mr McCarthy] may indeed have a claim/right to be included in any related patent application".

279 With regard to the attorney's advice of 17 April 2020 on Mr Tindall's co-inventorship, I have already noted that it was conditional and caveated. This adds to the view that no settled position had been reached, and it is not clear what further discussions or changes to the draft application took place between that conditional and caveated advice and the filing itself.

280 The exchanges over filing of the initial application also give a clear picture of their urgency regarding filing (given Mr McCarthy's actions) and their lack of clarity over the unresolved question of inventorship. Both Mr Tindall and Dr Clearwater believed that clarity could be achieved and the inventorship question resolved in the 12 months after the filing of the initial application. I do not think for a moment that Dr Clearwater's approval for filing meant that his own doubts over Mr Tindall's inventorship had been resolved, any more than I think that Mr Tindall's approval of the draft letter to Mr McCarthy showed that he was certain that he and Dr Clearwater were co-inventors. Quite clearly, neither of them regarded the matter settled, and of course the evidence (and these proceedings) show that any plan to settle the matter in the 12 months following the filing of the initial application did not happen.

281 There are considerable difficulties in determining questions of inventorship on the basis of what the parties thought or understood in the period leading up to the filing of a patent application, particularly when matters are still in flux. The evidence in this case is a clear illustration of those difficulties. I am also very mindful of the Court of Appeal's judgment in *IDA* where Jacob LJ held at paragraph 22 that "the views held at the time as to who should own what, in the absence of any agreement, do not assist". I have given my view of the various exchanges which took place around the time of drafting and filing of the initial application. In the light of *IDA* and because of the unresolved position on inventorship at the time, it is clear that I should give very little weight to the claims and statements which those exchanges contain.

282 Ultimately, what matters is the positions that the parties are each taking on inventorship now, and what the evidence shows actually took place, or did not take place, in relation to the devising of the inventive concept. For all these reasons, neither the various statements or claims of the parties, nor the attorney advice, assist me further in determining the matter before me.

IX.13 Relevance of the Bionome applications

283 There was some discussion about the relevance of the Bionome applications to the present proceedings and in particular to the question of inventorship. Mr Cordina tried to take Mr Tindall through a certain combination of claims in the Bionome application and compare them to the features of claim 1 of the applications in suit. Mr Tindall seemed to struggle with this task while on the witness stand.

284 Mr Cordina's point was that, in the Bionome applications, claim 1 combined with dependant claims 5 and 12 define a composition comprising an aqueous solution of saccharin and a penetrant. It was notable, he submitted, that the Bionome

applications pre-date the applications in suit, and that Dr Clearwater is accepted to be a joint inventor of the Bionome applications (it not being a point that was in dispute in the Bionome proceedings).

285 Mr Edwards submitted that the present proceedings relate to different patent applications from the Bionome proceedings and that, because the question of inventorship of the Bionome applications was not at issue in those proceedings, it was not subject to any findings.

286 He also argued that the Bionome applications had a "much broader inventive concept", since the main independent claim is to a "composition comprising an aqueous solution of at least one sugar", supported by a theory disclosed in the Bionome specifications as to the mode of action. He compared this to what he submitted was a narrower inventive concept in the applications in suit. He also pointed to "the large amount of experimental data" in the present applications as compared to the Bionome applications. The applications in suit, he said, provide detailed insights into particular penetrants, and show that silicone penetrants are particularly effective when combined with artificial sweeteners like saccharin.

287 I can deal with this point briefly. First, it is clear that Dr Clearwater is identified as a co-inventor of the Bionome applications, alongside Mr McCarthy. This point was not in issue during the Bionome proceedings. Second, it does appear to be the case that a composition comprising an aqueous solution of saccharin as a sugar substitute and a penetrant falls within the scope of claims 1, 5 and 12 of the Bionome applications.

288 However, I do not see that this gets the claimants home in terms of the inventorship of the applications in suit. The Bionome applications are different from the applications in suit – not least in the breadth of claim 1 but also in the nature of the disclosures made. It is not surprising that the evidence provided in this case has not been directed to showing which aspects and features of the disclosure and the broader claims in the Bionome applications were invented by Dr Clearwater and which by Mr McCarthy. But without such evidence, I do not see how I can reasonably infer that Dr Clearwater is an inventor of the present inventive concept simply because that concept falls within a particular claim combination of the Bionome applications.

289 What matters is the evidence I have before me as to who did what in relation to the inventive concept of the applications in suit. As is clear from my analysis, that is the basis upon which I have decided the matter.

IX.14 Summary of findings regarding who devised the inventive concept

290 In terms of the events concerning the devising of the inventive concept, I have made the following findings of fact:

> (i) Dr Clearwater conducted some trials in an apple orchard in 2002-3, as part of wider work involving fungicides, and trialled (amongst other products) a product which involved a mixture of water, sodium saccharin and an adjuvant, which had an unexpected and significant herbicidal effect. It is not proven

that the adjuvant was a penetrant, let alone that Dr Clearwater was aware that the adjuvant was a penetrant.

(ii) In 2015 (or possibly 2016 – nothing turns on it) Mr McCarthy, Dr Clearwater and Mr Tindall first worked together, and their collaboration at that point focussed on the hot foam composition, which comprised hot water and APG.

(iii) In Autumn 2016, Dr Clearwater proposed addition of the crystalline substance known as "6957/17" to the hot foam composition, and some trials were planned. It is more likely that Dr Clearwater did not give clear instructions to Mr Tindall to use an adjuvant in those trials. If I am wrong, and Dr Clearwater did give such instructions, then I consider it more likely that Dr Clearwater did not give clear instructions that the adjuvant had to be a penetrant.

(iv) Hot foam trials (with saccharin) were conducted at Villa Maria. The product was not commercially viable. There is no sound basis for concluding that the APG which was used in the hot foam composition was, on the balance of probabilities, an effective penetrant. But even if it was, the hot foam work did not lead to the devising of the inventive concept.

(v) On the balance of probabilities, the evidence does not support the contention that successful trials of saccharin solution mixed with Pulse led to the devising of the inventive concept.

(vi) It is more likely than not that Mr Tindall was unaware of the nature of the substance "6957/17" up until late 2018, and that Dr Clearwater disclosed the identity of the substance at the Elliot meeting on 4 December 2018. It is highly likely that the disclosure took place in the context of both the "soft pruner" aspect and the hot foam work.

(vii) On the balance of probabilities, the key trial devising the invention is the one referred to by Mr Tindall in his email to Caine Thompson of 12 January 2019. Some subsequent trials took place and there were discussions with Dr Clearwater. However, the claimants have not proved that, on the balance of probabilities, Dr Clearwater's involvement in those trials amounted to him having a role in devising the inventive concept.

(viii) None of these findings are altered by the correspondence with the patent attorney concerning the drafting and filing of the applications, nor when considering the Bionome applications.

291 It follows that it was Mr Tindall who devised the inventive concept of a composition for eliminating or reducing undesired plant growth comprising a liquid carrier, at least one artificial sweetener or sugar alcohol or an agriculturally acceptable salt thereof, and a penetrant.

X. The Okipa assignment

292 Both parties made arguments in relation to an assignment agreement between Dr Clearwater and Okipa dated 22 February 2022. Had I found on the facts that Dr Clearwater was a co-inventor, it would have been necessary for me to determine whether Dr Clearwater or Okipa then had joint entitlement to the applications. Given my finding I need say no more on this point.

XI. Conclusion

293 I have found that Mr Tindall is the sole inventor of the inventive concept of the applications which are the subject of these proceedings. I therefore conclude that Mr Tindall is solely entitled to the applications. Since he is currently the sole named applicant, I need make no order in this regard.

294 I invite the parties' submissions on the matter of costs.

295 Any appeal must be lodged within 28 days after the date of this decision.

Dr J E PORTER
Chief Hearing Officer, acting for the Comptroller